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Guiding Principles Compliance Overview

Introduction

Green Building Initiative’s (GBI) Guiding Principles Compliance for New Construction & Modernization (GPC NC) is a program designed specifically for federal construction and major modernization projects undergoing Third-Party Certification (TPC) per Implementing Instructions for Executive Order 13834 Efficient Federal Operations (Chapter III, Section A(5))1. The GPC NC program does not apply to existing buildings undergoing compliance validation for the Guiding Principles.

Developed with and for federal agencies, the GPC NC program validates compliance with The Guiding Principles for Sustainable Federal Buildings2. A building may qualify towards an agency’s sustainable building progress when meeting the requirements as specified within GBI’s GPC NC survey and supplemental technical reference manual.

GPC NC Program Materials

The Green Building Initiative’s (GBI) GPC NC program includes the following materials:

1. **GPC NC Scoping Checklist:** An initial document used in the planning process for determining scope and funding for projects, in advance of official registration with GBI’s Guiding Principles Compliance assessment program.

2. **GPC NC Survey:** The primary document used by design and construction project teams and the assigned third-party assessor, to track and determine compliance throughout the construction or modernization project undergoing GPC NC assessment.


Environmental Topic Areas

There are a total of six (6) environmental topic areas within the Guiding Principles:

I. Employ Integrated Design Principles
II. Optimize Energy Performance
III. Protect and Conserve Water
IV. Enhance Indoor Environmental Quality
V. Reduce the Environmental Impact of Materials
VI. Assess and Consider Climate Change Risks

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Projects that have a delay - either planned or unintentional - of more than 18 months between design completion and the solicitation of offers for construction must be re-evaluated to determine if any design revision is necessary due to changes in criteria (including codes and standards) or site infrastructure (e.g. water supply for fire department vehicle access).

Compliance Validation

A third-party assessment conducted by a GBI-trained assessor is required to validate compliance with the Guiding Principles as part of the GPC NC assessment program. An assessor with expertise in green building design, engineering, and construction interfaces with project teams and building owners during the assessment process by reviewing and evaluating documentation during design, either conducting a second document review when construction is complete/nearly complete or conducting an onsite assessment, and writing comprehensive assessment reports for each building assessed.

For the purposes of compliance validation, the “HPSB Guiding Principles” are met when all requirements are met, as applicable, during the third-party assessor’s final review.

GPC NC Survey and Process

The GPC NC assessment includes a third-party review of the completed GPC NC Survey and supporting documentation as part of the Design Submittal phase as well as one of two final assessment options; 1) an Onsite Assessment or 2) a Post-Construction Document Review. Supplementary reviews may be purchased for an additional fee if the team prefers more than one design review. The survey and assessments aid the Integrated Design Process (IDP) team throughout the design process per the unique goals and needs of each project.

GPC NC Scoping Checklist

The GPC NC Scoping Checklist is provided free of charge to assist Contracting Officers with creating the scope for funding federal building projects. The Scoping Checklist guides teams in identifying non-applicable criteria (if any) for their project so that all remaining items become part of the overall scope for the project as requirements for GP compliance. It is used in advance of official registration with GBI’s Guiding Principles Compliance assessment program.

GPC NC Survey

Registering and a project with GBI allows access to the GPC NC Survey. Upon receipt of project registration payment, GBI provides the survey to the project manager who, with the help of the project IDP team, will complete it by providing response options, narratives, and listing supporting documentation. The GPC NC Survey identifies all requirements that are the basis for determining compliance with the HBSP Guiding Principles.
Survey - Compliance Criteria, Specific Requirements, Life Cycle Cost Analysis (LCCA), and Tracking

Immediately below each Guiding Principle within the survey are requirements, as well as Life-Cycle Cost Analysis and Tracking fields (if applicable). Many requirements refer to ASHRAE 189.1 (including IgCC 2018) while others require the submission of specific documents or adherence to certain criteria. Underneath requirements for each Guiding Principle additional instructions are provided for agencies as necessary. Unless otherwise specified by agency directive, instructions and requirements in the GPC NC Survey apply to all federal agencies.

Within the GPC NC Survey, simply select the pink cell and pick from the drop-down list that appears for each requirement as applicable. For Life-Cycle Cost Analysis and Tracking (if applicable), enter the desired data in the open field blue cells. Specify answers according to the current construction phase. For example, during design select answers according to the goals, scope, and current progress (if any) towards meeting the requirement.

How to Answer Requirements

Next to every requirement is a drop-down list with two available answers:

1. "Yes" means an element is fully achieved, or highest resource efficiency is achieved with LCCA supporting documentation, or partial compliance is achieved with justification (with identified percentages), each of which is equivalent to “yes.”

2. “Partially compliant” means “the requirement is compliant to the greatest degree possible, based on LCCE (e.g., SDHW serves only 20% of water use, per LCCE); mission restriction (e.g., 24/7 operation); location/regional restriction (e.g., availability of high-efficiency equipment service); or locale restriction (e.g., proximity of existing buildings restricts daylighting).”

3. "Not Applicable" ("N/A") is to be used only when:
   a. **Mission** precludes the element (e.g. facility mission prohibits the use of windows);
   b. **Location of installation** restricts or precludes achievement of element (e.g. there is no local recycling);
   c. **Location conditions** mean that the element is not part of the project (e.g. there is no meter for steam because there is no steam);
   d. **Safety** (e.g. building orientation restriction for anti-terrorism due to existing infrastructure); or
   e. **LCCA does not support** any compliance with this requirement.

How to Answer Life-Cycle Cost Analysis (LCCA)

Life-Cycle Cost Analysis is required for several energy, water, and renewable Guiding Principles, as well as for any other requirements where first cost is higher but life cycle cost effectiveness is applicable to design decision. Simply enter in all applicable details within the open text fields (in blue) supplied for Life-Cycle Cost Analysis within the survey.
Justification must be entered in the Survey’s "Required Documentation & Comments" field for each element marked "N/A", including any LCCA supporting partial compliance (based on a percentage) or no compliance to a requirement. The project’s achievement will not be negatively impacted because of indicating "N/A," or where LCCA supports partial compliance (with percentages) or no compliance to a requirement. The intent is for the project team to determine if any of the Guiding Principles are not applicable, and that the remaining requirements must be fully met including partial compliance with LCCA allowance.

Required Documentation & Comments

After selecting an answer, provide supporting documentation and comments in the yellow box to the right of the answer selection within the survey. These comments (and supplied supporting documentation) are required for the third-party assessment of the project.

All data and documentation indicated in ToolTips within the GPC NC Survey must be supplied (pending the construction phase) unless otherwise specified.

