



NEW CONSTRUCTION 2021

TECHNICAL REFERENCE MANUAL

Implementation of ANSI/GBI 01-2021: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations

VERSION 1.0 FEBRUARY 2022

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Green Globes[®] for New Construction Overview

Introduction

Green Globes is a well-established green building guidance and assessment program that offers a practical and affordable way to advance the environmental performance and sustainability of a wide variety of building types. Green Globes for New Construction 2021 (Green Globes NC 2021) is implementation of ANSI/GBI 01-2021: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations, which was approved by ANSI 9/03/2021, and is designed to be a rating system specifically for new construction, major renovations, and additions.

Green Globes NC 2021 is a smart alternative for assessing and certifying design and construction owing to these five key attributes:

- A comprehensive environmental assessment protocol using accepted criteria
- Best practices guidance for designing sustainable new construction, major renovations, and additions
- A practical and cost-effective approach using licensed, independent third-party professionals as assessors to work with owners and design teams
- Implementation of *ANSI/GBI 01-2021: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations*, the only national consensus green building standard for new commercial construction, developed in 2010 and updated in 2021 by the Green Building Initiative
- Recognition by the U.S. General Services Administration and the U.S. Department of Defense

Implementation of ANSI/GBI 01-2021 Green Globes Assessment Protocol for Design, New Construction, and Major Renovations

Green Globes for New Construction 2021 is implementation of *ANSI/GBI 01-2021: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations*, which was approved by ANSI September 3, 2021. 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.

The ANSI/GBI 01-2021 Standard applies to a broad range of commercial building types, including offices, multifamily, health care, schools, universities, labs, industrial, retail, etc., to major renovations as defined in Appendix B: 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 ANSI/GBI 01-2021 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.

The ANSI/GBI 01-2021 Standard shall not be used to circumvent 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.

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: User, Producer, and General Interest. The seven Subcommittees are: Project Management, Energy, Site, 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 www.thegbi.org/ANSI.

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.

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

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 Technical Manual under Informational References, Recommended Documents, Assessment Guidance, and ToolTips.

Topics covered in Green Globes NC 2021 include:

Project Management

- Site and Building Resilience
- Moisture Control Analysis
- Two paths for Building Commissioning or Systems Manual & Training

Site

- Transportation
- Stormwater Management
- Urban-Wildland Interface Design

Energy

- Three paths provided for Assessing Energy Performance
- Renewable Energy clarified
- Sub-metering

Water Efficiency

- Four paths for Indoor Domestic Plumbing
- Alternate Sources of Water

- Metering

Materials

- Whole Building Life Cycle Assessment
- Construction Waste
- Post Occupancy Solid Waste Recycling

Indoor Environment

- Air Ventilation and Quality,
- Thermal Comfort
- Acoustic Comfort

Green Globes for New Construction

The Green Globes NC 2021 assessment begins with the completion of a user-friendly online questionnaire that helps architects, engineers, construction professionals, owners, and building operators evaluate and improve the environmental impact and sustainability of their project.

Green Globes helps building teams focus on sustainability, providing options when considering implementation of best practices. When combined with the third-party assessment process, Green Globes' value-added features provide a streamlined and affordable approach to assessing the environmental sustainability of building projects, leading to operating cost savings.

Who Should Use This Program

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 as previously described.

ANSI/GBI 01-2021: 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 www.thegbi.org/ANSI or contact GBI's Secretariat at comment@thegbi.org.

Environmental Assessment Areas

Green Globes NC 2021 ensures that environmental impacts and key sustainability issues are comprehensively assessed using a 1,000-point scale among six categories; Project Management, Site, Energy, Water Efficiency, Materials, and Indoor Environment. Each category utilizes weighted criteria assigning points to criteria based upon the impact to sustainability.

Building Certification

A third-party assessment conducted by a GBI-trained assessor (aka "Green Globes Assessor") is required for a Green Globes NC 2021 rating and certification. Assessors with expertise in green building design, engineering, and construction interface with project teams and building owners during the assessment process by reviewing and evaluating documentation, conducting site visits, and creating comprehensive assessment reports.

Items from the "**Recommended Documentation**" listed are typical documents that Green Globes Assessors will use prior to, or in conjunction with, a post-construction site visit and walk-through to assess compliance, although additional documentation may be requested or substituted prior to, or during, the site visit.

To become Green Globes-certified, each project must achieve a minimum of 35% of the total applicable points. Certified projects are assigned a rating of One to Four Green Globes, which is reflected in a final report and certificate issued by GBI.

Green Globes for New Construction Process

Green Globes for New Construction (NC) is part of the Green Building Initiative's (GBI) suite of Green Globes programs. The Green Globes NC 2021 assessment includes completion and review of the Green Globes NC 2021 Questionnaire as part of a Preliminary Assessment and a Final Assessment. The questionnaire and assessments aid the Integrated Design Process (IDP) team throughout the design process per the unique goals and needs of each individual project.

Green Globes NC 2021 Questionnaire

The first step is to register the project with GBI and order a third-party assessment. After purchase and receipt of payment, GBI provides questionnaire access to the client, who will complete it with the help of the project IDP team. The questionnaire collects information on a variety of environmental and sustainable characteristics, programs, policies, and technologies. The questionnaire is a helpful tool, but the strength and benefits of the program are best achieved when completing the questionnaire in tandem with a third-party assessment.

Preliminary Assessment

The Design Review is a third-party assessment of the project's construction documents. This review can take place at any point during the process after documents are available. If the client desires, the review may happen prior to 100% completion of the construction documents set. When the Preliminary Assessment Questionnaire and supporting documentation are ready for assessor review, the client (or client's project manager) submits the questionnaire to GBI, who assigns a third-party Green Globes Assessor to perform the Design Review. The client works with the assigned assessor to deliver all needed documentation. The Green Globes Assessor reviews the questionnaire and submitted documentation to verify point awards.

When the review is complete, the assessor will create a Preliminary Assessment Report that will be accessible from the project dashboard. The report will include score details, point variances, verification required, recommendations, and preliminary rating. GBI reviews the Preliminary Assessment Report (in the project dashboard) and when approved issues it to the client. The client reviews the report and shares the results with their team. The Preliminary Assessment is a non-binding assessment, meaning the results are preliminary not final. To be eligible for certification and subsequent rating, a project must complete the Final Assessment.

Final Assessment

The Final Assessment is a third-party assessment of the project's completed construction. A completed Preliminary Assessment is required prior to a Final Assessment. The final Green Globes rating and certification is based upon the assessor's site visit results, including review of additional supporting documentation, as necessary. If changes were made to the building design since the completion of the Preliminary Assessment, the client will update the Final Assessment Questionnaire and provide updated verification documentation as needed.

When construction is essentially complete (through the punch list) and the team is ready to schedule the site visit, the client submits the updated Final Assessment Questionnaire and contacts GBI to provide the preferred timing of onsite visit. GBI schedules a third-party Green Globes Assessor to perform the onsite visit and emails a formal scheduling letter to the client and assessor. The letter includes the contact information for both to facilitate direct contact. Whenever possible, GBI assigns the same assessor for both the Design Review and Final Assessment. Please note that the in-person site visits typically require 30 days advance notice. In the weeks leading up to the site visit, the assigned assessor contacts the client to discuss the itinerary and specific details of the assessment.

Typically, the site visit begins with an introductory meeting in which the assessor can interview the key project players (Architect, MEP Engineers, Project Manager/Owner, General Contractor, etc.). Someone knowledgeable about all aspects of the project should be onsite during the entire visit to ensure the assessor receives the information needed to verify any outstanding criteria. Afterward, one or two people can guide the assessor through the building. If any follow-up documentation is requested during the site visit, it should be sent to the assessor within one week.

GBI also offers two alternatives to a site visit, depending upon circumstances for the project: a virtual site visit which works similarly to a site visit but is handled remotely (typically using a tablet), and a final document review which is available in rare cases.

After the visit, the assessor creates a Final Assessment Report that is from the project dashboard. The report includes score details, point variances, recommendations, and the final Green Globes Rating. GBI reviews both the Final Assessment Report (in the project dashboard) and the Final Assessment Report (PDF) and, when approved, issues them to the client.

Figure 1: Preliminary / Final

Assessment Process



Green Globes Program Features

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 point distribution weights the Assessment Areas as follows:

- Project Management (100 points)
- Site (150 points)
- Energy (260 points)
- Water Efficiency (190 points)
- Materials (150 points)
- Indoor Environment (150 points)

The revised Standard, as is consistent with ANSI/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. Every building that achieves Green Globes certification under these proposed revisions must achieve a minimum of 35% of points overall.

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 Two, Three, or Four Green Globes.

Weighted Criteria

The Green Globes 1000-point scale allows for weighted criteria, wherein the assigned number of points for individual criteria reflects their relative impact and/or benefit on the sustainability of the building. For example, energy is considered to be the most important area so it carries the highest point value of all the Green Globes assessment areas within the New Construction (NC), Existing Building (EB), and Sustainable Interiors (SI) programs. This method emphasizes sustainable design while minimizing unnecessary "point chasing" for criteria that are outside of the project scope or provide relatively little environmental benefit.

No Prerequisites

Prerequisites are contrary to the objectivity and scientific accuracy of the Green Globes programs. They can be penalizing and result in building projects being excluded from green building assessment and certification. Green Globes aims to be inclusive and recognize sustainable achievements in all areas. A building is eligible for Green Globes certification when it achieves the 35% of the applicable points (1,000 maximum points less non-applicable points).





Third-Party Assessor

Green Globes Assessors are sustainability experts, generally with more than 10 years of applicable industry experience, who have successfully completed GBI's Green Globes Assessor Training Program. Once certified, Green Globes Assessors are authorized to perform Green Globes and Guiding Principles Compliance assessments for GBI as independent contractors. Their professional judgment is critical in the assessment process to verify point awards, to determine criteria applicability, and to provide sustainability recommendations within their assessment report. Once assigned, the client has direct access to contact the assessor for assessment guidance. Although GBI assigns Green Globes Assessors to projects, the assessor decisions and recommendations are not revised or redirected by GBI, thus ensuring assessor autonomy and their third-party status.

Achievement Levels

Green Globes Levels One, Two, Three, and Four are specified in Table 1 below:

Table 1: Achievement Levels

Green Globes Rating	Percentage of Points Achieved Out of Applicable Points	Description
	85-100%	Demonstrates world-class leadership in resource efficiency and reduced environmental impacts.
	70-84%	Demonstrates outstanding leadership in resource efficiency and reduced environmental impacts and a commitment to continual improvement.
	55-69%	Demonstrates noteworthy progress applying best practices toward resource efficiency and reducing environmental impacts.
	35%-54%	Demonstrates movement beyond awareness and a commitment to resource efficiency and reducing environmental impacts.

Minimum Requirements

GBI sets minimum requirements for its Standard and rating systems based on commonly valued environmental and efficiency outcomes, benchmarking against other global rating systems, analysis of federal, state/provincial, and local policies, as well as from public input. The Standard recognizes that:

1. Jurisdictions set their own minimum requirements, which may include requiring a specific Green Globes rating (e.g., One Green Globes, Two Green Globes, Three Green Globes, or Four Green Globes) and/or requiring that specific criteria be achieved.
2. GBI is an international organization and must consider a variety of markets in setting minimum requirements.

Existing minimum requirements are represented by the following statement:

To achieve compliance and final certification under the ANSI/GBI 01-2021 Standard and when using Green Globes® rating systems, each project must meet all jurisdictional requirements, achieve at least 35% of applicable points out of 1000 possible points, and complete third-party assessment by the certifying body, the Green Building Initiative, sole owner of the global rights to Green Globes. Specific protocols under the Green Globes suite of tools, such as the Green Globes Multifamily or Multifamily Performance Plus protocols, have additional and more stringent minimum requirements (e.g., energy savings of greater than 15% better than a baseline must be demonstrated). Rating systems and protocol minimum requirements for certification are updated from time to time following a [public input process](#). To obtain information on Green Globes minimum compliance requirements, please visit www.thegbi.org or inquire at info@thegbi.org.

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, Senior Manager, 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.

Non-Applicable Criteria

Within the Green Globes questionnaire, many criteria include a "non-applicable" (N/A) response selection. This provision increases the flexibility of the tool as points that are impossible or unreasonable for a building to achieve do not result in a penalty as they would if the criteria yielded a "No" response. This feature encourages a more regional approach and recognizes differences—and potential conflicts—between various local codes and standards. Selecting "Not Applicable" may be appropriate in the following circumstances as denoted in Table 2:

Table 2: Minimum Achievement Requirements

Reasons for Use of Non-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.

The user should only select an available N/A response within the questionnaire when there is a compelling, technical reason to do so. The non-applicable provision is not to be used when project teams/clients decide not to incorporate sustainability items that are part of the criteria measured in the assessment. In those cases, the client should select a "No" response, or reconsider incorporating more sustainable features and answer the question accordingly.

The Green Globes third-party assessor will validate all "N/A" responses during the third-party assessment based on four primary justifications: 1) Regional/climatic applicability; 2) Jurisdictional/code conflict or inconsistency; 3) Building occupancy type; and 4) Criteria that address a facility, design feature, or building appurtenance that is not designated or used for that particular project space, or is completely outside the control or influence of the client. Utilizing these four justifications, the Green Globes Assessor has the flexibility to use their professional judgment to categorize additional criteria as non-applicable.

Incremental Point Awards & Partial Credit

For some Green Globes criteria, there are threshold values, which allow the incremental award of points depending on the level of achievement. In these cases, reaching a higher threshold earns relatively more points. The third-party assessors are permitted to use their professional judgment to award partial credit where deserved, even when the thresholds don't exist within the program.

The incorporation of these flexibility features; 1000-point scale, weighted criteria, no pre-requisites, non-applicable criteria, incremental point awards, and partial credit results in the highest possible accuracy of the final Green Globes score and rating. This flexibility recognizes the vast differences in building types and represents an accurate look at the nuances of every tenant improvement project.

Environmental Assessment Areas & Point Allocation

Table 3 identifies (left-to-right) the Green Globes ID number (as found in the online Green Globes for New Construction 2021 questionnaire), ANSI/GBI 01-2021 ID number (for easier reference to the Standard), Environmental Assessment Areas and Section titles, and maximum points available.

Table 3: Environmental Assessment Areas, Sections, & Point Allocations

Green Globes ID	ANSI/GBI 01-2021 ID	AREA/Section/Sub-section	Max Points
1	6	PROJECT MANAGEMENT	100
1.1	6.1	Team & Owner Planning	45
1.2	6.2	Environmental Management During Construction	8
1.3	6.3	Life Cycle Cost Analysis or Building Service Life Planning	12
1.4	6.4	Moisture Control Analysis	6
1.5	6.5	Commissioning or Systems Manuals & Training	29
2	7	SITE	150
2.1	7.1	Development Area	35
2.2	7.2	Transportation	31
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3.2	8.2	Non-Modeled Energy Efficiency Impacts	15
3.3	8.3	Metering, Monitoring, and Measurement	25
3.4	8.4	Renewable Sources of Energy	40
4	9	WATER EFFICIENCY	190
4.1	9.1	Indoor Domestic Plumbing	54
4.2	9.2	Cooling Towers	22
4.3	9.3	Boilers and Hot Water Systems	9
4.4	9.4	Water Intensive Applications	19

Green Globes ID	ANSI/GBI 01-2021 ID	AREA/Section/Sub-section	Max Points
4.5	9.5	Water Treatment	4
4.6	9.6	Alternate Water Sources	25
4.7	9.7	Metering	20
4.8	9.8	Leak Detection	10
4.9	9.9	Irrigation	27
5	10	MATERIALS	150
5.1	10.1	Whole Building Life Cycle Assessment	20
5.2	10.2	Product Life Cycle	39
5.3	10.3	Product Risk Assessment	10
5.4	10.4	Sustainable Materials Attributes	15
5.5	10.5	Reuse of Existing Structures and Materials	30
5.6	10.6	Waste	26
5.7	10.7	Resources Conservation	10
6	11	INDOOR ENVIRONMENT	150
6.1	11.1	Air Ventilation and Quality	35
6.2	11.2	Source Control and Measurement of Indoor Pollutants	34
6.3	11.3	Lighting Design and Systems	32
6.4	11.4	Thermal Comfort	23
6.5	11.5	Acoustical Privacy and Comfort	26

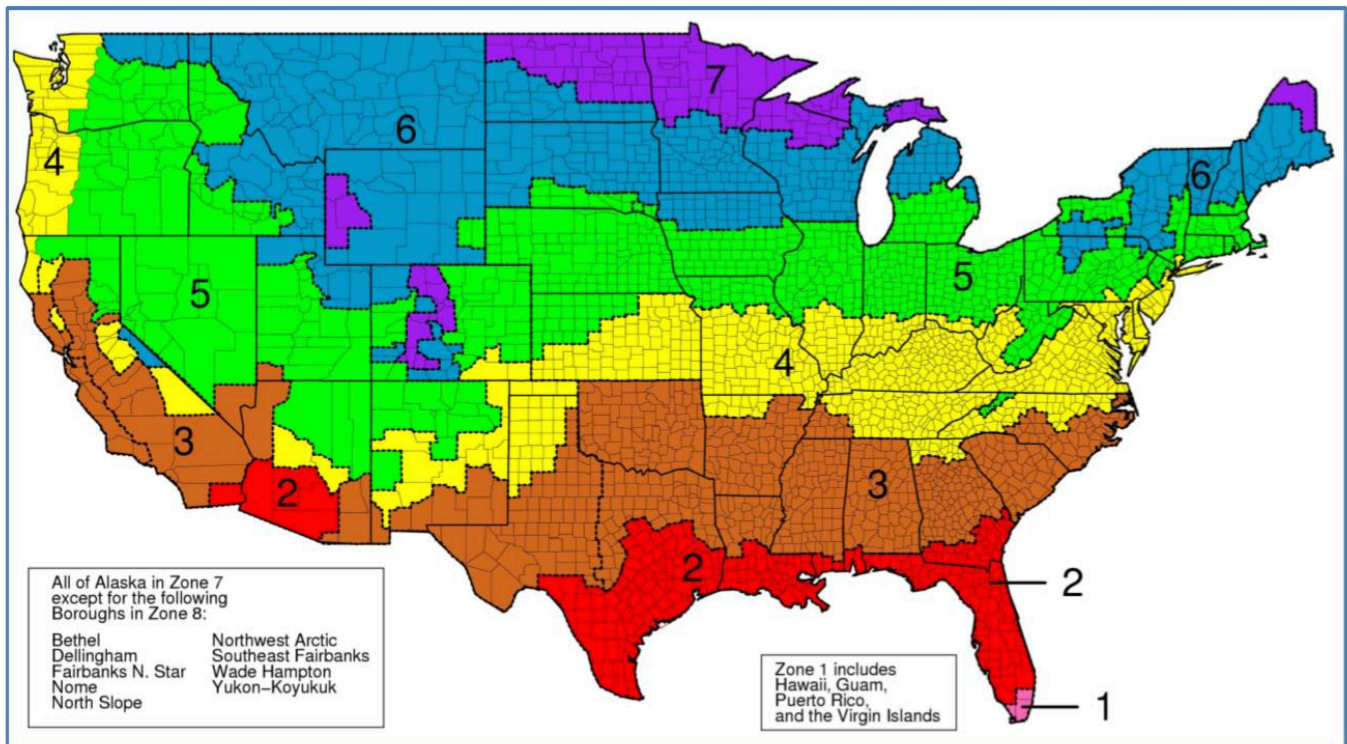
Additional Information and Footnotes

Additional Information

Some helpful hints before filling out the online questionnaire:

- For definitions used throughout this text, see Glossary at the end of this document.
- To determine which climate zone a project is in, reference a Climate Zone map, which can be found in multiple documents, including ASHRAE 90.1 (Energy Standard for Buildings Except Low-Rise Residential Buildings), the International Energy Conservation Code (IECC), and the International Green Construction Code (IgCC). A simplified version of the map is shown below for reference. If the project's climate zone can't be determined from the map, consult the references above for a list of cities and their zones.

Figure 2: ASHRAE Climate Zones map⁴



- Items from the "Recommended Documentation" list at the end of each criterion are typical documents that the Assessors will evaluate prior to or in conjunction with the Final Assessment, though other documentation may be requested or substituted. The more documentation that can be provided to the Assessor prior to the Final Assessment, the more productive the site visit can be.

- The project should incorporate development and simulation of at least one energy model in order to satisfy the requirements of several criteria in the Energy section in addition to the 3.1.1 Energy Performance subsection. Owners should be aware of this requirement prior to deciding to pursue Green Globes certification. Provisions should be made with one of the design firms or with an outside consultant to include at least one energy model in their scope of work. The number of iterations and the detail level of the model(s) will need to be determined by the project manager/sustainability consultant based on which criteria will be pursued that require information or results from the energy model(s).

Footnotes

1. **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, requirements, and administration of 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.
2. **Preliminary/Final Assessment Questionnaire:** there is one Green Globes for New Construction online Questionnaire that is completed twice by the project team as part of the full Green Globes Assessment process, which includes a Preliminary Assessment based on design and a Final Assessment including onsite visit (with options for virtual site visit or final document review in rare cases).
3. **approved:** acceptable to the code official or authority having jurisdiction.
4. Reprinted with permission from ASHRAE/IES Standard 90.1-2013, © 2013 by ASHRAE, www.ashrae.org/standard901

Project Management

100

Team & Owner Planning

45

Performance & Green Design Goals

20

1.1.1.1 (ANSI #6.1.1.1)

Are there written performance goals for the following?

Assessment Guidance

Performance and green design goals (qualitative AND/OR quantitative) must be established in collaboration with the owner in writing and regularly assessed from pre-design through to completion of construction and occupancy. One point is earned for each written performance and green design goal for the following listed items at pre-design (maximum of 8 points):

- Site design;
- Environmentally responsible construction activities;
- Water conservation, efficiency, alternate water sources, and reuse;
- Building envelope and moisture control;
- Energy efficiency;
- Materials including:
 - o Efficiency;
 - o Environmentally preferable products; and
 - o Storage of hazardous materials;
- Indoor environment including:

- o Acoustic comfort;
 - o Thermal comfort;
 - o Lighting;
 - o Air quality; and
- Building resilience

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Recommended Documents

- *Owner's Performance Requirements (OPR)*
- *List of written performance and green design goals*

Scoring Matrix

Response	Score	Max Points
0	0	8
1	1	8
2	2	8
3	3	8
4	4	8
5	5	8
6	6	8
7	7	8
8	8	8



1.1.1.1 (ANSI #6.1.1.1)

- Site Design

1.1.1.2 (ANSI #6.1.1.2)

- ↳ •Environmentally responsible construction activities

1.1.1.3 (ANSI #6.1.1.3)

- ↳ •Water conservation, efficiency, alternate water sources, and reuse

1.1.1.4 (ANSI #6.1.1.4)

- ↳ •Building envelope and moisture control

1.1.1.5 (ANSI #6.1.1.5)

- ↳ •Energy efficiency

1.1.1.6 (ANSI #6.1.1.6)

- ↳ •Materials, including efficiency, environmentally preferable products, and storage of hazardous materials

1.1.1.7 (ANSI #6.1.1.7)

- ↳ •Indoor environment, including acoustic comfort, thermal comfort, lighting, and air quality



1.1.1.8 (ANSI #6.1.1.8)

- Building resilience

1.1.1.2 (ANSI #6.1.1.1)

Is there evidence of reviews and assessment of goals prior to each of the following design stages?

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Scoring Matrix

Response	Score	Max Points
0	0	3
1	1	3
2	2	3
3	3	3

1.1.1.2.1 (ANSI #6.1.1.1)

- ↳ •Conceptual design

1.1.1.2.2 (ANSI #6.1.1.1)

- ↳ •Design development

1.1.1.2.3 (ANSI #6.1.1.1)

- Construction documents



1.1.1.3 (ANSI #6.1.1.1)

Is there evidence of review and assessment at the following stages?

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Scoring Matrix

Response	Score	Max Points
0	0	4
1	1	4
2	2	4
3	3	4
4	4	4

1.1.1.3.1 (ANSI #6.1.1.1)

- Pre-construction



1.1.1.3.2 (ANSI #6.1.1.1)



•25% completion

1.1.1.3.3 (ANSI #6.1.1.1)

↳ •50% completion

1.1.1.3.4 (ANSI #6.1.1.1)

↳ •Substantial completion

1.1.1.4 (ANSI #6.1.1.1)

Is there a written plan and contract for post-occupancy review and assessment?

- Yes (5 points)

- No (0 points)

Assessment Guidance

The owner must obtain the 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.

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5

Integrated Design Process

14

1.1.2.1 (ANSI #6.1.2.1)

Which of the following job functions were represented at the Pre-Design Event?

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Recommended Documents

- *Progress meeting agendas, attendance rosters showing function of each attendee, and meeting minutes*

Scoring Matrix

Response	Score	Max Points
1-5	0	5
6-9	3	5
10-20	5	5

1.1.2.1.1 (ANSI #6.1.2.1)

- ↳ •Architect

1.1.2.1.2 (ANSI #6.1.2.1)

- ↳ •Building Envelope Specialist

↳

1.1.2.1.3 (ANSI #6.1.2.1)

•Civil Engineer

1.1.2.1.4 (ANSI #6.1.2.1)

↳ •Commissioning Agent

1.1.2.1.5 (ANSI #6.1.2.1)

↳ •Community Representative

1.1.2.1.6 (ANSI #6.1.2.1)

↳ •Electrical Engineer

1.1.2.1.7 (ANSI #6.1.2.1)

↳ •Energy Engineer

1.1.2.1.8 (ANSI #6.1.2.1)

↳ •Facilities Manager

1.1.2.1.9 (ANSI #6.1.2.1)

↳ •General Contractor / Construction Manager

1.1.2.1.10 (ANSI #6.1.2.1)

↳

•Industrial Hygienist or Occupational Health and Safety Professional

1.1.2.1.11 (ANSI #6.1.2.1)

↳ •Infection Control Preventionist

1.1.2.1.12 (ANSI #6.1.2.1)

↳ •Interior Designer

1.1.2.1.13 (ANSI #6.1.2.1)

↳ •Irrigation Designer

1.1.2.1.14 (ANSI #6.1.2.1)

↳ •Landscape Architect or Designer

1.1.2.1.15 (ANSI #6.1.2.1)

↳ •Lighting Designer / Illuminating Engineer

1.1.2.1.16 (ANSI #6.1.2.1)

↳ •Mechanical Engineer (Plumbing, HVAC, Refrigeration)

1.1.2.1.17 (ANSI #6.1.2.1)

↳ •Owner's Representative

1.1.2.1.18 (ANSI #6.1.2.1)

- ↳ •Structural Engineer

1.1.2.1.19 (ANSI #6.1.2.1)

- ↳ •Sustainability Consultant

1.1.2.1.20 (ANSI #6.1.2.1)

- ↳ •User Group Representative

1.1.2.2 (ANSI #6.1.2.1)

How many job functions were represented during the Conceptual or Design Phase?

- 10 or more (3 points)

- 6 to 9 (1 points)

- Fewer than 6 (0 points)

Assessment Guidance

Job functions include the following:

- Architect;
- Building Envelope Specialist;
- Civil Engineer;
- Commissioning Agent;
- Community Representative;
- Electrical Engineer;

- Energy Engineer;
- Facilities Manager;
- General Contractor/Construction Manager;
- 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.

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Recommended Documents

- *Progress meeting agendas, attendance rosters showing function of each attendee, and meeting minutes*

Scoring Matrix

Response	Score	Max Points
10 or more	3	3
6 to 9	1	3
Fewer than 6	0	3

1.1.2.3 (ANSI #6.1.2.1)

How many job functions were represented during the Construction Documents phase?

- 10 or more (3 points)
-

- 6 to 9 (1 points)
-

- Fewer than 6 (0 points)

Assessment Guidance

Job functions include the following:

- Architect;
- Building Envelope Specialist;
- Civil Engineer;
- Commissioning Agent;
- Community Representative;
- Electrical Engineer;
- Energy Engineer;
- Facilities Manager;
- General Contractor/Construction Manager;

- 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.

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Recommended Documents

- *Progress meeting agendas, attendance rosters showing function of each attendee, and meeting minutes*

Scoring Matrix

Response	Score	Max Points
10 or more	3	3
6 to 9	1	3
Fewer than 6	0	3

1.1.2.4 (ANSI #6.1.2.1)

How many job functions were represented during the Final Budget or Guaranteed Maximum Price (GMP) Review?

- 10 or more (3 points)

- 6 to 9 (1 points)

- Fewer than 6 (0 points)

Assessment Guidance

Job functions include the following:

- Architect;
- Building Envelope Specialist;
- Civil Engineer;
- Commissioning Agent;
- Community Representative;
- Electrical Engineer;
- Energy Engineer;
- Facilities Manager;
- General Contractor/Construction Manager;
- 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.

References

- *ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design*

Recommended Documents

- *Progress meeting agendas, attendance rosters showing function of each attendee, and meeting minutes*

Scoring Matrix

Response	Score	Max Points
10 or more	3	3
6 to 9	1	3
Fewer than 6	0	3

Site and Building Resilience

11

1.1.3.1 (ANSI #6.1.3.1)

Was a Building Risk Assessment conducted and provided to building owners and designers?

- Yes (3 points)

- No (0 points)

Assessment Guidance

A Building Risk Assessment identifies 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.

The Building Risk Assessment must be 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.

References

- [National Academies and the Climate Resilience Toolkit/Climate Explorer](#)
- [NOAA Digital Coast](#)
- *NOAA NESDIS 142 Series – Regional Climate Trends and Scenarios for the U.S. National Climate Assessment*

Recommended Documents

- *Site and building resilience narratives and/or report*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

1.1.3.2 (ANSI #6.1.3.2)

Was an assessment conducted to gauge the necessity of continuous or rapid recovery of various building functions during and after an extreme event?

- Yes (3 points)

- No (0 points)

Assessment Guidance

A Building Operational Continuity or Recovery Assessment is an assessment of the necessity of continuous or rapid recovery of various building functions during and after an extreme event has been conducted.

Recommended Documents

- *Site and building resilience narratives and/or report*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

1.1.3.3 (ANSI #6.1.3.3)

Were the findings of both the risk and building function assessments integrated into the building design parameters and reflected in the final design and construction?

- Yes (3 points)

- No (0 points)

Assessment Guidance

Project Specific Design Parameters should document the findings of both the risk and building function assessments, be integrated into the building design parameters, and be reflected in the final design and construction of the building.

1.1.3.1 and 1.1.3.2 must both be answered "Yes" for this criteria (1.1.3.3) to also be "Yes." Otherwise, mark "No."

References

- [National Academies and the Climate Resilience Toolkit/Climate Explorer](#)
- NOAA NESDIS 142 Series – Regional Climate Trends and Scenarios for the U.S. National Climate Assessment
- [NOAA Digital Coast](#)

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

1.1.3.4 (ANSI #6.1.3.4)

Was a building operation manual prepared that outlines the following?

- Actions to be taken in the event of an extreme event
 - Materials to be stockpiled if continuing occupancy is anticipated
 - A timeline for regular review
- Yes (2 points)
 - No (0 points)

References

- [National Academies and the Climate Resilience Toolkit/Climate Explorer](#)
- NOAA NESDIS 142 Series – Regional Climate Trends and Scenarios for the U.S. National Climate Assessment
- [NOAA Digital Coast](#)

Recommended Documents

- *Emergency Preparedness Manual*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Environmental Management During Construction

8

Environmental Management System (EMS)

8

1.2.1.1 (ANSI #6.2.1.1)

Were any of the following elements documented in an Environmental Management System (EMS) by the general contractor (GC) or construction manager (CM)?

Recommended Documents

- *Environmental Management Plan*

1.2.1.1.1 (ANSI #6.2.1.1.1)

↳ GC/CM Environmental Policy

- Yes (2 points)

- No (0 points)

Assessment Guidance

A GC/CM Environmental Policy must include policies and practices that support the health of humans and site-environment during construction.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

1.2.1.1.2 (ANSI #6.2.1.1.2)

↳ Designated GC/CM Environmental Management Plan and Compliance Manager

- Yes (2 points)

- No (0 points)

Assessment Guidance

A 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 mechanisms.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

1.2.1.1.3 (ANSI #6.2.1.1.3)

↳ Project Ecological and Health Risk Assessment

- Yes (2 points)
- No (0 points)

Assessment Guidance

The Project Ecological and Health Risk Assessment must be 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.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



1.2.1.1.4 (ANSI #6.2.1.1.4)

Construction management policy on smoking

- Yes (2 points)

- No (0 points)

Assessment Guidance

The construction management policy must prohibit 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.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Life Cycle Cost Analysis or Building Service Life Planning

12

LCCA or Building Service Life Planning

12

1.3.1 (ANSI #6.3.1)

There are two paths available for assessing Life Cycle Cost Analysis or Building Service Life Planning.

- 1.3.1A Path A: Life Cycle Cost Analysis - up to 12/12 points

OR

- 1.3.1B Path B: Building Service Life Plan - up to 12/12 points

- Path A: Life Cycle Cost Analysis
- Path B: Building Service Life Plan

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

Scoring Matrix

Response	Score	Max Points
Path A: Life Cycle Cost Analysis	0	0
Path B: Building Service Life Plan	0	0

↩ Criterion only visible if 1.3.1 is answered with "Path A: Life Cycle Cost Analysis"

1.3.1A.1 (ANSI #6.3.1A.1)

Path A: Life Cycle Cost Analysis

Has a life cycle cost analysis been performed that includes all of the following?

Assessment Guidance

12 points are earned only if all of the below items are checked.

References

- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 Table 10.3.2.3
- NIST Handbook 135, 1995

Recommended Documents

- *Capital asset plan and business case summary*

Scoring Matrix

Response	Score	Max Points
0-3	0	12
4	12	12



Criterion only visible if 1.3.1 is answered with "Path A: Life Cycle Cost Analysis"

1.3.1A.1.1 (ANSI #6.3.1A.1.1)



•A cost of ownership financial analysis is performed on the project's collective bundle of green features that are expected to impact:

- Project first costs;
- Operation costs;
- Other financial features of ownership.

Assessment Guidance

Green features may include energy/water conservation measures, energy/water efficiency features, maintenance best practices, and/or waste reduction.

Examples of operation costs include utility costs/savings, maintenance and repair costs, costs of replacement.