Design Submittal Review

The third-party assessment of the project’s contract documents occurs during design submittals. This review is required as part of the assessment process. It can take place at any point during the process as contract documents become available. The Project Execution Phases as specified within the GPC NC Survey are:

- 1 - 30% Design Submittals
- 31 - 60% Design Submittals
- 61 - 90% Design Submittals
- 91 - 100% Design Submittals
- 100% Construction

If the project team desires, the review may happen prior to the 100% contract documents set is complete. When the GPC NC Survey and supporting documentation are ready for assessor review, the project manager submits the completed survey to GBI, who assigns a third-party assessor to perform the Design Review. The project team works with the assigned assessor to deliver all needed documentation. The assessor reviews the survey and submitted documentation to verify progress towards compliance.

When the review is complete, the assessor writes a Design Review Report containing their findings. The report includes all requirements completed, requirements in progress, actions required for compliance, etc.

3 contract 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 “Contract 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.
justifications for any partial or non-applicable criteria, projected compliance, and recommendations for the project. GBI reviews the report and, when approved, issues it to the project manager and uploads it to their GBI account (https://www.thegbi.org/login). The project team will review the report and may communicate with their assessor regarding any questions. The Design Review is a non-binding assessment, meaning the results are preliminary not final. To be validated as Compliant, a project must complete one of the two final assessment options and address all UFC requirements as “Yes” – completely compliant, partially compliant, or not applicable.

Final Assessment Options

There are two options for final assessment: On-Site Assessment or Post-Construction Document Review. The project must undergo one of these options as part of the assessment process.

Final Assessment Option 1: Onsite Assessment

The On-site Assessment is a third-party assessment of the project’s completed construction. A completed Design Review is required prior to an On-site Assessment. Final validation of compliance is based upon the assessor’s site visit results, including review of additional supporting documentation as necessary. If there are any changes made to construction since the completion of the Design Review Report, the project team must update the GPC NC Survey and provide any additional verification documentation as needed.

When construction is essentially complete (through the punch list) and the team is ready to schedule the site visit, the project manager submits the updated GPC NC Survey and contacts GBI to discuss the preferred timing of the site visit. GBI schedules a third-party assessor to perform the On-site Assessment and issues a formal scheduling letter to the project manager and assessor. The letter includes the contact information for both parties to facilitate direct contact. Whenever possible, GBI assigns the same assessor for both the Design Review(s) and On-site Assessment. Please note that the site visit typically requires 30 days of advance notice. In the weeks leading up to the site visit, the assigned assessor contacts the project manager to discuss the itinerary and specific details of the assessment.

Typically, the On-site Assessment begins with an introductory meeting in which the assessor interviews the key project players (Architect, MEP Engineers, Project Manager, General Contractor, etc.). Afterwards, one or two people can guide the assessor through the building. The government project manager must be present at all meetings and site visits to ensure the assessor receives the information needed to verify any outstanding criteria. If any follow-up documentation is requested during the site visit, it must be sent to the assessor within one week.

After the visit, the assessor will create a report of their findings along with verification of compliance, including partial compliance (with percentages) and non-applicable requirements. GBI will review the report and, when approved, issue it to the project manager. After reviewing the report, the project manager may order recognition items (if not pre-ordered) to help celebrate and market the achievement.
The duration of the site visit varies considerably based on the scope and size of the completed new construction project. Please allow approximately three to six hours for the assessor to review new documentation onsite, conduct a thorough walk-through of the interior space, and interview personnel.

Final Assessment Option 2: Post-Construction Document Review

The Post-Construction Document Review is a third-party assessment of the project’s completed construction. A completed Design Review is required prior to a Post-Construction Document Review. Final validation of compliance is based upon the assessor’s review of additional supporting documentation such as submittals, cut sheets, commissioning reports and inspection reports. If there are any changes made to construction since the completion of the Design Review Report, the project team must update the GPC NC Survey and provide any additional verification documentation as needed.

When construction is essentially complete (through the punch list) and the team has the post construction documentation available for review, the project manager submits the updated GPC NC Survey and contacts GBI to schedule the review. GBI schedules a third-party assessor to perform the final review and issues a formal scheduling letter to the project manager and assessor. The letter includes the contact information for both parties to facilitate direct contact. Whenever possible, GBI assigns the same assessor for both the Design Review(s) and Post-Construction Document Review.

The assessor will create a report of their findings along with verification of compliance, including partial compliance (with percentages) and non-applicable requirements. GBI will review the report and, when approved, issue it to the project manager. After reviewing the report, the project manager may order recognition items (if not pre-ordered) to help celebrate and market the achievement.
i. LIFE-CYCLE COST ANALYSIS (LCCA)

i.a LCCA Format

i.a.1

A properly performed Life-Cycle Cost Analysis (LCCA) can be used to verify requirements that are not applicable (N/A) due to life-cycle cost effectiveness (LCCE).

*Note that these are not requirements, but are intended to help project teams:*

i.a.1.1: Was a Life-Cycle Cost Analysis (LCCA) performed as part of this project?

i.a.1.2: If “Yes” to the above, describe how the LCCA was prepared, and findings from the LCCA as pertain to Guiding Principles requirements for New Construction and Modernization.

i.a.1 Required Documentation:

- LCCA report from Building Life Cycle Costing (BLCC) program;
- Narrative describing estimated building life.

i.a.1 References:

- 10 CFR Part 436, Subpart A

i.a.1 Links:

1. EMPLOY INTEGRATED DESIGN PRINCIPLES

1.a Sustainable Locations

1.a.1
Consider the environmental impact of siting decisions when making new facility investments and balance those concerns with cost and security. The guidance included in Implementing Instructions-Sustainable Locations for Federal Facilities highlights the need to strike the appropriate balance. Consider site-specific long-term climate change impacts such as drought, flood, wind, and wildfire risks. Prioritize sites that offer robust transportation options, including walking, biking, and transit, and minimize the combined greenhouse gas emissions of the building and associated commuter and visitor transportation emissions over the project’s life. Leverage existing infrastructure, and align, where possible, with local and regional planning goals; protect natural, historic, and cultural resources.

1.a.1 Requirements:

1.a.1.1: Consider the environmental impact of siting decisions, and balance those concerns with cost and security.

1.a.1.1 Assessment Guidance: The guidance included in Implementing Instructions - Sustainable Locations for Federal Facilities highlights the need to strike the appropriate balance.

1.a.1.2: Consider site-specific long-term climate change impacts such as drought, flood, wind, and wildfire risks.

1.a.1.3: Prioritize sites that offer robust transportation options, and minimize combined greenhouse gas emissions of the building and associated commuter and visitor transportation emissions over the project’s life.

1.a.1.3 Assessment Guidance: "Robust transportation options" include walking, biking, and public transit as a few examples.

1.a.1.4: Leverage existing infrastructure, and align, where possible, with local and regional planning goals; protect natural, historic, and cultural resources.

1.a.1 Required Documentation:

- Copy of Design Charrette meeting minutes that identify each of the required elements.