Criterion only visible if 1.3.1 is answered with "Path A: Life Cycle Cost Analysis"

1.3.1A.1.2 (ANSI #6.3.1A.1.2)



•The analysis is a life cycle cost analysis (LCCA) that compares the life time 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.



Criterion only visible if 1.3.1 is answered with "Path A: Life Cycle Cost Analysis"



1.3.1A.1.3 (ANSI #6.3.1A.1.3)

•The LCCA study period is not less than the expected life of the building or system.



Criterion only visible if 1.3.1 is answered with "Path A: Life Cycle Cost Analysis"



1.3.1A.1.4 (ANSI #6.3.1A.1.4)

- Uses projected annual energy costs for the proposed design for this LCCA.

↩ Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"

1.3.1B.1 (ANSI #6.3.1B.1)

Path B: Building Service Life Plan

Is a Building Service Life Plan implemented that includes the expected service life estimates and covers the following systems?

Assessment Guidance

The expected service life estimates include inspection and replacement during the life of the building.

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.

References

- *CSA S478-95 (R2007): Guideline on Durability in Buildings*
- *ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Section 10.3.2.3*

- *ISO 15686 (series), 2014*
- *Preparing a Building Service life plan for Green Buildings, Dru Meadows, 2014*
- *Whole Building Design Guide (WBDG), Section 01 81 10 (01120), 2001*

Recommended Documents

- *Building service life plan*

Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1A (ANSI #6.3.1B.1A)

Structural systems

- Yes (2 points)
-

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1B (ANSI #6.3.1B.1B)

Building envelope including facades, doors, and windows

- Yes (2 points)
-

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1C (ANSI #6.3.1B.1C)

Building roof system

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1D (ANSI #6.3.1B.1D)

Mechanical, electrical, plumbing, fire protection, and energy generation systems

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1E (ANSI #6.3.1B.1E)

Site hardscape

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



Criterion only visible if 1.3.1 is answered with "Path B: Building Service Life Plan"



1.3.1B.1F (ANSI #6.3.1B.1F)

Furnishing and interior fit-out

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Moisture Control Analysis

6

Moisture Control Design Analysis

6

1.4.1.1 (ANSI #6.4.1.1)

Was a moisture control design analysis performed on walls and ceilings adjacent to spaces of added moisture?

- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no spaces of added moisture.

References

- *ANSI/ASHRAE Standard 160-2009: Criteria for Moisture Control Design Analysis in Buildings*

Recommended Documents

- *Moisture Control Report*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

1.4.1.2 (ANSI #6.4.1.1)

Was moisture control design analysis performed on above-grade portions of the building envelope?

- Yes (3 points)

- No (0 points)

Assessment Guidance

Must be in accordance with ASHRAE 160-2009 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.

References

- *ANSI/ASHRAE Standard 160-2009: Criteria for Moisture Control Design Analysis in Buildings*

Recommended Documents

- *Moisture Control Report*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

Commissioning or Systems Manual & Training

29

Commissioning or Systems Manual & Training

29

1.5.1 (ANSI #6.5.1)

There are two paths available for assessing Commissioning or Systems Manual & Training.

- 1.5.1A Path A: Building Commissioning and Training - up to 29/29 points

OR

- 1.5.1B Path B: Systems Manual and Training - up to 20/29 points

- Path A: Building Commissioning and Training

- Path B: Systems Manual and Training


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

Assessment Guidance

Path B awards a maximum of 20 points out of 29 total for 1.5.1 Commissioning or Systems Manual & Training.

Scoring Matrix

Response	Score	Max Points
Path A: Building Commissioning and Training	0	0
Path B: Systems Manual and Training	0	9

 Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"

1.5.1A.1 (ANSI #6.5.1A.1)

Path A: Building Commissioning and Training

Were commissioning and building operator training conducted for the following building systems?

Assessment Guidance

Training is in accordance with ANSI/ASHRAE/IES Standard 202–2018, *Commissioning Process for Buildings and Systems*, and ASHRAE Guideline 0-2019, *The Commissioning Process*.



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.

References

- *ASHRAE Guideline 0-2019, The Commissioning Process*
- *ANSI/ASHRAE/IES Standard 202–2018, Commissioning Process for Buildings and Systems*
- *ASTM E2813-18 Standard Practice for Building Enclosure Commissioning*
- *ASTM E2947-16a Standard Guide for Building Enclosure Commissioning*

Recommended Documents

- *Final Commissioning Report, Systems Manual, training syllabus and evidence of completion*

  Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"

1.5.1A.1A (ANSI #6.5.1A.1A)

HVAC&R systems and controls

- Yes (6 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6

Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"



1.5.1A.1B (ANSI #6.5.1A.1B)

Building envelope

- Yes (6 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6



Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"

1.5.1A.1C (ANSI #6.5.1A.1C)

Lighting systems and controls

- Yes (6 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6

Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"



1.5.1A.1D (ANSI #6.5.1A.1D)

Plumbing

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"

1.5.1A.1E (ANSI #6.5.1A.1E)

Irrigation systems

- Yes (2 points)
-

- No (0 points)
-

- N/A

Assessment Guidance

Not applicable if there are no irrigation systems.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0



Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"



1.5.1A.1F (ANSI #6.5.1A.1F)

Electrical system including all renewable electrical generation

- Yes (2 points)
-

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2





Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"

1.5.1A.1G (ANSI #6.5.1A.1G)

Elevating and conveying systems

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there are no elevating/conveying systems.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0



Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"



1.5.1A.1H (ANSI #6.5.1A.1H)

Communication AND/OR Sound Masking systems

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there are no communications OR sound masking systems.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0



Criterion only visible if 1.5.1 is answered with "Path A: Building Commissioning and Training"



1.5.1A.1I (ANSI #6.5.1A.1I)

Other significant functional AND/OR energy systems that account for 10% or more of the total building energy use that have been adequately described.

- Yes (2 points)

- No (0 points)

- N/A


Assessment Guidance

The other significant functional AND/OR energy systems must be approved by the assessor and described in the final submission, as well as the total building energy use.

Not applicable if there are no other significant systems.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

 Criterion only visible if 1.5.1 is answered with "Path B: Systems Manual and Training"

1.5.1B.1 (ANSI #6.5.1B.1)

Path B: Systems Manual and Training

Is a systems manual produced in accordance with ASHRAE Guideline 0-2019, *The Commissioning Process*, Informative Annex O – Systems Manual, Sections 4 to 10, inclusive?

- Yes (10 points)

- No (0 points)

References


- *ASHRAE Guideline 0-2019, The Commissioning Process*

Recommended Documents

- *Systems Manual, training syllabus and evidence of training completion*

Scoring Matrix

Response	Score	Max Points
Yes	10	10
No	0	10

 Criterion only visible if 1.5.1 is answered with "Path B: Systems Manual and Training"

1.5.1B.2 (ANSI #6.5.1B.2)

Is conduct systems training in accordance with ASHRAE Guideline 0-2019, The Commissioning Process, Informative Annex P – Training Manual and Training Needs?

- Yes (10 points)

- No (0 points)

References

- *ASHRAE Guideline 0-2019, The Commissioning Process*

Recommended Documents

- *Systems Manual, training syllabus and evidence of training completion*

Scoring Matrix

Response	Score	Max Points
Yes	10	10
No	0	10

Site

150

Development Area

35

Urban Infill and Urban Sprawl

10

2.1.1.1 (ANSI #7.1.1.1)

Is the building 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?

- Yes (10 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	10	10
No	0	10

Greenfields, Brownfields, and Floodplains

25

2.1.2.1 (ANSI #71.2.1)

Is the building being constructed on a brownfield or remediated Superfund site?

- Yes (10 points)

- No (0 points)

Recommended Documents

- *Documentation by EPA, municipal, or other governmental authority of Superfund and Brownfield site*

Scoring Matrix

Response	Score	Max Points
Yes	10	10
No	0	10

2.1.2.2 (ANSI #71.2.2)

Does the project avoid being located on all of the following?

- | | |
|---|--|
| <ul style="list-style-type: none"> • On or adjacent to sensitive natural sites 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 • 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 • Within or adjacent to a wildland-urban interface area where established by the legislative body with jurisdiction | <ul style="list-style-type: none"> • Yes (6 points) <hr/> • No (0 points) <hr/> • N/A |
|---|--|

Assessment Guidance

Examples of a sensitive natural site include land that is forest or woodland area, savanna, prairie, wetland, undeveloped riparian zones, or wildlife corridor.

Not applicable where the legislative body with jurisdiction has not declared a wildland-urban interface area.

References

- [Executive Order 13728: Wildland-Urban Interface Federal Risk Mitigation, 2016](#)
- *ICC, 2015 International Wildland-Urban Interface Code*
- [United States Department of Agriculture, The 2010 Wildland-Urban Interface of the Continuous United](#)

Recommended Documents

- *Community resilience, climate action, or similar mitigation plan*
- *Landscaping plans*
- *Pre-construction site documentation*

- Government maps of wildland-urban interface areas
- Site civil plans and existing site civil plans

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6
N/A	0	0

2.1.2.3

There are two paths for assessing impact within the 100-year floodplain.

- 2.1.2.3A Path A: Avoids construction or site disturbance - up to 9/9 points or N/A

- Path A: Avoids construction or site disturbance (0 points)

OR

- 2.1.2.3B Path B: Floodplain best practices - up to 6/9 points

- Path B: Floodplain best practices (0 points)

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

Assessment Guidance

If no areas in the local jurisdiction fall within the 100-year floodplain, select Path A and then N/A.

Path B awards a maximum of 6 points out of 9 total for 2.1.2.3.

Scoring Matrix

Response	Score	Max Points
Path A: Avoids construction or site disturbance	0	0
Path B: Floodplain best practices	0	3



Criterion only visible if 2.1.2.3 is answered with "Path A: Avoids construction or site disturbance"

2.1.2.3A (ANSI #7.1.2.3.1)

Path A: Avoids construction or site disturbance

Does the project avoid construction or site disturbance in the 100-year floodplain?

- Yes (9 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where no areas in the local jurisdiction fall within the 100-year floodplain.

References

- ASCE/SEI 24-14 "Flood Resistant Design and Construction"(2014)
- FEMA Technical Bulletin 2/2008
- International Building Code®(IBC)

Recommended Documents

- Floodplain map
- Pre-construction site documentation
- Zoning maps
- Construction Documents

Scoring Matrix

Response	Score	Max Points
Yes	9	9
No	0	3
N/A	0	0

↩ Criterion only visible if 2.1.2.3 is answered with "Path B: Floodplain best practices"

2.1.2.3B (ANSI #71.2.3.2)

Path B: Floodplain best practices

If the project will be constructed or disturb the 100-year floodplain, will all of the below best practices concerning floodplains take place?

- 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.
 - The facility is within 0.25 mi (0.4 km) walking distance of developed residential land of at least 8 dwelling units per acre.
 - 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.
- Yes (6 points)

 - No (0 points)

Assessment Guidance

For walking distance to developed residential land, the facility also earns points if they meet the requirements of Green Globes ID 2.21.1 / ANSI ID 7.2.1.1 or 2.2.1.7 / 7.2.1.7.

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 is 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. This requirement is not applicable where no areas in the local jurisdiction fall within the 500-year floodplain.

References

- *FEMA Technical Bulletin 2/2008*
- *ASCE/SEI 24-14 “Flood Resistant Design and Construction”(2014)*

Recommended Documents

- *Floodplain map*
- *Pre-construction site documentation*
- *Zoning maps*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6

Transportation

31

Transportation

31

2.2.1.1 (ANSI #72.1.1)

Is the building entrance 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?

- Yes (10 points)

- No (0 points)

Assessment Guidance

A rapid transit stop must comprise of the following:

- Served by a transit route that offers service with single direction intervals no longer than 15 minutes during peak hours and 30-minute single direction intervals during off-peak hours for a minimum of 14 hours each weekday;
- Single direction intervals no longer than 1 hour and operating at a minimum of 14 hours at least one day each weekend.

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.

Intervals may also be called headways.

References

- *ASTM E2844-15, Standard Specification for Demonstrating that a Building's Location Provides Access to Public Transit*

Recommended Documents

- *Site civil plans, existing site civil plans, and civil engineering plans*

Scoring Matrix

Response	Score	Max Points
Yes	10	10
No	0	10

2.2.1.2 (ANSI #7.2.1.2)

Is there designated preferred parking for car/van pooling, and shelter from weather for persons waiting for transportation serving carpools or transit?

- Yes (1 points)

- No (0 points)

Recommended Documents

- Site civil plans, existing site civil plans, and civil engineering plans

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

2.2.1.3 (ANSI #7.2.1.3)

Are there alternative refueling facilities or electric charging stations located on site or within 0.25 mi (0.4 km) of the site?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where this strategy is not possible or where the project will have no parking associated with the building.

Recommended Documents

- *Site civil plans, existing site civil plans, and civil engineering plans*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

2.2.1.4 (ANSI #7.2.1.4)

Is a building entrance 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?

- *Yes (2 points)*

- *No (0 points)*

Assessment Guidance

The existing dedicated bicycle lane must comprise of the following:

- The path, lane, or associated bicycle network connects within 5 mi (8.05 km) to a transit stop as described in Green Globes ID 2.2.1.1 / ANSI ID 7.2.1.1 or to the developed residential land of at least 8 dwelling units per acre.
- There is reasonable, unobstructed access between the bicycle lane or shared use [multi-user] path and the bicycle parking facilities or the building entrance.

Recommended Documents

- *Site civil plans, existing site civil plans, and civil engineering plans*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

2.2.1.5 (ANSI #7.2.1.5)

Is a bicycle parking rack located within 50 ft. (15.24 m) of an entrance, and is it either readily visible from a main entrance, or is signage indicating the location posted at main entrances?

- Yes (1 points)

- No (0 points)

References

- *The Association of Pedestrian and Bicycle Professionals, Bicycle Parking Guidelines, 2nd Edition (2010)*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

2.2.1.6 (ANSI #7.2.1.6)

Are the following best practices for facilities for Bicycle Commuting and Long-Term Bicycle Parking available?



2.2.1.6.1 (ANSI #72.1.6.1)

Is sheltered bicycle parking provided for the following?

- At least 10% of building occupants AND shower and changing facilities are provided within the building project.

• Yes (2 points)

• No (0 points)

OR

- At least 50% of units in a multi-family residential building.

Assessment Guidance

The building occupant load must be established in accordance with the International Building Code.

Sheltered bicycle parking facilities should provide showers and changing facilities as applicable.

Recommended Documents

- *Narrative stating total expected full-time building occupants*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2



2.2.1.6.2 (ANSI #7.2.1.6.2)

Are at least 50% of the sheltered bicycle parking 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?

- Yes (2 points)

- No (0 points)

Assessment Guidance

Only applicable if 2 points are achieved for 2.2.1.6.1.

Recommended Documents

- *Narrative stating total expected full-time building occupants*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

2.2.1.7 (ANSI #7.2.1.6.3)

Is the building located within 0.25 mi (0.4 km) walking distance of a bike share facility?

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

2.2.1.8 (ANSI #7.2.1.7)

Concerning the building's Walkscore[®]:

- The building's Walkscore[®] is ≥ 90 (10 points)

- The building's Walkscore[®] is ≥ 75 to ≤ 89 (7 points)

- A building entrance is within 0.5 mi (0.8 km) walking distance of six neighborhood assets (7 points)

- A building entrance is within 0.5 mi (0.8 km) walking distance of a grocery store and three other neighborhood assets (7 points)

- None of the above (0 points)

Assessment Guidance

Neighborhood assets are open to the general public, in operation, and as a group have NAICS codes that start with a minimum of three different numbers.

References

- *ASTM E2843 - 17 Standard Specification for Demonstrating That a Building is in Walkable Proximity to Neighborhood Assets*
- [North American Industry Classification System.\(NAICS\)](#)
- [Walk Score](#)

Scoring Matrix

Response	Score	Max Points
The building's Walkscore® is ≥90	10	10
The building's Walkscore® is ≥75 to ≤89	7	10
A building entrance is within 0.5 mi (0.8 km) walking distance of six neighborhood assets	7	10
A building entrance is within 0.5 mi (0.8 km) walking distance of a grocery store and three other neighborhood assets	7	10
None of the above	0	10

Construction Impacts

34

Site Erosion

5

2.3.1 (ANSI #7.3.1)

There are two paths available 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

- Path A: Erosion and Sedimentation Control Plan

- Path B: Erosion and Sedimentation Control Specifications

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

Scoring Matrix

Response	Score	Max Points
Path A: Erosion and Sedimentation Control Plan	0	0
Path B: Erosion and Sedimentation Control Specifications	0	0



Criterion only visible if 2.3.1 is answered with "Path A: Erosion and Sedimentation Control Plan"

2.3.1A.1 (ANSI #73.1A.1)

Path A: Erosion and Sedimentation Control Plan

Is an Erosion and Sedimentation Control Plan, signed and stamped by a professional engineer or designer approved by the authority having jurisdiction, included in the construction documents?

- Yes (5 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where projects are interior-only.

References

- [U.S. Environmental Protection Agency \(EPA\) National Pollutant Discharge Elimination System \(NPDES\) Permit Programs](#)

Recommended Documents

- *Erosion and sediment control plan*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5
N/A	0	0



Criterion only visible if 2.3.1 is answered with "Path B: Erosion and Sedimentation Control Specifications"

2.3.1B.1 (ANSI #7.3.1B.1)

Path B: Erosion and Sedimentation Control

Specifications

Have the following best practices as appropriate to the site for erosion and sediment control during construction been implemented?

- Construction Site Planning and Management Measures
- Erosion Control
- Runoff Control
- Sediment Control
- Good Housekeeping/Materials Management

• Yes (5 points)

• No (0 points)

• N/A

Assessment Guidance

Examples of each of the best practices are below.

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

Good Housekeeping/Materials Management: concrete washout, general construction site waste management, spill prevention, and control plan, vehicle maintenance and washing areas at construction sites

Not applicable where the lot is larger than one acre or projects are interior-only.

References

- *U.S. EPA's Construction Site Stormwater Runoff Control - Menu of Best Management Practices*

Recommended Documents

- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5
N/A	0	0

Site Disturbance

5

2.3.2.1 (ANSI #7.3.2.1)

Do construction activities avoid going 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 are intended to specifically improve the natural integrity of the site?

- Yes (5 points)

- No (0 points)

- N/A

Assessment Guidance

Examples of construction activities intended to specifically improve the natural integrity of the site include removing invasive plant species, replacing existing hardscapes with vegetation, restoring prairie or wetlands, or increasing on-site water retention by building rain gardens, swales, retention ponds, or berms.

Not applicable where projects are interior-only.

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5
N/A	0	0

Tree and Shrub Preservation

6

2.3.3.1 (ANSI #7.3.3.1)

What percentage of the canopy of existing trees and shrubs is retained and protected during construction?

- > 90% (6 points)

- ≥75% to ≤90% (5 points)

- ≥50% to <75% (4 points)

- < 50% (0 points)

- N/A

Assessment Guidance

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.

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%).

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.

References

- [International Society of Arboriculture’s “Avoiding Tree Damage During Construction,” \(2011\)](#)
- [Invasive plant lists published by regional invasive plant councils](#)
- [Sustainable Sites Initiative, SITES v2 Rating System, \(2014\)](#)

Recommended Documents

- *Tree preservation plan or landscaping or civil engineering plans that document the protection of existing trees during construction*
- *Landscaping plans*
- *Shade site plan*
- *Ten-year hardscape shading plan*

Scoring Matrix

Response	Score	Max Points
> 90%	6	6
≥75% to ≤90%	5	6
≥50% to <75%	4	6
< 50%	0	6
N/A	0	0

Mitigating Heat Island Effect

14

2.3.4.1 (ANSI #7.3.4.1)

Does the building have a vegetated roof, is shaded during summer months, AND/OR has a roof with a high Solar Reflectance Index (SRI)?

- $\geq 40\%$ of the roof is vegetated or shaded

- $< 40\%$ of the roof has a high SRI

- Neither

- N/A

Assessment Guidance

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.

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.

Not applicable for interior-only projects.

References


- [Cool Roof Rating Council](#)
- *State and local university or college landscape reference guide*
- [USDA National Invasive Species Information Center](#)

Recommended Documents

- *Roof plans*
- *Shade site plan*

Scoring Matrix

Response	Score	Max Points
≥40% of the roof is vegetated or shaded	0	0
<40% of the roof has a high SRI	0	6
Neither	0	6
N/A	0	0

 Criterion only visible if 2.3.4.1 is answered with "≥40% of the roof is vegetated or shaded"

2.3.4.1.1 (ANSI #7.3.4.1)

What percentage of the roof has a high initial Solar Reflectance Index (SRI) as prescribed based on the slope of the roof?

- >70% (3 points)

- ≥56% to ≤70% (2 points)

- ≥40% to <56% (1 points)

Assessment Guidance

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.

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.

References

- [Cool Roof Rating Council](#)

Recommended Documents

- *Roof plans*

Scoring Matrix

Response	Score	Max Points
>70%	3	3
≥56% to ≤70%	2	3
≥40% to <56%	1	3



Criterion only visible if 2.3.4.1 is answered with "≥40% of the roof is vegetated or shaded"

2.3.4.1.2 (ANSI #7.3.4.1)

What percentage of the roof has a high three-year-aged SRI?

- >70% (3 points) _____
- ≥56% to ≤70% (2 points) _____
- ≥40% to <56% (1 points)

Assessment Guidance

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.

- 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.

Recommended Documents

- *Roof plans*

Scoring Matrix

Response	Score	Max Points
>70%	3	3
≥56% to ≤70%	2	3
≥40% to <56%	1	3

2.3.4.2 (ANSI #7.3.4.2)

What percentage of hardscape surfaces are addressed by one or more of the following strategies?

- Solar Reflectance
- Shading
- Permeable Surfaces

- ≥50% (5 points)

- ≥25% to <50% (3 points)

- <25% (0 points)

- N/A

Tooltip

2.3.4.2.1 - Solar Reflectance Index: Hardscape surfaces with a solar reflectance index (SRI) of 29 or greater. New concrete and concrete masonry without additional colored pigment are deemed to comply without additional testing.

- o 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 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)

Not applicable where there are no hardscape surfaces.

Recommended Documents

- *Site civil plans*
- *Photo-documentation*
- *Landscaping plans*
- *Ten-year hardscape shading plan*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥50%	5	5
≥25% to <50%	3	5
<25%	0	5
N/A	0	0

2.3.4.3 (ANSI #7.3.4.3)

Do at least 75% of opaque wall surfaces (by area) on the east, west, and south have a solar reflectance index (SRI) of 29 or greater, are covered by or are designed to be covered by, non-invasive vegetation AND/OR a vegetative wall during the summer months?

- Yes (3 points)

- No (0 points)

- N/A

Tooltip

New concrete or concrete masonry without additional colored pigment is deemed to comply without additional testing.

Not applicable for climate zone 6, 7, and 8.

References

- *ASTM E1980-11(2019) Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*

Recommended Documents

- *Construction Documents*
- *Pre-construction site documentation*
- *Landscaping plans*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

Bird Strikes

4

2.3.5.1.1 (ANSI #7.3.5.1)

Are there measures in place to address bird strikes?

- Yes (3 points)

- No (0 points)

Assessment Guidance

Measures to address bird strikes include, but are not limited to the following:

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 Hazard:
- Buildings located inside of, or within a clear flight path of less than 300 feet from an Urban Bird Refuge (defined below) require treatment when:
 - New buildings are constructed
 - Additions are made to existing buildings (Note: only the new construction will require treatment)
 - Existing buildings replace 50% or more of the glazing within the “bird collision zone” on the façade(s) facing the Urban Bird Refuge

Bird Collision Zone:

The portion 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.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

2.3.5.1.2 (ANSI #7.3.5.1)

Has an assessment and report on the design analysis for bird safety been conducted?

- Yes (1 points)
- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Stormwater Management

21

Stormwater Management

21

2.4.1.1 (ANSI #74.1.1)

Has a qualified professional made a stormwater management report that includes the following?

- The site retains at least the 95th percentile storm volume as per a site water balance assessment.
(17 points)

- Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment.

- Neither of the above *(0 points)*

- N/A

Assessment Guidance

The site must retain at least the 95th percentile storm volume as per a site water balance assessment, to be included in the stormwater management report.

Not applicable for interior-only projects.

References

- [U.S. Environmental Protection Agency \(EPA\) National Stormwater Calculator](#)
- *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects 2009*

Recommended Documents

- *Storm water discharge plan*
- *Soil boring reports*

- Site plans, including all areas of hardscape
- Percolation test results
- Civil AND/OR landscaping drawings indicating drainage
- Area rainfall charts

Scoring Matrix

Response	Score	Max Points
The site retains at least the 95th percentile storm volume as per a site water balance assessment.	17	17
Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment.	0	10
Neither of the above	0	17
N/A	0	0

Criterion only visible if 2.4.1.1 is answered with "Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment."

2.4.1.1 (ANSI #74.1.1.1)

Does the project meet a minimum of 80% Total Suspended Solids (TSS) removal or complies with municipal AND/OR local watershed water quality control targets?

- Yes (3 points)
- No (0 points)

Assessment Guidance

The project must meet whichever is more stringent: a minimum of 80% Total Suspended Solids (TSS) removal or complies with municipal AND/OR local watershed water quality control targets.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

↶ Criterion only visible if 2.4.1.1 is answered with "Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment."

2.4.1.1.2 (ANSI #74.1.1.2)

Is there 50% annual average total phosphorus (TP) removal assuming typical pollutant concentrations in urban runoff?

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Criterion only visible if 2.4.1.1 is answered with "Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment."

2.4.1.1.3 (ANSI #74.1.1.3)

Is there a target removal for nitrate + nitrite reduction of 40%?

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Criterion only visible if 2.4.1.1 is answered with "Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment."

2.4.1.1.4 (ANSI #74.1.1.3)

Is there a target removal of pH below 6.5?

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Criterion only visible if 2.4.1.1 is answered with "Yes, but the site does NOT retain at least the 95th percentile storm volume as per a site water balance assessment."

2.4.1.1.5 (ANSI #74.1.1.3)

Is there a target removal of alkalinity below 10 mg CaCO₃/L

- Yes (1 points) _____
- No (0 points)

Assessment Guidance

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.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

2.4.1.2 (ANSI #74.1.2)

Are hardscapes and structures located 100 ft. (30.5 m) or more from a natural body of water or natural waterway on or adjacent to the site?

- Yes (4 points) _____
- No (0 points) _____
- N/A

Assessment Guidance

Hardscapes and structures exclude pervious walkways 48 in. (121.9 cm) or less in width.

Document the distance on the site plan.

Water bodies and waterways include:

- Oceans;

- Lakes;
- Rivers;
- Streams;
- Estuaries;
- Bays;
- Wetlands;
- Springs, or seeps;
- Ravines;
- Arroyos; AND/OR
- Canyons.

Waterways may be intermittently dry provided they define channeled flow of water when wet.

Not applicable where the body of water is a retention pond or constructed wetland, or is a constructed feature that receives all stormwater runoff.

Scoring Matrix

Response	Score	Max Points
Yes	4	4
No	0	4
N/A	0	0

Landscaping

21

Landscaping

21

2.5.1.1 (ANSI #75.1.1)

Was a landscape design planned and installed as follows?

Assessment Guidance

Where an irrigation system is installed, refer to Water Efficiency, Section Green Globes #4.9, Irrigation (ANSI #9.9).

References

- [Cooperative Extension Research, Education and Extension Service \(USDA CSREES\) - Local Cooperative Extension System Offices](#)
- *State and local university or college landscape reference guide*
- *Agroforestry Note 38 – Landscape planning for environmental benefits USDA Natural Resources Conservation Service, (2008)*

2.5.1.1.1 (ANSI #75.1.1.1)

Developed by a landscape architect, certified professional landscape designer, certified horticulturalist, or other qualified professional; AND shows the natural light conditions of the site; AND structural limitations that would impact the location and growth of plants.

- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Examples of structural limitations are shading, utilities, overhangs, lights.

Not applicable where there is no room for landscaping.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

2.5.1.1.2 (ANSI #75.1.1.2)

↳ Identifies existing soil types, and the installed landscape incorporates appropriate soil preparation and drainage to support root development for vegetation planned for the site.

- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no room for landscaping.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

2.5.1.2 (ANSI #75.1.2)

What percentage of the vegetated area uses non-invasive and drought tolerant plants?

- >75% (3 points)

- ≥50 to ≤75% (2 points)

- ≥25 to <50% (1 points)

- <25% (0 points)

- N/A

Assessment Guidance

Website or literature that indicates the given plant(s) are drought-tolerant or require little to no supplemental water for the specific region is required documentation.

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.

Not applicable where there is no room for landscaping.

References

- *State and local university or college landscape reference guide*
- [USDA National Invasive Species Information Center](#)
- [Federal and state noxious weed lists](#)
- [2016 Invasive Species Compendium](#)
- [WaterSense[®]'s "What to Plant"](#)

Recommended Documents

- *Local or regional plant list*
- *Landscape and irrigation plan*

Scoring Matrix

Response	Score	Max Points
>75%	3	3
≥50 to ≤75%	2	3
≥25 to <50%	1	3
<25%	0	3
N/A	0	0

2.5.1.3 (ANSI #7.5.1.3)

What percentage of the vegetated area is covered with plants (new, retained, or salvaged plantings) that are native?

- >75% (4 points)
-

- >50 to ≤75% (3 points)
-

- >32 to ≤50% (2 points)
-

- ≥20 to ≤32% (1 points)
-

- <20% (0 points)
-

- N/A

Assessment Guidance

Not applicable where there is no room for landscaping.

Recommended Documents

- *Landscape and irrigation plan*
- *Local or regional plant list*

Scoring Matrix

Response	Score	Max Points
>75%	4	4
>50 to ≤75%	3	4
>32 to ≤50%	2	4
≥20 to ≤32%	1	4
<20%	0	4
N/A	0	0

2.5.1.4 (ANSI #7.5.1.4)

Does the landscape design show that plants with similar water requirements are grouped together on the site?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where all of the landscaping is a preserved natural area or where there is no room for landscaping.

Recommended Documents

- *Landscape and irrigation plan*
- *Local or regional plant list*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

2.5.1.5 (ANSI #7.5.1.5)

Does the building project support on-site agriculture accessible to building users or employees in any of the following ways?

Assessment Guidance

Not applicable for interior-only projects.

References

- [Pollinator Partnership, Ecoregional Planting Guides](#)
- [Xerces Society for Invertebrate Conservation, Pollinator-Friendly Plant Lists](#)

2.5.1.5.1 (ANSI #7.5.1.5.1)

↳ Rooftop garden(s), edible landscape(s), food forest, or community garden is installed on-site.

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable for interior-only projects.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

2.5.1.5.2 (ANSI #7.5.1.5.2)

↳ 25% of vegetated area is dedicated to pollinator-friendly plantings or an apiary.

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable for interior-only projects.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

2.5.1.5.3 (ANSI #7.5.1.5.3)

↳ Chicken coop, aquaponics farm, AND/OR greenhouse is installed on-site.

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable for interior-only projects.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

Light Pollution

5

Exterior Light Pollution

5

2.6.1 (ANSI #76.1)

There are two paths available for assessing exterior light pollution:

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

OR

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

- Path A: Lighting Design Performance

- Path B: Prescriptive Lighting Requirements

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

Scoring Matrix

Response	Score	Max Points
Path A: Lighting Design Performance	0	0
Path B: Prescriptive Lighting Requirements	0	0



Criterion only visible if 2.6.1 is answered with "Path A: Lighting Design Performance"

2.6.1A.1 (ANSI #7.6.1A.1)

Path A: Lighting Design Performance

Has an engineer or lighting professional created a lighting design that meets all the performance requirements of the *IDA - IES Model Lighting Ordinance (MLO), Tables A and B, 2011*.

- Yes (5 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no site lighting.

References

- *IDA – IES Model Lighting Ordinance (MLO), Tables A and B, 2011*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5
N/A	0	0



Criterion only visible if 2.6.1 is answered with "Path B: Prescriptive Lighting Requirements"

2.6.1B.1 (ANSI #7.6.1B.1)

Path B: Prescriptive Lighting Requirements

Does exterior lighting avoid exceeding prescribed values for the amount of light per unit of the area per *IDA – IES Model Lighting Ordinance (MLO), Tables A and B, 2011*?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no exterior lighting.

References

- *IDA – IES Model Lighting Ordinance (MLO), Tables A and B, 2011*

Recommended Documents

- *Cut-sheets and calculations*
- *Exterior lighting plans*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0



Criterion only visible if 2.6.1 is answered with "Path B: Prescriptive Lighting Requirements"

2.6.1B.2 (ANSI #7.6.1B.2)

Does exterior lighting trespass avoid exceeding prescribed Backlight, Uplight and Glare (BUG) ratings?

- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Prescribed ratings are per IDA – IES Model Lighting Ordinance (MLO), Table C, C1, C2, C3, 2011 for the following:

- Backlight trespass;

- Uplight trespass; and
- Glare

Not applicable where there is no exterior lighting.

References

- *IDA – IES Model Lighting Ordinance (MLO), Table C, C1, C2, C3, 2011*

Recommended Documents

- *Exterior lighting plans*
- *Path taken for compliance to the MLO*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0



Criterion only visible if 2.6.1 is answered with "Path B: Prescriptive Lighting Requirements"

2.6.1B.3 (ANSI #76.1B.3)

Does parking lot lighting avoid emitting light above 90 degrees from the vertical axis?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no parking lot lighting.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Wildland–Urban Interface Site Design

3

Wildland–Urban Interface Site Design

3

2.7.1.1 (ANSI #7.7.1.1)

Concerning wildland-urban interface site design, are all of the below items true?

- A fire protection engineer or certified fire marshal determined that the site wildland-urban interface hazard is moderate, high or extreme.

AND

- The project achieves points for Green Globes ID 2.2.11 / ANSI ID 7.2.1.1 or Green Globes ID 2.2.17 / ANSI ID 7.2.1.7 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 (2015).

- Yes (3 points)
-

- No (0 points)
-

- N/A

AND

- Excluding athletic fields and agriculture, greater than 50% of the vegetation on site achieves points for Green Globes Section 2.5.12 / ANSI 7.5.1.2 for drought tolerant plants, and greater than 50% of the vegetation on site achieves points for Green Globes Section 2.5.1.3 / ANSI 7.5.1.3 for native plants.

AND

- A fire protection engineer or certified fire marshal has inspected the completed site within 90 days prior to project certification

Assessment Guidance

Not applicable where the authority having jurisdiction or legislative body has not formally declared a wildland-urban interface area.