1.a.1 References:

- Implementing Instructions - Sustainable Locations for Federal Facilities:
  https://www.sustainability.gov/pdfs/sustainable_locations_federal_facilities.pdf (PDF)
1.b Integrated Design

1.b.1

Use a collaborative, integrated process and team to plan, program, design, construct, commission, and transition to operation each new building project or modernization. Ensure that the process and team:

1.b.1 Requirements:


1.b.1.2: Establish performance goals for energy, water, materials, indoor environmental quality, and daylighting along with other comprehensive design goals and ensure incorporation of these goals throughout the design and life cycle of the building.

1.b.1.2 Assessment Guidance: Submit meeting notes, project goals, and design charrette matrix and decisions Showing established goals for siting, energy, water, materials, indoor environmental quality, and other comprehensive design goals.

1.b.1.2 Required Documentation:

- Team charters and description of names and roles of integrated team members
- Project meeting minutes and agendas detailing which project members were in attendance
- Project goals and outcomes of meetings

1.b.1.3: Follow sustainable landscape design principles including protection and promotion of pollinator habitat.

1.b.1.4: Evaluate and provide appropriate electric vehicle charging infrastructure, in accordance with applicable laws and regulations.

1.b.1.5: Consider design choices that improve environmental performance, protect historic properties, enhance indoor environmental quality, support health and wellness of building occupants, and address climate risks, including wildfire.

1.b.1.5 Assessment Guidance: This includes evaluating site and building components for determination on passive &/or natural design strategies; taking into account site attributes, including climate and local and regional context, which impact design of the building; and orienting the building to maximize energy efficiency, passive solar, and daylighting potential.
Furthermore, design promotes opportunities for occupants to voluntarily increase physical activity. E.g. making stairwells a desirable option for circulation, active workstations, including an exercise and/or fitness center, etc.

1.b.1.5 Required Documentation:
- Project goals and design choices
- Conceptual and final design reports or Owner’s Project Requirements

1.b.1.6: Consider all stages of the building’s life cycle.

1.b.1 References:
- 2018 IgCC Informative Appendix F, Integrated Design
- ASHRAE 189.1 Informative Appendix F, Integrated Design

1.c Commissioning

1.c.1
Employ commissioning tailored to the size and complexity of the building and its system components in order to optimize and verify performance of building systems. Commissioning should be led by an experienced commissioning provider who is independent of the project design and construction team and the operations team. At a minimum, commissioning should include a commissioning plan, verification of the installation and performance of systems being commissioned, and a commissioning report that confirms identified issues were appropriately addressed. Follow EISA 2007 section 432 and associated Federal Energy Management Program (FEMP) commissioning guidance.

1.c.1 Requirements: Complete all nine (9) requirements (as applicable).

1.c.1.1: Submit the design documentation requirements for ASHRAE 189.1 Section 10.3.1.2.1 Activities Prior to Building Permit.

1.c.1.1 Assessment Guidance: Documentation as described per10.3.1.2.1(c) (ASHRAE 55 Section 6.2) is not required.
Compliance with IgCC 2018 Section 1001.3.1.2.2 Cx Activities Prior to Building Permit may be completed in lieu of ASHRAE 189.1.

1.c.1.1 Required Documentation:
- Designated project commissioning authority (CxA)
- Owner’s Project Requirements (OPR)
- Design team’s Basis of Design (BOD)
- Project specifications including construction phase commissioning requirements
- Other contract documents including construction phase commissioning requirements
- Commissioning plan

1.c.1.1 References:
- 2018 IgCC Section 1001.3.1.1.1 Activities Prior to Building Permit for Facilities Using the FPT Process
- 2018 IgCC Section 1001.3.1.2.2 Cx Activities Prior to Building Permit
- ASHRAE 189.1 Section 10.3.1.2.1 Activities Prior to Building Permit

1.c.1.2: The CxA has conducted a focused OPR review of the contract documents at or near 50% design completion.

1.c.1.2 Required Documentation:
- Owner’s project requirements (OPR)
- Design review report

1.c.1.2 References:
- 2018 IgCC Section 1001.3.1.2 Building Project Commissioning (Cx) Process
- 2018 IgCC Section 1001.3.1.3.2 Design Review Report
- ASHRAE 189.1 Section 10.3.1.2.1 Activities Prior to Building Permit

1.c.1.3: The CxA has conducted a second, focused OPR review of the final contract documents.

1.c.1.3 Required Documentation:
- Owner’s project requirements (OPR)
- Final Cx report

1.c.1.3 References:
- 2018 IgCC Section 1001.3.1.3.4 Final Cx Report
- ASHRAE 189.1 Section 10.3.1.2.1 Activities Prior to Building Permit

1.c.1.4: Submit the contract documentation requirements for ASHRAE 189.1 Section 10.3.1.2.2 Activities Prior to Building Occupancy.
1.c.1.4 Assessment Guidance: Compliance with IgCC 2018 Section 1001.3.1.1.1.2 Activities Prior to Building Occupancy for Facilities Using the FPT Process OR Section 1001.3.1.2.3 Cx Activities Prior to Building Occupancy may be completed in lieu of ASHRAE 189.1.

1.c.1.4 Required Documentation:
- Construction checklist and verification
- Owner’s Project Requirements (OPR)
- Preliminary commissioning report
- System manual, including O&M documentation

1.c.1.4 References:
- 2018 IgCC Section 1001.3.1.1.1.2 Activities Prior to Building Occupancy for Facilities Using the FPT Process
- 2018 IgCC Section 1001.3.1.2.3 Cx Activities Prior to Building Occupancy
- ASHRAE 189.1 Section 10.3.1.2.2 Activities Prior to Building Occupancy

1.c.1.5: Submit the contract documentation requirements for ASHRAE 189.1 Section 10.3.1.2.3 Post-Occupancy Activities.

1.c.1.5 Assessment Guidance: Compliance with IgCC 2018 Section 1001.3.1.2.4 Postoccupancy Cx Activities may be completed in lieu of ASHRAE 189.1.

1.c.1.5 Required Documentation:
- Commissioning plan
- Owner’s Project Requirements (OPR)
- Final Commissioning Report

1.c.1.5 References:
- 2018 IgCC Section 1001.3.1.2.4 Postoccupancy Cx Activities
- ASHRAE 189.1 Section 10.3.1.2.3 Postoccupancy Activities

1.c.1.6: Submit the contract documentation requirements for ASHRAE 189.1 Section 10.3.1.2.4 Systems.

1.c.1.6 Assessment Guidance: Compliance with IgCC 2018 Section 1001.3.1.1 Building Systems FPT OR Section 1001.3.1.2.1 Systems to be Commissioned may be completed in lieu of ASHRAE 189.1.

1.c.1.6 Required Documentation:
- Contract documentation

1.c.1.6 References:
- 2018 IgCC Section 1001.3.1.1 Building Systems FPT
- 2018 IgCC Section 1001.3.1.2.1 Systems to be Commissioned
1.c.1.7: Submit the contract documentation requirements for ASHRAE 189.1 Section 10.3.1.2.5 Building Envelope Airtightness.

1.c.1.7 Assessment Guidance: Compliance with IgCC 2018 Section 1001.3.1.3.5 Building Envelope Airtightness may be completed in lieu of ASHRAE 189.1.

1.c.1.7 Required Documentation:
- System Manual
- Final Commissioning Report

References:
- 2018 IgCC Section 1001.3.1.3.5 Building Envelope Airtightness
- ASHRAE 189.1 Section 10.3.1.2.5 Building Envelope Airtightness

1.c.1.8: Submit the contract documentation requirements for ASHRAE 189.1 Section 10.3.1.2.6 Documentation.

1.c.1.8 Assessment Guidance: Compliance with IgCC 2018 Section 1001.3.1.1.1.3 Documentation (FPT) OR Section 1001.3.1.10.2 Documentation may be completed in lieu of ASHRAE 189.1.

1.c.1.8 Required Documentation:
- System Manual
- Final Commissioning Report

References:
- 2018 IgCC Section 1001.3.1.1.3 Documentation (FPT)
- 2018 IgCC Section 1001.3.1.10.2 Documentation
- ASHRAE 189.1 Section 10.3.1.2.6 Documentation

1.c.1.9: Submit an electronic O&M Manual (hard copy optional).

1.c.1.9 Assessment Guidance: An "O&M Manual" is an Operations and Maintenance (O&M) Manual that encompass all operating aspects of the building that have an impact on its surrounding environment and occupants.

1.c.1.9 Required Documentation:
- Electric O&M Manual (hard copy optional)

References:
- 2018 IgCC Section 1001.3.1.1.2(c) Activities Prior to Building Occupancy for Facilities Using the FPT Process
- 2018 IgCC Section I201.7 Systems Manual
1.c.1 Assessment Guidance:

During the design phase, the CxA must review the OPR, design documents and any Basis of Design (BOD) documents assembled by the design team. The design document reviews focus on the “big picture”, focusing on operability, accessibility, maintainability, efficiency, coordination between systems and controls. Approximately one-third of commissioning field problems can be traced back to design, so this process is key. The CxA must also help prepare commissioning related specifications for the design team, develop pre-functional checklists and functional performance tests for all equipment to be commissioned, and finalize the Commissioning Plan. Specification sections related to commissioning are typically included in the Division 01 sections (listing checklists, prerequisites to testing, testing requirements and reports) and also in individual sections in Divisions 02 through 48 (stating which systems are to be commissioned and requirements for contractors to complete checklists and performance tests). The CxA will also develop training and systems manual requirements.

The construction phase is where the largest amount of commissioning work takes place. The CxA’s activities will include:

- Reviewing submittals against the Commissioning Plan, OPR, and BOD
- Revise the OPR, Commissioning Plan and schedule, if necessary
- Document construction observations on site and compile these into a commissioning issues log and photo log
- Review pre-functional test checklists completed by contractors
- Conduct Functional Performance Testing of equipment and systems
- Develop a systems manual that includes operations and maintenance manuals for commissioned equipment

During this time, the CxA might also meet with the designers and contractors to review complex systems such as the BAS and sequence of operations. Once all the above activities are complete, the CxA will develop and distribute the Commissioning Report.

Close-out documents for typical new construction projects include what may be often be referred to as an Operations and Maintenance (O&M) Manual. Electronic O&M Manuals (hard copy optional) for green and sustainable buildings need to encompass all the operating aspects of the building that have an impact on its surrounding environment and occupants. Simply because a building was built green does not mean it will operate in an environmentally friendly fashion unless thorough operating procedures are in place as soon as the building is occupied. Conventional practices may provide O&M Manuals that include mainly HVAC equipment. Manuals of this type are useful but are not sufficient to ensure the building staff can successfully operate the building post-construction.
This requirement is meant to address the building’s overall operating procedures, not solely the engineered systems.

All management plans and policies should include who the responsible parties are, including any outside vendors, what actions will be taken as part of the plan, why the actions are environmentally preferable versus standard operating procedures and any tracking or verifying documentation that will be required. The Assessor will look for submission of an electronic Operations and Maintenance Manual (hard copy optional) that clearly notes each of the site management items it addresses. The Assessor will also be checking to ensure each management plan or policy is complete.

1.c.1 Links:

2. OPTIMIZE ENERGY PERFORMANCE

2.a Energy Efficiency

2.a.1
Employ strategies that minimize energy usage. Focus on reducing energy loads before considering renewable or clean and alternative energy sources.

Follow the Path applicable to your project type:

- **Path A: New Construction** (non-low-rise residential)
- **Path B: New Construction – Low-Rise Residential Buildings**
- **Path C: Modernization**

2.a.1.A Path A – New Construction (non-low-rise residential)

2.a.1.A (Path A) Requirements:

2.a.1.A.1: Meet the requirements of ASHRAE 90.1.

2.a.1.A.2: Submit energy model showing the proposed building model to achieve at least 30% energy consumption reduction from ASHRAE 90.1 baseline (less, pending life-cycle cost effectiveness).

2.a.1.A.3: Determine energy consumption levels for ASHRAE Baseline Building and proposed building alternatives.

2.a.1.A (Path A) Required Documentation:

- Summary of the proposed energy model’s inputs and outputs
- Modeling report
- Performance Rating Method calculation for baseline and proposed buildings

2.a.1.A (Path A) References:

• 42 U.S.C. § 8259b: Federal procurement of energy efficient products
• ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings\textsuperscript{13}

2.a.1.A (Path A) Assessment Guidance:

ASHRAE 90.1 version is applicable per the following

• \textit{90.1-2013}: Design for construction began on or after November 6, 2016
• \textit{90.1-2010}: Design for construction began on or after July 9, 2014, but before November 6, 2016
• \textit{90.1-2007}: Design for construction began on or after August 10, 2012, but before July 9, 2014
• \textit{90.1-2004}: Design for construction began on or after January 3, 2007, but before August 10, 2012

Model compared to ASHRAE using DOE-2, Energy Plus, eQuest, or other recognized modeling program. Ensure that contractor’s design compared to ASHRAE baseline.

If a 30% reduction is not Life Cycle Cost Effective (LCCE), modify the design of the proposed building to achieve an energy consumption level at the highest level of energy efficiency that is LCCE. Document what savings and measures are achievable. At a minimum, meet CFR § 433 Subpart 433.100 (Energy efficiency performance standard), Paragraph a.