References

- *ICC, 2015 International Wildland-Urban Interface Code*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

Energy

260

Energy Performance

180

Assessing Energy Performance

180

3.1.1 (ANSI #8.1.1)

Three paths are provided for assessing energy performance. Path A and Path B provide a maximum of 180 points out of 180, and Path C provides a maximum of 111 points out of 180.

- 3.1.1A Path A: Performance: ANSI/ASHRAE/IES Standard 90.1-2010, Appendix G - up to 180/180 points

OR

- 3.1.1B Path B: Performance: Building Carbon Dioxide Equivalent (CO₂e) Emissions - up to 180/180 points

OR

- 3.1.1C Path C: Prescriptive - up to 111/180 points

Points cannot be combined between paths. Select a path.

- Path A: Performance - ASHRAE 90.1-2010, Appendix G

- Path B: Performance - Building CO₂e Emissions

- Path C: Prescriptive

Assessment Guidance

Path C awards a maximum of 111 points out of 180 total for 3.1.1 Assessing Energy Performance.

Scoring Matrix

Response	Score	Max Points
Path A: Performance - ASHRAE 90.1-2010, Appendix G	0	0
Path B: Performance - Building CO ₂ e Emissions	0	0
Path C: Prescriptive	0	69



Criterion only visible if 3.1.1 is answered with "Path A: Performance - ASHRAE 90.1-2010, Appendix G"

3.1.1A.1 (ANSI #8.1.1A.1)

Path A: Performance - ANSI/ASHRAE/IES Standard 90.1-2010, Appendix G

Does the building comply only with minimum performance based requirements of ANSI/ASHRAE/IES Standard 90.1-2010 or the 2012 IECC?

- Yes

AND

- No

Does the building demonstrate an improvement over an ANSI/ASHRAE/IES Standard 90.1-2010 baseline using Appendix G?

Assessment Guidance

Energy cost calculations may include price components based on time of day and demand if these are available. Credit for demand-saving measures, cogeneration, and energy storage may be claimed by utilizing rate schedules that reflect the billing rates in effect for the local utility, rather than using EIA state average utility rates.

The energy modeling report must include a narrative describing energy efficiency measures in the project along with input and output reports sufficient to verify the modeling approach used to demonstrate the higher level of performance, including key assumptions and methods used to determine the inputs. The report may include tabular summaries of:

- Building envelope performance (permit document tabulation for the enclosure, such as COMcheck forms);
- HVAC system capacities and efficiencies;
- Lighting power densities and control methods;
- Schedules for occupancy, equipment, and HVAC;
- Assumptions for plug and process loads; AND/OR
- Benchmarking comparisons for the baseline and proposed models.

In addition to the energy modeling report, include the following documentation:

- Description of any variances between models for plug and process loads.
- Documentation of basis for utility rates used in whole-building energy model.
- People moving equipment will be modeled identically in the proposed and baseline buildings, and credit taken appropriately in Section 8.4 Non-Modeled Energy Efficiency Statement of energy cost savings rounded to one-tenth of a percent.

References

- *International Energy Conservation Code (IECC) 2012*
- *ANSI/ASHRAE/IES Standard 90.1-2010*


Recommended Documents

- *Energy Modeling Report*

Scoring Matrix

Response	Score	Max Points
Yes	0	0
No	0	0



 Criterion only visible if 3.1.1 is answered with "Path A: Performance - ASHRAE 90.1-2010, Appendix G"

3.1.1A.1.1 (ANSI #8.1.1A.1)


What is the percentage improvement over baseline demonstrated by the energy model?

Scoring Matrix

Response	Score	Max Points
0	0	180
1	4	180
2	8	180
3	12	180
4	16	180
5	20	180
6	24	180
7	28	180
8	32	180
9	36	180
10	40	180
11	44	180
12	48	180
13	52	180
14	56	180
15	60	180
16	64	180
17	68	180
18	72	180
19	76	180
20	80	180

Response	Score	Max Points
21	84	180
22	88	180
23	92	180
24	96	180
25	100	180
26	104	180
27	108	180
28	112	180
29	116	180
30	120	180
31	124	180
32	128	180
33	132	180
34	136	180
35	140	180
36	144	180
37	148	180
38	152	180
39	156	180
40	160	180
41	164	180
42	168	180

Response	Score	Max Points
43	172	180
44	176	180
45-100	180	180

 Criterion only visible if 3.1.1 is answered with "Path B: Performance - Building CO₂e Emissions"

3.1.1B.1 (ANSI #8.1.1B.1)

Path B: Performance - Building Carbon Dioxide Equivalent (CO₂e) Emissions

- Yes

Does the building achieve more than a 50% reduction in carbon dioxide equivalent (CO₂e) emissions over the BER?

- No

Assessment Guidance

Reduction in carbon dioxide equivalent (CO₂e) emissions over the baseline building is calculated using the following formula:

Percent reduction in CO₂e = 100 X (1 – PER/BER), where:

- The Baseline Equivalent Emission Rate (BER) is the baseline building’s carbon dioxide equivalent (CO₂e) emission rate.
- PER is the proposed building’s carbon dioxide equivalent (CO₂e) emission rate.
- PER is less than BER.

Baseline Equivalent Emission Rate (BER) Calculations

BER is calculated using the following formula:

BER = (baseline Energy Use Intensity (EUI)) X product of [(percentage of each fuel in the annual energy fuel mix for the planned building type and location) X (CO₂e Emission Factor for each fuel)], where:

- The baseline building's site Energy Use Intensity (EUI) is determined using ENERGY STAR® Target Finder.
- The baseline building's site EUI is 35% better than the Energy Performance Rating (Target Finder) score of 50.
- The annual energy fuel mix for the baseline building is determined from DOE-EIA and reported at the top of Target Finder's Results page.
- The CO₂e emission factor for each fuel in the baseline building's annual energy fuel mix can be found in Table 8.1.1- A.

Proposed Equivalent Emission Rate (PER) Calculations

PER is calculated using the following formula:

PER = (proposed EUI) X product of [(percentage of each fuel in the annual energy fuel mix for the proposed building) X (CO₂e Emission Factor for each fuel)], where:

- The proposed building's Energy Use Intensity (EUI) is calculated using a computer-based simulation program that conforms to the requirements outlined in Section 506 of the 2009 International Energy Conservation Code or ANSI/ASHRAE/IES Standard 90.1-2010, Appendix G, Section G2.2.
- Determine the Proposed Building's Equivalent Emission Rate (PER) by performing an EUI calculation for the proposed building using the energy performance requirements specified by Table G3.1 Modeling Requirements for Calculating Proposed and Baseline Building Performance in ANSI/ASHRAE/IES Standard 90.1-2010. Only the Proposed Building Performance column is used for modeling the PER.
- Use the annual energy fuel mix planned for the proposed building for this calculation.
- The CO₂e emission factor for each fuel in the proposed building's annual energy fuel mix can be found in ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings, Table 3.1.1B.

Table 8.1.1B - A: CO₂e Emission Factors

Fuel	CO₂e Emission Factor kg/kWh (lb./kWh)
Biomass	0.026 (0.057) ²
Coal	0.379 (0.836) ⁷
Fuel oil (residual)	0.341 (0.751) ⁷
Fuel oil (distillate)	0.320 (0.706) ⁷
Gasoline	0.313 (0.689) ⁷
Grid-delivered electricity	0.630 (1.387) ⁷
<i>Grid- displaced electricity</i> ³	-0.833 (-1.835) ¹
LPG	0.272 (0.600) ⁷
Natural gas	0.219 (0.483) ⁷
<i>Off-site renewable electricity</i> ⁴	-0.758 (-1.670) ¹
<i>Waste heat</i> ⁵	0.019 (0.042) ²
<i>District chilled water</i>	0.151 (0.332) ⁷
<i>District steam</i>	0.368 (0.812) ⁷
<i>District hot water</i>	0.348 (0.767) ⁷

¹ Deru, M., P. Torcellini. 2007. Source Energy and Emissions Factors for Energy Use in Buildings. NREL/TP-550-38617, June 2007. Golden, CO. National *Renewable Energy* Laboratory.

² L2A Conservation of Fuel and Power in New Buildings other than Dwellings. April 2006. Office of the Deputy Prime Minister, United Kingdom.

³ *Grid displaced electricity* comprises all electricity generated at the building site by, for example, PV panels, wind-power, combined heat and power systems (CHP), etc. The associated CO₂e emissions are subtracted from the total CO₂e emissions for the building before determining the PER. CO₂e emissions arising from fuels used by the building's power generation system (e.g., to power the CHP plant) is included in the building's CO₂e emission calculations.

⁴ The associated CO₂e emissions from off-site renewable electricity (e.g., using *renewable energy certificates* or "green power") are subtracted from the total CO₂e emissions for the building before determining the PER. Contracts have a duration of at least three years. Only 25% of off-site renewable electricity can be credited to the proposed building's CO₂e calculation.

⁵ This includes *waste heat* from industrial processes and power stations rated at more than 10MWe and with a power efficiency of greater than 35%.

⁶ Values include direct and indirect emissions.

⁷ ASHRAE/USGBC/IES Standard 189.1-2014 Standard for the Design of High-Performance Green Buildings

For projects that have concerns about the potential results for U.S., Canada, or global projects based on applicability of Target Finder, contact GBI Chief Engineer or assigned Green Globes Assessor for an alternate compliance path.

References

- [ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings](#)

Recommended Documents

- *Energy simulation program's inputs and results*
- *ENERGY STAR Target Finder results*
- *Lighting design permit documents (e.g. COMcheck reports)*
- *PER, BER, and CO₂e emission reduction calculations*

Scoring Matrix

Response	Score	Max Points
Yes	0	0
No	0	0



Criterion only visible if 3.1.1 is answered with "Path B: Performance - Building CO₂e Emissions"



3.1.1B.1.1 (ANSI #8.1.1B.1)

What is the percentage reduction in CO₂e emissions above the baseline?

References

- [ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings](#)

Recommended Documents

- *Energy simulation program's inputs and results*
- *ENERGY STAR Target Finder results*

- *Lighting design permit documents (e.g. COMcheck reports)*
- *PER, BER, and CO2e emission reduction calculations*

Scoring Matrix

Response	Score	Max Points
0-50	0	180
51	4	180
52	8	180
53	12	180
54	16	180
55	20	180
56	24	180
57	28	180
58	32	180
59	36	180
60	40	180
61	44	180
62	48	180
63	52	180
64	56	180
65	60	180
66	64	180
67	68	180
68	72	180
69	76	180
70	80	180

Response	Score	Max Points
71	84	180
72	88	180
73	92	180
74	96	180
75	100	180
76	104	180
77	108	180
78	112	180
79	116	180
80	120	180
81	124	180
82	128	180
83	132	180
84	136	180
85	140	180
86	144	180
87	148	180
88	152	180
89	156	180
90	160	180
91	164	180
92	168	180

Response	Score	Max Points
93	172	180
94	176	180
95-100	180	180

Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1 (ANSI #8.1.1C)

Path C: Prescriptive

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.

Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.1 (ANSI #8.1.1C.1.1)

BUILDING ENVELOPE AND FORM



Thermal Resistance and Transmittance

What standard will be used to determine prescriptive requirements for opaque and fenestration elements of the building envelope?

- 2015 International Energy Conservation Code

- ANSI/ASHRAE/IES Standard 90.1-2013

Assessment Guidance

The same standard must be used to determine all factors.

References

- 2015 IECC, Section C402
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 5](#)

Scoring Matrix

Response	Score	Max Points
2015 International Energy Conservation Code	0	0
ANSI/ASHRAE/IES Standard 90.1-2013	0	0

 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.2 (ANSI #8.1.1C.1.1.1)

Do all opaque and fenestration elements of the building envelope have a window-to-wall ratio less than or equal to 40%, and meet or exceed prescriptive requirements of the 2015 IECC (section C402) or ANSI/ASHRAE/IES Standard 90.1-2013, Section 5?

- There is a 10% or greater decrease in U-factor, C-factor, F-factor, and SHGC (*10 points*)
- There is a 5-9% decrease in U-factor, C-factor, F-factor, and SHGC (*8 points*)
- The R-value/RSI-value or U-factor, C-factor, F-factor; and fenestration, U-factor, and SHGC meet or exceed the specified prescriptive requirements (*5 points*)
- They do not meet or exceed the specified prescriptive requirements (*0 points*)

Assessment Guidance

All of the opaque and fenestration elements of the building envelope must 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 through 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 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.

References

- *2012 IECC, Section C402*
- *2015 IECC, Section C402*
- [ANSI/ASHRAE/IES Standard 90.1-2013](#)

Recommended Documents


- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Fenestration ratios for north/south and east/west orientations*
- *Construction Documents*

- *List of SGHC values including calculations for overall performance*
- *List of thermal resistance or thermal transmittance factors, thermal conductance factors, and F-factors*

Scoring Matrix

Response	Score	Max Points
There is a 10% or greater decrease in U-factor, C-factor, F-factor, and SHGC	10	10
There is a 5-9% decrease in U-factor, C-factor, F-factor, and SHGC	8	10
The R-value/RSI-value or U-factor, C-factor, F-factor; and fenestration, U-factor, and SHGC meet or exceed the specified prescriptive requirements	5	10
They do not meet or exceed the specified prescriptive requirements	0	10



 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.3 (ANSI #8.1.1C.1.2.1)

Orientation

Per orientation of the building, what is the ratio of west fenestration to total fenestration and the ratio of east fenestration to total fenestration?

- The ratio is less than or equal to 1/6 (10 points)

- The ratio is greater than 1/6 but less than or equal to 1/5 (6 points)

- The ratio is greater than 1/5 but less than or equal to 1/4 (2 points)

- The ratio is greater than 1/4 (0 points)

Assessment Guidance

The building should be oriented such that the ratio of the west fenestration to the total fenestration and the ratio of the east fenestration to the total fenestration is between 1/4 and 1/6.

Recommended Documents

- *Construction Documents*
- *Fenestration ratios for north/south and east/west orientations*
- *Site plans*

Scoring Matrix

Response	Score	Max Points
The ratio is less than or equal to 1/6	10	10
The ratio is greater than 1/6 but less than or equal to 1/5	6	10
The ratio is greater than 1/5 but less than or equal to 1/4	2	10
The ratio is greater than 1/4	0	10



↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.4 (ANSI #8.1.1C.2.1.1)

LIGHTING

Interior Lighting Power

Does total interior lighting power density (LPD) comply with ANSI/ASHRAE/IES Standard 90.1-2013 or 2015 IECC?

- Compliant with ANSI/ASHRAE/IES Standard 90.1-2013 (5 points)

- Compliant with 2015 IECC (5 points)

- No (0 points)

Assessment Guidance

The total interior lighting power density (LPD) of the building must be less than the referenced standard. Base calculations for LPD on either the whole-building method or space-by-space method.

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.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)
- 2015 IECC

Recommended Documents

- *Manufacturer's product cut-sheets*
- *List of lamps specified on the project*
- *LPD calculations and results (COMcheck is one acceptable calculation method)*
- *Lighting plans with controls information or separate lighting controls plan*

Scoring Matrix

Response	Score	Max Points
Compliant with ANSI/ASHRAE/IES Standard 90.1-2013	5	5
Compliant with 2015 IECC	5	5
No	0	5

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"



3.1.1C.1.4.1 (ANSI #8.1.1C.2.1.1)

What is the total percentage beyond the requirements of either ANSI/ASHRAE/IES Standard 90.1-2013 or 2015 IECC?

Assessment Guidance

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.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)
- *2015 IECC*

Scoring Matrix

Response	Score	Max Points
0-1	0	15
2-3	1	15
4-5	2	15
6-7	3	15
8-9	4	15
10-11	5	15
12-13	6	15
14-15	7	15
16-17	8	15
18-19	9	15
20-21	10	15
22-23	11	15
24-25	12	15
26-27	13	15
28-29	14	15
30-50	15	15



 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.5 (ANSI #8.1.C.2.2.1)

Interior Automatic Light Shutoff Controls

- Yes (2 points)
-

Do all spaces have automatic controls that turn off non-twenty-four-hour lighting based on occupancy or time schedule?

- No (0 points)

- N/A

Assessment Guidance

One or more of the following provides automatic control:

- Occupancy or vacancy sensors;
- Building control system based on timer or schedule, for example:
 - 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 m²) on a single floor.

Not applicable where lighting control could endanger occupant safety in a space, patient care space, AND/OR dwelling units and guest rooms, or where local code prohibits such systems.

Recommended Documents

- *Lighting plans with controls information or separate lighting controls plan*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0



↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.6 (ANSI #8.1.1C.2.3.1)

Lighting Level Control

Do 90% or more of light fixtures in regularly occupied spaces reduce the lighting load by at least 50% from full lighting power using listed technologies?

- ≥90% of light fixtures have continuously dimmable light reduction controls (3 points)

- ≥90% of the light fixtures have multi-level lighting (2 points)

- There is bi-level lighting control (1 points)

- No (0 points)

- N/A

Assessment Guidance

In all regularly occupied spaces that use at least 0.5 W/ft² (5.4 W/m²) of lighting power, more than 90% of light fixtures must 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.

Not applicable where spaces use less than 0.5 W/ft² (5.4W/m²).

Recommended Documents

- *Lighting plans with controls information or separate lighting controls plan*

Scoring Matrix

Response	Score	Max Points
≥90% of light fixtures have continuously dimmable light reduction controls	3	3
≥90% of the light fixtures have multi-level lighting	2	3
There is bi-level lighting control	1	3
No	0	3
N/A	0	0

Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.7 (ANSI #8.1.1C.2.3.2)

Can occupants in private offices less than 250 ft² (23.23 m²) and in open office workstation areas adjust their direct overhead lighting levels via continuous dimming or multi-level lighting?

- ≥90% of light fixtures have continuously dimmable personal lighting control (3 points)
- ≥90% of the light fixtures have multi-level lighting (2 points)
- There is bi-level control of overhead lighting and separate task lights (1 points)
- No (0 points)
- N/A


Assessment Guidance

Providing bi-level overhead lighting in conjunction with separate task lighting is permitted for compliance. Not applicable for buildings that will have no private offices (less than 250 ft² (23.23 m²)) or open office workstation areas.

Scoring Matrix

Response	Score	Max Points
≥90% of light fixtures have continuously dimmable personal lighting control	3	3
≥90% of the light fixtures have multi-level lighting	2	3
There is bi-level control of overhead lighting and separate task lights	1	3
No	0	3
N/A	0	0



 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.8 (ANSI #8.1.1C.2.4.1)

Daylighting

Does the building meet the following?

- For buildings two stories or less above grade: a minimum of 50% of the total combined floor area is in a daylight area.

OR

- For buildings three or more stories above grade: a minimum of 25% of the total combined floor area is in a daylight area.

- Yes, the building meets the requirements (*3 points*)
-

- No (*0 points*)
-

- N/A

AND

Control Lighting in the primary and secondary daylight areas with daylight responsive dimming plus OFF.

Assessment Guidance

Excludes 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.

References


- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 3](#)

Recommended Documents

- *Lighting plans with controls information or separate lighting controls plan*
- *Floor plans illustrating daylight areas*

Scoring Matrix

Response	Score	Max Points
Yes, the building meets the requirements	3	3
No	0	3
N/A	0	0

 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.9 (ANSI #8.1.1C.2.4.2)

Does a minimum 2% of the roof area consist of skylights that comply with the requirements of Sections 5 and 9 of ASHRAE Standard 90.1-2013?

Earning this credit is contingent on compliance with the daylight control credit 3.1.1C.2.5 (ANSI 8.1.1C.2.5).

- $\geq 5\%$ of the roof consists of skylights (*3 points*)

- $>3\%$ to $<5\%$ of the roof consists of skylights (*2 points*)

- $\geq 2\%$ to $\leq 3\%$ of the roof consists of skylights (*1 points*)

- $<2\%$ of the roof consists of skylights (*0 points*)

- N/A

Assessment Guidance

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 3.1.1C.2.5 (ANSI 8.1.1C.2.5).

Not applicable where the building is located in Climate Zones 7 or 8.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 5](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 9](#)

Recommended Documents

- *Roof plan illustrating skylight area*

Scoring Matrix

Response	Score	Max Points
≥5% of the roof consists of skylights	3	3
>3% to <5% of the roof consists of skylights	2	3
≥2% to ≤3% of the roof consists of skylights	1	3
<2% of the roof consists of skylights	0	3
N/A	0	0



 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.10 (ANSI #8.1.1C.2.5.1)

Control for Daylit Zones

Do primary and secondary daylight zones [use 90.1-2013 definitions for daylight zones] control lighting with automatic daylight responsive lighting controls that lower the power consumption of the lighting system when daylight is available?

- There is automatic continuous daylight dimming to OFF control of all the general lighting in both primary and secondary zones (3 points)

- There is automatic daylighting switching to OFF control of the general lighting in primary zone and secondary daylight zones (2 points)

- There is no daylighting as it would be detrimental to the intended use of more than 90% of the building area (2 points)

- None of the above (0 points)

Assessment Guidance

Automatic daylight responsive lighting controls lower power consumption of the lighting system when daylight is available.

Credit for 3.1.1C.2.4 (ANSI 8.1.1C.2.4) can be earned only if points are earned for this criterion.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)

Recommended Documents

- *Lighting plans with controls information or separate lighting controls plan*

Scoring Matrix

Response	Score	Max Points
There is automatic continuous daylight dimming to OFF control of all the general lighting in both primary and secondary zones	3	3
There is automatic daylighting switching to OFF control of the general lighting in primary zone and secondary daylight zones	2	3
There is no daylighting as it would be detrimental to the intended use of more than 90% of the building area	2	3
None of the above	0	3

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.11 (ANSI #8.1.1C.2.6.1)

Exterior Luminaires and Controls

↳ Do exterior LPDs comply with or improve upon ANSI/ASHRAE/IES Standard 90.1-2013 Section 9.4.3 for exterior lighting power density?

- LPDs are 20% below ANSI/ASHRAE/IES Standard 90.1-2013 (2 points)

- LPDs meet ANSI/ASHRAE/IES Standard 90.1-2013 (1 points)

- No (0 points)

- N/A

Assessment Guidance

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.

Not applicable where there are no exterior luminaries.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)


Recommended Documents

- *Specifications for time switch/photo sensor*
- *Electrical exterior/site lighting plans*
- *Manufacturer's product cut-sheets*
- *List of lamps specified on the project*
- *LPD calculations and results*

Scoring Matrix

Response	Score	Max Points
LPDs are 20% below ANSI/ASHRAE/IES Standard 90.1-2013	2	2
LPDs meet ANSI/ASHRAE/IES Standard 90.1-2013	1	2
No	0	2
N/A	0	0



 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.12 (ANSI #8.1.1C.2.6.2)

Is pole lighting in parking lots and garage luminaires controlled such that at least 50% of the lighting power is automatically reduced during periods of no activity detected in the lighting zone?

- All garage and parking lot general lights are controlled to more than one lighting level (2 points)

- 50% of the garage and parking lot general lighting is controlled to more than one lighting level (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no garage or parking lot general lighting fixtures.

Recommended Documents

- *Lighting plans with controls information or separate lighting controls plan*

Scoring Matrix

Response	Score	Max Points
All garage and parking lot general lights are controlled to more than one lighting level	2	2
50% of the garage and parking lot general lighting is controlled to more than one lighting level	1	2
No	0	2
N/A	0	0



↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.13 (ANSI #8.1.1C.3.1.1)

HVAC SYSTEMS AND CONTROLS

Building Automation System (BAS)

Is there a central Building Automation System (BAS) encompassing all systems that affect building energy performance, lighting, and thermal comfort including all listed functionality?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

The central Building Automation System (BAS) must encompass 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
 - 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.

Not applicable where buildings are under 20,000 ft.² (1,858.06 m²).

Recommended Documents

- *BAS specifications*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.14 (ANSI #8.1.1C.3.1.2)

↳ Does the BAS have the capability to accept and collate data generated by any and all metering equipment per Section 3.3 Metering, Monitoring, and Measurement?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Section 3.3 Metering, Monitoring, and Measurement (ANSI 8.3) lists metering and sub-metering criteria from which the BAS must be able to accept and collate data.

Not applicable where buildings are under 20,000 ft.² (1,858.06 m²).

References


- [ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings, Section 8.5](#)

Recommended Documents

- *BAS specifications*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

 Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.15 (ANSI #8.1.1C.3.2.1)

Cooling Equipment

Does cooling equipment base efficiency meet ANSI/ASHRAE/IES Standard 90.1-2013 efficiency requirements with respect to COP, EER, IEER, and SEER?



OR

Does the building not use mechanical cooling?

- Performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 *(5 points)*

- Performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 *(3 points)*

- Performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 *(1 points)*

- No *(0 points)*

- N/A

Assessment Guidance

Not Applicable where 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 (<u>multisplit</u>) 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 must be 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 utilize hydronic heat rejection must 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
- Measures that allow operation at reduced fan power during part-load operation.

Heat rejection equipment must comply with minimum efficiency levels in ANSI/ASHRAE/IES Standard 90.1-2013, Table 6.8.1-7.

Table 6.8.1-10 also covers water source products.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	5	5
Performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	3	5
Performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	1	5
No	0	5
N/A	0	0

Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

↳ 3.1.1C.1.15.1 (ANSI #8.1.1C.3.2.1)

Describe the cooling equipment technology and list the manufacturer.

Assessment Guidance

HVAC systems typically account for the largest energy consumption in a building as well as contribute to occupant comfort and satisfaction.

Cooling equipment technology includes, but is not limited to, the following:

- Unitary A/C and condensing units,
- Unitary and applied heat pumps,
- Water-chilling packages,

- PTAC, PTHP, single-package vertical A/C and heat pumps, room air-conditioners, and room A/C heat pumps,
- Variable refrigerant flow A/C (multisplit) systems,
- Variable refrigerant flow air-to-air, applied heat pumps, and water source products, or
- Computer room A/C and condensing units.



↶ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.16 (ANSI #8.1.1C.3.3.1)**Heating Equipment**

Does heating equipment base efficiency meet 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

Does the building not have a heating system?

- Performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 (5 points)

- Performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 (3 points)

- Performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 (1 points)

- There is electric resistance heat (0 points)

- No (0 points)

- N/A

Assessment Guidance

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

The design engineer must provide 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 must 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.

Table 6.8.1-10 also covers water source products.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013](#)

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	5	5
Performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	3	5
Performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	1	5
There is electric resistance heat	0	5
No	0	5
N/A	0	0

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

↳ 3.1.1C.1.16.1 (ANSI #8.1.1C.3.3.1)

Describe the heating equipment technology and list the manufacturer.

Assessment Guidance

HVAC systems typically account for the largest energy consumption in a building as well as contribute to occupant comfort and satisfaction.

Heating equipment technology includes, but is not limited to, the following:

- Unitary and applied heat pumps (heating mode),
- PTHP, single-package vertical heat pumps, and room A/C heat pumps (heating mode),

- Warm-air furnaces and unit heaters,
- Gas and oil-fired boilers, or
- Variable refrigerant flow air-to-air, applied heat pumps, and water source products.

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.17 (ANSI #8.1.1C.3.4.1)

Domestic Hot Water Heaters

Do all domestic hot water heaters meet the efficiency requirements of ANSI/ASHRAE/IES STANDARD 90.1-2013, Table 7.8?

↳ OR

Are domestic hot water heaters not provided?

- Performance is 10% better than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 *(1 points)*

- There are no domestic hot water heaters *(1 points)*

- There is electric resistance heat supplied by 100% onsite renewable electricity *(1 points)*

- There is electric resistance heat *(0 points)*

- No *(0 points)*

Assessment Guidance

No points are earned where there is electric resistance heat **unless the source of electricity was documented as 100% onsite renewable electricity.**

References

- [ANSI/ASHRAE/IES STANDARD 90.1-2013, Table 7.8](#)

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Performance is 10% better than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013	1	1
There are no domestic hot water heaters	1	1
There is electric resistance heat supplied by 100% onsite renewable electricity	1	1
There is electric resistance heat	0	1
No	0	1

↶ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

↳ 3.1.1C.1.18 (ANSI #8.1.1C.3.5.1) Energy Recovery

Does the HVAC design comply with Section 6.5.6 of ANSI/ASHRAE/IES Standard 90.1-2013?

- Yes (6 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where projects meet the exemptions of Section 6.5.6.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.6](#)

Recommended Documents

- *Equipment specifications, control schedules, and diagrams*

- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6
N/A	0	0

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.19 (ANSI #8.1.1C.3.6.1)

Simultaneous Heating and Cooling

Does the HVAC design minimize or eliminate 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.

- HVAC design uses ventilation compartmentalization (6 points)
- HVAC design complies with ASHRAE 90.1-2013, Section 6.5.2 (4 points)
- No (0 points)
- N/A

Assessment Guidance

Not applicable for projects that meet the exemptions of ASHRAE 90.1-2013, Section 6.5.2.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.2](#)

Recommended Documents

- *Equipment specifications, control schedules, and diagrams*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
HVAC design uses ventilation compartmentalization	6	6
HVAC design complies with ASHRAE 90.1-2013, Section 6.5.2	4	6
No	0	6
N/A	0	0

↶ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.20 (ANSI #8.1.1C.3.7.1)



Economizers

Does the project comply with Section 6.5.1 of ANSI/ASHRAE/IES Standard 90.1-2013?

- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where projects meet the exemptions of ASHRAE 90.1-2013, Section 6.5.1.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.1](#)

Recommended Documents

- *Equipment specifications, control schedules, and diagrams*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0



↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.21 (ANSI #8.1.1C.3.8.1)

Air-Handling Equipment and Ventilation Control

Does the project use 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)?

- Yes, at 30%+ less than the allowance per Table 6.5.3.1-1 (6 points)

- Yes, at 20% to 29% less than the allowance per Table 6.5.3.1-1 (5 points)

- Yes, at 10% to 19% less than the allowance per Table 6.5.3.1-1 (4 points)

- Yes, <10% less than the allowance per Table 6.5.3.1-1 (3 points)

- No (0 points)

- N/A

Assessment Guidance

Three points are awarded for projects that comply with ANSI/ASHRAE/IES Standard 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 an additional 3 points maximum.

References

- [ANSI/ASHRAE/IES Standard 90.1-2013, Table 6.5.3.1-1](#)

Recommended Documents

- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Yes, at 30%+ less than the allowance per Table 6.5.3.1-1	6	6
Yes, at 20% to 29% less than the allowance per Table 6.5.3.1-1	5	6
Yes, at 10% to 19% less than the allowance per Table 6.5.3.1-1	4	6
Yes, <10% less than the allowance per Table 6.5.3.1-1	3	6
No	0	6
N/A	0	0

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.22 (ANSI #8.1.1C.3.8.2)

↳ Are occupancy AND/OR CO₂ sensors installed to control ventilation rates in regularly occupied spaces that may experience frequent variation in the number of occupants?

- Yes (3 points) _____
- No (0 points) _____
- N/A

Assessment Guidance

CO₂ sensors maintain calibration within 2% for one year after initial installation.

Not applicable where spaces meeting this criterion represent less than 40% of the total design ventilation volume of the building.

Recommended Documents

- *Equipment specifications, control schedules, and diagrams*
- *Mechanical design drawing, details, and specifications*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

↩ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.23 (ANSI #8.1.1C.4.1.1)

ENERGY SIMULATION AIDED DESIGN & INTEGRATIVE PROCESS

↳ Energy Simulation Aided Design

- Yes (8 points)

Was an energy simulation performed on a simplified geometric representation of the building to determine strategies to save lighting and HVAC energy before finalizing the building footprint?

- No (0 points)

Assessment Guidance

This simulation must include massing, orientation, window-to-wall ratio, and building envelope strategies.

Recommended Documents

- *The findings, as well as the name and contact information for the individual responsible for the energy modeling*

Scoring Matrix

Response	Score	Max Points
Yes	8	8
No	0	8

↶ Criterion only visible if 3.1.1 is answered with "Path C: Prescriptive"

3.1.1C.1.24 (ANSI #8.1.1C.4.2.1)

Integrative Process



Was a simulation used to inform design decisions regarding incremental equipment efficiency of building systems for the envelope, lighting, and HVAC before issuing construction documents?

- Yes (5 points)

- No (0 points)

Recommended Documents

- *The findings, as well as the name and contact information for the individual responsible for the energy modeling*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5

Non-Modeled Energy Efficiency Impacts

15

Vertical, Horizontal, and Inclined Transport Systems - Efficiency Measures

5

3.2.1.1 (ANSI #8.2.1.1)

Do building elevators use regenerative braking AND/OR machine-roomless (MRL) elevators for all passenger elevators and any regularly utilized elevators?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no elevators.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Construction Documents*
- *Drawings and specifications of vertical transport equipment*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

3.2.1.2 (ANSI #8.2.1.2)

Are the following used to enhance the energy efficiency of elevator systems?

- TWIN elevators (stacked cabins on one operating elevator in one shaft)
- One or more of the prescribed strategies are used (1 points)

AND/OR

- Elevators with a destination dispatch system (grouping people traveling to the same floor)
- There are no escalators or elevators (1 points)

AND/OR

- Elevators with a zero-power sleep mode
- No (0 points)

Assessment Guidance

Per ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings, one point is awarded where there are no escalators or elevators.

Recommended Documents

- *Construction Documents*
- *Drawings and specifications of vertical transport equipment*
- *Manufacturer’s specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
One or more of the prescribed strategies are used	1	1
There are no escalators or elevators	1	1
No	0	1

3.2.1.3 (ANSI #8.2.1.3)

Do escalators and moving walkways have the capability to slow down or stop when detectors indicate no traffic or for the use of motor efficiency controllers?

- Yes (1 points)
-

- No (0 points)
-

- N/A

Assessment Guidance

Not applicable where there are no escalators or moving walkways.

Recommended Documents

- *Construction Documents*
- *Drawings and specifications of vertical transport equipment*
- *Manufacturer's specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

3.2.1.4 (ANSI #8.2.1.4)

Are one or more of the following energy efficient equipment systems related to the movement of people in use?

- Reclaim of Machine Room Waste Heat

AND/OR

- Linear Induction Motor (LIM)

- Yes (1 points)
-

AND/OR

- AC Synchronous Guide Rail hoisting motors with integral braking and controls

- No (0 points)
-

- N/A

AND/OR

- Innovative energy efficient people-transport equipment or system (Requires statement of system description and benefits document for submittal)

Assessment Guidance

Not applicable where the building does not contain any systems capable of using this equipment.

Recommended Documents

- *Construction Documents*
- *Descriptive explanation and technical definition document on the innovative solution used within the project*
- *Drawings and specifications of vertical transport equipment*
- *Manufacturer's specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Load Shedding

5

3.2.2.1 (ANSI #8.2.2.1)

Are lighting systems installed that are capable of load shedding?

- Lighting systems can reduce power by $\geq 30\%$ from peak levels (3 points)

- Lighting systems can reduce power by $\geq 15\%$ to $< 30\%$ from peak levels (2 points)

- Lighting systems can reduce power by $< 15\%$ (0 points)

- No (0 points)

Assessment Guidance

Loading shedding may be initiated automatically or manually.

Recommended Documents

- *Description and control specifications for load shedding systems*

Scoring Matrix

Response	Score	Max Points
Lighting systems can reduce power by $\geq 30\%$ from peak levels	3	3
Lighting systems can reduce power by $\geq 15\%$ to $< 30\%$ from peak levels	2	3
Lighting systems can reduce power by $< 15\%$	0	3
No	0	3

3.2.2.2 (ANSI #8.2.2.2)

Are HVAC equipment controls installed that are capable of load shedding?

- Yes (2 points)

- No (0 points)

Assessment Guidance

Load 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.

Recommended Documents

- *Description and control specifications for load shedding systems*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Plug Load and Process Energy Management

5

3.2.3.1 (ANSI #8.2.3.1)

Do project documents include an inventory of appliances and equipment organized by location?

- There is a complete inventory of expected plug load equipment appliances, and hard-wired process equipment (2 points)

- There is a complete inventory of hard-wired process equipment only (1 points)

- There is a complete inventory of plug load equipment and appliances only (1 points)

- No (0 points)

Assessment Guidance

The inventory must include:

- Nameplate power use;
- Typical power use; and
- An expected schedule of use.

Recommended Documents

- *Appliance and equipment inventory*

Scoring Matrix

Response	Score	Max Points
There is a complete inventory of expected plug load equipment appliances, and hard-wired process equipment	2	2
There is a complete inventory of hard-wired process equipment only	1	2
There is a complete inventory of plug load equipment and appliances only	1	2
No	0	2

3.2.3.2 (ANSI #8.2.3.2)

Is there an established policy requiring all new equipment purchases be based on energy efficient criteria, such as ENERGY STAR or other equivalent energy efficiency standards?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if no equipment is subject to ENERGY STAR label criteria.

References

- [ENERGY STAR Qualified Product Lists](#)
- [Federal Energy Management Program's \(FEMP\) Energy-Efficient Product Procurement](#)

Recommended Documents

- *Purchase policy*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

3.2.3.3 (ANSI #8.2.3.3)

Is the project 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 90.1-2010?

- Energy-saving power strips are installed on $\geq 75\%$ to 100% of private offices, open offices and computer classrooms (*2 points*)

- Energy-saving power strips are installed on $\geq 50\%$ and $< 75\%$ of private offices, open offices and computer classrooms (*1 points*)

- Energy-saving power strips are installed on less than 50% of private offices, open offices and computer classrooms (*0 points*)

- No (*0 points*)

Assessment Guidance

This includes receptacles installed in modular partitions.

References

- ANSI/ASHRAE/IES Standard 90.1-2010

Recommended Documents

- *Description and control specifications for receptacle control systems*

Scoring Matrix

Response	Score	Max Points
Energy-saving power strips are installed on $\geq 75\%$ to 100% of private offices, open offices and computer classrooms	2	2
Energy-saving power strips are installed on $\geq 50\%$ and $< 75\%$ of private offices, open offices and computer classrooms	1	2
Energy-saving power strips are installed on less than 50% of private offices, open offices and computer classrooms	0	2
No	0	2

Metering, Monitoring, and Measurement

25

Metering

10

3.3.1.1 (ANSI #8.3.1.1)

What percentage of the building's total site energy is metered through any combination of building-level energy meters?

- 100% (5 points)

- ≥80% to <100% (4 points)

- ≥60% to <80% (3 points)

- ≥40% to <60% (2 points)

- ≥20% to <40% (1 points)

- ≥0% to <20% (0 points)

Assessment Guidance

One point is 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 5 points.

Recommended Documents

- *Cut sheets for meters and meter reading equipment*

Scoring Matrix

Response	Score	Max Points
100%	5	5
≥80% to <100%	4	5
≥60% to <80%	3	5
≥40% to <60%	2	5
≥20% to <40%	1	5
≥0% to <20%	0	5

3.3.1.2 (ANSI #8.3.1.1)

Is metering installed, or is there a mandatory design requirement for metering (at the building level)? Check all that apply.

3.3.1.2.1 (ANSI #8.3.1.1)

- ↳ •Electricity

3.3.1.2.2 (ANSI #8.3.1.1)

- ↳ •Heating fuels

3.3.1.2.3 (ANSI #8.3.1.1)

- ↳ •Steam

3.3.1.2.4 (ANSI #8.3.1.1)

- ↳

•Other (e.g., chilled or hot water for campus/district systems)

3.3.1.2.5 



Describe "other" meter(s):

3.3.1.3 (ANSI #8.3.1.2)

Four paths are provided for assessing sub-metering based on the building type. Path A is for building level systems sub-metering for multi-unit residential buildings (MURBs). Path B is for individual unit sub-metering for MURBs. Path C is for all non-MURB buildings. Path D is for buildings less than 20,000 ft².

- 3.3.1.3A Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering - up to 5/5 points

OR

- 3.3.1.3B Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering - up to 5/5 points

OR

- 3.3.1.3C Path C: All Other Buildings (non-MURBs), Sub-metering - up to 5/5 points

OR

- 3.3.1.3D Path D: Building is less than 20,000 ft² - 0/0 points ("N/A")

Points cannot be combined between paths. Select path applicable for the project.

Assessment Guidance

- Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering
-

- Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering
-

- Path C: All Other Buildings (non-MURBs), Sub-metering
-

- Path D: Building is less than 20,000 ft²

One point each for sub-metering five or more of the listed systems in a MURB at the building level to a maximum of 5 points. Additionally, two points each are earned when heating, cooling, and electricity are sub-metered at the individual unit level in a MURB to a maximum of 5 points.

For non-MURBs, one point is earned for each listed system where sub-metering is installed to a maximum of 5 points.

Major electric HVAC equipment 5 HP or greater include chillers, cooling towers, AHU fans, and pumps as examples.

Select Path D if the building is less than 20,000 ft².

Scoring Matrix

Response	Score	Max Points
Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering	0	0
Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering	0	0
Path C: All Other Buildings (non-MURBs), Sub-metering	0	0
Path D: Building is less than 20,000 ft ²	0	0



Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"

3.3.1.3A (ANSI #8.3.1.2)

**Path A: Multi-Unit Residential Building (MURB),
Building Level Systems Sub-metering**

Which of the following systems are sub-metered at the building level? Check all systems being sub-metered:

Assessment Guidance

One point each for sub-metering five or more of the listed systems in a MURB at the building level to a maximum of 5 points.

Major electric HVAC equipment 5 HP or greater include chillers, cooling towers, AHU fans, and pumps as examples.

Scoring Matrix

Response	Score	Max Points
0	0	5
1	1	5
2	2	5
3	3	5
4	4	5
5-7	5	5




Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.1 (ANSI #8.3.1.2)


- Lighting and lighting controls by floor or by zones with floor areas no greater than 20,000 ft² (1860 m²)

 Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.2 (ANSI #8.3.1.2)


- Plug loads by floor or by zones no greater than 20,000 ft² (1860 m²)

 Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.3 (ANSI #8.3.1.2)


- Major electric HVAC equipment (e.g., chillers, cooling towers, AHU fans, pumps) 5 HP or greater

 Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.4 (ANSI #8.3.1.2)

- Chilled water generation

 Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.5 (ANSI #8.3.1.2)

- On-site renewable energy power generation



Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.6 (ANSI #8.3.1.2)

- Heating water or steam generation



Criterion only visible if 3.3.1.3 is answered with "Path A: Multi-Unit Residential Building (MURB), Building Level Systems Sub-metering"



3.3.1.3A.7 (ANSI #8.3.1.2)

- Specialty or process electrical equipment



Criterion only visible if 3.3.1.3 is answered with "Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering"

3.3.1.3B (ANSI #8.3.1.2)

Path B: Multi-Unit Residential Building (MURB),
Individual Unit Sub-metering

Which of the following are sub-metered at the individual unit level? Check all that will be sub-metered:

Assessment Guidance

Two points each are earned when heating, cooling, and electricity are sub-metered at the individual unit level in a MURB to a maximum of 5 points.

Scoring Matrix

Response	Score	Max Points
0	0	5
1	2	5
2	4	5
3	5	5



Criterion only visible if 3.3.1.3 is answered with "Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering"



3.3.1.3B.1 (ANSI #8.3.1.2)

•Heating



Criterion only visible if 3.3.1.3 is answered with "Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering"



3.3.1.3B.2 (ANSI #8.3.1.2)

•Cooling



Criterion only visible if 3.3.1.3 is answered with "Path B: Multi-Unit Residential Building (MURB), Individual Unit Sub-metering"



3.3.1.3B.3 (ANSI #8.3.1.2)

•Electricity



Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"

3.3.1.3C (ANSI #8.3.1.2)

**Path C: Multi-Unit Residential Building (MURB),
Building Level Systems Sub-metering**

Which of the following systems are sub-metered?

Check all systems being sub-metered:


Assessment Guidance

One point is earned for each listed system where sub-metering is installed to a maximum of 5 points.

Scoring Matrix


Response	Score	Max Points
0	0	5
1	1	5
2	2	5
3	3	5
4	4	5
5-7	5	5



 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"

3.3.1.3C.1 (ANSI #8.3.1.2)


- Lighting and lighting controls by floor or by zones with floor areas no greater than 20,000 ft² (1860 m²)

 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"



3.3.1.3C.2 (ANSI #8.3.1.2)


- Plug loads by floor or by zones no greater than 20,000ft² (1860 m²)

 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"



3.3.1.3C.3 (ANSI #8.3.1.2)

- Major electric HVAC equipment 5 HP or greater


 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"



3.3.1.3C.4 (ANSI #8.3.1.2)


- Chilled water generation



 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"

3.3.1.3C.5 (ANSI #8.3.1.2)


- On-site renewable energy power generation

 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"



3.3.1.3C.6 (ANSI #8.3.1.2)


- Heating water or steam generation

 Criterion only visible if 3.3.1.3 is answered with "Path C: All Other Buildings (non-MURBs), Sub-metering"



3.3.1.3C.7 (ANSI #8.3.1.2)

- Specialty or process electrical equipment

 Criterion only visible if 3.3.1.3 is answered with "Path D: Building is less than 20,000 ft²"

3.3.1.3D

Path D: Building is less than 20,000 ft²

Is the building less than 20,000 ft²?

- Yes, building is less than 20,000 ft² (0 points)

Scoring Matrix

Response	Score	Max Points
Yes, building is less than 20,000 ft2	0	0

Monitoring and Reporting

5

3.3.2.1 (ANSI #8.3.2.1)

Is there a Resource Management Plan addressing all energy consuming areas, the listed monitoring protocols, and that also includes one or more of the following?

Assessment Guidance

An Resource Management Plan must address all energy consuming areas of a building or project, and include the following monitoring protocols (i.e., hourly, daily, monthly, seasonal, by floor, etc.):

- Electricity;
- Heating fuels;
- Steam; and
- Other (e.g., chilled or hot water for campus/district systems)

Note: "Other" may reflect new technology that uses other energy sources as long as they are measurable.

References

- *International Performance Measurement and Verification Protocol; DOE/EE-0157 (December 1997)*

Recommended Documents

- *Resource Management Plan in the Operations and Maintenance Manual for both building level and sub-metering applications*

Scoring Matrix

Response	Score	Max Points
0	0	2
1	1	2
2-3	2	2

3.3.2.1.1 (ANSI #8.3.2.1)



- Documentation provides guidance for monitoring installed systems based upon Section 4.5 of the International Performance Measurement & Verification Protocol (IPMVP).

References

- *International Performance Measurement and Verification Protocol; DOE/EE-0157 (December 1997)*

3.3.2.1.2 (ANSI #8.3.2.1)



- The plan has identified a constant feedback loop process for defining improvements in the efficiency of energy usage, based upon review and analysis of the gathered building level monitoring documentation.

3.3.2.1.3 (ANSI #8.3.2.1)



- Gathered data is provided for review by occupants and visitors with up-to-date or real-time information on space energy consumption.

3.3.2.2 (ANSI #8.3.2.2)

Is there an action plan that evaluates results of documentation defined by the Resource Management Plan and gathered by metering equipment, and that includes one or both of the following?

Assessment Guidance

Evaluation of documentation and metering equipment is to be based on 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 must also include a process for implementing changes identified by analysis of the monitoring of energy use, and address a minimum of two listed systems:

- Lighting and lighting controls by floor or by zones;
- Plug loads by floor or by zones;
- Major electric HVAC equipment (e.g., chillers, cooling towers, AHU fans, pumps) 5 HP or greater;
- Chilled water generation;
- On-site renewable energy power generation;
- Heating water or steam generation;
- Specialty or process electrical equipment.

References

- *International Performance Measurement and Verification Protocol; DOE/EE-0157 (December 1997)*

Recommended Documents

- *Description of the monthly monitoring and verification reports that will be sent to building management and the process for constant feedback evaluation for improvement*



3.3.2.2.1 (ANSI #8.3.2.2)

There are provisions in the plan that mandate the creation of improvement goals identified based on automated data collection from monitored meter usage information for two or more of the listed systems.

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

3.3.2.2.2 (ANSI #8.3.2.2)



There is a defined process for implementing improvements in energy usage to reach stated goals, based upon review and analysis for two or more of the listed systems.

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Verification

10

3.3.3.1 (ANSI #8.3.3.1)

Does documentation verify that energy data gathered, analysis performed, and computation of energy efficiency is consistent with design objectives and intent?

- Yes (9 points)

- No (0 points)

Assessment Guidance

Provide verification of the measurement of energy use and efficiency in accordance with Section 4.5 Option D – Whole Building Calibrated Simulation, of the International Performance Measurement & Verification Protocol (IPMVP): Concepts and Practices for Determining Energy Savings in New Construction, Volume III, Part I. January 2006.

Savings are determined at the whole-building level by measuring energy use at main meters or sub-meters or using whole-building simulation calibrated to measured energy use data.

References

- *International Performance Measurement and Verification Protocol; DOE/EE-0157 (December 1997)*

Recommended Documents

- *IPMVP Measurement & Verification Plan*

Scoring Matrix

Response	Score	Max Points
Yes	9	9
No	0	9

3.3.3.2 (ANSI #8.3.3.2)

Has a fault detection and diagnostic system (FDD) been installed for HVAC and lighting systems with the ability to detect the following?

- Economizer operation
- Simultaneous heating and cooling
- Photocell malfunction
- Additional HVAC and lighting setpoints

• Yes (1 points)

• No (0 points)

• N/A

Assessment Guidance

Not applicable for buildings without a Building Automation System (BAS).

Recommended Documents

- *BAS specifications*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Renewable Sources of Energy

40

On-Site Renewable Energy

30

3.4.1.1 (ANSI #8.4.1.1)

Has a study been conducted determining the technical feasibility and life cycle cost effectiveness of on-site renewable energy providing at least 2% of the total building annual energy cost?

- Yes (5 points)

- No (0 points)

References

- [Guide to Integrating Renewable Energy in Federal Construction](#)
- [National Institute of Standards and Technology \(NIST\) Building Life Cycle Cost \(BLCC\) Program](#)

Recommended Documents

- *Study and financial evaluation for implementation*
- *On-site renewable energy feasibility studies*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5

3.4.1.2 (ANSI #8.4.1.2)

Three paths are provided for assessing on-site renewable energy system(s) based on the Feasibility Study described in 3.4.1.1.

If the Feasibility Study found on-site renewable energy system(s) for at least 2% of the total building annual energy cost to be life cycle cost effective (LCCE), select Path A. If the Feasibility Study found on-site renewable energy for at least 2% of total building annual energy cost is *not* LCCE, select Path B. If there was no Feasibility Study conducted, select Path C.

- 3.4.1.2A Path A: Feasibility Study completed and on-site renewable is LCCE - up to 25/25 points

OR

- 3.4.1.2B Path B: Feasibility Study completed and on-site renewable energy is *NOT* LCCE: 25 points removed from total denominator ("N/A")

OR

- 3.4.1.2C Path C: No Feasibility Study was completed - 0/25 points

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

Assessment Guidance

-
- Path A: Feasibility Study completed and on-site renewable is LCCE

-
- Path B: Feasibility Study completed and on-site renewable energy is NOT LCCE

-
- Path C: No Feasibility Study was completed

If the Feasibility Study (as described in 3.4.1.1) was completed and implementation of on-site renewable energy system(s) for at least 2% of total building annual energy cost was found to be *not* life cycle cost effective select Path B. If no Feasibility Study was conducted, select Path C.

Scoring Matrix

Response	Score	Max Points
Path A: Feasibility Study completed and on-site renewable is LCCE	0	0
Path B: Feasibility Study completed and on-site renewable energy is NOT LCCE	0	0
Path C: No Feasibility Study was completed	0	0



Criterion only visible if 3.4.1.2 is answered with "Path A: Feasibility Study completed and on-site renewable is LCCE"

3.4.1.2A.1 (ANSI #8.4.1.2)

Path A: Feasibility Study completed and on-site renewable is LCCE

What percentage of project energy is produced by on-site renewable energy systems?

Assessment Guidance

Use the recommendations of a Feasibility Study (as described in 3.4.1.1) or other owner's project requirements to implement on-site renewable energy system(s) for at least 2% of total building annual energy cost. If the Feasibility Study was found to be life cycle cost effective (LCCE) but no on-site renewable energy systems were implemented, input "0."

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *On-site renewable energy construction documents*

Scoring Matrix

Response	Score	Max Points
0	0	25
1	1	25
2	2	25
3	3	25
4	4	25
5	5	25
6	6	25
7	7	25
8	8	25
9	9	25
10	10	25
11	11	25
12	12	25
13	13	25
14	14	25
15	15	25
16	16	25
17	17	25
18	18	25
19	19	25
20	20	25

Response	Score	Max Points
21	21	25
22	22	25
23	23	25
24	24	25
25-100	25	25



Criterion only visible if 3.4.1.2 is answered with "Path B: Feasibility Study completed and on-site renewable energy is NOT LCCE"

3.4.1.2B.1 (ANSI #8.4.1.2)

Path B: Feasibility Study completed and on-site renewable energy is NOT LCCE

Was a Feasibility Study completed and implementation of on-site renewable energy providing at least 2% of total building annual energy cost found to *not* be life cycle cost effective (LCCE)?

- Yes, on-site renewable was found to not be LCCE (0 points)

Assessment Guidance

Complete Path B only if a Feasibility Study was completed for on-site renewable energy providing at least 2% of total building annual energy cost and it was found to *not* be life cycle cost effective (LCCE).

Scoring Matrix

Response	Score	Max Points
Yes, on-site renewable was found to not be LCCE	0	0



Criterion only visible if 3.4.1.2 is answered with "Path C: No Feasibility Study was completed"

3.4.1.2C.1 (ANSI #8.4.1.2)

Path C: No Feasibility Study was completed

Was there no Feasibility Study conducted for on-site renewable energy system(s)?

- Yes, there was no Feasibility Study conducted (0 points)

Assessment Guidance

Complete Path C only if there was no Feasibility Study conducted for on-site renewable energy system(s) providing at least 2% of total building annual energy cost. If a Feasibility Study was conducted, select either Path A or Path B as applicable.

Scoring Matrix

Response	Score	Max Points
Yes, there was no Feasibility Study conducted	0	25

Off-Site Renewable Energy Credits

10

3.4.2.1 (ANSI #8.4.2.1)

What percentage of renewable energy supplies (e.g. Renewable Energy Certificates (RECs), Green Power (US Dept. of Energy), listed renewable energy credit products, or other certified RECs or carbon offsets) the building's energy (minimum 3-year commitment)?

- 100% (10 points)

- ≥90% to <100% (9 points)

- ≥80% to <90% (8 points)

- ≥70% to <80% (7 points)

- ≥60% to <70% (6 points)

- ≥50% to <60% (5 points)

- ≥40% to <50% (4 points)

- ≥30% to <40% (3 points)

- ≥20% to <30% (2 points)

- ≥10% to <20% (1 points)

- ≥0% to <10% (0 points)

Assessment Guidance

The building owner must commit to signing a contract to purchase Renewable Energy Certificates (RECs), either certified Green Power (US Dept. of Energy) listed renewable energy credit 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 utilizing 10% or greater of power from appropriate sources. Buildings using 3.1.1C Path C: Prescriptive 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.

Recommended Documents

- *Descriptive documentation of the utility provider's renewable energy sources used to provide consumable energy at the project*
- *Executed agreements on "green" power or REC contracts*

Scoring Matrix

Response	Score	Max Points
100%	10	10
≥90% to <100%	9	10
≥80% to <90%	8	10
≥70% to <80%	7	10
≥60% to <70%	6	10
≥50% to <60%	5	10
≥40% to <50%	4	10
≥30% to <40%	3	10
≥20% to <30%	2	10
≥10% to <20%	1	10
≥0% to <10%	0	10

Water Efficiency

190

Indoor Domestic Plumbing

54

Plumbing Fixture and Fitting Standards

52

4.1.1 (ANSI #9.1.1)

Where installed in the project and as permitted by local codes, plumbing fixtures and fittings must be certified and listed as being compliant with the requirements of the U.S. EPA's WaterSense Program, where WaterSense specifications exist.

Four paths are provided for assessing Indoor Domestic Plumbing.

- | | |
|--|--|
| <ul style="list-style-type: none"> • 4.1.1A Path A: ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1 - up to 52/52 points | <ul style="list-style-type: none"> • Path A: ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1 |
| OR | |
| <ul style="list-style-type: none"> • 4.1.1B Path B: 2018 International Green Construction Code (IgCC), Table 601.3.2.1 - up to 52/52 points | <ul style="list-style-type: none"> • Path B: 2018 International Green Construction Code (IgCC), Table 601.3.2.1 |
| OR | |
| <ul style="list-style-type: none"> • 4.1.1C Path C: 2020 IAPMO WEstand Section 402 - up to 52/52 points | <ul style="list-style-type: none"> • Path C: 2020 IAPMO WEstand Section 402 |
| OR | |
| <ul style="list-style-type: none"> • 4.1.1D Path D: Major Renovations - up to 45/52 points. <i>Not an eligible path for New Construction.</i> | <ul style="list-style-type: none"> • Path D: Major Renovations |
| OR | |
| <ul style="list-style-type: none"> • 4.1.1E Path E: No fixtures or fittings exist - 0/0 points ("N/A") | <ul style="list-style-type: none"> • Path E: No fixtures or fittings exist |

If no fixtures or fittings exist, select Path E.

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

Assessment Guidance

Not applicable where no fixtures or fittings exist - select 4.1.1E Path E.

"Major Renovation" is defined as when 50% of the gross area (measured to the exterior footprint) of the building has been renovated.

Path D awards a maximum of 45 points out of 52 total for 4.1.1 Plumbing Fixture and Fitting Standards, and is not an eligible path for new construction projects.

References

- *2020 IAPMO WEstand*
- *2018 International Green Construction Code (IgCC)*
- *ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017*

Recommended Documents

- [ENERGY STAR labeling](#)
- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)

Scoring Matrix

Response	Score	Max Points
Path A: ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1	0	0
Path B: 2018 International Green Construction Code (IgCC), Table 601.3.2.1	0	0
Path C: 2020 IAPMO WEstand Section 402	0	0
Path D: Major Renovations	0	7
Path E: No fixtures or fittings exist	0	0

↔ Criterion only visible if 4.1.1 is answered with "Path A: ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1"

4.1.1A.1 (ANSI #9.1.1A.1)

Path A: ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017

What percentage of plumbing fixtures and fittings comply with ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1?

Assessment Guidance

Where installed in the project and as permitted by local codes, plumbing fixtures and fittings must also be certified and listed as being compliant with the requirements of the U.S. EPA's WaterSense Program where WaterSense specifications exist.

For points to be earned fifty percent of fixtures must comply. Points earned = percentage of compliant fixtures x 52 (fractional points are rounded upward).

Not applicable where no fixtures or fittings exist - select 4.1.1E Path E.

References

- *ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017*

Recommended Documents

- [WaterSense labeling](#)
- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [ENERGY STAR labeling](#)

Scoring Matrix

Response	Score	Max Points
0-49	0	52
50	26	52
51-52	27	52
53-54	28	52
55-56	29	52
57-58	30	52
59-60	31	52
61-62	32	52
63-64	33	52
65-66	34	52
67-68	35	52
69-70	36	52
71-72	37	52
73-74	38	52
75	39	52
76-77	40	52
78-79	41	52
80-81	42	52
82-83	43	52
84-85	44	52
86-87	45	52

Response	Score	Max Points
88-89	46	52
90-91	47	52
92-93	48	52
94-95	49	52
96-97	50	52
98-99	51	52
100	52	52



Criterion only visible if 4.1.1 is answered with "Path B: 2018 International Green Construction Code (IgCC), Table 601.3.2.1"

4.1.B.1 (ANSI #9.1.B.1)

Path B: 2018 International Green Construction Code (IgCC)

What percentage of plumbing fixtures and fittings comply with the 2018 International Green Construction Code (IgCC), Table 601.3.2.1.?

Assessment Guidance

Where installed in the project and as permitted by local codes, plumbing fixtures and fittings must also be certified and listed as being compliant with the requirements of the U.S. EPA's WaterSense Program where WaterSense specifications exist.

For points to be earned fifty percent of fixtures must comply. Points earned = percentage of compliant fixtures x 52 (fractional points are rounded upward).

Not applicable where no fixtures or fittings exist - select 4.1.1E Path E.

References

- *2018 International Green Construction Code (IgCC)*

Recommended Documents

- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)
- [ENERGY STAR labeling](#)

Scoring Matrix

Response	Score	Max Points
0-49	0	52
50	26	52
51-52	27	52
53-54	28	52
55-56	29	52
57-58	30	52
59-60	31	52
61-62	32	52
63-64	33	52
65-66	34	52
67-68	35	52
69-70	36	52
71-72	37	52
73-74	38	52
75	39	52
76-77	40	52
78-79	41	52
80-81	42	52
82-83	43	52
84-85	44	52
86-87	45	52

Response	Score	Max Points
88-89	46	52
90-91	47	52
92-93	48	52
94-95	49	52
96-97	50	52
98-99	51	52
100	52	52



Criterion only visible if 4.1.1 is answered with "Path C: 2020 IAPMO WEstand Section 402"

4.1.1C.1 (ANSI #9.1.1C.1)

Path C: 2020 IAPMO WEstand

What percentage of plumbing fixtures and fittings comply with 2020 IAPMO WEstand, Section 402.?

Assessment Guidance

Where installed in the project and as permitted by local codes, plumbing fixtures and fittings must also be certified and listed as being compliant with the requirements of the U.S. EPA's WaterSense Program where WaterSense specifications exist.

For points to be earned fifty percent of fixtures must comply. Points earned = percentage of compliant fixtures x 52 (fractional points are rounded upward).

Not applicable where no fixtures or fittings exist - select 4.1.1E Path E.

References

- *2020 IAPMO WEstand*

Recommended Documents

- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)
- [ENERGY STAR labeling](#)

Scoring Matrix

Response	Score	Max Points
0-49	0	52
50	26	52
51-52	27	52
53-54	28	52
55-56	29	52
57-58	30	52
59-60	31	52
61-62	32	52
63-64	33	52
65-66	34	52
67-68	35	52
69-70	36	52
71-72	37	52
73-74	38	52
75	39	52
76-77	40	52
78-79	41	52
80-81	42	52
82-83	43	52
84-85	44	52
86-87	45	52

Response	Score	Max Points
88-89	46	52
90-91	47	52
92-93	48	52
94-95	49	52
96-97	50	52
98-99	51	52
100	52	52

↩ Criterion only visible if 4.1.1 is answered with "Path D: Major Renovations"

4.1.1D.1 (ANSI #9.1.1D.1)

Path D: Major Renovations

What percentage of plumbing fixtures and fittings meet or exceed the following requirements for water consumption, and are certified as being compliant with the requirements of 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)
- Pre-rinse spray valves (Maximum flow rate 1.28 gal. (4.8 L) per minute)

Assessment Guidance

New construction projects are not eligible for Path D.

"Major Renovation" is defined as when 50% of the gross area (measured to the exterior footprint) of the building has been renovated.

Points are earned 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.

For points to be earned fifty percent of fixtures must comply. Points earned = percentage of compliant fixtures x 45 (fractional points are rounded upward)

Not applicable where no fixtures or fittings exist - select 4.1.1E Path E.

Recommended Documents

- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)
- [ENERGY STAR labeling](#)

Scoring Matrix

Response	Score	Max Points
0-49	0	45
50-52	23	45
53-54	24	45
55-56	25	45
57	26	45
58	29	45
59-61	27	45
62-63	28	45
64-65	29	45
66-67	30	45
68-69	31	45
70-72	32	45
73-74	33	45
75-76	34	45
77-78	35	45
79-81	36	45
82-83	37	45
84-85	38	45
86-87	39	45
88-89	40	45
90-92	41	45

Response	Score	Max Points
93-94	42	45
95-96	43	45
97-98	44	45
99-100	45	45

↶ Criterion only visible if 4.1.1 is answered with "Path E: No fixtures or fittings exist"

4.1.1E (ANSI #9.1.1)

4.1.1E Path E: No fixtures or fittings exist

Are there no plumbing fixtures or fittings within the project?

- There are no plumbing fixtures or fittings (0 points)

Scoring Matrix

Response	Score	Max Points
There are no plumbing fixtures or fittings	0	0

Residential Indoor Appliances

2

4.1.2.1 (ANSI #9.1.2.1)

Are residential clothes washers ENERGY STAR 8.0 labeled and possess a maximum integrated water factor (IWF) of 4.3 or less?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no clothes washers.

Recommended Documents

- [ENERGY STAR labeling](#)
- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.1.2.2 (ANSI #9.1.2.2)

Are residential dishwashers ENERGY STAR 6.0 labeled and possess a maximum water use of 3.5 gal per cycle (13.2 L per cycle)?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no dishwashers.

Recommended Documents

- [ENERGY STAR labeling](#)
- *Manufacturer's published fixture flush and flow rates*
- *Manufacturer's published water use rates*
- [WaterSense labeling](#)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Cooling Towers

22

Cooling Towers

22

4.2.1.1 (ANSI #9.2.1.1)

Is a conductivity controller installed, and if so, do cooling towers achieve one of the below respective threshold cycles of concentration?

- A minimum of 5 cycles of concentration for makeup water having less than or equal to 200 ppm (200 mg/L) total hardness as calcium carbonate or 3.5 cycles for makeup water with more than 200 ppm (200 mg/L) total hardness as calcium carbonate

• Yes (4 points)

• No (0 points)

• N/A

OR

- A minimum discharge conductivity of 1500 micromhos/cm or a maximum of 150 ppm (150 mg/L) of silica measured as silicon dioxide

Assessment Guidance

Not applicable where there are no wet-cooling towers.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Plumbing plans*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	4	4
No	0	4
N/A	0	0

4.2.1.1.1 (ANSI #9.2.1.1)

Are cooling towers equipped with conductivity controllers and meeting one of the following target performance metrics:

- 6 cycles are achieved where the tower target performance metric is defined in 4.2.1.1.1 as 5 (3 points)

- 4.5 cycles are achieved where the target performance metric is defined in 4.2.1.1.1 as 3.5 and these cycles of concentration are sustained while maintaining the defined threshold water quality parameters in 4.2.1.1.1 (3 points)

- None of the above (0 points)

- N/A

Assessment Guidance

Not applicable where there are no wet-cooling towers.

Recommended Documents

- *Plumbing plans*
- *Manufacturer's specifications, cut sheets, and performance documentation*

- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
6 cycles are achieved where the tower target performance metric is defined in 4.2.1.1.1 as 5	3	3
4.5 cycles are achieved where the target performance metric is defined in 4.2.1.1.1 as 3.5 and these cycles of concentration are sustained while maintaining the defined threshold water quality parameters in 4.2.1.1.1	3	3
None of the above	0	3
N/A	0	0

4.2.1.2 (ANSI #9.2.1.2)

Are advanced predictive or tracking tower control systems used to mediate cooling tower makeup and discharge?

- Yes (2 points)
-

- No (0 points)
-

- N/A

Assessment Guidance

Possible examples include integrated systems with occupancy sensors estimating demand, tracer based monitoring systems, etc.

Not applicable where there are no wet-cooling towers.

Recommended Documents

- *Plumbing plans*
- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.2.1.3 (ANSI #9.2.1.3)

What percentage of annual cooling demands are replaced by non-evaporative cooling?

- $\geq 75\%$ to $\leq 100\%$ (7 points)

- $\geq 50\%$ to $< 75\%$ (4 points)

- $\geq 20\%$ to $< 50\%$ (2 points)

- $< 20\%$ (0 points)

- N/A

Assessment Guidance

Not applicable where evaporative cooling is not required.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Plumbing plans*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥75% to ≤100%	7	7
≥50% to <75%	4	7
≥20% to <50%	2	7
<20%	0	7
N/A	0	0

4.2.1.4.1 (ANSI #9.2.1.4.1)

Are cooling tower(s) equipped with an overflow alarm (with an audible signal or alert) to detect overflow of water from the basin caused by makeup water valve failure?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Overflow alarm shall send an audible signal or provide an alert to the tower operator via the building automation system (BAS).

Not applicable where there are no wet-cooling towers.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Plumbing plans*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.2.1.4.2 (ANSI #9.2.1.4.2)

Are cooling tower(s) equipped with drift eliminators that achieve an efficiency of 0.001% or less for counterflow systems or 0.002% or less for crossflow systems?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no wet-cooling towers.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Plumbing plans*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.2.1.5 (ANSI #9.2.1.5)

What percentage of safe and approved alternative nonpotable sources exist to meet the cooling tower’s annual makeup water demand?