Determine energy consumption levels for both baseline and proposed building by using the Performance Rating Method found in appendix G of ASHRAE 90.1. Energy consumption for the purposes of calculating the 30% savings requirements shall include the building envelope and energy consuming systems normally specified as part of the building design by ASHRAE 90.1 (including space heating, space cooling, ventilation, service water heating, and lighting) but shall not include receptacle and process loads not within the scope of ASHRAE 90.1 (e.g. specialized medical or research equipment and equipment used in manufacturing processes).

2.a.1.B Path B - New Construction – Low-Rise Residential

2.a.1.B (Path B) Requirements:

2.a.1.B.1: Meet the requirements of International Energy Conservation Code (IECC).

2.a.1.B.2: Submit energy model showing the proposed building alternatives to achieve at least 30% - less if LCCE - energy consumption reduction from IECC baseline (Section 405, Simulated Performance Alternative).

2.a.1.B (Path B) Required Documentation:

• Summary of the proposed energy model’s inputs and outputs;
• Modeling report.

2.a.1.B (Path B) References:

• 10 CFR Part 435 Energy Efficiency Standards For The Design And Construction Of New Federal Low-Rise Residential Buildings
• 2009 International Energy Conservation Code (IECC)
• 2015 International Energy Conservation Code (IECC)

2.a.1.B (Path B) Assessment Guidance:

International Energy Conservation Code (IECC) is applicable per the following:

• IECC 2015: Design for construction began on or after January 10, 2018
• IECC 2009: Design for construction began on or after August 12, 2012, but before January 10, 2018
• IECC 2004: Design for construction began on or after January 3, 2007, but before August 10, 2012

Meeting 2015 IECC also includes the mandatory mechanical ventilation requirements in Section R403.6.

Model compared to IECC using DOE-2, Energy Plus, eQuest, or other recognized modeling program. Ensure that contractor’s design compared to IECC baseline.

2015 IECC: Energy consumption for the purposes of calculating the 30% savings shall include heating, space cooling, lighting, mechanical ventilation, and domestic water heating.

2009 IECC: Energy consumption for the purposes of calculating the 30% savings shall include space heating, space cooling, and domestic water heating.

If a 30% reduction is not Life Cycle Cost Effective (LCCE), modify the design of the proposed building to achieve an energy consumption level at the highest level of energy efficiency that is LCCE. Document what savings and measures are achievable. At a minimum, meet CFR § 435 Subpart 435.4 (Energy efficiency performance standard), Paragraph a.

2.a.1.C Path C - Modernization

Meet one of the following options for modernization projects:

2.a.1.C.1: The building has an ENERGY STAR® rating of 75 or higher in Portfolio Manager.

2.a.1.C.1 Assessment Guidance: Building must be accurately entered into Portfolio Manager, and ENERGY STAR score must be based on a 12-month performance period no older than 1 year.
2.a.1.C.1 Required Documentation:
- ENERGY STAR Data Verification Checklist
- Printout from Portfolio Manager account displaying ENERGY STAR score

2.a.1.C.1 References:
- ENERGY STAR Portfolio Manager (U.S. Environmental Protection Agency):
  https://portfoliomanager.energystar.gov/pm/login.html

2.a.1.C.2: Energy use is 20% below the fiscal year (FY) 2015 energy use baseline (less, pending LCCE).

2.a.1.C.2 Assessment Guidance: If a 20% reduction is not Life Cycle Cost Effective (LCCE), modify the design of the proposed building to achieve an energy consumption level at the highest level of energy efficiency that is LCCE. Document what savings and measures are achievable.

2.a.1.C.2 Required Documentation:
- Calculations based on utility or site-owned meter data, or energy engineering, or software modeling estimates
- Methodologies and/or computer programs used to determine savings

2.a.1.C.3: Energy use is 30% below the FY 2003 energy use baseline (less, pending LCCE).

2.a.1.C.3 Assessment Guidance: If a 30% reduction is not Life Cycle Cost Effective (LCCE), modify the design of the proposed building to achieve an energy consumption level at the highest level of energy efficiency that is LCCE. Document what savings and measures are achievable.

2.a.1.C.3 Required Documentation:
- Calculations based on utility or site-owned meter data, or energy engineering, or software modeling estimates
- Methodologies and/or computer programs used to determine savings

2.a.1.C.4: Energy use is 30% better than baseline case modeled to the current ASHRAE 90.1 (less, pending LCCE).

2.a.1.C.4 Assessment Guidance: If a 30% reduction is not Life Cycle Cost Effective (LCCE), modify the design of the proposed building to achieve an energy consumption level at the highest level of energy efficiency that is LCCE. Document what savings and measures are achievable.

ASHRAE 90.1 version is applicable per the following
- 90.1-2013: Design for construction began on or after November 6, 2016
- **90.1-2010**: Design for construction began on or after July 9, 2014, but before November 6, 2016
- **90.1-2007**: Design for construction began on or after August 10, 2012, but before July 9, 2014
- **90.1-2004**: Design for construction began on or after January 3, 2007, but before August 10, 2012

### 2.a.1.C.4 Required Documentation:
- Summary of the baseline case energy model’s inputs and outputs
- Modeling report

#### 2.a.1.C (Path C) References:

#### 2.a.2

Use energy efficient products as required by statute.

#### 2.a.2 Requirements:

#### 2.a.2.1: A policy demonstrates that purchases are required to be ENERGY STAR and FEMP-designated.

#### 2.a.2 Assessment Guidance:

Campus or installation-wide documentation can be used to meet this requirement. Final design documents or cut sheets or contracts must demonstrate the purchase of ENERGY STAR and FEMP-designated products for all products for which there is an ENERGY STAR label or FEMP-designation, when life-cycle cost effective, reasonably available and meets functional requirements.

#### 2.a.2 Required Documentation:
- ENERGY STAR & FEMP labeling for plug-in equipment and fixed building equipment.

#### 2.a.2 References:
- 42 U.S.C. § 8259b: Federal procurement of energy efficient products

#### 2.a.2 Links:
2. a LCCA: If performed, what was the finding of the Life-Cycle Cost Analysis (LCCA)? If meeting the applicable energy reduction % target is not life cycle cost effective (LCCE), document what savings and measures are achievable.

2. a Tracking 1: What is the current energy consumption reduction percentage? (provide per agency policy, if applicable)

2. a Tracking 2: Provide Energy Use Intensity (EUI) (kBTU/Sq. Ft./Year per building). (provide per agency policy, if applicable)

2. a Links:
- ENERGY STAR (U.S. Environmental Protection Agency): http://www.energystar.gov
- ENERGY STAR Portfolio Manager login (U.S. Environmental Protection Agency): https://portfoliomanager.energystar.gov/pm/login.html

2. b Renewable and Clean Energy

2. b.1
Implement life cycle cost-effective renewable electric energy and thermal energy projects on-site. Consider long-term off-site sources of renewable power or Renewable Energy Certificates (RECs) where on-site opportunities are limited. Utilize clean and alternative energy sources where possible.