- $\geq 25\%$ (4 points)

- $\geq 20\%$ to $< 25\%$ (3 points)

- $\geq 15\%$ to $< 20\%$ (2 points)

- $\geq 10\%$ to $< 15\%$ (1 points)

- $< 10\%$ (0 points)

Recommended Documents

- *Plumbing plans*
- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
$\geq 25\%$	4	4
$\geq 20\%$ to $< 25\%$	3	4
$\geq 15\%$ to $< 20\%$	2	4
$\geq 10\%$ to $< 15\%$	1	4
$< 10\%$	0	4

Boilers and Hot Water Systems

9

Boilers and Water Heaters

3

4.3.1.1 (ANSI #9.3.1.1)

Do boilers and/or water heaters have the following features:

4.3.1.1.1 (ANSI #9.3.1.1.1)

Boiler systems with over 50 BHP or 1.67MBtu/hr have condensate return systems?

- Yes (2 points)
- No (0 points)
- N/A

Assessment Guidance

Not applicable where there will be no steam boilers or where steam boilers are less than 200 BHP.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.3.1.1.2 (ANSI #9.3.1.1.2)

Do non steam boilers have conductivity controllers AND/OR steam boilers have conductivity meters?

- Non-steam boilers have conductivity controllers *(1 points)*

- Steam boilers have conductivity meters *(1 points)*

- Both non-steam and steam boilers have conductivity controllers *(1 points)*

- No *(0 points)*

- N/A

Assessment Guidance

Not applicable where there are no boilers.

Scoring Matrix

Response	Score	Max Points
Non-steam boilers have conductivity controllers	1	1
Steam boilers have conductivity meters	1	1
Both non-steam and steam boilers have conductivity controllers	1	1
No	0	1
N/A	0	0

Domestic Hot Water Systems

6

4.3.2.1 (ANSI #9.3.2.1)

Is energy and water conserved by designing efficient hot water delivery piping systems by one of the following options?

- A maximum of 48 oz. from a water heater AND/OR a maximum of 24 oz. from a recirculation or similar hot water line *(3 points)*

- A maximum of 64 oz. from a water heater AND/OR a maximum of 24 oz. from a recirculation or similar hot water line *(2 points)*

- A maximum of 96 oz. from a water heater AND/OR a maximum of 36 oz. from a recirculation or similar hot water line *(1 points)*

- None of the above *(0 points)*

Assessment Guidance

Reduce hot water piping volume to all lavatory sinks, kitchen sinks, and showers.

Table E202.1
INTERNATL VOLUME OF VARIOUS WATER DISTRIBUTION TUBING

Size Nominal Inch	Ounces of water per foot of tube								
	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE- RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9
3/8	1.06	0.97	0.84	N/A	1.17	-	0.64	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

2018 International Plumbing Code (IPC)

References

- 2018 International Plumbing Code (IPC)

Scoring Matrix

Response	Score	Max Points
A maximum of 48 oz. from a water heater AND/OR a maximum of 24 oz. from a recirculation or similar hot water line	3	3
A maximum of 64 oz. from a water heater AND/OR a maximum of 24 oz. from a recirculation or similar hot water line	2	3
A maximum of 96 oz. from a water heater AND/OR a maximum of 36 oz. from a recirculation or similar hot water line	1	3
None of the above	0	3

4.3.2.2 (ANSI #9.3.2.2)

What is the percentage of a reduction of hot water waste to lavatory sinks, kitchen sinks, and showers by use of hot water recirculating systems that use occupant sensors, occupant controls, and thermocouples to reduce waiting times and water purged down the drain?

- >90% (3 points)

- ≥75 to ≤90% (2 points)

- <75% (0 points)

Assessment Guidance

Continuously operating recirculation systems and recirculation systems on timers are not eligible for this credit.

Scoring Matrix

Response	Score	Max Points
>90%	3	3
≥75 to ≤90%	2	3
<75%	0	3

Water Intensive Applications

19

Commercial Food Service Equipment

5

4.4.1.1

Do food services avoid water intensive equipment by the following?

4.4.1.1.1 (ANSI #9.4.1.1.1)

The project does not include once-through water-cooled equipment.

- Yes (1 points)
- No (0 points)
- N/A

Assessment Guidance

Not applicable where there are no commercial food service facilities.

Recommended Documents

- *Plumbing plans*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.1.1.2 (ANSI #9.4.1.1.2)

The project does not include water-fed food waste disposers.

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no commercial food service facilities.

Recommended Documents

- *Plumbing plans*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.1.2 (ANSI #9.4.1.2)

Six paths are provided for assessing commercial food service equipment appliances and fittings.

Complete Path A if all five of the listed appliances and fittings are applicable to the project. Path B is if four out of five appliances and fittings are applicable to the project. Path C is if three out of five appliances and fittings are applicable. Path D is if two out of five appliances and fittings are applicable. Path E is if one out of five appliances and fittings are applicable.

Complete Path F if none (0) of the listed appliances and fittings are applicable to the project.

- 4.4.1.2A Path A: All five appliances & fittings are applicable - up to 3/3 points

OR

- 4.4.1.2B Path B: Four appliances & fittings are applicable - up to 3/3 points

OR

- 4.4.1.2C Path C: Three appliances & fittings are applicable - up to 3/3 points

OR

- 4.4.1.2D Path D: Two appliances & fittings are applicable - up to 2/2 points

OR

- 4.4.1.2E Path E: One appliance and/or fitting is applicable - up to 1/1 points

OR

- 4.4.1.2A Path A: All five appliances & fittings are applicable
-

- 4.4.1.2B Path B: Four appliances & fittings are applicable
-

- 4.4.1.2C Path C: Three appliances & fittings are applicable
-

- 4.4.1.2D Path D: Two appliances & fittings are applicable
-

- 4.4.1.2E Path E: One appliance or fitting is applicable
-

- 4.4.1.2F Path F: None (0) of the appliances & fittings are applicable

Assessment Guidance

Select the pathway based on how many of the following appliances and fittings are applicable to the project:

1. Combination ovens
2. Pre-rinse spray valves
3. Boilerless/connectionless food steamers
4. Commercial dishwashers
5. Ice makers

Scoring Matrix

Response	Score	Max Points
4.4.1.2A Path A: All five appliances & fittings are applicable	0	0
4.4.1.2B Path B: Four appliances & fittings are applicable	0	0
4.4.1.2C Path C: Three appliances & fittings are applicable	0	0
4.4.1.2D Path D: Two appliances & fittings are applicable	0	0
4.4.1.2E Path E: One appliance or fitting is applicable	0	0
4.4.1.2F Path F: None (0) of the appliances & fittings are applicable	0	0



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"

4.4.1.2A (ANSI #9.4.1.2)

Path A: All five appliances and fittings are applicable

Check each of the following appliances and fittings that meet the prescribed limits for water usage:

Assessment Guidance

Complete Path A if all five of the listed appliances and fittings are applicable to the project.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for pre-rinse spray valves, ice machines, food steamers, dishwashers, and combination ovens*

Scoring Matrix

Response	Score	Max Points
0	0	3
1	1	3
2	2	3
3-5	3	3

Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"



4.4.1.2A.1 (ANSI #9.4.1.2.1)

- Combination ovens consume 1.5 gal per pan/hr. (39L/hr.) or less in the steamer mode.

Assessment Guidance

N/A where there are no combination ovens.

Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"



4.4.1.2A.2 (ANSI #9.4.1.2.2)

- Pre-rinse spray valves consume 1.28 gal/min (4.8 L/min) or less;

Assessment Guidance

N/A where there are noPre-rinse spray valves.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"



4.4.1.2A.3 (ANSI #9.4.1.2.3)

- Boilerless/connectionless food steamers comply with ENERGY STAR® 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.

Assessment Guidance

N/A where there are no food steamers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"



4.4.1.2A.4 (ANSI #9.4.1.2.4)

- Commercial dishwashers comply with ENERGY STAR® 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7L/hr.) or less.

Assessment Guidance

N/A where there are no dishwashers.





Criterion only visible if 4.4.1.2 is answered with "4.4.1.2A Path A: All five appliances & fittings are applicable"

4.4.1.2A.5 (ANSI #9.4.1.2.5)

- Ice Makers comply with ENERGY STAR® 3.0 requirements where such requirements exist.

Assessment Guidance

N/A where there are no ice makers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"

4.4.1.2B

Path B: Four of the five appliances and fittings are applicable

Check each of the following appliances and fittings that meet the prescribed limits for water usage:

Assessment Guidance

Complete Path B if four of the five listed appliances and fittings are applicable to the project.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation for pre-rinse spray valves, ice machines, food steamers, dishwashers, and combination ovens*

Scoring Matrix

Response	Score	Max Points
0	0	3
1	1	3
2	2	3
3-5	3	3



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"



4.4.1.2B.1

- Combination ovens consume 1.5 gal per pan/hr. (39L/hr.) or less in the steamer mode.

Assessment Guidance

N/A where there are no combination ovens.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"




4.4.1.2B.2

- Pre-rinse spray valves consume 1.28 gal/min (4.8 L/min) or less.

Assessment Guidance

N/A where there are no Pre-rinse spray valves.




 Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"

4.4.1.2B.3

- Boilerless/connectionless food steamers comply with ENERGY STAR® 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.

Assessment Guidance

N/A where there are no food steamers.

 Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"




4.4.1.2B.4

- Commercial dishwashers comply with ENERGY STAR® 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7L/hr.) or less.

Assessment Guidance

N/A where there are no dishwashers.

 Criterion only visible if 4.4.1.2 is answered with "4.4.1.2B Path B: Four appliances & fittings are applicable"



4.4.1.2B.5

- Ice Makers comply with ENERGY STAR® 3.0 requirements where such requirements exist.

Assessment Guidance

N/A where there are no ice makers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"

4.4.1.2C

Path C: Three of the five appliances and fittings are applicable

Check each of the following appliances and fittings that meet the prescribed limits for water usage:

Assessment Guidance

Complete Path C if three of the five listed appliances and fittings are applicable to the project.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation for pre-rinse spray valves, ice machines, food steamers, dishwashers, and combination ovens*

Scoring Matrix

Response	Score	Max Points
0	0	3
1	1	3
2	2	3
3-5	3	3



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"

4.4.1.2C.1

- Combination ovens consume 1.5 gal per pan/hr. (39L/hr.) or less in the steamer mode.

Assessment Guidance

N/A where there are no combination ovens.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"



4.4.1.2C.2

- Pre-rinse spray valves consume 1.28 gal/min (4.8 L/min) or less.

Assessment Guidance

N/A where there are no Pre-rinse spray valves.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"



4.4.1.2C.3

- Boilerless/connectionless food steamers comply with ENERGY STAR[®] 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.

Assessment Guidance

N/A where there are no food steamers.





Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"

4.4.1.2C.4

- Commercial dishwashers comply with ENERGY STAR® 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7L/hr.) or less.

Assessment Guidance

N/A where there are no dishwashers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2C Path C: Three appliances & fittings are applicable"



4.4.1.2C.5

- Ice Makers comply with ENERGY STAR® 3.0 requirements where such requirements exist.

Assessment Guidance

N/A where there are no ice makers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"

4.4.1.2D

Path D: Two of the five appliances and fittings are applicable

Check each of the following appliances and fittings that meet the prescribed limits for water usage:

Assessment Guidance

Complete Path D if two of the five listed appliances and fittings are applicable to the project.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for pre-rinse spray valves, ice machines, food steamers, dishwashers, and combination ovens*

Scoring Matrix

Response	Score	Max Points
0	0	2
1	1	2
2-5	2	2

Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"



4.4.1.2D.1

- Combination ovens consume 1.5 gal per pan/hr. (39L/hr.) or less in the steamer mode.

Assessment Guidance

N/A where there are no combination ovens.





Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"

4.4.1.2D.2

- Pre-rinse spray valves consume 1.28 gal/min (4.8 L/min) or less.

Assessment Guidance

N/A where there are no Pre-rinse spray valves.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"



4.4.1.2D.3

- Boilerless/connectionless food steamers comply with ENERGY STAR® 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.

Assessment Guidance

N/A where there are no food steamers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"



4.4.1.2D.4

- Commercial dishwashers comply with ENERGY STAR® 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7L/hr.) or less.

Assessment Guidance

N/A where there are no dishwashers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2D Path D: Two appliances & fittings are applicable"



4.4.1.2D.5

- Ice Makers comply with ENERGY STAR[®] 3.0 requirements where such requirements exist.

Assessment Guidance

N/A where there are no ice makers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"

4.4.1.2E

Path E: One of the five appliances and fittings are applicable

Check each of the following appliances and fittings that meet the prescribed limits for water usage:

Assessment Guidance

Complete Path E if one of the five listed appliances and fittings are applicable to the project.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation for pre-rinse spray valves, ice machines, food steamers, dishwashers, and combination ovens*

Scoring Matrix

Response	Score	Max Points
0	0	1
1-5	1	1



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"



4.4.1.2E.1

- Combination ovens consume 1.5 gal per pan/hr. (39L/hr.) or less in the steamer mode.

Assessment Guidance

N/A where there are no combination ovens.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"



4.4.1.2E.2

- Pre-rinse spray valves consume 1.28 gal/min (4.8 L/min) or less.

Assessment Guidance

N/A where there are no Pre-rinse spray valves.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"



4.4.1.2E.3

- Boilerless/connectionless food steamers comply with ENERGY STAR® 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.

Assessment Guidance

N/A where there are no food steamers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"



4.4.1.2E.4

- Commercial dishwashers comply with ENERGY STAR® 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7L/hr.) or less.

Assessment Guidance

N/A where there are no dishwashers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2E Path E: One appliance or fitting is applicable"



4.4.1.2E.5

- Ice Makers comply with ENERGY STAR® 3.0 requirements where such requirements exist.

Assessment Guidance

N/A where there are no ice makers.



Criterion only visible if 4.4.1.2 is answered with "4.4.1.2F Path F: None (0) of the appliances & fittings are applicable"

4.4.1.2F

Path F: None (0) of the appliances and fittings are applicable

Are any of the listed appliances and fittings applicable to the project?

- None of the listed appliances or fittings are applicable (*0 points*)

Assessment Guidance

Complete Path F if **none** of the following appliances and fittings are applicable to the project:

1. Combination ovens
2. Pre-rinse spray valves
3. Boilerless/connectionless food steamers
4. Commercial dishwashers
5. Ice makers

Scoring Matrix

Response	Score	Max Points
None of the listed appliances or fittings are applicable	0	0

Laboratory and Medical Equipment

2

4.4.2.1 (ANSI #9.4.2.1)

When installed, are steam sterilizers 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)?

- Yes (1 points)
-

- No (0 points)
-

- N/A

Assessment Guidance

Not applicable where there are no steam sterilizers.

Recommended Documents

- *Manufacturer’s specifications, cut sheets and performance documentation for steam sterilizers, laboratory or medical equipment using non-potable water for once through cooling, water recycling units, and wet scrubbers*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.2.2 (ANSI #9.4.2.2)

Are steam sterilizers equipped with specify dry vacuum systems for all laboratory/medical/dental purposes?

- Yes (1 points)
-

- No (0 points)
-

- N/A

Assessment Guidance

Not applicable where there are no laboratory/medical/dental systems.

Recommended Documents

- *Manufacturer’s specifications, cut sheets and performance documentation for steam sterilizers, laboratory or medical equipment using non-potable water for once through cooling, water recycling units, and wet scrubbers*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Laundry Equipment

6

4.4.3.1 (ANSI #9.4.3.1)

Do self service clothes washers have an IWF of 4.3 or less and comply with ENERGY STAR 8.0 requirements?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no clothes washers.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.4.3.2 (ANSI #9.4.3.2)

Do 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

• Yes (2 points)

• No (0 points)

AND

- Maximum water consumption of washers is 1.0 gal/lb. (8 L/kg)

• N/A

AND

- Washers have a water recycling system

Assessment Guidance

Not applicable where there is no industrial laundry or where volumes do not exceed 350lbs. (160 kg) per hour.

Recommended Documents

- *Plumbing plans*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.4.3.3 (ANSI #9.4.3.3)

In an on-premise/institutional laundry, do non-residential clothes washers have a maximum IWF of 4.0?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no non-residential clothes washers.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

Water Features and Pools

6

4.4.4.1 (ANSI #9.4.4.1)

Do water features re-circulate water for reuse within the system and have a leak/water loss detection system?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no water features.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for all special water features and for all meters*
- *Plumbing plans*
- *Description of alternate water sources to be used*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.4.2 (ANSI #9.4.4.2)

Do water features use alternate water sources of non-potable water for make-up water?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no water features.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for all special water features and for all meters*
- *Plumbing plans*
- *Description of alternate water sources to be used*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.4.3 (ANSI #9.4.4.3)

Do pools and spas or water features have an evaporation reduction/mitigation feature?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Examples of evaporation reduction/mitigation features include pool covers, storage of feature water in underground tanks, controls to curtail use during high loss periods, etc.

Not applicable where there are no pools, spas, or water features.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for all special water features and for all meters*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.4.4 (ANSI #9.4.4.4)

Are pools and spas equipped with splash out troughs to recover water?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no pools or spas.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation for all special water features and for all meters*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.4.5 (ANSI #9.4.4.5)

Are pools and spa backwash water treated and recovered for appropriate reclamation, recycling, AND/OR irrigation?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no pools or spas.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for all special water features and for all meters*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.4.4.6 (ANSI #9.4.4.6)

Do pools and spas use regenerative sorptive media (not conventional filtration or standard sand-based filtration) or cartridge filtration?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no pools or spas.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for all special water features and for all meters*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Water Treatment

4

Water Treatment for End Uses

4

4.5.1.1 (ANSI #9.5.1.1)

Are filtration systems equipped with pressure drop gauges that allow backwash to be based on pressure drop and not on timers?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no water treatment system.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for filtration systems, pressure drop gauges, reverse osmosis systems, water softeners, and recharge controls*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.5.1.2 (ANSI #9.5.1.2)

Does reverse osmosis achieve one of the following?

- Rejects <60% of feed-water volume for a system that produces more than 100 gal. (380 L) per day

OR

- Rejects <70% of feed-water volume for a system that produces less than 100 gal. (380 L) per day

- Rejects <60% (2 points)
-

- Rejects <70% (1 points)
-

- Neither (0 points)
-

- N/A

Assessment Guidance

Not applicable where there is no water treatment system.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for filtration systems, pressure drop gauges, reverse osmosis systems, water softeners, and recharge controls*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Rejects <60%	2	2
Rejects <70%	1	2
Neither	0	2
N/A	0	0

4.5.1.3 (ANSI #9.5.1.3)

Are water softeners demand-initiated, equipped with recharge controls based on volume of water treated or hardness and not on clock timers?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no water treatment system.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for filtration systems, pressure drop gauges, reverse osmosis systems, water softeners, and recharge controls*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Alternate Water Sources

25

Alternate Water Sources for Indoor Uses

12

4.6.1.1 (ANSI #9.6.1.1)

What percentage of indoor water demands are met with non-potable water?

- >75 (10 points)

- >50 to ≤75% (8 points)

- >25% to ≤50% (6 points)

- ≥15% to ≤25% (3 points)

- <15% (0 points)

- N/A

Assessment Guidance

Not applicable where the authority having jurisdiction prohibits the use of alternate water sources for indoor applications.

References

- *EPA's Guidelines for Water Reuse*

Recommended Documents

- *Description of alternate water sources and implementation for non-potable water applications*
- *Designer's drawings, specifications, and performance documentation including estimated yield and calculations to demonstrate the percentage of water from non-potable sources and alternate water sources*

Scoring Matrix

Response	Score	Max Points
>75	10	10
>50 to ≤75%	8	10
>25% to ≤50%	6	10
≥15% to ≤25%	3	10
<15%	0	10
N/A	0	0

4.6.1.2 (ANSI #9.6.1.2)

Is one or more of the following systems at least 80% pre-plumbed (pipes and valves) during construction?

- Graywater
 - Reclaimed water
 - Recycled water
 - Stormwater
 - Rainwater
- Yes (2 points)

 - No (0 points)

Assessment Guidance

Pre-plumbed systems are marked or otherwise identified as such.

Recommended Documents

- *Construction Documents*
- *Description of alternate water sources and implementation for non-potable water applications*
- *Designer’s drawings, specifications, and performance documentation including estimated yield and calculations to demonstrate the percentage of water from non-*

potable sources and alternate water sources

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Alternate Water Sources for Non-Domestic for Non-Potable Use **12**

4.6.2.1 (ANSI #9.6.2.1)

What percentage are alternate water source(s) used to replace potable water for one or more of the following purposes (but not limited to)?

- Cooling Towers;
- Irrigation;
- Water features;
- Wash Down/Surface Washing;
- Dust Control.

- $\geq 50\%$ (12 points)

- $\geq 40\%$ to $< 50\%$ (9 points)

- $\geq 30\%$ to $< 40\%$ (6 points)

- $\geq 20\%$ to $< 30\%$ (3 points)

- $\geq 10\%$ to $< 20\%$ (1 points)

- $< 10\%$ (0 points)

- N/A

Assessment Guidance

Points are earned where alternate water source(s) are used to supply a percentage of annual makeup water demand for the combined purposes listed above as applicable to the project. Only calculate for end uses included and applicable to the project.

Select "N/A" where listed end uses are not included or reclaimed water is not available.

Scoring Matrix

Response	Score	Max Points
≥50%	12	12
≥40% to <50%	9	12
≥30% to <40%	6	12
≥20% to <30%	3	12
≥10% to <20%	1	12
<10%	0	12
N/A	0	0

Graywater Treatment

1

4.6.3.1 (ANSI #9.6.3.1)

Are graywater treatment systems NSF/ANSI 350, NSF/ANSI 350-1 or IAPMO IGC 324 listed where present?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no Graywater treatment systems.

References

- *IAPMO IGC 324-2019 Alternate Water Source Systems for Multi-Family, Residential, and Commercial Use*
- *NSF/ANSI 350-1-2017 Onsite Residential And Commercial Greywater Treatment Systems For Subsurface Discharge*
- *NSF/ANSI 350-2020 Onsite Residential And Commercial Water Reuse Treatment Systems*

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Description of alternate water sources and implementation for non-potable water applications*
- *Designer’s drawings, specifications, and performance documentation including estimated yield and calculations to demonstrate the percentage of water from non-potable sources and alternate water sources*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Metering

20

Metering

20

4.7.1.1 (ANSI #9.7.1.1)

Is sub-metering installed for all water-intensive applications such as commercial kitchens, commercial laundries, laboratories, pools, spas, etc?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no water intensive applications.

Recommended Documents

- *Building plans showing sub-meters*
- *Plan for billing of tenants*
- *Sub-meter specifications*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.7.1.2 (ANSI #9.7.1.2)

Is metering or sub-metering installed for water that is used for pressurized irrigation?

- Yes (4 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no irrigation.

Recommended Documents

- *Building plans showing sub-meters*
- *Plan for billing of tenants*
- *Sub-meter specifications*
- *Plumbing design drawings*

Scoring Matrix

Response	Score	Max Points
Yes	4	4
No	0	4
N/A	0	0

4.7.1.3 (ANSI #9.7.1.3)

Are all water meters and sub-meters linked to a Meter Data Management System to store and report water consumption data?

- *Yes (2 points)*

- *No (0 points)*

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation for the Meter Data System and meters*
- *Building plans showing sub-meters*
- *Sub-meter specifications*
- *Water Efficiency Measurement and Verification Plan including monthly reports*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

4.7.1.4 (ANSI #9.7.1.4)

Are chilled or hot water loops or cooling towers that make up water supply pipes equipped with meters?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no chilled or hot water loops.

Recommended Documents

- *Building plans showing sub-meters*
- *Sub-meter specifications*
- *Plumbing design drawings*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.71.5 (ANSI #9.71.5)

What percentage of the units in the development are sub-metered and allow for tenants to view their consumption and be billed based upon it?

- $\geq 90\%$ (10 points)

- $\geq 75\%$ to $< 90\%$ (7 points)

- $\geq 50\%$ to $< 75\%$ (5 points)

- $\geq 25\%$ to $< 50\%$ (2 points)

- < 25 (0 points)

- N/A

Assessment Guidance

Not applicable where there is no multi-unit development.

Recommended Documents

- *Plan for billing of tenants*
- *Building plans showing sub-meters*
- *Sub-meter specifications*
- *Plumbing design drawings*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
$\geq 90\%$	10	10
$\geq 75\%$ to $< 90\%$	7	10
$\geq 50\%$ to $< 75\%$	5	10
$\geq 25\%$ to $< 50\%$	2	10
< 25	0	10
N/A	0	0

Leak Detection

10

Leak Detection

10

4.8.1 (ANSI #9.8)

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 utilizes sensor inputs to continuously monitor the hydraulic conditions and intelligently adapts to remotely report expected normal vs abnormal plumbing system states.

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems*

4.8.1.1 (ANSI #9.8.1.1)

Are water leak detection devices installed for all water-intensive applications such as commercial kitchens, commercial laundries, laboratories, pools, spas, etc?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no water intensive applications.

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of*

Plumbing Systems

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.8.1.2 (ANSI #9.8.1.2)

Are water leak detection devices installed for water that is used for pressurized irrigation?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no irrigation.

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

4.8.1.3 (ANSI #9.8.1.3)

Are all water leak detection devices linked to the internet or a central Data Management System to store monitor and report data?

- Yes (1 points)

- No (0 points)

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

4.8.1.4 (ANSI #9.8.1.4)

Are chilled or hot water loops or cooling towers that makeup water supply pipes equipped with water leak detection devices?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there are no chilled or hot water loops.

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

4.8.1.5 (ANSI #9.8.1.5)

What percentage are tenant water leak detection devices used in multi-unit developments?

- $\geq 90\%$ (5 points)

- $\geq 80\%$ to $< 90\%$ (4 points)

- $\geq 40\%$ to $< 80\%$ (2 points)

- $\geq 20\%$ to $< 40\%$ (1 points)

- $< 20\%$ (0 points)

- N/A

Assessment Guidance

Percentages are based on units with water supply.

Not applicable where there is no multi-unit development.

References

- *IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems*

Scoring Matrix

Response	Score	Max Points
≥90%	5	5
≥80% to <90%	4	5
≥40% to <80%	2	5
≥20% to <40%	1	5
<20%	0	5
N/A	0	0

Irrigation

27

Irrigation

27

4.9.1

Green Globes for New Construction 2021 provides two paths for assessing irrigation:

- 4.9.1A Path A: No Irrigation - up to 16/16 points
- 4.9.1A Path A: No Irrigation

OR

- 4.9.1B Path B: Water Demand Reduction - up to 15/16 points
- 4.9.1B Path B: Water Demand Reduction

Please select a Path.

Assessment Guidance

If there is no irrigation, select Path A. Otherwise, select Path B.

Path B awards a maximum of 15 points out of 16 total for 4.9.1 Irrigation.

Scoring Matrix

Response	Score	Max Points
4.9.1A Path A: No Irrigation	0	0
4.9.1B Path B: Water Demand Reduction	0	0

Criterion only visible if 4.9.1 is answered with "4.9.1A Path A: No Irrigation"

4.9.1A (ANSI #9.9.1.1)

Path A: No Irrigation

Was an irrigation system avoided from being installed?

- Yes (16 points)

- No (0 points)

- N/A

Assessment Guidance

Not Applicable where there is no landscaping or the landscaping has no vegetation.

References

- ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard
- 2014 IA/ASIC Landscape Irrigation Best Management Practices
- EPA WaterSense Water Budget Tool (V 1.03)

Recommended Documents

- Manufacturer’s specifications, cut sheets, and performance documentation
- Construction Documents
- Landscape architect/designer approved irrigation plan

Scoring Matrix

Response	Score	Max Points
Yes	16	16
No	0	16
N/A	0	0



Criterion only visible if 4.9.1 is answered with "4.9.1B Path B: Water Demand Reduction"

4.9.1B.1 (ANSI #9.9.1.1)

Path B: Water Demand Reduction

What is the project's reduction in water demand compared to the baseline as determined by the EPA WaterSense Water Budget Tool?

- ≥ 75 to $\leq 100\%$ (15 points)
-

- ≥ 70 to < 75 (14 points)
-

- $\geq 65\%$ to $< 70\%$ (13 points)
-

- $\geq 60\%$ to $< 65\%$ (12 points)
-

- $\geq 55\%$ to $< 60\%$ (11 points)
-

- $\geq 50\%$ to $< 55\%$ (10 points)
-

- $\geq 45\%$ to $< 50\%$ (9 points)
-

- $\geq 40\%$ to $< 45\%$ (8 points)
-

- $\geq 35\%$ to $< 40\%$ (7 points)
-

- $\geq 30\%$ to $< 35\%$ (6 points)
-

- $\geq 0\%$ to $< 30\%$ (0 points)
-

- N/A (0 points)

Assessment Guidance

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.

Six points are earned when there is a 30% reduction in water demand, and one point is earned for each additional 5% reduction in water demand above 30% to a maximum of 15 points. Path B awards a maximum of 15 points out of 16 points available for 4.9.1 Irrigation.

References

- *EPA WaterSense Water Budget Tool (V 1.03)*

Scoring Matrix

Response	Score	Max Points
≥75 to ≤100%	15	16
≥70 to <75	14	16
≥65% to <70%	13	16
≥60% to <65%	12	16
≥55% to <60%	11	16
≥50% to <55%	10	16
≥45% to <50%	9	16
≥40% to <45%	8	16
≥35% to <40%	7	16
≥30% to <35%	6	16
≥0% to <30%	0	16
N/A	0	0

4.9.1.2 (ANSI #9.9.1.2)

Was an irrigation plan developed by a certified/ licensed irrigation designer for the approved landscape plan that shows calculations for landscape water requirements compared to the LWA?

- Yes (4 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where there is no landscaping, the landscaping has no vegetation, or where no irrigation system is installed.

Recommended Documents

- *Landscape architect/designer approved irrigation plan*

Scoring Matrix

Response	Score	Max Points
Yes	4	4
No	0	4
N/A	0	0

4.9.1.3 (ANSI #9.9.1.3)

Two paths are provided for assessing irrigation system features. Path A works as a Not Applicable, removing 5 points from the total denominator (out of 1,000 points). Path B provides points based on irrigation system features that are installed.

- **4.9.1.3A: No Irrigation System or Features Installed:** 5 points removed from total denominator ("N/A")

OR

- **4.9.1.3B: Irrigation System Features:** 5 points

- 4.9.1.3A: No Irrigation System or Features Installed
- 4.9.1.3B: Irrigation System Features

Assessment Guidance

Path A may only be selected if there is no irrigation system installed. For all other buildings, select Path B.

Scoring Matrix

Response	Score	Max Points
4.9.1.3A: No Irrigation System or Features Installed	0	0
4.9.1.3B: Irrigation System Features	0	0



Criterion only visible if 4.9.1.3 is answered with "4.9.1.3A: No Irrigation System or Features Installed"

4.9.1.3A (ANSI #9.9.1.3)

Path A: No Irrigation System or Features Installed

Is there no irrigation system installed?

- There is no irrigation system installed (*0 points*)

- There is an irrigation system with no water saving features (*0 points*)

Assessment Guidance

Path A is provided for buildings with no irrigation system installed. If there is an irrigation system, please select Path B for 4.9.1.3 and complete the sub-criteria.

Water saving features include:

- WaterSense labeled weather-based irrigation controller, WaterSense labeled bypass soil moisture sensors, on-demand soil moisture sensor, AND/OR automatic rain shutoff devices;
- Pressure regulation for each zone to maintain proper operating pressures for landscape irrigation sprinklers or drip components;
- 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;
- Flow sensing incorporated in the control system to suspend irrigation in any zone where flows exceed expectation;
- Landscape irrigation sprinklers and drip emitters that comply with *ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard*.
- Spray sprinkler bodies are WaterSense labeled.

References

- *ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard*

Scoring Matrix

Response	Score	Max Points
There is no irrigation system installed	0	0
There is an irrigation system with no water saving features	0	5



Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"

4.9.1.3B (ANSI #9.9.1.3)

Path B: Irrigation System Features

Does the installed irrigation system include the following features?


Recommended Documents

- *Landscape architect/designer approved irrigation plan*
- *Manufacturer's specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
0	0	5
1	1	5
2	2	5
3	3	5
4	4	5
5-6	5	5




 Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"

4.9.1.3B.1 (ANSI #9.9.1.3.1)

- WaterSense labeled weather-based irrigation controller, WaterSense labeled bypass soil moisture sensors, on-demand soil moisture sensor, AND/OR automatic rain shutoff devices

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*

 Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"




4.9.1.3B.2 (ANSI #9.9.1.3.2)

- Pressure regulation for each zone to maintain proper operating pressures for landscape irrigation sprinklers or drip components

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*

 Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"



4.9.1.3B.3 (ANSI #9.9.1.3.3)

- 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

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*



Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"



4.9.1.3B.4 (ANSI #9.9.1.3.4)

- Flow sensing incorporated in the control system to suspend irrigation in any zone where flows exceed expectation

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*



Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"



4.9.1.3B.5 (ANSI #9.9.1.3.5)

- Landscape irrigation sprinklers and drip emitters that comply with *ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard*

References

- *ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard*

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*



Criterion only visible if 4.9.1.3 is answered with "4.9.1.3B: Irrigation System Features"



4.9.1.3B.6 (ANSI #9.9.1.3.6)

- Spray sprinkler bodies are WaterSense labeled.

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Landscape architect/designer approved irrigation plan*

4.9.1.4 (ANSI #9.9.1.4)

Has the sprinkler system been inspected for proper installation of all components specified on the irrigation plan and to assure that there is no runoff or overspray onto impervious surfaces?

- Yes (2 points) _____
- No (0 points) _____
- N/A

Assessment Guidance

Not applicable where no irrigation system is installed.

Recommended Documents

- *Landscape architect/designer approved irrigation plan*
- *Manufacturer's specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

Materials

150

Whole Building Life Cycle Assessment

20

Whole Building Life Cycle Assessment

20

5.1.1.1 (ANSI #10.1.1.1)

When evaluating a minimum of two different building designs and using at least three impact indicators, what is the reduction demonstrated in environmental impact?

- $\geq 25\%$ (20 points)

- $\geq 24\%$ to $< 25\%$ (19 points)

- $\geq 23\%$ to $< 24\%$ (18 points)

- $\geq 22\%$ to $< 23\%$ (17 points)

- $\geq 21\%$ to $< 22\%$ (16 points)

- $\geq 20\%$ to $< 21\%$ (15 points)

- $\geq 19\%$ to $< 20\%$ (14 points)

- $\geq 18\%$ to $< 19\%$ (13 points)

- $\geq 17\%$ to $< 18\%$ (12 points)

- $\geq 16\%$ to $< 17\%$ (11 points)

- $\geq 15\%$ to $< 16\%$ (10 points)

- $< 15\%$ (0 points)

Assessment Guidance

The project team must evaluate a minimum of two different building designs using ASTM E2921-16a and the following assessment protocol to select the building with the lower environmental impact:

The life cycle assessment reports the following life cycle impact indicators:

- Global warming potential (GWP)/climate change;
- Acidification potential;
- Eutrophication potential;
- Ozone depletion potential (ODP); and
- Smog potential.

The proposed final design of the building with the lower anticipated environmental impact achieves the following performance targets compared to the reference design:

- A minimum 5% reduction each, for at least three impact indicators, one of which is global warming potential; and
- No other impact indicator exceeds the reference design by more than 5%.

Percentage reduction is demonstrated by adding at least three impact indicators.

Operating energy consumption and MEP systems can be included. A registered design professional verifies structural material quantities, with the exception of existing buildings.

References

- [*The Athena Impact Estimator for Buildings \(Version 4.2 or later\)*](#)
- [*GaBi Software Building LCA*](#)
- [*SimaPro Sustainability Life Cycle Assessment Carbon Footprinting*](#)
- [*Tally™*](#)
- *ASTM E2843-16a Standard Specification for Demonstrating That a Building is in Walkable Proximity to Neighborhood Assets*

Scoring Matrix

Response	Score	Max Points
≥25%	20	20
≥24% to <25%	19	20
≥23% to <24%	18	20
≥22% to <23%	17	20
≥21% to <22%	16	20
≥20% to <21%	15	20
≥19% to <20%	14	20
≥18% to <19%	13	20
≥17% to <18%	12	20
≥16% to <17%	11	20
≥15% to <16%	10	20
<15%	0	20

Product Life Cycle

39

Product Life Cycle

39

5.2.1.1 (ANSI #10.2.1.1)

How many products include third-party verifications/certifications that evaluate the cradle-to-gate product life cycle?

- ≥ 40 (29 points)

- ≥ 38 to ≤ 39 (26 points)

- ≥ 35 to ≤ 37 (23 points)

- ≥ 33 to ≤ 34 (20 points)

- ≥ 30 to ≤ 32 (17 points)

- ≥ 28 to ≤ 29 (14 points)

- ≥ 25 to ≤ 27 (11 points)

- ≥ 23 to ≤ 24 (8 points)

- ≥ 21 to ≤ 22 (7 points)

- ≥ 18 to ≤ 20 (6 points)

- ≥ 15 to ≤ 17 (5 points)

- < 15 (0 points)

Assessment Guidance

Product Manufacturers provide one or more of the following for a minimum of fifteen products that evaluate the cradle-to-gate product life cycle:

- Third-party verified Type III Environmental Product Declarations (EPD) according to ISO 21930: 2017 or ISO 14025: 2006, either product specific or industry average. 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.

References

- *NSF/ANSI 140-2015 Sustainability Assessment for Carpet*
- *NSF/ANSI 332-2015 Sustainability Assessment for Resilient Flooring*
- *NSF/ANSI 336-2011 Sustainability Assessment for Commercial Furnishings Fabric*
- *NSF/ANSI 342-2014 Sustainability Assessment for Wallcovering Products*
- *NSF/ANSI 347-2012 Sustainability Assessment for Single Ply Roof Membranes*
- *ANSI/NSC 373-2014 Sustainability Assessment for Natural Dimension Stone*
- *ANSI/BIFMA e3-2014: Business and Institutional Furniture Sustainability Standard (BIFMA e3) and Level[®] Sustainability Certification Program for Furniture*
- *Tile Council of North America's Green Squared Certification (ANSI A138.1-2011)*
- *UL 100: Standard for Sustainability for Gypsum Boards and Panels*
- *UL 102: Standard for Sustainability for Swinging Door Leafs*
- *ISO 21930:2017 Sustainability In Buildings And Civil Engineering Works - Core Rules For Environmental Product Declarations Of Construction Products And Services*
- *ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
- *ISO 14044:2006: Environmental Management – Life Cycle Assessment – Requirements and Guidelines*
- *ISO 14040:2006 Environmental Management – Life Cycle Assessment – Principles and Framework*
- *ISO 21930:2007 Sustainability in Building Construction - Environmental Declaration of Building Products*

Scoring Matrix

Response	Score	Max Points
≥40	29	29
≥38 to ≤39	26	29
≥35 to ≤37	23	29
≥33 to ≤34	20	29
≥30 to ≤32	17	29
≥28 to ≤29	14	29
≥25 to ≤27	11	29
≥23 to ≤24	8	29
≥21 to ≤22	7	29
≥18 to ≤20	6	29
≥15 to ≤17	5	29
<15	0	29

5.2.1.2 (ANSI #10.2.1.2)

How many products include one or more of the following verifications that evaluate the products through end of life (cradle-to-grave product life cycle)?

- Third-party verified Type III Environmental Product Declarations (EPD) according to ISO 21930: 2017 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

• ≥10 (10 points)

• 9 (9 points)

• 8 (8 points)

• 7 (7 points)

• 6 (6 points)

• 5 (5 points)

• <5 (0 points)

References

- *Multi-attribute Standards (MAS): products compared use the same MAS*
- *NSF/ANSI 140-2015 Sustainability Assessment for Carpet*
- *NSF/ANSI 332-2015 Sustainability Assessment for Resilient Flooring*
- *NSF/ANSI 336-2011 Sustainability Assessment for Commercial Furnishings Fabric*
- *NSF/ANSI 342-2014 Sustainability Assessment for Wallcovering Products*
- *NSF/ANSI 347-2012 Sustainability Assessment for Single Ply Roof Membranes*
- *ANSI/NSC 373-2014 Sustainability Assessment for Natural Dimension Stone*
- *ANSI/BIFMA e3-2014: Business and Institutional Furniture Sustainability Standard (BIFMA e3) and Level® Sustainability Certification Program for Furniture*
- *Tile Council of North America's Green Squared Certification (ANSI A138.1-2011)*
- *UL 100: Standard for Sustainability for Gypsum Boards and Panels*
- *UL 102: Standard for Sustainability for Swinging Door Leafs*

- *ISO 14044:2006: Environmental Management – Life Cycle Assessment – Requirements and Guidelines*
- *ISO 14040:2006 Environmental Management – Life Cycle Assessment – Principles and Framework*
- *ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
- *ISO 21930:2007 Sustainability in Building Construction - Environmental Declaration of Building Products*
- *ISO 21930:2017 Sustainability In Buildings And Civil Engineering Works - Core Rules For Environmental Product Declarations Of Construction Products And Services*

Scoring Matrix

Response	Score	Max Points
≥10	10	10
9	9	10
8	8	10
7	7	10
6	6	10
5	5	10
<5	0	10

Product Risk Assessment

10

Occupant Exposure Screening Report (OESR)

10

5.3.1.1 (ANSI #10.3.1.1)

How many formulated products have 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?*

- ≥10 (10 points) _____
- 9 (9 points) _____
- 8 (8 points) _____
- 7 (7 points) _____
- 6 (6 points) _____
- 5 (5 points) _____
- 4 (4 points) _____
- 3 (3 points) _____
- 2 (2 points) _____
- 1 (1 points) _____
- 0 (0 points) _____

Assessment Guidance

Points are earned for discrete products with different functional uses and not variations of the same product, unless the manufacturers show substantial difference between the chemical constituents or components.

References

- *ASTM E3182-20 - Standard Practice for Preparing an Occupant Exposure Screening Report (OESR)*

Scoring Matrix

Response	Score	Max Points
≥10	10	10
9	9	10
8	8	10
7	7	10
6	6	10
5	5	10
4	4	10
3	3	10
2	2	10
1	1	10
0	0	10

Sustainable Materials Attributes

15

Product Sustainable Materials Attributes

15

5.4.1.1 (ANSI #10.4.1.1)

What percentage is the Sustainable Materials Index?

- $\geq 38\%$ (15 points)

- $\geq 36\%$ to $< 38\%$ (14 points)

- $\geq 34\%$ to $< 36\%$ (13 points)

- $\geq 32\%$ to $< 34\%$ (12 points)

- $\geq 30\%$ to $< 32\%$ (11 points)

- $\geq 28\%$ to $< 30\%$ (10 points)

- $\geq 26\%$ to $< 28\%$ (9 points)

- $\geq 24\%$ to $< 26\%$ (8 points)

- $\geq 22\%$ to $< 24\%$ (7 points)

- $\geq 20\%$ to $< 22\%$ (6 points)

- $\geq 18\%$ to $< 20\%$ (5 points)

- $\geq 16\%$ to $< 18\%$ (4 points)

- $\geq 14\%$ to $< 16\%$ (3 points)

- $\geq 12\%$ to $< 14\%$ (2 points)

- $\geq 10\%$ to $< 12\%$ (1 points)

- $< 10\%$ (0 points)

Assessment Guidance

Points are earned based on the Sustainable Materials Index (SMI), the percentage of the total value of the building materials that have sustainable materials attributes. The sustainable materials attributes considered in calculating the SMI are pre-consumer recycled content, postconsumer recycled content, biobased content, third-party 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 Materials Value (TMV) expressed as a percentage.

Sustainable Materials Index (%) =

$$\begin{aligned} &100 \times \\ &(\$ \text{ value of pre-consumer recycled content} \\ &+ \\ &\$ \text{ value of post-consumer recycled content} \\ &+ \\ &\$ \text{ value of biobased content} \\ &+ \\ &\$ \text{ value of third-party sustainable forestry certification content} \\ &+ \\ &\$ \text{ value of Eco-Certified Composite/TMV}) \end{aligned}$$

Only the portion of materials that has the identified attribute should be included. For example, if a product has 40% preconsumer recycled content, only 40% of the value of that product is included.

Products that are claimed for credit under Third-Party Sustainable Forestry Certification are not also included as biobased content.

Biobased 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.

The following forest certification systems are recognized:

- [Forest Stewardship Council \(FSC\)](#)
- [Sustainable Forestry Initiative, Inc. \(SFI\)](#)
- [American Tree Farm System \(ATFS\)](#)
- [Canadian Standards Association Sustainable Forestry Management \(CSA\)](#)
- [Programme for the Endorsement of Forest Certification \(PEFC\)](#)

References

- *ASTM D6866-16 Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis*

Recommended Documents

- *Manufacturer's product data sheets or a statement from manufacturer(s) certifying claims or third-party certification from an organization that has the program in its ISO 17065 scope of accreditation.*

Scoring Matrix

Response	Score	Max Points
≥38%	15	15
≥36% to <38%	14	15
≥34% to <36%	13	15
≥32% to <34%	12	15
≥30% to <32%	11	15
≥28% to <30%	10	15
≥26% to <28%	9	15
≥24% to <26%	8	15
≥22% to <24%	7	15
≥20% to <22%	6	15
≥18% to <20%	5	15
≥16% to <18%	4	15
≥14% to <16%	3	15
≥12% to <14%	2	15
≥10% to <12%	1	15
<10%	0	15

Reuse of Existing Structures and Materials

30

Structural Systems and Non-Structural/Interior Elements

22

5.5.1.1 (ANSI #10.5.1.1)

What percentage of the structural systems from an existing building on the site are retained and incorporated in the new design?

- $\geq 95\%$ (12 points)

- $\geq 90\%$ to $< 95\%$ (11 points)

- $\geq 85\%$ to $< 90\%$ (10 points)

- $\geq 80\%$ to $< 85\%$ (9 points)

- $\geq 75\%$ to $< 80\%$ (8 points)

- $\geq 70\%$ to $< 75\%$ (7 points)

- $\geq 65\%$ to $< 70\%$ (6 points)

- $\geq 60\%$ to $< 65\%$ (5 points)

- $\geq 50\%$ to $< 60\%$ (4 points)

- $\geq 40\%$ to $< 50\%$ (3 points)

- $< 40\%$ (0 points)

Assessment Guidance

Examples of structural systems include exterior walls, interior bearing walls, roof systems, and floor systems.

Percentage = $100 \times (A \div B)$, where:

A = Total square footage of reused 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.

Recommended Documents

- *Calculation for area of existing major structural systems reused*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥95%	12	12
≥90% to <95%	11	12
≥85% to <90%	10	12
≥80% to <85%	9	12
≥75% to <80%	8	12
≥70% to <75%	7	12
≥65% to <70%	6	12
≥60% to <65%	5	12
≥50% to <60%	4	12
≥40% to <50%	3	12
<40%	0	12

5.5.1.2 (ANSI #10.5.1.2)

What percentage of non-structural interior systems and finishes from an existing building on the site are retained and incorporated in the new design?

- $\geq 95\%$ (10 points)

- $\geq 85\%$ to $< 95\%$ (9 points)

- $\geq 75\%$ to $< 85\%$ (8 points)

- $\geq 65\%$ to $< 75\%$ (7 points)

- $\geq 55\%$ to $< 65\%$ (6 points)

- $\geq 45\%$ to $< 55\%$ (5 points)

- $\geq 35\%$ to $< 45\%$ (4 points)

- $\geq 25\%$ to $< 35\%$ (3 points)

- $\geq 15\%$ to $< 25\%$ (2 points)

- $\geq 10\%$ to $< 15\%$ (1 points)

- $< 10\%$ (0 points)

Assessment Guidance

Examples of non-structural interior systems and finishes include ceiling, interior partitions, demountable walls, flooring, and doors.

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).

Percentage = $100 \times (A \div B)$, where:

A = Total area of reused existing interior systems and finishes

B = Total area of interior systems and finishes in the new design

Recommended Documents

- *Calculations for surface area of existing non-structural elements reused*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥95%	10	10
≥85% to <95%	9	10
≥75% to <85%	8	10
≥65% to <75%	7	10
≥55% to <65%	6	10
≥45% to <55%	5	10
≥35% to <45%	4	10
≥25% to <35%	3	10
≥15% to <25%	2	10
≥10% to <15%	1	10
<10%	0	10

Material Reuse from Off-Site

8

5.5.2.1 (ANSI #10.5.2.1)

What percentage of the project incorporates reused, refurbished AND/OR off-site salvaged materials in place of new materials (except furnishings)?

- $\geq 20\%$ (4 points)

- $\geq 10\%$ to $< 20\%$ (3 points)

- $\geq 5\%$ to $< 10\%$ (2 points)

- $\geq 2\%$ to $< 5\%$ (1 points)

- $< 2\%$ (0 points)

Assessment Guidance

The value of the reused, refurbished, or salvaged material is the greater of the cost of the reused, refurbished or salvaged material or the cost of new comparable material which is being avoided.

Percentages are calculated as the percentage of the total materials cost.

Percentage = $100 \times (A \div B)$, where:

A = Total value of reused materials

B = Total value of materials

Recommended Documents

- *Calculation for percentage of off-site material reused onsite*

Scoring Matrix

Response	Score	Max Points
≥20%	4	4
≥10% to <20%	3	4
≥5% to <10%	2	4
≥2% to <5%	1	4
<2%	0	4

5.5.2.2 (ANSI #10.5.2.2)

What percentage of furnishings (including systems furniture) are reused, salvaged AND/OR refurbished for reuse within the project?

- ≥30% (4 points)

- ≥20% to <30% (3 points)

- ≥15% to <20% (2 points)

- ≥10% to <15% (1 points)

- <10% (0 points)

- N/A

Assessment Guidance

Percentages are calculated as the percentage of the total furnishings cost.

Percentage = 100 x (A ÷ B), where:

A = Total value of reused furnishings

B = Total value of furnishings

Not applicable where there are no existing furnishings or if it is not feasible to reuse existing furnishings.

Recommended Documents

- *Calculation for percentage of furniture reused*

Scoring Matrix

Response	Score	Max Points
≥30%	4	4
≥20% to <30%	3	4
≥15% to <20%	2	4
≥10% to <15%	1	4
<10%	0	4
N/A	0	0

Waste

26

Construction Waste

20

5.6.1.1 (ANSI #10.6.1.1)

Was a preconstruction waste management plan created prior to any construction or demolition activities?

- Yes (2 points)

- No (0 points)

Assessment Guidance

The 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 on-site 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 5.6.1.3 (ANSI #10.6.1.3) below; and
- Target waste diversion rate.

Recommended Documents

- *Construction Documents*
- *Preconstruction waste management plan*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

5.6.1.2 (ANSI #10.6.1.2)

Was a final waste management summary report completed after construction documenting the results of the implementation of the preconstruction waste management plan?

- Yes (1 points)

- No (0 points)

Tooltip

The final waste management summary report must include:

- The weight or volume of the total quantity of construction and demolition waste;
- The calculated construction waste per unit area for the project (see 10.6.1.3 below);
- 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 the processing of materials through source separate or by a comingled waste hauler;
- 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 at the off-site recycling facility responsible for date collection and reporting.

Recommended Documents

- *Waste management report*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

5.6.1.3 (ANSI #10.6.1.3)

What is the amount of construction waste, per unit area of new building floor area, generated in new portions of buildings?

- < 1.2 lbs./ft² (5.9 kgf/m²) (10 points)

- 1.2 lbs./ft² (5.9 kgf/m²) to 2.0 lbs./ft² (9.8 kgf/m²) (6 points)

- 2.0 lbs./ft² (9.8 kgf/m²) to 2.5 lbs./ft² (12.2 kgf/m²) (3 points)

- > 2.5 lbs./ft² (12.2 kgf/m²) (0 points)

Assessment Guidance

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.

Recommended Documents

- *Waste management report*

Scoring Matrix

Response	Score	Max Points
< 1.2 lbs./ft ² (5.9 kgf/m ²)	10	10
1.2 lbs./ft ² (5.9 kgf/m ²) to 2.0 lbs./ft ² (9.8 kgf/m ²)	6	10
2.0 lbs./ft ² (9.8 kgf/m ²) to 2.5 lbs./ft ² (12.2 kgf/m ²)	3	10
> 2.5 lbs./ft ² (12.2 kgf/m ²)	0	10

5.6.1.4 (ANSI #10.6.1.4)

What percentage of construction waste, including building demolition waste and packaging, is diverted from the landfill through recycling, reuse, repurposing, or composting?

- ≥75% (6 points)

- ≥50% to <75% (4 points)

- ≥25% to <50% (2 points)

- <25% (0 points)

Assessment Guidance

The amount of construction waste that is used for waste-to-energy combustion is multiplied by 0.5 when counted as waste 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.

Recommended Documents

- *Waste management report*

Scoring Matrix

Response	Score	Max Points
≥75%	6	6
≥50% to <75%	4	6
≥25% to <50%	2	6
<25%	0	6

5.6.1.5 (ANSI #10.6.1.4)

Has the facility verified their annual average recycling rate from an independent third-party organization?

- Yes (1 points)
-

Projects that have answered <25% for the previous question, Green Globes #5.6.1.4 - ANSI #10.6.1.4, must answer No.

- No (0 points)

Assessment Guidance

Projects that have answered <25% for the previous question, Green Globes #5.6.1.4 - ANSI #10.6.1.4, must answer No.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Post Occupancy Solid Waste Recycling

2

5.6.2.1 (ANSI #10.6.2.1)

Does the building design address recycling for solid waste using one or more of the following items?

Recommended Documents

- *Preconstruction waste management plan*

Scoring Matrix

Response	Score	Max Points
0	0	2
1	1	2
2-3	2	2

5.6.2.1.1 (ANSI #10.6.2.1.1)



- Capacity

Assessment Guidance

Provide recycling collection capacity as follows:

- Multi-family: 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 (ANSI #10.6.2.1.2)

•Interior Storage Requirements

Assessment Guidance

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 (ANSI #10.6.2.1.3)



•Exterior Storage Requirements

Assessment Guidance

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.

Supply Chain Waste Minimization

4

5.6.3.1 (ANSI #10.6.3.1)

What percentage, by cost, of building products used come from facilities that divert over 80% of their waste?

- $\geq 50\%$ (4 points)

- $\geq 40\%$ to $< 50\%$ (3 points)

- $\geq 30\%$ to $< 40\%$ (2 points)

- $\geq 20\%$ to $< 30\%$ (1 points)

- $< 20\%$ (0 points)

Assessment Guidance

The diversion rate is expressed as a percentage and calculated as follows: $\text{Diversion Rate} =$

$$(1 - [(\text{Mass Landfilled} + \text{Mass Incinerated without Energy Recovery}) / (\text{Mass Discarded Material})]) \times 100$$

Discarded materials resulting 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
- Have followed and certified to UL2799 2017

The following methods are accepted as valid diversion from landfill:

- Recycling;
- Returning to supplier;
- Reuse in same process;
- Reuse in different process;

- 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.

References

- *Zero Waste Principles of the Zero Waste International Alliance (ZWIA), 2015*
- *UL 2799, 2017*

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*
- *Verification to ZWIA or UL 2799*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥50%	4	4
≥40% to <50%	3	4
≥30% to <40%	2	4
≥20% to <30%	1	4
<20%	0	4

Resource Conservation

10

Off-Site Fabrication for Construction Optimization

4

5.7.1.1 (ANSI #10.7.1.1)

What percentage of the project incorporates building elements that are produced by one or both of the following methods, alone or in combination?

- Modular Construction
- Prefabrication

- $\geq 20\%$ (4 points)

- $\geq 15\%$ to $< 20\%$ (3 points)

- $\geq 10\%$ to $< 15\%$ (2 points)

- $\geq 5\%$ to $< 10\%$ (1 points)

- $< 5\%$ (0 points)

Recommended Documents

- *Construction Documents*
- *Design specifications*

Scoring Matrix

Response	Score	Max Points
$\geq 20\%$	4	4
$\geq 15\%$ to $< 20\%$	3	4
$\geq 10\%$ to $< 15\%$	2	4
$\geq 5\%$ to $< 10\%$	1	4
$< 5\%$	0	4

Design for Deconstruction (DfD)

6

5.7.2.1 (ANSI #10.7.2.1)

Do the project teams document the application of design for deconstruction (DFD) principles in the design of the building and provide 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?

- Yes (6 points)

- No (0 points)

References

- *CSA Z783-12 Deconstruction of Buildings and Their Related Parts*
- *Design for Disassembly in the Built Environment*, Brad Guy, Hamer Center, Penn State University (2008)
- *Design for Deconstruction: Principles of Design to Facilitate Reuse and Recycling*, W. Addis, B. Happold, and J. Shouten, Construction Industry Research & Information Association (2004)
- *Design for Deconstruction*, M. Pulaski, C. Hewitt, M/ Horman, and B. Guy, Modern Steel, (June 2004)

Recommended Documents

- *Deconstruction Plan*

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6

Indoor Environment

150

Air Ventilation and Quality

35

Ventilation Air Quantity

9

6.1.1.1 (ANSI #11.1.1.1)

Is the quantity of ventilation for the building 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*
- Yes (9 points)
-
- No (0 points)

OR

Local codes or standards (if more stringent)

References

- *ANSI/ASHRAE/ASHE Standard 170-2017, Ventilation of Health Care Facilities*
- *IAPMO UMC (2018): Uniform Mechanical Code*
- *The ICC International Mechanical Code (ICC IMC 2018)*
- *ANSI/ASHRAE Standard 62.1-2019; Ventilation for Acceptable Indoor Air Quality*

Recommended Documents

- *Balancing reports for the ventilation systems*
- *Engineering drawings and specifications for ductwork*
- *Filter submittals*

- *List of regularly occupied zones and associated air distribution system*
- *Local ventilation codes or standards*
- *Specifications for ventilation systems, CO2 sensing and ventilation control equipment*
- *Ventilation air quality design data*
- *Ventilation schedule and tables*
- *HVAC drawings*

Scoring Matrix

Response	Score	Max Points
Yes	9	9
No	0	9

Air Change Effectiveness

9

6.1.2.1 (ANSI #11.1.2.1)

Are the following strategies implemented when ventilation systems are used?

- 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.
 - 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.
- Yes (9 points)
 - No (0 points)

Assessment Guidance

The E_z value is determined using ANSI # Table 11.1.2.1 (Green Globes # 6.1.2.1).

Table 11.1.2.1: Air Distribution Effectiveness

Air Distribution Configuration	E_z
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 <u>150 fpm</u> supply air jet reaches to within 4.5 ft. (1.37 m) of the floor level. <i>Note: For lower velocity supply air, $E_z = 0.8$</i>	1.0
Floor supply of cool air and ceiling return provided that the <u>150 fpm</u> supply jet reaches 4.5 ft. (1.37 m) or more above the floor. <i>Note: Most underfloor air distribution systems comply with this provision.</i>	1.0
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
<ol style="list-style-type: none"> 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 <i>ANSI/ASHRAE 129-1997 (RA 02), Measuring Air Change Effectiveness</i> for all air distribution configurations except unidirectional flow. 	

References

- *ANSI/ASHRAE Standard 62.1-2019; Ventilation for Acceptable Indoor Air Quality*

Recommended Documents

- *Engineering drawings and specifications for ductwork*
- *Filter submittals*
- *List of regularly occupied zones and associated air distribution system*
- *Balancing reports for the ventilation systems*
- *Local ventilation codes or standards*

- *Specifications for ventilation systems, CO2 sensing and ventilation control equipment*
- *Ventilation air quality design data*
- *Ventilation schedule and tables*
- *HVAC drawings*

Scoring Matrix

Response	Score	Max Points
Yes	9	9
No	0	9

Air Handling Equipment

11

6.1.3.1 (ANSI #11.1.3.1.)

Is air handling equipment equipped with filtration as follows?

- Air handling equipment that provides ventilation air: minimum MERV 13

- Yes (6 points)

- No (0 points)

AND

- Terminal equipment that circulates room or zone air: minimum MERV 8

- N/A

Assessment Guidance

Examples of air handling equipment that provides ventilation air is central mixed air equipment, make-up air equipment, ventilation equipment for “compartmental” systems such as fan coils or unitary heat pumps

Examples of terminal equipment that circulates room or zone air is fan coils or unitary heat pumps.

Not applicable where non-ducted circulating unitary equipment serves only a single zone (e.g. unit heaters, force-flows).

Recommended Documents

- *Air-handling equipment submittals*
- *Engineering drawings and specifications for ductwork*
- *List of regularly occupied zones and associated air distribution system*
- *Occupant density calculation*
- *Balancing reports for the ventilation systems*
- *Local ventilation codes or standards*
- *Ventilation air quality design data*
- *Ventilation schedule and tables*
- *HVAC drawings and specifications*

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6
N/A	0	0

6.1.3.2 (ANSI #11.1.3.2)

Are interior liners that could harbor microbial growth AND/OR erode in the air stream avoided in any outdoor air, return air, and supply air ductwork, or any fan, coil, terminal, or other devices exposed to the airstream?

- Yes (5 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable where a building does not have ductwork with radiant systems and operable windows.

Recommended Documents

- *Air-handling equipment submittals*
- *Engineering drawings and specifications for ductwork*
- *Filter submittals*
- *List of regularly occupied zones and associated air distribution system*
- *Balancing reports for the ventilation systems*
- *Local ventilation codes or standards*
- *Ventilation air quality design data*
- *Ventilation schedule and tables*
- *HVAC drawings and specifications*

Scoring Matrix

Response	Score	Max Points
Yes	5	5
No	0	5
N/A	0	0

CO2 Sensing and Ventilation Control Equipment

6

6.1.4.1 (ANSI #11.1.4.1)

Do densely occupied rooms with variable occupancy have CO₂ sensing and ventilation control equipment?

- Yes (6 points)

- No (0 points)

- N/A

Assessment Guidance

A densely occupied room is 25 or more people per 1,000 ft.² (92.9 m²).

Examples of variable occupancy rooms are meeting rooms or assembly areas.

Not applicable where there are no densely occupied spaces with variable occupancy.

Recommended Documents

- *Construction documents and specifications*
- *List of regularly occupied zones and associated air distribution system*
- *HVAC drawings and specifications*
- *Occupant density calculation*
- *Specifications for ventilation systems, CO₂ sensing and ventilation control equipment*
- *Design drawings*

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6
N/A	0	0

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Volatile Organic Compounds 17

6.2.1.1 (ANSI #11.2.1.1)

Do adhesives and sealants (not including carpet adhesives) that are applied on site within, or part of, the building envelope's continuous plane of air tightness comply with the following?

Assessment Guidance

Table 11.2.1.1: 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 <u>Non porous</u>	250 g/L
	Porous	775 g/L
1. The VOC content must conform to the VOC limits in the <i>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)</i> . 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, February 2017; or *UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, 2013*.

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 certification body accredited to ISO/IEC 17065:2012 and with relevant certification program in the scope of its accreditation. Certification programs include but are limited to, one of the following:

- *UL GREENGUARD Gold– UL Environment*
- *UL 2818 GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings, 2013*
- *FloorScore[®] Standard for flooring adhesives, 2015*
- *Indoor Advantage Gold TM –SCS Global Services*
- *SCS - EC10.2 -2007, Environmental Certification Program—Indoor Air Quality Performance, May, 2007*

Provide documentation indicating compliance with the VOC content requirements. Such documentation includes manufacturer declarations or a certification by a third party testing organization including, but not limited to, one of the following:

- *UL EcoLogo – UL Environment*
- *UL 2762 Sustainability for Adhesives, 2011*
- *Green Seal GS-36 Adhesives for Commercial Use (July 12, 2013)*

References

- [*UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, 2013*](#)
- [*UL 2762 Sustainability for Adhesives, 2011*](#)
- [*South Coast Air Quality Management District \(SCAQMD\)- Rule 1168 \(October 6, 2017\)*](#)

6.2.1.1.1 (ANSI #11.2.1.1)



70% (or greater) of products by volume comply with VOC emissions criteria.

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

6.2.1.1.2 (ANSI #11.2.1.1)



90% (or greater) of products by volume comply with VOC content limits.

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.1.2 (ANSI #11.2.1.2)

Do paints and coatings applied on site within, or are a part of, the building’s continuous plane of air tightness comply with the following VOC content limits detailed in CARB 2007 SCM?

Assessment Guidance
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 Indoor Sources Using Environmental Chambers, Version 1.2, February 2017; or *UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, 2013*.

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 certification body accredited to ISO/IEC 17065:2012 and with relevant certification program in the scope of its accreditation. Certification programs include but not limited to, one of the following:

- *UL GREENGUARD Gold– UL Environment*
- *UL 2818 GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings, 2013*
- *Indoor Advantage Gold TM –SCS Global Services*

Provide documentation indicating compliance with the VOC content requirements. Such documentation includes manufacturer declarations or a certification by a third party testing organization including, but not limited to, one of the following:

- *UL EcoLogo*
- *UL 2760 Sustainability for Surface Coatings: Recycled Water-borne, 2011*
- *UL 2768 Standard for Sustainability for Architectural Surface Coatings, 2011 Green Seal*
- *Environmental Standard for Paints and Coatings, GS-11 (July 12, 2013)*

References

- *California Air Resources Board Suggested Control Measure for Architectural Coatings (February 1, 2008)*
- [*UL 2760 Sustainability for Surface Coatings: Recycled Water-borne, 2011*](#)
- [*UL 2768 Standard for Sustainability for Architectural Surface Coatings, 2011*](#)
- [*UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, 2013*](#)



6.2.1.2.1 (ANSI #11.2.1.2)

70% (or greater) of products by volume comply with VOC emissions criteria.

- Yes (2 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

6.2.1.2.2 (ANSI #11.2.1.2)

↳ 90% (or greater) of products by volume comply with VOC content limits.

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.1.3 (ANSI #11.2.1.3)

Do 90% by area of the below interior products comply with prescribed limits of product VOC emissions?

Assessment Guidance

Table 11.2.1.3: Interior Product VOC Emissions

Product Area
11.2.1.3.1: Floors / Floor Coverings (including carpeting, resilient, other non-carpet flooring, and padding/cushion) ¹
11.2.1.3.2: Acoustical and Thermal Insulation
11.2.1.3.3: Ceiling Systems (including acoustical ceiling and gypsum board)
11.2.1.3.4: Wall Systems (including wall coverings, gypsum board, and window shading devices) ¹
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.
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) <i>“Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,”</i> V 1.2, 2017, Standard Private Office Scenario. Alternatively, VOC emission results are determined by UL 2821 <i>“GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings,”</i> March 2013, Table 2 Office Model and Section 34.1 Allowable Limits for GREENGUARD Certification Gold.

Provide documentation indicating compliance with the VOC emission requirements or a certification by a third party testing organization including, but not limited to, one of the following:

- FloorScore (Resilient Flooring) – Resilient Floor Covering Institute
 - *SCS - EC10.2 -2007, Environmental Certification Program—Indoor Air Quality Performance. May, 2007*
- GREENGUARD Gold – UL Environment
 - *UL 2818, “GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings,” March 2013.*
- Indoor Advantage Gold TM –SCS Global Services
 - *SCS - EC10.2 -2007, “Environmental Certification Program—Indoor Air Quality*

Performance”, May, 2007.

- [CRI Green Label Plus – Carpet and Rug Institute: CRI Green Label Plus Carpet Program Test Criteria](#)

For products containing composite wood, provide copies of product labels, chain-of-custody records, or documentation demonstrating compliance with the CARB/ATCM formaldehyde regulation.

6.2.1.3.1 (ANSI #11.2.1.3.1)

Floors/floor coverings



- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there are no floor coatings/floor coverings.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

6.2.1.3.2 (ANSI #11.2.1.3.2)

Ceiling systems



- Yes (3 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there are no ceiling systems.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3
N/A	0	0

6.2.1.3.3 (ANSI #11.2.1.3.3:)

Acoustical and thermal insulation

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there is no acoustical and thermal insulation.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

6.2.1.3.4 (ANSI #11.2.1.3.4)

Wall systems

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable if there are no wall systems.

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

6.2.1.4

Do furniture, casework, cabinets, workstations, and seating comply with the below prescribed limits of VOC emissions AND/OR are certified?

Assessment Guidance

Note: "certified" means compliance with any of the certifications listed per Table 11.2.1.4 (Green Globes 6.2.1.4): Furniture and Furnishings VOC Emissions.

Table 11.2.1.4: Furniture and Furnishings VOC Emissions

Product Area
Furniture and <i>Furnishings</i> (including case work, cabinetry, work stations, and seating)
<p>VOC Emissions Criteria</p> <p>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) <i>Standard Test Method for Determining VOC Emissions From Office Furniture Systems, Components and Seating</i>. Alternatively, VOC emission results may be determined by UL 2821 “<i>GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings</i>,” 2013 Table 2 Office Model and Section 34.1 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.</p>

Provide documentation indicating compliance with the VOC emission requirements or a certification by a third party testing organization including, but not limited to, one of the following:

- *GREENGUARD Gold – UL Environment – 7.6.1, 7.6.2, and 7.6.3*
- *UL 2818, GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings, 2013.*
- *MAS Certified Green Furniture per ANSI/BIFMA M7.1-2011 (R2016)*
- *SCS Indoor Advantage per ANSI/BIFMA M7.1-2011 (R2016)*

6.2.1.4.1

100% by cost of installed furniture products comply with *ANSI/BIFMA e3 Section 7.6.1 Low Emitting Furniture - Prerequisite* AND/OR are certified.