2. b.1 Requirements:

2. b.1.1: Submit Life Cycle Cost Analysis for on-site renewable energy.

2. b.1.1 Required Documentation:
- On-site renewable energy feasibility studies or Life-Cycle Cost Analysis (LCCA).
- Renewable energy design documents plans and specifications, and sub-contract, if applicable.
2.b.1.2: Submit documentation for on-site renewable energy system(s), and/or long-term off-site sources of renewable power, and/or RECs as applicable.

2.b.1.2 Assessment Guidance: Pending findings of on-site renewable energy feasibility studies or LCCA, provide documentation per one (or more if applicable) of the following:

- **ASHRAE/IgCC Renewable Energy Design**: Final design or construction documents demonstrate ASHRAE Standard 189.1 Section 7.4.1.1 On-Site Renewable System was followed or IgCC 2018 Chapter 7; OR

- **Renewable Energy On Building/Federal Property**: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate agency-owned renewable energy or Power Purchase Agreements for renewable energy on federal property or from federal property. Agency must own RECs. If taking credit for a centralized system, demonstrate percentage of renewable energy attributed to the building; OR

- **Off-Site Renewable Energy**: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate Power Purchase Agreements for renewable energy or green power purchased from the utility. Demonstrate percentage of renewable energy for federal use attributed to the building. Agency must own RECs; OR

- **Alternative Energy System**: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate there is an alternative energy system on the building, or the building is served by a district alternative energy system; OR

- **Renewable Energy Certificates**: Demonstrate that RECs are purchased for a term of at least 2 years; OR

- **Life-Cycle Cost Analysis**: An LCCA demonstrates that renewable or alternative energy is not life-cycle cost effective.

2.b.1.2 References:

- 10 U.S.C. § 2911: Energy Performance Goals and Master Plan

2.b.1 LCCA: If performed, what was the finding of the Life-Cycle Cost Analysis (LCCA)?

2.b.1 Tracking 1: What percentage of energy will come from the renewable energy system(s)? (provide per agency policy, if applicable)

2.b.1 Tracking 2: What is the system’s total capacity for renewable electric energy? (provide per agency policy, if applicable)
2.b.1 Tracking 3: What is the system’s total capacity for renewable **thermal** energy? (provide per agency policy, if applicable)

2.b.1 Tracking 4: List renewable energy technology.

2.c Metering

2.c.1
To track and continuously optimize energy performance, install building level meters for electricity, natural gas, and steam. Install advanced meters as required by statute. Standard meters should be used when advanced meters are not appropriate.

2.c.1 Requirements:

2.c.1.1: Is electricity metered at the building level?

2.c.1.2: Is natural gas metered at the building level?
   
   2.c.1.2 Assessment Guidance: Not applicable if there is no natural gas.

2.c.1.3: Is steam metered at the building level?
   
   2.c.1.3 Assessment Guidance: Not applicable if there is no steam.

2.c.1 Required Documentation:

- Mechanical and electrical plans showing what utilities will be metered.

2.c.1 References:

- 42 U.S.C. § 8253(3), Metering of Energy Use

2.c.1 Assessment Guidance:

For new buildings, use advanced meters whenever appropriate. Documents such as utility bills or photos will demonstrate the installation and location of building-level standard meters for electricity, natural gas, steam, or other sources (when present).
“Not Applicable” is justifiable for 2.c.1.4 and 2.c.1.5 as a “location” when the base does not yet have the centralized system.

2.d Benchmarking

2.d.1
Benchmark building performance at least annually, preferably using ENERGY STAR Portfolio Manager. Agencies should strive to benchmark unusual buildings and space types against similar facilities within their portfolios. Regularly monitor building energy performance against historic performance data and peer buildings to identify operating inefficiencies and conservation opportunities.

2.d.1.1: Benchmarking options - *Select one of the following options for meeting the benchmarking requirement:*

1. ENERGY STAR - 2.d.1.A
2. ASHRAE - 2.d.1.B

2.d.1.A: Demonstrate that an ENERGY STAR Portfolio Manager record has been created for the designated building.

2.d.1.A Assessment Guidance: The record may consist of only basic building information and property uses. A policy must be in place for regular review and verification of the Portfolio Manager record.

If baselines for energy and/or water have not yet been established, follow the steps below:

1. Enter your project into ENERGY STAR Portfolio Manager: [https://portfoliomanager.energystar.gov/pm/signup](https://portfoliomanager.energystar.gov/pm/signup)
2. Establish baseline for energy consumption by entering the energy use along with building characteristics such as area, number of units, amenities, etc.
3. Establish baseline for water consumption by entering the water use along with building characteristics such as area, number of units, amenities, etc.

2.d.1.A Required Documentation:

- ENERGY STAR Portfolio Manager documents

2.d.1.A References:


2.d.1.B: Demonstrate that ASHRAE Standard 189.1 Section 10.3.2.1.3.2 Track and Assess Energy Consumption has been met.
2.d.1.B Assessment Guidance: Procedures for tracking and benchmarking building project energy performance must be specified in an operational plan. The initial benchmark shall be completed after 12 months, but no later than 18 months, after the certificate of occupancy has been issued. Building parameter inputs must use actual average values. The plan must include:

- Energy usage reports
- Energy performance tracking
- Energy performance assessing (benchmarking)

2.d.1.B Required Documentation:

- Documents demonstrate ASHRAE 189.1 Section 10.3.2.1.3.2 Track and Assess Energy Consumption

2.d.1 References:

- ASHRAE 189.1 Standard for the Design of High-Performance Green Buildings

2.d.1 Assessment Guidance:

Benchmark building performance at least annually, preferably using ENERGY STAR Portfolio Manager; regularly monitor building energy performance against historic performance data and peer buildings.
3. PROTECT AND CONSERVE WATER

3.a Indoor Water Use

3.a.1

Employ strategies that minimize water use and waste, including (each of the following):

3.a.1 Requirements:

3.a.1.1 - ASHRAE: Build to ASHRAE Standard 189.1-2014 sections 6.3.2, 6.4.2, and 6.4.3, or current comparable ASHRAE standards;

OR

IgCC: Build to IgCC 2018 sections 601.3.2 and 601.3.3.

3.a.1.1 Assessment Guidance: Water efficient products can be WaterSense or products with performance equivalent to WaterSense.

3.a.1.1 Required Documentation:

- Final design or construction documents specify ASHRAE 189.1-2014 sections 6.3.2, 6.4.2, and 6.4.3 (or comparable); OR
- Final design or construction documents specify IgCC 2018 sections 601.3.2 and 601.3.3.