- *Yes (1 points)*

- *No (0 points)*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.1.4.2

↳ 90% by cost of installed furniture products comply with *ANSI/BIFMA e3 Section 7.6.2 Low Emitting Furniture - Intermediate* AND/OR are certified.

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.1.4.3

↳ 70% by cost of installed furniture products comply with *ANSI/BIFMA e3 Section 7.6.3 Low Emitting Furniture - Advanced* AND/OR are certified.

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Pre-Occupancy Indoor Air Quality Testing

6

6.2.2.1 (ANSI #11.2.2.1)

Two paths are available for assessing pre-occupancy indoor air quality testing:

- 6.2.2.1A Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing: up to 6/6 points

OR

- 6.2.2.2B Path B: Total Volatile Organic Compounds (TVOC): up to 3/6 points

- 6.2.2.1 Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing

- 6.2.2.2 Path B: Total Volatile Organic Compounds (TVOC)

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

Assessment Guidance

Path B awards a maximum of 3 points out of 6 total for 6.2.2 Pre-Occupancy Indoor Air Quality Testing.

Scoring Matrix

Response	Score	Max Points
6.2.2.1 Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing	0	0
6.2.2.2 Path B: Total Volatile Organic Compounds (TVOC)	0	3



Criterion only visible if 6.2.2.1 is answered with "6.2.2.1 Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing"

6.2.2A.1 (ANSI #11.2.2A.1)

Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing

Has the buildings indoor environments been tested and determined acceptable using the below methods?

- Yes (6 points)

 - No (0 points)
- *U.S. EPA's Compendium of Methods for the Determination of Toxic Organic Pollutants in Ambient Air*
 - TO-1, TO-11, TO-17
 - *ASTM D 5197-16 Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)*

Assessment Guidance

The testing takes 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 of the contaminant levels listed in ANSI # Table 11.2.2A.1 (Green Globes # 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 m²) of floor area.

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

Table 11.2.2A.1: Maximum level of contaminants:

Contaminant	Maximum Concentration
	µg/m ³ (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.

Scoring Matrix

Response	Score	Max Points
Yes	6	6
No	0	6



Criterion only visible if 6.2.2.1 is answered with "6.2.2.2 Path B: Total Volatile Organic Compounds (TVOC)"

6.2.2B.1 (ANSI #11.2.2B.1)

Path B: Total Volatile Organic Compounds (TVOC)

Upon Substantial Completion, but prior to occupancy, has a TVOC indoor air sampling and laboratory analysis of collected samples been conducted?

- Yes (3 points)

- No (0 points)

Assessment Guidance

The TVOC indoor air sampling and laboratory analysis of collected samples is conducted as follows:

Sampling for TVOCs is conducted over a minimum four-hour 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 workstations 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 m²) 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.

There are no pass/fail criteria for conducting this test.

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

Carbon Monoxide Monitoring

1

6.2.3.1 (ANSI #11.2.3.1)

Are carbon monoxide monitoring devices and alarms installed in enclosed areas where there are sources of combustion?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Sources of combustion could include stoves, ovens, grills, clothes dryers, furnaces, boilers, water heaters, heaters and fireplaces.

Not applicable where there are no areas with combustion sources.

References

- *NFPA 720 2015, CSA 6.19, UL 2034 or similar standard for detector*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

Legionellosis Mitigation in the Building Water Systems

3

6.2.4.1 (ANSI #11.2.4.1)

Does the building water systems conform with *ASHRAE 188-2018, Legionellosis: Risk Management for Building Water Systems*?

- Yes (3 points)

- No (0 points)

References

- *ASHRAE 188-2018, Legionellosis: Risk Management for Building Water Systems*

Scoring Matrix

Response	Score	Max Points
Yes	3	3
No	0	3

Pest and Contamination Control

2

6.2.5.1 (ANSI #11.2.5.1)

Are the following integrated pest management strategies 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
 - Mullions and ledges are less than 1 in. (2.5 cm) deep to discourage bird roosting
- Yes (1 points)

 - No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.5.2 (ANSI #11.2.5.2)

Does the building have a sealed storage area for food/kitchen solid waste and recycling?

- Yes (1 points)

- No (0 points)

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Other Indoor Pollutants (Tobacco, Radon)

5

6.2.6.1 (ANSI #11.2.6.1)

Is there an occupancy policy prohibiting smoking and signage posted at every building entrance prohibiting smoking and the use of electronic cigarettes within 25 ft. (7.6 m) of the building?

- Yes (1 points)

- No (0 points)

Assessment Guidance

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

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.2.6.2 (ANSI #11.2.6.2.1)

Has a site-specified assessment of radon potential been conducted, and if so, have radon prevention and mitigation measures been implemented if indicated by the assessment?

- Yes (2 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable when there is a documented absence of risk.

References

- U.S. EPA document *Radon Prevention in the Design and Construction of Schools and Other Large Buildings* (EPA 625-R-92-016, June 1994).

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

6.2.6.3 (ANSI #11.2.6.3)

Are spaces housing specialized activities that generate hazardous pollutants:

- provided with separate ventilation AND/OR exhaust systems?
 - physically isolated by doors and deck-to-deck partitions or hard lid ceilings?
- Yes (2 points)
 - No (0 points)
 - N/A

Assessment Guidance

Exhaust systems must be 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.

Not applicable where there are no spaces housing specialized activities.

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

Lighting Design and Systems

32

Daylighting and Views

12

6.3.1.1 (ANSI #11.3.1.1)

For regularly occupied floor area is a minimum daylight factor (DF) of at least 2 (excluding all direct sunlight penetration) achieved?

- ≥75% of the floor area achieves a DF of 3 or more (5 points)

- ≥50 to <75% of the floor area achieves a DF of 3 or more (4 points)

- ≥25 to <50% of the floor area achieves a DF of 3 or more (3 points)

- ≥75% of the floor area achieves a DF of 2 to <3 (2 points)

- ≥50 to <75% of the floor area achieves a DF of 2 to <3 (1 points)

- None of the above (0 points)

Assessment Guidance

Estimate the DF for a daylit space that has vertical windows using the following formula:

$DF = 0.1 \times PG$, where:

DF = daylight factor

PG = percentage of glass to floor area (area of the windows/floor area)

References

- [International Commission on Illumination](#)
- [RADIANCE software \(for evaluation\) Validated Lighting Simulation Tool](#)
- [Whole Building Design Guide \(WBDG\): Sustainability of Building Envelope, 2016](#)
- [ASHRAE Advanced Energy Design Guides](#)
- [Architectural Lighting Magazine –Benefits of Natural Light](#)
- [New Building Institute –Advanced Buildings® Daylighting pattern guide](#)

Recommended Documents

- *Percentages and calculations for occupied areas with daylight illumination levels*
- *Percentages and calculations for primary occupied spaces with IESNA recommended task lighting levels*
- *Construction Documents*

Scoring Matrix

Response	Score	Max Points
≥75% of the floor area achieves a DF of 3 or more	5	5
≥50 to <75% of the floor area achieves a DF of 3 or more	4	5
≥25 to <50% of the floor area achieves a DF of 3 or more	3	5
≥75% of the floor area achieves a DF of 2 to <3	2	5
≥50 to <75% of the floor area achieves a DF of 2 to <3	1	5
None of the above	0	5

6.3.1.2 (ANSI #11.3.1.2)

What percentage of regularly occupied task areas are designed to have clear views to the exterior or atria within 25 ft. (7.6 m) from a window?

- ≥90% (3 points)
- ≥60% to <90% (2 points)
- ≥40% and <60% (1 points)
- <40% (0 points)

Recommended Documents

- *Construction Documents*
- *Percentage and calculations for views to building exterior or atria*

Scoring Matrix

Response	Score	Max Points
≥90%	3	3
≥60% to <90%	2	3
≥40% and <60%	1	3
<40%	0	3

6.3.1.3 (ANSI #11.3.1.3)

What type of shading devices are used for southern, western, and eastern exposures?

- Active automated shading devices (2 points)

- Passive shading devices (1 points)

- No shading device are used (0 points)

Assessment Guidance

Active automated shading devices (e.g. automated window shades or electrochromic glazing) that automatically adjust based on sky conditions for all listed exposures;

Passive shading devices (e.g. manual window shades or permanent projections such as overhangs).

Recommended Documents

- *Specifications for solar shading devices and luminaries*

Scoring Matrix

Response	Score	Max Points
Active automated shading devices	2	2
Passive shading devices	1	2
No shading device are used	0	2

6.3.1.4 (ANSI #11.3.1.4)

What percentage of 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?

- >75% (2 points)
- ≥50% to ≤75% (1 points)
- <50% (0 points)

Recommended Documents

- *Construction Documents*
- *Lighting plans*
- *Percentages and calculations for occupied areas with daylight illumination levels*
- *Percentages and calculations for primary occupied spaces with IESNA recommended task lighting levels*

Scoring Matrix

Response	Score	Max Points
>75%	2	2
≥50% to ≤75%	1	2
<50%	0	2

Lighting Design Quantity

9

6.3.2.1 (ANSI #11.3.2.1)

What percentage of regularly occupied spaces meet the Recommended Illuminance for the Locations/Tasks in Table 11.3.2.1-A and Table 11.3.2.1-B?

- $\geq 90\%$ (5 points)

- $\geq 70\%$ and $< 90\%$ (4 points)

- $\geq 50\%$ and $< 70\%$ (2 points)

- $< 50\%$ (0 points)

Assessment Guidance

“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 11.3.2.1-A: IES Illuminance Categories and Table 11.3.2.1-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 11.3.2.1–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
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 11.3.2.1–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

References

- *IESNA Lighting Handbook, 10th Edition, 2011*

Recommended Documents

- *Construction Documents*
- *Lighting plans*
- *Percentages and calculations for primary occupied spaces with IESNA recommended task lighting levels*

Scoring Matrix

Response	Score	Max Points
≥90%	5	5
≥70% and <90%	4	5
≥50% and <70%	2	5
<50%	0	5

6.3.2.2 (ANSI #11.3.2.2)

Do luminance ratios avoid exceeding the following as per IESNA for tasks?

- | | |
|--|--|
| <ul style="list-style-type: none"> • 3:1 between the task and adjacent surroundings • 10:1 between the task and remote (non-adjacent) surfaces • 20:1 between the brightest and darkest surface in the field of view • 8:1 between rows of luminaires where there is indirect lighting and where ceiling luminance exceeds 124.1 fL (425 cd/m²) | <ul style="list-style-type: none"> • Yes (2 points) <hr/> • No (0 points) <hr/> • N/A |
|--|--|

Assessment Guidance

Not applicable where spaces are designed such that source/task eye geometry do not require IESNA Standard VDT compliant luminaires.

References

- *IESNA Lighting Handbook, 10th Edition, 2011*

Recommended Documents

- *Percentages and calculations for primary occupied spaces with IESNA recommended*

task lighting levels

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

6.3.2.3 (ANSI #11.3.2.3)

Does the average luminance avoid exceeding at least one of the following values for given luminaire angles where there is direct lighting?

- 248.1 fL (850 cd/m²) at 65° from the vertical
- 102.2 fL (350 cd/m²) at 75° from the vertical
- 51.1 fL (175 cd/m²) at 85° from the vertical

• Yes (2 points)

• No (0 points)

• N/A

Assessment Guidance

Not applicable where spaces are designed such that source/task eye geometry do not require IESNA Standard VDT compliant luminaires.

Recommended Documents

- *Percentages and calculations for primary occupied spaces with IESNA recommended task lighting levels*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2
N/A	0	0

Lighting Design Quality

6

6.3.3.1 (ANSI #11.3.3.1)

Do regularly occupied spaces use electric light sources with a minimum Color Rendering Index (CRI) of 80?

- Yes (1 points)

- No (0 points)

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.3.3.2 (ANSI #11.3.3.2)

Does regularly occupied space use electric light sources with a Correlated Color Temperature (CCT) between 2700°K and 4500°K?

- Yes (1 points)

- No (0 points)

- N/A

Assessment Guidance

Not applicable to specialty retail, medical, or exterior environments.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1
N/A	0	0

6.3.3.3 (ANSI #11.3.3.3)

Does regularly occupied spaces use no more than 50% direct only general lighting?

- Yes (2 points)
- No (0 points)

Assessment Guidance

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).

Recommended Documents

- *Manufacturer's specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

6.3.3.4 (ANSI #11.3.3.4)

Is individual control of primary workspace lighting provided for at least 90% of occupants?

- Continuous dimming of at least 10% to 100% (2 points)

- Stepped dimming or switching with at least three steps (100%, 50%, 0%) (1 points)

- Neither (0 points)

Assessment Guidance

“Control” may either be dimming from 100% to at least 10% or stepped dimming with at least three (3) steps: 100%, 50% and 0%.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Lighting plans*

Scoring Matrix

Response	Score	Max Points
Continuous dimming of at least 10% to 100%	2	2
Stepped dimming or switching with at least three steps (100%, 50%, 0%)	1	2
Neither	0	2

Lighting Sustainability

5

6.3.4.1 (ANSI #11.3.4.1)

Do a minimum of 75% of electric light sources have a Lumen Maintenance factor of 35,000 hours to L70 or greater?

- Yes (2 points)

- No (0 points)

Assessment Guidance

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.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

6.3.4.2 (ANSI #11.3.4.2)

Are all luminaires RoHS compliant with EU Directive 2011/65/EU of the European Parliament?

- Yes (2 points)

- No (0 points)

Assessment Guidance

RoHS specifies maximum levels for the following six restricted materials:

- Lead (Pb): < 1000 ppm;
- Mercury (Hg): < 100 ppm;
- Cadmium (Cd): < 100 ppm;
- Hexavalent Chromium: (Cr VI) < 1000 ppm;
- Polybrominated Biphenyls (PBB): < 1000 ppm; and

- Polybrominated Diphenyl Ethers (PBDE): < 1000 ppm.

Certification is provided by the luminaire manufacturer.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

6.3.4.3 (ANSI #11.3.4.3)

Is a maintenance and operations plan documented and supplied to the building owners, management, and maintenance?

- Yes (1 points)

- No (0 points)

Assessment Guidance

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).

Recommended Documents

- *Maintenance, cleaning, and recycling plan*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

Thermal Comfort

23

Thermal Control Zones

14

6.4.1.1 (ANSI #11.4.1.1)

Which of the following occupancy types applies to your project?

- Office Occupancies/Areas

- Educational Occupancies/Areas

- Healthcare Occupancies/Areas

- Open-Area Mercantile and Assembly Occupancies/Areas

- N/A

Assessment Guidance

Office Occupancies/Areas: Includes offices and conference rooms, among others. For open areas, thermal control zones are designed to be between 500 ft² (46.5 m²) and 1000 ft² (92.9 m²) for open areas. For single rooms, thermal control zones are designed to be between 750 ft² (69.7 m²) and 1200 ft² (111.5 m²).

Circulation and support areas are excluded.

Educational Occupancies/Areas: Includes classrooms, teaching labs, etc. Classrooms AND/OR teaching labs are designed thermal control zones under 1500 ft.² (139.4 m²).

Healthcare Occupancies/Areas: Includes patient wards, diagnostic and treatment areas. Thermal control zones are designed to be between 500 ft.² (46.5m²) and 1000 ft.² (92.9m²).

Open-Area Mercantile and Assembly Occupancies/Areas: Includes retail, food service, convention halls, etc. For spaces exceeding 464.5 m² (5000 ft.²) thermal control zones are designed to be less than 2500 ft.² (232.3 m²). For spaces between 2500 ft.² (232.3 m²) and 5000 ft.² (464.5 m²) thermal control zones are designed to be less than 1500 ft.² (139.4 m²).

Not applicable for other occupancies/areas.

Recommended Documents

- *Basis of Design document AND/OR specifications*
- *Construction Documents*
- *Project specifications*
- *Zone plan*

Scoring Matrix

Response	Score	Max Points
Office Occupancies/Areas	0	0
Educational Occupancies/Areas	0	0
Healthcare Occupancies/Areas	0	0
Open-Area Mercantile and Assembly Occupancies/Areas	0	0
N/A	0	0

↩ Criterion only visible if 6.4.1.1 is answered with "Office Occupancies/Areas"

6.4.1.1.1 (ANSI #11.4.1.1.1)

What is the size of thermal control zones?

- <500 SF for open areas or <750 SF for a single room *(14 points)*

- ≥500 to <1000 SF for open areas or ≥750 to <1200 SF for a single room *(10 points)*

- ≥1000 SF for open areas or ≥1200 SF or greater for a single room *(0 points)*

- N/A

Assessment Guidance

Not applicable where there are no office occupancies/areas.

Scoring Matrix

Response	Score	Max Points
<500 SF for open areas or <750 SF for a single room	14	14
≥500 to <1000 SF for open areas or ≥750 to <1200 SF for a single room	10	14
≥1000 SF for open areas or ≥1200 SF or greater for a single room	0	14
N/A	0	0

↪ Criterion only visible if 6.4.1.1 is answered with "Educational Occupancies/Areas"

6.4.1.1.2 (ANSI #11.4.1.1.2)

What is the size of thermal control zones for classrooms and teaching labs?

- <1500 SF (14 points)

- ≥1500 SF (0 points)

- N/A

Assessment Guidance

Not applicable where there are no educational occupancies/areas.

Scoring Matrix

Response	Score	Max Points
<1500 SF	14	14
≥1500 SF	0	14
N/A	0	0

↩ Criterion only visible if 6.4.1.1 is answered with "Healthcare Occupancies/Areas"

6.4.1.1.3 (ANSI #11.4.1.1.3)

What is the size of thermal control zones in patient wards, diagnostic areas, and treatment areas?

- <500 SF (14 points)

- ≥500 to <1000 SF (10 points)

- ≥1000 SF (0 points)

- N/A

Assessment Guidance

Not applicable where there are no healthcare occupancies/areas.

Scoring Matrix

Response	Score	Max Points
<500 SF	14	14
≥500 to <1000 SF	10	14
≥1000 SF	0	14
N/A	0	0



Criterion only visible if 6.4.1.1 is answered with "Open-Area Mercantile and Assembly Occupancies/Areas"

6.4.1.1.4 (ANSI #11.4.1.1.4)

What is the size of thermal control zones?

- ≥2500 to ≤5000 SF are designed to be <1500 SF (14 points)

- >5000 SF are designed to be <2500 SF (10 points)

- Neither of the above (0 points)

- N/A

Assessment Guidance

Not applicable where there are no open-area mercantile and assembly occupancies/areas.

Not applicable for other occupancies/areas.

Scoring Matrix

Response	Score	Max Points
≥ 2500 to ≤ 5000 SF are designed to be < 1500 SF	14	14
> 5000 SF are designed to be < 2500 SF	10	14
Neither of the above	0	14
N/A	0	0

Thermal Comfort Design

9

6.4.2.1 (ANSI #11.4.2.1)

Are the HVAC systems and building designed to provide a thermal environment in conformance with *ANSI/ASHRAE Standard 55-2017, Thermal Environmental Conditions for Human Occupancy?*

- Yes (9 points)

- No (0 points)

- N/A

Assessment Guidance

Exceedance hours for regularly occupied spaces do not exceed 300 hours per year.

Not applicable where the occupancy is outside the purview of 55-2017.

Recommended Documents

- *Manufacturer’s specifications, cut sheets, and performance documentation*
- *Documentation demonstrating compliance with ANSI/ASHRAE Standard 55- 2017, including relevant worksheets and report*

Scoring Matrix

Response	Score	Max Points
Yes	9	9
No	0	9
N/A	0	0

Acoustical Privacy and Comfort

26

Noise Limits and Masking Sound Level

12

6.5.1.1 (ANSI #11.5.1.1)

Does design comply with noise limit criteria, quantified by either Noise Criterion (NC) or A-weighted Overall Sound Level (dBA)/C-weighted Overall Sound Level (dBC)?

- Yes (1 points)

- No (0 points)

Assessment Guidance

Healthcare spaces noise limit criteria is in accordance with one of the following as applicable:

- *2018 FGI Guidelines for Design and Construction of Hospitals*
- *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
- *2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*

Educational spaces noise limit criteria is in accordance with the following:

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

All other spaces noise limit criteria is 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.*

User-Specific Guidance:

The purpose of establishing criteria for noise is to limit the emission of sound from unwanted source(s)—i.e., noise—as measured in a space to improve acoustical comfort.

Noise limits can be evaluated using:

- The Noise Criterion (NC) is a single-value metric that approximates the level and the spectrum of the ambient background sound (primarily due to HVAC noise) in a space. Note, it's calculation cannot be easily completed on-site verification (11.5.1.1.1) from measurements.
- The A-weighted overall sound level is a simpler, single-value metric that indicates the total sound level (sum of all frequencies) in a space. Note, special care should be taken during verification (11.5.1.1.1) because a space may comply with the A-weighted overall sound level and still be uncomfortable due to tones or spectrally imbalanced sound (e.g., buzzing, rumbly and hissy sound).

From the referred applicable documents, determine acceptable noise limit criterion for each space in the project building. Where a 'room type' in the project building is not found in the referred to document, the user may refer to another room type with similar 'function' or 'purpose' and select its criterion.

Examples of Noise Assessments include calculations and simulations, demonstrating the reduction of 'noise' from building systems within or about a space to comply with the required criteria.

References

- *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*
- *ANSI S12.60 Series: Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools*
- *2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*
- *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
- *2018 FGI Guidelines for Design and Construction of Hospitals*
- *ANSI/ASA S12.2-2019, Criteria For Evaluating Room Noise*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.5.1.1.A (ANSI #11.5.1.1)

What percentage of listed spaces has been validated for compliance with a Noise Assessment of noise limit criteria?

- $\geq 75\%$ to $\leq 100\%$ (3 points)

- $\geq 50\%$ to $< 75\%$ (2 points)

- $\geq 10\%$ to $< 50\%$ (1 points)

- $< 10\%$ (0 points)

Assessment Guidance

Healthcare spaces noise limit criteria is in accordance with one of the following as applicable:

- *2018 FGI Guidelines for Design and Construction of Hospitals*
- *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
- *2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*

Educational spaces noise limit criteria is in accordance with the following:

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

All other spaces noise limit criteria is 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.*

User-Specific Guidance:

The purpose of establishing criteria for noise is to limit the emission of sound from unwanted source(s)—i.e., noise—as measured in a space to improve acoustical comfort.

Noise limits can be evaluated using:

- The Noise Criterion (NC) is a single-value metric that approximates the level and the spectrum of the ambient background sound (primarily due to HVAC noise) in a space. Note, it's calculation cannot be easily completed on-site verification (11.5.1.1.1) from measurements.
- The A-weighted overall sound level is a simpler, single-value metric that indicates the total sound level (sum of all frequencies) in a space. Note, special care should be taken during verification (11.5.1.1.1) because a space may comply with the A-weighted overall sound level and still be uncomfortable due to tones or spectrally imbalanced sound (e.g., buzzing, rumbly and hissy sound).

From the referred applicable documents, determine acceptable noise limit criterion for each space in the project building. Where a 'room type' in the project building is not found in the referred to document, the user may refer to another room type with similar 'function' or 'purpose' and select its criterion.

Examples of Noise Assessments include calculations and simulations, demonstrating the reduction of 'noise' from building systems within or about a space to comply with the required criteria.

Assessor-Specific Guidance:

For example, if 7 of 10 rooms (70%) demonstrate compliance, 2 points are earned. Examples (i.e., documentation) of Noise Assessments include calculations and/or simulations (e.g., by a consultant, manufacturer or other).

References

- *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*
- *ANSI S12.60 Series: Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools*
- *2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*
- *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
- *2018 FGI Guidelines for Design and Construction of Hospitals*
- *ANSI/ASA S12.2-2019, Criteria For Evaluating Room Noise*

Scoring Matrix

Response	Score	Max Points
≥75% to ≤100%	3	3
≥50% to <75%	2	3
≥10% to <50%	1	3
<10%	0	3

6.5.1.1.1 (ANSI #11.5.1.1.1)

Has there been verification of building-related systems’, services’ and utilities’ that noise levels comply with noise limit criteria in Green Globes ID #6.5.1.1 / ANSI ID #11.5.1.1, measured after construction but prior to occupancy, using a Type I or Type II sound level meter?

- Yes (1 points)

- No (0 points)

Assessment Guidance

User-Specific Guidance:

The purpose of verifying compliance with noise limit criteria is to confirm continuous noise emission from building systems, services and utilities are within design-specified noise limits (Green Globes ID #6.5.1.1 / ANSI ID #11.5.1.1) to improve acoustical comfort.

For guidance on the measurement process, the user may refer to *ANSI S12.72-2015 (R2020), Measuring The Ambient Noise Level In A Room*. The objective is to perform at least a “survey method” (i.e., basic) measurement of spaces to identify whether the continuous background sound meets the noise limit criteria for the space (NC or dBA).

Assessor-Specific Guidance:

Documentation is provided indicating that noise emission from building systems, services and utilities in spaces comply with their noise limit criteria (as in Green Globes ID #6.5.1.1 / ANSI ID #11.5.1.1).

References

- *ANSI S12.72-2015 (R2020), Measuring The Ambient Noise Level In A Room*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.5.1.1.2 (ANSI #11.5.1.1.2)

Has an assessment of transient noise been evaluated, after construction but prior to occupancy, using appropriate metrics?

- Yes (1 points)

- No (0 points)

Assessment Guidance

Appropriate metrics are 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)*

User-Specific Guidance:

Like in 11.5.1.1.1, the purpose is to confirm transient (i.e., intermittent) noise is within design-specified noise limits to improve acoustical comfort. Using the referred applicable documents, assess transient noise sources that may exist within or about project building using appropriate metric(s).

Note—not all referred documents need to be used because of overlapping subject content.

References

- *Chapter 49. Noise and Vibration Control of the 2019 ASHRAE Applications Handbook*
- *2018 International Green Construction Code (IgCC)*
- *ANSI/ASA S12.2-2019, Criteria For Evaluating Room Noise*
- *ANSI/ASA S12.60-2010/Part 1*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.5.1.2 (ANSI #11.5.1.2)

What percentage of design incorporates a sound masking system to provide the specified minimum A-weighted Overall Sound Level (dBA) for each type of space, selected from within the following ranges?

- | | |
|---|--|
| <ul style="list-style-type: none"> • Offices: <ul style="list-style-type: none"> ◦ Open: 45-48dBA ◦ Enclosed: 35-45dBA ◦ Meeting/Conference: 30-45dBA ◦ Circulation: 45-48dBA • Healthcare: <ul style="list-style-type: none"> ◦ Patient room: 40-48dBA ◦ Private offices and exam/treatment room: 35-45dBA ◦ Waiting area: 45-48dBA ◦ Corridor and public spaces: 45-48dBA ◦ Circulation: 45-48dBA • Other: <ul style="list-style-type: none"> ◦ All other areas where speech privacy, concentration, or sleep/relaxation is required: 35-48-dBA | <ul style="list-style-type: none"> • $\geq 80\%$ to $\leq 100\%$ (4 points) <hr/> • $\geq 50\%$ to $< 80\%$ (3 points) <hr/> • $\geq 25\%$ to $< 50\%$ (2 points) <hr/> • $\geq 10\%$ to $< 25\%$ (1 points) <hr/> • $< 10\%$ (0 points) |
|---|--|

Assessment Guidance

User-Specific Guidance:

The purpose of incorporating a sound masking system is to provide an appropriate background sound level to improve acoustical privacy and comfort.

There are two parts to incorporating a sound masking system:

- ‘Design’ (11.5.1.2), and
- ‘Tuning’ (sometimes referred to as ‘Field-Commissioning’) (11.5.1.2.1).

The design of a sound masking system is generally completed by a sound masking manufacturer or acoustical consultant. In order to address different acoustical expectations (spaces with different sound level goals), the design of a system needs to enable localized spatial control of sound throughout the building (i.e., adjustment of the sound level in individual rooms and in small zones in open-plan areas).

Scoring Matrix

Response	Score	Max Points
≥80% to ≤100%	4	4
≥50% to <80%	3	4
≥25% to <50%	2	4
≥10% to <25%	1	4
<10%	0	4

6.5.1.2.1 (ANSI #11.5.1.2.1)

Does the installed sound masking system measure 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 the following specified performance requirements?

- 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.
- Yes (2 points)

 - No (0 points)

Assessment Guidance

User-Specific Guidance:

The purpose of field-commissioning (or tuning) a sound masking system is to ensure the specified masking sound level and spectrum are provided in the space. Where good design enables localized spatial control of masking sound in the space, tuning of the system (accurately and precisely to meet specifications within tolerances) ensures the system is performing as intended to improve acoustical privacy and comfort.

The sound masking manufacturer must demonstrate with a report, the tuning measurement results for the space. The report must show for all sound masking zones (i.e., for types of spaces), compliance within tolerances of the specified minimum A-weighted overall sound level and spectrum (i.e., the one-third octave band sound levels). Tuning of the sound masking system should reflect the same principles as in referred ASTM Standard.

Note—ASTM E1573 is not a tuning standard, but a standard to assess the masking sound in a space.

Where a report is not provided by a sound masking manufacturer, an assessment of the masking sound in a space can be performed according to the referred ASTM Standard.

References

- *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*

Scoring Matrix

Response	Score	Max Points
Yes	2	2
No	0	2

Acoustic Insulation and Vibration Isolation

10

6.5.2.1 (ANSI #11.5.2.1)

What percentage of design complies with minimum composite Sound Transmission Class ratings of rooms or with minimum composite Sound Transmission Class ratings calculated to meet the noise limit criteria or 5 dBA less than the masking sound levels for spaces?

- $\geq 80\%$ to $\leq 100\%$ (4 points)

- $\geq 50\%$ to $< 80\%$ (3 points)

- $\geq 25\%$ to $< 50\%$ (2 points)

- $< 25\%$ (0 points)

Assessment Guidance

Minimum Composite Sound Transmission Class Ratings

- Healthcare spaces, one of the following as applicable:
 - *2018 FGI Guidelines for Design and Construction of Hospitals*
 - *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
 - *2018 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)*

For spaces requiring speech privacy, the minimum composite Sound Transmission Class ratings is calculated 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*

User-Specific Guidance:

The purpose of sound insulation and vibration isolation is to reduce the transmission of noise between spaces to improve acoustical privacy and comfort.

Section 11.5.2.1 offers two paths—prescriptive and performance. Specifications may be selected from the referred documents or the user can perform their own calculations to determine the required insulation and isolation between spaces (which may be more or less than the values via the prescriptive path). It is advised that the calculation of the required sound insulation (ensuring privacy) between spaces be performed by an acoustical professional.

The reference to “minimum composite sound transmission class” is a call for attention in design—to consider the combined sound insulating performance of the assembly components (e.g., wall, door, ceiling, floor) between spaces.

When designing to meet a sound insulating value (e.g., STC-50), the user should be diligent in reviewing the construction detail in the technical documentation (i.e., “how” that product was tested). Below is a comprehensive, but not exhaustive, list of important considerations:

- Stud material (wood, metal), gauge, spacing and configuration (single, staggered, separate).
- Thickness, density and type (fire-rated, laminate), number of layers of drywall
- Use of other materials (e.g., plywood)
- Use of insulating materials (glass fiber, mineral wool, closed-cell (e.g., Styrofoam), spray-in fibrous), thickness and number of layers.
- Use of resilient channels, tracks and gussets.

The sound insulating performance of an assembly, as advertised on a ‘brochure’ or summary manual depends on all of these factors. The user is encouraged to refer to the test report (which should be referenced to on the brochure or manual) and not only the summary description.

Assessor-Specific Guidance:

Note—the assessor is not responsible to reviewing the calculations.

References

- *ASTM E1130-16 Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*
- *ASTM E2638-10 Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room*
- *Table 801.3.3.3 Minimum Sound & Impact Sound Ratings of the 2018 International Green Construction Code (IgCC)*
- *ANSI S12.60 Series: Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools*
- *2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*
- *2018 FGI Guidelines for Design and Construction of Outpatient Facilities*
- *2018 FGI Guidelines for Design and Construction of Hospitals*

Scoring Matrix

Response	Score	Max Points
≥80% to ≤100%	4	4
≥50% to <80%	3	4
≥25% to <50%	2	4
<25%	0	4

6.5.2.2 (ANSI #11.5.2.2)

Does design of floor-ceiling assemblies comply with *Table 801.3.3.3 Minimum Sound & Impact Sound Ratings* in the *2018 International Green Construction Code (IgCC)* for Impact Insulation Class (IIC)?

- Yes (1 points)

- No (0 points)

Assessment Guidance

User-Specific Guidance:

The purpose of impact sound insulation is to reduce the transmission of impact-related (primarily footfall) noise from above spaces to improve acoustical privacy and comfort.

References

- *Table 801.3.3.3 Minimum Sound & Impact Sound Ratings of the 2018 International Green Construction Code (IgCC)*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.5.2.3 (ANSI #11.5.2.3)

Does design identify and address 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 comply with recommendations in the selection guide?

- Yes (1 points)

- No (0 points)

Assessment Guidance

User-Specific Guidance:

The purpose of vibration isolation of mechanical equipment is to reduce the transmission of structure-borne sound to improve acoustical comfort.

References

- *2019 ASHRAE Applications Handbook*

Scoring Matrix

Response	Score	Max Points
Yes	1	1
No	0	1

6.5.2.4 (ANSI #11.5.2.4)

Two paths are available for field testing.

- 6.5.2.4A Path A: Room Design Performance
Ratings: 4 points

OR

- 6.5.2.4B Path B: Space Performance
Ratings: 4 points

- 6.5.2.4A Path A: Room Design Performance Ratings

- 6.5.2.4B Path B: Space Performance Ratings

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

Scoring Matrix

Response	Score	Max Points
6.5.2.4A Path A: Room Design Performance Ratings	0	0
6.5.2.4B Path B: Space Performance Ratings	0	0



Criterion only visible if 6.5.2.4 is answered with "6.5.2.4A Path A: Room Design Performance Ratings"

6.5.2.4A.1 (ANSI #11.5.2.4A.1)

Path A: Room Design Performance Rating

Does field-testing of room design performance ratings in Green Globes ID #6.5.2.1 / ANSI ID #11.5.2.1, quantified by either Noise Insulation Class (NIC) or Apparent Sound Transmission Class (ASTC), comply within 5 points in accordance with *ASTM E336-20 Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings?*

Assessment Guidance

Field testing is measured after construction but prior to occupancy.