3.a.1.1 References:

- ASHRAE 189.1 Section 6.3.2 (Building Water Use Reduction)
- ASHRAE 189.1 Section 6.4.2 (Building Water Use Reduction)
- ASHRAE 189.1 Section 6.4.3 (Special Water Features)
- IgCC 2018 Section 601.3.2 Building Water Use Reduction
- IgCC 2018 Section 601.3.3 Special Water Features

3.a.1.2 - Water-Efficient Products: Purchase water-efficient products, include WaterSense and FEMP-designated products.

3.a.1.2 Assessment Guidance: Documentation can be compiled cut sheets, product declarations, and/or plumbing fixture and fittings schedule showing flush or flow rate performance consistent with ASHRAE 189.1-2014 section 6.3.2, IgCC 2018 Section 601.3.2, or WaterSense or equivalent.

Exception: Fixtures used for sanitizing potential biohazards are exempt from low-flow and WaterSense labeling requirements.

3.a.1.2 Required Documentation:

- Product cut sheets demonstrating compliance

3.a.1.2 References:

- ASHRAE 189.1 Section 6.3.2 (Building Water Use Reduction)
- ASME A112.19.2/CSA B45.1 Ceramic Plumbing Fixtures
3.a.1.3 - Water Meters: Install building level water meters.

3.a.1.3 Assessment Guidance: Water meters are for the management of water use during occupancy, including detection of leaks. Final design or construction documents must specify, at a minimum, a meter(s) exclusive to the building measuring whole-building potable water consumption, including all potable water sources. Preferably there will be advanced data management capabilities as part of a campus-wide monitoring system (if applicable) for remote data access, electronic data storage and reporting, and the collection of interval data (minimum hourly).

3.a.1.3 Required Documentation:
- Documentation for water meter(s) at each building;
- Copy of campus-wide monitoring plan that includes the installation of the building specific meters (if applicable);
- Cut sheets for installed water meters that demonstrate connection to campus-wide monitoring system (if applicable).

3.a.1.3 References:
- ASHRAE 189.1 Section 6.3.3 Water Consumption Management
- IgCC 2018 Section 601.3.4 Water Consumption Measurement

3.a.1.4 - Cooling Towers: Optimize cooling tower operations.

3.a.1.4 Required Documentation:
- Design drawings

3.a.1.4 References:
- ASHRAE 189.1 Section 6.4.2.1 Cooling Towers
- IgCC 2018 Section 601.3.2

3.a.1.5 - Single Pass Cooling: Eliminate single pass cooling.

3.a.1.5 Required Documentation:
- Design drawings

3.a.1 Links:
- WaterSense (U.S. Environmental Protection Agency): https://www.epa.gov/watersense

3.b Outdoor Water Use

3.b.1

Use water efficient landscapes that incorporate native, non-invasive, drought tolerant, and low maintenance plant species and employ water efficient irrigation strategies to reduce outdoor potable water consumption. Install water meters for irrigation systems serving more than 25,000 square feet of landscaping.

Follow the Path applicable to your project type:

- Path A: No Irrigation
- Path B: Prescriptive Irrigation Requirements

3.b.1.A Path A - No Irrigation

3.b.1.A (Path A) Requirements:

3.b.1.A.1: Submit documentation showing no potable water is used for new landscaping.

3.b.1.A.1 Required Documentation:

- Irrigation system design and short narrative describing that no potable water is used for irrigating new landscaping (other than for plant establishment).

3.b.1.B Path B - Prescriptive Irrigation Requirements

3.b.1.B (Path B) Requirements:

3.b.1.B.1: Install a water meter exclusive to the irrigation system.

3.b.1.B.1 Required Documentation:

- Utility invoices or comparable for the irrigation system meter
- Contract documents: plans and specifications

3.b.1.B.2: Submit documentation demonstrating use of water efficient landscaping and non-invasive plant species.

3.b.1.B.2 Assessment Guidance: Must be for a minimum of 60% of areas that will be/are landscaped, consistent with ASHRAE 189.1-2014 Section 6.3.1.1 Landscape Design, QR
3.b.1.B.2 Required Documentation:
- Landscape design document
- Contract documents: plans and specifications

3.b.1.B.2 References
- ASHRAE 189.1 Section 6.3.1.1 Landscape Design
- IgCC 2018 Section 601.3.1.1 Landscape Design

3.b.1.B.3: Submit documentation demonstrating use of water efficient landscaping and non-invasive plant species.

3.b.1.B.3 Assessment Guidance: Compare results to a baseline building, preferably using the EPA WaterSense landscape water budget tool version 1.01 or later.

3.b.1.B.3 Required Documentation:
- Copy of the WaterSense Water Budget Tool, with the following completed worksheets:
  - Part 1 - Baseline & LWA
  - Part 2 - LWR
  - Part 3 - Results

3.b.1.B.3 References
- IgCC 2018 Section 601.3.1 Site Water Use Reduction

3.b.1 Links:
- EPA’s WaterSense Water Budget Tool: www.epa.gov/watersense/water_budget

3.c Alternative Water

3.c.1
Implement cost effective methods to utilize alternative sources of water such as harvested rainwater, treated wastewater, air handler condensate capture, grey water, and reclaimed water, to the extent permitted under local laws and regulations.

3.c.1 Requirements:

3.c.1.1: Submit documentation of water efficient landscape and irrigation strategies, such as water reuse and the use of harvested rainwater.
3.c.1.1 Assessment Guidance:

Where life-cycle is cost-effective and permitted by local laws and regulations, use alternative water sources. Alternative water is water not obtained from a surface water source, ground water source, or purchased reclaimed water from a third party.

Examples of alternative water include rainwater harvesting, gray water, condensate capture, process discharge, and wastewater reclaim. Applications include irrigation, cooling tower make-up, toilet/urinal flushing, vehicle wash, as well as other industrial applications.

3.c.1.1 Required Documentation:

- NIST BLCC calculations that compare the use of alternate water sources to the use of potable water for irrigation; and
- Drawing and specifications that demonstrate the use of alternate water sources;
  
  OR
  
  - A copy of local regulations that demonstrate that the use of alternate water sources is prohibited.

3.d Stormwater Management

3.d.1

Employ design and construction strategies that reduce stormwater runoff and discharges of polluted water offsite to protect the natural hydrology and watershed health. For any new construction per EISA section 438, use site planning, design, construction, and maintenance strategies to maintain hydrologic conditions after development, or to restore hydrologic conditions following development, to the maximum extent that is technically feasible.

3.d.1 Requirements:

3.d.1.1: Submit documentation demonstrating EISA stormwater management requirements have been met or exceeded.

3.d.1 Required Documentation:

- Pre-development condition;
- EISA Section 438 estimated implementation costs for design and construction;
- Calculation for run-off volumes and rates in 95th percentile rainfall;
- Technical constraints;
- Stormwater features and their location(s);
- Construction cost;
• Validation documentation of constructed features.