User-Specific Guidance:

The purpose of testing assemblies is to verify the sound insulating performance of the assembly which affords occupants in contiguous spaces, each their own acoustical privacy.

The user is encouraged to conduct testing of complete assemblies, soon after they are completed, to determine compliance or to identify and diagnose underperforming assemblies.

References

- *ASTM E336-20 Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings*

Scoring Matrix

Response	Score	Max Points
0	0	4
1	1	4
2	2	4
3	3	4
4	4	4



Criterion only visible if 6.5.2.4 is answered with "6.5.2.4A Path A: Room Design Performance Ratings"



6.5.2.4A.1.1 (ANSI #11.5.2.4A.1)

- ≥10% of different sound-rated assemblies' performance ratings comply with designed composite STC-45 rating or greater of the room or adjacency




Criterion only visible if 6.5.2.4 is answered with "6.5.2.4A Path A: Room Design Performance Ratings"




6.5.2.4A.1.2 (ANSI #11.5.2.4A.1)

- ≥10% of different sound-rated assemblies' performance ratings comply with designed composite STC-50 rating or greater of the room or adjacency. If not applicable, the additional point is earned if the criteria for STC-45 is met.

 Criterion only visible if 6.5.2.4 is answered with "6.5.2.4A Path A: Room Design Performance Ratings"


 **6.5.2.4A.1.3 (ANSI #11.5.2.4A.1)**

- ≥10% of different sound-rated assemblies' performance ratings comply with designed composite STC-55 rating or greater of the room or adjacency. If not applicable, the additional point is earned if the criteria for STC-50 is met.

 Criterion only visible if 6.5.2.4 is answered with "6.5.2.4A Path A: Room Design Performance Ratings"

 **6.5.2.4A.1.4 (ANSI #11.5.2.4A.1)**

- ≥10% of different sound-rated assemblies' performance ratings comply with designed composite STC-60 rating or greater of the room or adjacency. If not applicable, the additional point is earned if the criteria for STC-55 is met.

 Criterion only visible if 6.5.2.4 is answered with "6.5.2.4B Path B: Space Performance Ratings"

6.5.2.4B.1 (ANSI #11.5.2.4B.1)

Path B: Space Performance Ratings

What percentage of field-testing of adjacent spaces comply with criteria limits in Green Globes ID #6.5.2.1 / ANSI ID #11.5.2.1?

- $\geq 15\%$ (4 points)

- $\geq 10\%$ to $< 15\%$ (3 points)

- $\geq 5\%$ to $< 10\%$ (2 points)

- $\geq 5\%$ of MEP and HVAC rooms' adjacencies performance ratings comply with designed composite Sound Transmission Class rating. If not applicable, the point is earned. (1 points)

- $< 5\%$ 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 (0 points)

Assessment Guidance

**This criterion text is not consistent with ANSI/GBI 01-2021: Green Globes Assessment Protocol for Commercial Buildings.*

If not applicable, the additional point is earned if the criteria for STC-45, STC-50, STC-55 is met.

Spaces are measured after construction but prior to occupancy.

Spaces are measured 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*

User-Specific Guidance:

The purpose of testing assemblies is to verify the sound insulation between spaces. The combination of sound insulation between spaces and background sound can be used to determine the degree to which there is acoustical privacy.

References

- *ASTM E1130-16 Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*
- *ASTM E2638-10 Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room*
- *ASTM E336-20 Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings*

Scoring Matrix

Response	Score	Max Points
≥15%	4	4
≥10% to <15%	3	4
≥5% to <10%	2	4
≥5% of MEP and HVAC rooms' adjacencies performance ratings comply with designed composite Sound Transmission Class rating. If not applicable, the point is earned.	1	4
<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	0	4

Reverberation Time or Ceiling Noise Reduction Coefficient (NRC)^{1 4}

6.5.3.1 (ANSI #11.5.3.1)

What percentage of 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)*?

- ≥80% to ≤100% (4 points)

- ≥50% to <80% (3 points)

- ≥25% to <50% (2 points)

- <25% (0 points)

- N/A

Assessment Guidance

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.

Not applicable for Multi-Unit Residential Buildings (MURBs).

User-Specific Guidance:

The purpose of establishing a maximum reverberation time (or incorporating absorptive materials) is to manage the length of time sound reverberates in a room. Excess reverberation in a space (too much reflection) can negatively impact speech intelligibility and acoustical comfort.

References

- *2018 International Green Construction Code (IgCC)*

Scoring Matrix

Response	Score	Max Points
≥80% to ≤100%	4	4
≥50% to <80%	3	4
≥25% to <50%	2	4
<25%	0	4
N/A	0	0

Appendix A: REFERENCES AND GUIDELINES

The following is an alphabetical list of References recommended within this Technical Reference Manual. Click on the criteria number to link back to the corresponding subsection heading within the manual (references with website links listed at end of Appendix A).

- 2012 IECC, Section C402
 - [3.1.1C.1.2 \(ANSI #8.1.1C.1.1\)](#)
- 2014 IA/ASIC Landscape Irrigation Best Management Practices
 - [4.9.1A \(ANSI #9.9.1.1\)](#)
- 2015 IECC
 - [3.1.1C.1.4 \(ANSI #8.1.1C.2.1.1\)](#)
 - [3.1.1C.1.4.1 \(ANSI #8.1.1C.2.1.1\)](#)
- 2015 IECC, Section C402
 - [3.1.1C.1.1 \(ANSI #8.1.1C.1.1.1\)](#)
 - [3.1.1C.1.2 \(ANSI #8.1.1C.1.1.1\)](#)
- [2016 Invasive Species Compendium](#)
 - [2.5.1.2 \(ANSI #7.5.1.2\)](#)
- 2018 FGI Guidelines for Design and Construction of Hospitals
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
- 2018 FGI Guidelines for Design and Construction of Outpatient Facilities
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
- 2018 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
- 2018 International Green Construction Code (IgCC)
 - [4.1.1 \(ANSI #9.1.1\)](#)
 - [4.1.1B.1 \(ANSI #9.1.1B.1\)](#)
 - [6.5.1.1.2 \(ANSI #11.5.1.1.2\)](#)
 - [6.5.3.1 \(ANSI #11.5.3.1\)](#)
- 2018 International Plumbing Code (IPC)

- [4.3.2.1 \(ANSI #9.3.2.1\)](#)
- 2019 ASHRAE Applications Handbook
 - [6.5.2.3 \(ANSI #11.5.2.3\)](#)
- 2020 IAPMO WEstand
 - [4.1.1 \(ANSI #9.1.1\)](#)
 - [4.1.1C.1 \(ANSI #9.1.1C.1\)](#)
- ANSI S12.60 Series: Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
- ANSI S12.72-2015 (R2020), Measuring The Ambient Noise Level In A Room
 - [6.5.1.1.1 \(ANSI #11.5.1.1.1\)](#)
- ANSI/ASA S12.2-2019, Criteria For Evaluating Room Noise
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.2 \(ANSI #11.5.1.1.2\)](#)
- ANSI/ASA S12.60-2010/Part 1
 - [6.5.1.1.2 \(ANSI #11.5.1.1.2\)](#)
- ANSI/ASHRAE Standard 160-2009: Criteria for Moisture Control Design Analysis in Buildings
 - [1.4.1.1 \(ANSI #6.4.1.1\)](#)
 - [1.4.1.2 \(ANSI #6.4.1.1\)](#)
- ANSI/ASHRAE Standard 62.1-2019; Ventilation for Acceptable Indoor Air Quality
 - [6.1.1.1 \(ANSI #11.1.1.1\)](#)
 - [6.1.2.1 \(ANSI #11.1.2.1\)](#)
- ANSI/ASHRAE/ASHE Standard 170-2017, Ventilation of Health Care Facilities
 - [6.1.1.1 \(ANSI #11.1.1.1\)](#)
- ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017
 - [4.1.1 \(ANSI #9.1.1\)](#)
 - [4.1.1A.1 \(ANSI #9.1.1A.1\)](#)
- [ANSI/ASHRAE/IES STANDARD 90.1-2013, Table 7.8](#)
 - [3.1.1C.1.17 \(ANSI #8.1.1C.3.4.1\)](#)
- ANSI/ASHRAE/IES Standard 202–2018, Commissioning Process for Buildings and Systems
 - [1.5.1A.1 \(ANSI #6.5.1A.1\)](#)
- ANSI/ASHRAE/IES Standard 90.1-2010
 - [3.1.1A.1 \(ANSI #8.1.1A.1\)](#)

- [3.2.3.3 \(ANSI #8.2.3.3\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013](#)
 - [3.1.1C.1.2 \(ANSI #8.1.1C.1.1\)](#)
 - [3.1.1C.1.4 \(ANSI #8.1.1C.2.1.1\)](#)
 - [3.1.1C.1.4.1 \(ANSI #8.1.1C.2.1.1\)](#)
 - [3.1.1C.1.10 \(ANSI #8.1.1C.2.5.1\)](#)
 - [3.1.1C.1.11 \(ANSI #8.1.1C.2.6.1\)](#)
 - [3.1.1C.1.15 \(ANSI #8.1.1C.3.2.1\)](#)
 - [3.1.1C.1.16 \(ANSI #8.1.1C.3.3.1\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 3](#)
 - [3.1.1C.1.8 \(ANSI #8.1.1C.2.4.1\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 5](#)
 - [3.1.1C.1.1 \(ANSI #8.1.1C.1.1.1\)](#)
 - [3.1.1C.1.9 \(ANSI #8.1.1C.2.4.2\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.1](#)
 - [3.1.1C.1.20 \(ANSI #8.1.1C.3.7.1\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.2](#)
 - [3.1.1C.1.19 \(ANSI #8.1.1C.3.6.1\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.6](#)
 - [3.1.1C.1.18 \(ANSI #8.1.1C.3.5.1\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Section 9](#)
 - [3.1.1C.1.9 \(ANSI #8.1.1C.2.4.2\)](#)
- [ANSI/ASHRAE/IES Standard 90.1-2013, Table 6.5.3.1-1](#)
 - [3.1.1C.1.21 \(ANSI #8.1.1C.3.8.1\)](#)
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 Table 10.3.2.3
 - [1.3.1A.1 \(ANSI #6.3.1A.1\)](#)
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Informative Appendix F: Integrated Design
 - [1.1.1.1 \(ANSI #6.1.1.1\)](#)
 - [1.1.1.2 \(ANSI #6.1.1.1\)](#)
 - [1.1.1.3 \(ANSI #6.1.1.1\)](#)
 - [1.1.2.1 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.2 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.3 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.4 \(ANSI #6.1.2.1\)](#)
- ANSI/ASHRAE/USGBC/IES Standard 189.1-2014, Section 10.3.2.3
 - [1.3.1B.1 \(ANSI #6.3.1B.1\)](#)
- ANSI/BIFMA e3-2014: Business and Institutional Furniture Sustainability Standard (BIFMA)

- e3) and Level[®] Sustainability Certification Program for Furniture
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- [ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings](#)
 - [3.1.1B.1 \(ANSI #8.1.1B.1\)](#)
 - [3.1.1B.1.1 \(ANSI #8.1.1B.1\)](#)
- [ANSI/GBI 01-2019 Green Globes Assessment Protocol for Commercial Buildings, Section 8.5](#)
 - [3.1.1C.1.14 \(ANSI #8.1.1C.3.1.2\)](#)
- ANSI/MTS 1.0 Whole Systems Integrated Process Guide (WISP) - 2007
 - [1.1.1.1 \(ANSI #6.1.1.1\)](#)
 - [1.1.1.2 \(ANSI #6.1.1.1\)](#)
 - [1.1.1.3 \(ANSI #6.1.1.1\)](#)
 - [1.1.2.1 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.2 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.3 \(ANSI #6.1.2.1\)](#)
 - [1.1.2.4 \(ANSI #6.1.2.1\)](#)
- ANSI/NSC 373-2014 Sustainability Assessment for Natural Dimension Stone
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- ASABE/ICC 802-2020 Landscape Irrigation Sprinkler and Emitter Standard
 - [4.9.1A \(ANSI #9.9.1.1\)](#)
 - [4.9.1.3A \(ANSI #9.9.1.3\)](#)
 - [4.9.1.3B.5 \(ANSI #9.9.1.3.5\)](#)
- ASCE/SEI 24-14 “Flood Resistant Design and Construction”(2014)
 - [2.1.2.3A \(ANSI #71.2.3.1\)](#)
 - [2.1.2.3B \(ANSI #71.2.3.2\)](#)
- ASHRAE 188-2018, Legionellosis: Risk Management for Building Water Systems
 - [6.2.4.1 \(ANSI #11.2.4.1\)](#)
- [ASHRAE Advanced Energy Design Guides](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- ASHRAE Guideline 0-2019, The Commissioning Process
 - [1.5.1A.1 \(ANSI #6.5.1A.1\)](#)
 - [1.5.1B.1 \(ANSI #6.5.1B.1\)](#)
 - [1.5.1B.2 \(ANSI #6.5.1B.2\)](#)
- ASTM D6866-16 Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis

- [5.4.1.1 \(ANSI #10.4.1.1\)](#)
- ASTM E1130-16 Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
 - [6.5.2.4B.1 \(ANSI #11.5.2.4B.1\)](#)
- 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
 - [6.5.1.2.1 \(ANSI #11.5.1.2.1\)](#)
- ASTM E1980-11(2019) Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
 - [2.3.4.3 \(ANSI #7.3.4.3\)](#)
- ASTM E2638-10 Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
 - [6.5.2.4B.1 \(ANSI #11.5.2.4B.1\)](#)
- ASTM E2813-18 Standard Practice for Building Enclosure Commissioning
 - [1.5.1A.1 \(ANSI #6.5.1A.1\)](#)
- ASTM E2843 - 17 Standard Specification for Demonstrating That a Building is in Walkable Proximity to Neighborhood Assets
 - [2.2.1.8 \(ANSI #7.2.1.7\)](#)
- ASTM E2843-16a Standard Specification for Demonstrating That a Building is in Walkable Proximity to Neighborhood Assets
 - [5.1.1.1 \(ANSI #10.1.1.1\)](#)
- ASTM E2844-15, Standard Specification for Demonstrating that a Building's Location Provides Access to Public Transit
 - [2.2.1.1 \(ANSI #7.2.1.1\)](#)
- ASTM E2947-16a Standard Guide for Building Enclosure Commissioning
 - [1.5.1A.1 \(ANSI #6.5.1A.1\)](#)
- ASTM E3182-20 - Standard Practice for Preparing an Occupant Exposure Screening Report (OESR)
 - [5.3.1.1 \(ANSI #10.3.1.1\)](#)
- ASTM E336-20 Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings
 - [6.5.2.4A.1 \(ANSI #11.5.2.4A.1\)](#)
 - [6.5.2.4B.1 \(ANSI #11.5.2.4B.1\)](#)
- Agroforestry Note 38 – Landscape planning for environmental benefits USDA Natural Resources Conservation Service, (2008)

- [2.5.1.1 \(ANSI #7.5.1.1\)](#)
- [Architectural Lighting Magazine –Benefits of Natural Light](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- CSA S478-95 (R2007): Guideline on Durability in Buildings
 - [1.3.1B.1 \(ANSI #6.3.1B.1\)](#)
- CSA Z783-12 Deconstruction of Buildings and Their Related Parts
 - [5.7.2.1 \(ANSI #10.7.2.1\)](#)
- California Air Resources Board Suggested Control Measure for Architectural Coatings (February 1, 2008)
 - [6.2.1.2 \(ANSI #11.2.1.2\)](#)
- Chapter 49. Noise and Vibration Control of the 2019 ASHRAE Applications Handbook
 - [6.5.1.1.2 \(ANSI #11.5.1.1.2\)](#)
- [Cool Roof Rating Council](#)
 - [2.3.4.1 \(ANSI #7.3.4.1\)](#)
 - [2.3.4.1.1 \(ANSI #7.3.4.1\)](#)
- [Cooperative Extension Research, Education and Extension Service \(USDA CSREES\) - Local Cooperative Extension System Offices](#)
 - [2.5.1.1 \(ANSI #7.5.1.1\)](#)
- Design for Deconstruction, M. Pulaski, C. Hewitt, M/ Horman, and B. Guy, Modern Steel, (June 2004)
 - [5.7.2.1 \(ANSI #10.7.2.1\)](#)
- Design for Deconstruction: Principles of Design to Facilitate Reuse and Recycling, W. Addis, B. Happold, and J. Shouten, Construction Industry Research & Information Association (2004)
 - [5.7.2.1 \(ANSI #10.7.2.1\)](#)
- Design for Disassembly in the Built Environment, Brad Guy, Hamer Center, Penn State University (2008)
 - [5.7.2.1 \(ANSI #10.7.2.1\)](#)
- [ENERGY STAR Qualified Product Lists](#)
 - [3.2.3.2 \(ANSI #8.2.3.2\)](#)
- EPA WaterSense Water Budget Tool (V 1.03)
 - [4.9.1A \(ANSI #9.9.1.1\)](#)
 - [4.9.1B.1 \(ANSI #9.9.1.1\)](#)
- EPA's Guidelines for Water Reuse
 - [4.6.1.1 \(ANSI #9.6.1.1\)](#)
- [Executive Order 13728: Wildland-Urban Interface Federal Risk Mitigation, 2016](#)
 - [2.1.2.2 \(ANSI #7.1.2.2\)](#)

- FEMA Technical Bulletin 2/2008
 - [2.1.2.3A \(ANSI #71.2.3.1\)](#)
 - [2.1.2.3B \(ANSI #71.2.3.2\)](#)
- [Federal Energy Management Program's \(FEMP\) Energy-Efficient Product Procurement](#)
 - [3.2.3.2 \(ANSI #8.2.3.2\)](#)
- [Federal and state noxious weed lists](#)
 - [2.5.1.2 \(ANSI #7.5.1.2\)](#)
- [GaBi Software Building LCA](#)
 - [5.1.1.1 \(ANSI #10.1.1.1\)](#)
- [Guide to Integrating Renewable Energy in Federal Construction](#)
 - [3.4.1.1 \(ANSI #8.4.1.1\)](#)
- IAPMO IGC 324-2019 Alternate Water Source Systems for Multi-Family, Residential, and Commercial Use
 - [4.6.3.1 \(ANSI #9.6.3.1\)](#)
- IAPMO UMC (2018): Uniform Mechanical Code
 - [6.1.1.1 \(ANSI #11.1.1.1\)](#)
- IAPMO Z1349-2021 Standard for Devices for Detection, Monitoring or Control of Plumbing Systems
 - [4.8.1 \(ANSI #9.8\)](#)
 - [4.8.1.1 \(ANSI #9.8.1.1\)](#)
 - [4.8.1.2 \(ANSI #9.8.1.2\)](#)
 - [4.8.1.3 \(ANSI #9.8.1.3\)](#)
 - [4.8.1.4 \(ANSI #9.8.1.4\)](#)
 - [4.8.1.5 \(ANSI #9.8.1.5\)](#)
- ICC, 2015 International Wildland-Urban Interface Code
 - [2.1.2.2 \(ANSI #71.2.2\)](#)
 - [2.7.1.1 \(ANSI #7.7.1.1\)](#)
- IDA – IES Model Lighting Ordinance (MLO), Table C, C1, C2, C3, 2011
 - [2.6.1B.2 \(ANSI #7.6.1B.2\)](#)
- IDA – IES Model Lighting Ordinance (MLO), Tables A and B, 2011
 - [2.6.1A.1 \(ANSI #7.6.1A.1\)](#)
 - [2.6.1B.1 \(ANSI #7.6.1B.1\)](#)
- IESNA Lighting Handbook, 10th Edition, 2011
 - [6.3.2.1 \(ANSI #11.3.2.1\)](#)
 - [6.3.2.2 \(ANSI #11.3.2.2\)](#)
- ISO 21930:2007 Sustainability in Building Construction - Environmental Declaration of Building Products

- [5.2.1.1 \(ANSI #10.2.1.1\)](#)
- [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- ISO 14040:2006 Environmental Management – Life Cycle Assessment – Principles and Framework
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- ISO 14044:2006: Environmental Management – Life Cycle Assessment – Requirements and Guidelines
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- ISO 15686 (series), 2014
 - [1.3.1B.1 \(ANSI #6.3.1B.1\)](#)
- ISO 21930:2017 Sustainability In Buildings And Civil Engineering Works - Core Rules For Environmental Product Declarations Of Construction Products And Services
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- Informative Annex C – Recommended noise level specifications for various occupied activity areas of ANSI/ASA S12.2-2019: Criteria For Evaluating Room Noise
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
- International Building Code®(IBC)
 - [2.1.2.3A \(ANSI #71.2.3.1\)](#)
- [International Commission on Illumination](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- International Energy Conservation Code (IECC) 2012
 - [3.1.1A.1 \(ANSI #8.1.1A.1\)](#)
- International Performance Measurement and Verification Protocol; DOE/EE-0157 (December 1997)
 - [3.3.2.1 \(ANSI #8.3.2.1\)](#)
 - [3.3.2.1.1 \(ANSI #8.3.2.1\)](#)
 - [3.3.2.2 \(ANSI #8.3.2.2\)](#)
 - [3.3.3.1 \(ANSI #8.3.3.1\)](#)
- [International Society of Arboriculture’s “Avoiding Tree Damage During Construction,” \(2011\)](#)

- [2.3.3.1 \(ANSI #7.3.3.1\)](#)
- [Invasive plant lists published by regional invasive plant councils](#)
 - [2.3.3.1 \(ANSI #7.3.3.1\)](#)
- Multi-attribute Standards (MAS): products compared use the same MAS
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NFPA 720 2015, CSA 6.19, UL 2034 or similar standard for detector
 - [6.2.3.1 \(ANSI #11.2.3.1\)](#)
- NIST Handbook 135, 1995
 - [1.3.1A.1 \(ANSI #6.3.1A.1\)](#)
- [NOAA Digital Coast](#)
 - [1.1.3.1 \(ANSI #6.1.3.1\)](#)
 - [1.1.3.3 \(ANSI #6.1.3.3\)](#)
 - [1.1.3.4 \(ANSI #6.1.3.4\)](#)
- NOAA NESDIS 142 Series – Regional Climate Trends and Scenarios for the U.S. National Climate Assessment
 - [1.1.3.1 \(ANSI #6.1.3.1\)](#)
 - [1.1.3.3 \(ANSI #6.1.3.3\)](#)
 - [1.1.3.4 \(ANSI #6.1.3.4\)](#)
- NSF/ANSI 140-2015 Sustainability Assessment for Carpet
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NSF/ANSI 332-2015 Sustainability Assessment for Resilient Flooring
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NSF/ANSI 336-2011 Sustainability Assessment for Commercial Furnishings Fabric
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NSF/ANSI 342-2014 Sustainability Assessment for Wallcovering Products
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NSF/ANSI 347-2012 Sustainability Assessment for Single Ply Roof Membranes
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- NSF/ANSI 350-1-2017 Onsite Residential And Commercial Greywater Treatment Systems For Subsurface Discharge
 - [4.6.3.1 \(ANSI #9.6.3.1\)](#)
- NSF/ANSI 350-2020 Onsite Residential And Commercial Water Reuse Treatment Systems

- [4.6.3.1 \(ANSI #9.6.3.1\)](#)
- [National Academies and the Climate Resilience Toolkit/Climate Explorer](#)
 - [1.1.3.1 \(ANSI #6.1.3.1\)](#)
 - [1.1.3.3 \(ANSI #6.1.3.3\)](#)
 - [1.1.3.4 \(ANSI #6.1.3.4\)](#)
- [National Institute of Standards and Technology \(NIST\) Building Life Cycle Cost \(BLCC\) Program](#)
 - [3.4.1.1 \(ANSI #8.4.1.1\)](#)
- [New Building Institute –Advanced Buildings® Daylighting pattern guide](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- [North American Industry Classification System.\(NAICS\)](#)
 - [2.2.1.8 \(ANSI #7.2.1.7\)](#)
- [Pollinator Partnership, Ecoregional Planting Guides](#)
 - [2.5.1.5 \(ANSI #7.5.1.5\)](#)
- [Preparing a Building Service life plan for Green Buildings, Dru Meadows, 2014](#)
 - [1.3.1B.1 \(ANSI #6.3.1B.1\)](#)
- [RADIANCE software \(for evaluation\) Validated Lighting Simulation Tool](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- [SimaPro Sustainability Life Cycle Assessment Carbon Footprinting](#)
 - [5.1.1.1 \(ANSI #10.1.1.1\)](#)
- [South Coast Air Quality Management District \(SCAQMD\)- Rule 1168 \(October 6, 2017\)](#)
 - [6.2.1.1 \(ANSI #11.2.1.1\)](#)
- [State and local university or college landscape reference guide](#)
 - [2.3.4.1 \(ANSI #7.3.4.1\)](#)
 - [2.5.1.1 \(ANSI #7.5.1.1\)](#)
 - [2.5.1.2 \(ANSI #7.5.1.2\)](#)
- [Sustainable Sites Initiative, SITES v2 Rating System, \(2014\)](#)
 - [2.3.3.1 \(ANSI #7.3.3.1\)](#)
- [Table 1 Design Guidelines for HVAC-Related Background Sound in Rooms in Chapter 49. Noise and Vibration Control of the 2019 ASHRAE Applications Handbook](#)
 - [6.5.1.1 \(ANSI #11.5.1.1\)](#)
 - [6.5.1.1.a \(ANSI #11.5.1.1\)](#)
- [Table 801.3.3.3 Minimum Sound & Impact Sound Ratings of the 2018 International Green Construction Code \(IgCC\)](#)
 - [6.5.2.1 \(ANSI #11.5.2.1\)](#)
 - [6.5.2.2 \(ANSI #11.5.2.2\)](#)
- [Tally™](#)

- [5.1.1.1 \(ANSI #10.1.1.1\)](#)
- Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects 2009
 - [2.4.1.1 \(ANSI #7.4.1.1\)](#)
- The Association of Pedestrian and Bicycle Professionals, Bicycle Parking Guidelines, 2nd Edition (2010)
 - [2.2.1.5 \(ANSI #7.2.1.5\)](#)
- [The Athena Impact Estimator for Buildings \(Version 4.2 or later\)](#)
 - [5.1.1.1 \(ANSI #10.1.1.1\)](#)
- The ICC International Mechanical Code (ICC IMC 2018)
 - [6.1.1.1 \(ANSI #11.1.1.1\)](#)
- Tile Council of North America's Green Squared Certification (ANSI A138.1-2011)
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- U.S. EPA document Radon Prevention in the Design and Construction of Schools and Other Large Buildings (EPA 625-R-92-016, June 1994).
 - [6.2.6.2 \(ANSI #11.2.6.2.1\)](#)
- U.S. EPA's Construction Site Stormwater Runoff Control - Menu of Best Management Practices
 - [2.3.1B.1 \(ANSI #7.3.1B.1\)](#)
- [U.S. Environmental Protection Agency \(EPA\) National Pollutant Discharge Elimination System \(NPDES\) Permit Programs](#)
 - [2.3.1A.1 \(ANSI #7.3.1A.1\)](#)
- [U.S. Environmental Protection Agency \(EPA\) National Stormwater Calculator](#)
 - [2.4.1.1 \(ANSI #7.4.1.1\)](#)
- UL 100: Standard for Sustainability for Gypsum Boards and Panels
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- UL 102: Standard for Sustainability for Swinging Door Leafs
 - [5.2.1.1 \(ANSI #10.2.1.1\)](#)
 - [5.2.1.2 \(ANSI #10.2.1.2\)](#)
- [UL 2760 Sustainability for Surface Coatings: Recycled Water-borne, 2011](#)
 - [6.2.1.2 \(ANSI #11.2.1.2\)](#)
- [UL 2762 Sustainability for Adhesives, 2011](#)
 - [6.2.1.1 \(ANSI #11.2.1.1\)](#)
- [UL 2768 Standard for Sustainability for Architectural Surface Coatings, 2011](#)
 - [6.2.1.2 \(ANSI #11.2.1.2\)](#)

- [UL 2799, 2017](#)
 - [5.6.3.1 \(ANSI #10.6.3.1\)](#)
- [UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, 2013](#)
 - [6.2.1.1 \(ANSI #11.2.1.1\)](#)
 - [6.2.1.2 \(ANSI #11.2.1.2\)](#)
- [USDA National Invasive Species Information Center](#)
 - [2.3.4.1 \(ANSI #7.3.4.1\)](#)
 - [2.5.1.2 \(ANSI #7.5.1.2\)](#)
- [United States Department of Agriculture, The 2010 Wildland-Urban Interface of the Continuous United](#)
 - [2.1.2.2 \(ANSI #7.1.2.2\)](#)
- [Walk Score](#)
 - [2.2.1.8 \(ANSI #7.2.1.7\)](#)
- [WaterSense[®]'s "What to Plant"](#)
 - [2.5.1.2 \(ANSI #7.5.1.2\)](#)
- [Whole Building Design Guide \(WBDG\), Section 01 81 10 \(01120\), 2001](#)
 - [1.3.1B.1 \(ANSI #6.3.1B.1\)](#)
- [Whole Building Design Guide \(WBDG\): Sustainability of Building Envelope, 2016](#)
 - [6.3.1.1 \(ANSI #11.3.1.1\)](#)
- [Xerces Society for Invertebrate Conservation, Pollinator-Friendly Plant Lists](#)
 - [2.5.1.5 \(ANSI #7.5.1.5\)](#)
- [Zero Waste Principles of the Zero Waste International Alliance \(ZWIA\), 2015](#)
 - [5.6.3.1 \(ANSI #10.6.3.1\)](#)

Appendix B: DEFINITIONS, ABBREVIATIONS AND ACRONYMS

Appendix B: DEFINITIONS, ABBREVIATIONS AND ACRONYMS

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.

acoustically separated area: an enclosed space that, to function properly, requires separation from other adjacent spaces by wall, floor, and ceiling *assemblies* that have an STC rating adequate to allow clear, intelligible communication between sender and receiver within the space (e.g. meeting rooms, auditoria, theaters, concert venues, cinemas, lecture halls, libraries, classrooms, conference rooms, counseling offices, private offices, private rooms in health care facilities, sleeping rooms, etc.).

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

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

baseline equivalent emission rate (BER): the baseline building emission rate (BER) represents the mass *carbon dioxide equivalent (CO₂e)* emitted for the average U.S. commercial building in the proposed building's location when using data from the U.S. Department of Energy's Energy Information Administration's (EIA) "Commercial Building Energy Consumption Survey (CBECS)." The BER is expressed as the mass of CO₂e emitted per year per unit area of the total useful floor area of a building – lb./ft²/yr. (kg/m²/yr.).

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.

C-factor (thermal conductance): the amount, in British Thermal Units (Btu), that flows each hour through 1 ft² of the surface area of material when there is a 1° temperature difference between the inside and outside air Btu/hr-ft²-F.

carbon dioxide equivalent (CO₂e): a measure used to compare the impact of various greenhouse gases based on their global warming potential (GWP). CO₂e approximates the time-integrated warming effect of a unit of a given greenhouse gas, relative to that of carbon dioxide (CO₂). GWP is an index for estimating the relative global warming contribution of atmospheric emissions of a unit mass of a particular greenhouse gas compared to the emission of a unit mass of CO₂.

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. *Charrettes* 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. *Charrettes* 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 multi-family 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: sorptive 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.

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.

direct lighting: lighting provided from a source without reflection from other surfaces, which allows light to travel on a straight path from the light source to the point of interest, such as ceiling-mounted or suspended *luminaires* with mostly downward light distribution characteristics.

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 utilizing 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-°F (W/m-K).

food waste disposer: a device used to shred food and other kitchen wastes prior to disposal.

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.

furnishings, finishes, and fit-outs: products and materials permanently installed on the interior of a building. This definition includes casework, shelving, and cabinets as well as finish materials used on floors, walls and ceilings. This definition does not include moveable furniture such as desks, tables, and chairs.

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. (See *carbon dioxide equivalent*).

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.

grid displaced electricity: all electricity generated in or on the building site by, for example, PV panels, wind-power, combined heat and power systems (CHP), or similar systems.

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.

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.

neighborhood asset(s): a single physical location where business transactions or services are available to the public. *Neighborhood assets* include, but are not limited to, grocery stores, banks, retail outlets, and nonprofit and public services such as religious facilities, schools, parks, police and fire stations, and government offices.

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 or *Renewable Energy Certificates (RECs)* 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.

on-site renewable energy: energy derived from sun, wind, water, the Earth's core, and various forms of biomass from recovered waste sources 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 *ODPs* that range from 0.01 to 1.0. The halons have *ODPs* 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 *ODPs*, *GWPs*, 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.

proposed equivalent emission rate (PER): *PER* is expressed as the mass of CO_2e emitted per year per unit area of the total useful floor area of the proposed building – lb./ft²/yr. (kg/m²/yr.).

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-values* 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 utilized 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 sorptive 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 perform activities for which the space has been specifically designed.

remediation: cleanup or other methods used to remove or contain a toxic spill, contamination or hazardous material.

renewable energy: energy that is continuously replenished on the Earth, such as wind, solar thermal, solar electric, geothermal, hydropower, and various forms of biomass from recovered waste sources.

Renewable Energy Certificates (RECs): renewable energy certificates (RECs) also known as renewable energy credits, green certificates, green tags, or tradable renewable certificates, represent the environmental attributes of the power produced from *renewable energy* projects and are sold separately from commodity electricity. Customers can buy green certificates whether or not they have access to green power through their local utility or a competitive electricity marketer and they can purchase RECs without having to switch electricity suppliers.

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 utilize a sorptive 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.

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.

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 utilize 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-ft²-oF (W/m²-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 repellent 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.

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.

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

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

IWF: Integrated Water Factor

IECC: International Energy Conservation Code

IES: Illuminating Engineering Society of North America

ISO: International Organization for Standardization

LCA: life cycle assessment

LWA: Landscape water allowance

MERV: Minimum Efficiency Reporting Value

MURB: Multi-Unit Residential Building

NC: Noise Criterion

NREL: National Renewable Energy Laboratory

PEFC: Programme for Endorsement of Forest Certification

RELs: Reference Exposure Levels

SCAQMD: South Coast Air Quality Management District

VOC: Volatile Organic Compounds