3.d.1.1 References:
• Energy Independence and Security Act (EISA), Section 438

3.d.1.1 Assessment Guidance:
Stormwater management examples include:
• Reduced impervious surfaces
• Previous paving materials
• Bio-swales
• On-site filtration
• Rain gardens
• Green roofs
• Retention ponds and rainwater collection systems
4. ENHANCE INDOOR ENVIRONMENTAL QUALITY

4.a Ventilation and Thermal Comfort

4.a.1
Provide safe and healthy ventilation and thermal comfort.

Complete **one** of the following Paths:

- **4.a.1.A** Path A: ASHRAE 55 and 62
- **4.a.1.B** Path B: IgCC 2018

4.a.1.A Path A:
Meet ASHRAE 55 and either ASHRAE 62.1 or 62.2 (as applicable to project)

4.a.1.A Requirements:


OR


4.a.1.A (Path A) Assessment Guidance:

Current versions are as follows:

- ASHRAE 55-2017
- ASHRAE 62.1-2016
- ASHRAE 62.2-2016

Take corrective actions for conditions that are outside of acceptable ranges. Building managers must balance ventilation requirements with energy efficiency goals and be cautious of over ventilating to avoid higher HVAC costs. Building automation systems and a process to respond to alarms and occupant complaints further support this requirement. Consider the owner’s project requirements and the comfort criteria for the building regarding activity level and occupants.
ENERGY STAR Certified Buildings can meet this requirement as licensed professionals validate ASHRAE 55 and 62.

4.a.1.A.2 Ventilation (Option 1) is for all building types except low-rise residential. For low-rise residential facilities, meet 4.a.1.A.3 Low-Rise Residential Ventilation (Option 2).

4.a.1.A.3 Low-Rise Residential Ventilation (Option 2) is for low-rise residential facilities only. For all other building types meet 4.a.1.A.2 (Ventilation).

4.a.1.A (Path A) Required Documentation:

- Balancing reports, ventilation schedules, and CO2 specifications for equipment
- Documentation from licensed architect, engineer, or qualified building professional

4.a.1.A (Path A) References:


4.a.1.A (Path A) Links:

- Read-Only Versions Of ASHRAE Standards: https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards

4.a.1.B Path B:

Meet IgCC 2018 Sections 801.3.1 and 801.3.2

4.a.1.B Requirements:

4.a.1.B.1: Documents demonstrate International Green Construction Code 2018, Section 801.3.1 Indoor Air Quality and Section 801.3.2 Thermal Environmental Conditions for Human Activity have been met.

4.a.1.B (Path B) Assessment Guidance:

Take corrective actions for conditions that are outside of acceptable ranges. Building managers must balance ventilation requirements with energy efficiency goals and be cautious of over ventilating to avoid higher HVAC costs. Building automation systems and a process to respond to alarms and occupant complaints further support this requirement. Consider the owner’s project requirements and the comfort criteria for the building regarding activity level and occupants.
4.a.1.B (Path B) Required Documentation:

- Balancing reports, ventilation schedules, and CO2 specifications for equipment
- Documentation from licensed architect, engineer, or qualified building professional

4.a.1.B (Path B) References:

- IgCC 2018 Section 801.3.1 Indoor Air Quality
- IgCC 2018 Section 801.3.2 Thermal Environmental Conditions for Human Occupancy

4.b Daylighting and Lighting Controls

4.b.1

Maximize opportunities for daylighting in regularly occupied space, except where not appropriate because of building function, mission, or structural constraints. Maximize the use of automatic dimming controls or accessible manual lighting controls, task lighting, and appropriate shade and glare control.

Requirements:

4.b.1.1: Submit documentation demonstrating that the building was designed (where feasible) to best orient the building to allow for passive solar strategies and to improve daylight penetration and distribution.

4.b.1.2: Complete one of the following two paths for daylighting and lighting controls:

- 4.b.1.2.A Path A: ASHRAE 189.1
- 4.b.1.2.B Path B: IgCC 2018

4.b.1.2.A Path A – ASHRAE 189.1

4.b.1.2.A Path A Requirements:

4.b.1.2.A.1: Submit documentation demonstrating the building meets ASHRAE 189.1 Section 8.3.5 (Lighting Quality).

4.b.1.2.A.1 Required Documentation:

- Enclosed office space(s) lighting documentation, including multilevel lighting control and/or bilevel lighting control and separate task lighting
- Multilevel lighting control documentation for multioccupant spaces (as applicable): conference rooms, meeting rooms, multipurpose rooms, gymnasiums, auditoriums, ballrooms, cafeterias, classrooms, and other training or lecture rooms
- Minimum two separately controlled luminaire groups for gymnasiums, auditoriums, ballrooms, and cafeterias.

4.b.1.2.A.1 References:
- ASHRAE 189.1 Section 8.3.5 Lighting Quality

4.b.1.2.A.2: Submit documentation demonstrating the building meets ASHRAE 189.1 8.4.1 (Daylighting).

4.b.1.2.A.2 Required Documentation:
- Minimum sidelighting effective aperture for all north-, south-, and east-facing facades
- Combined width of the primary sidelighted areas against length of the facade wall
- Opaque interior surfaces' visible light reflectance percentages in daylight areas for:
  - Ceilings
  - Partitions higher than 60 in. (1.8 m)
- Narrative describing any exceptions to ASHRAE 189.1 Section 8.4.1.1 Minimum Sidelighting Effective Aperture

4.b.1.2.A.2 References:
- ASHRAE 189.1 Section 8.4.1 Daylighting by Sidelighting
- ASHRAE 189.1 TABLE 8.4.1.1 Minimum Sidelighting Effective Aperture

4.b.1.2.B Path B – IgCC 2018
Meet one of the following IgCC Sections:

4.b.1.2.B Path B Requirements:

4.b.1.2.B.1: Submit documentation demonstrating the prescriptive based provisions related to daylighting and lighting controls in IgCC 2018 Section 801.4 Prescriptive Option have been met.

4.b.1.2.B.2: Submit documentation demonstrating the performance based provisions related to daylighting and lighting controls in IgCC 2018 Section 801.5 Performance Option have been met.

4.b.1.2.B Path B Required Documentation:
- Minimum sidelighting effective aperture for all north-, south-, and east-facing facades;
- Combined width of the primary sidelighted areas against length of the facade wall;
• Opaque interior surfaces’ visible light reflectance percentages in daylight areas for:
  ▪ Ceilings
  ▪ Partitions higher than 60 in. (1.8 m)
• Narrative describing any exceptions to ASHRAE 189.1 Section 8.4.1.1 Minimum Sidelighting Effective Aperture;
• Construction drawings, specifications, and product cut sheets that demonstrate the use of automated lighting controls.

4.b.1.2.B Path B References:
• IgCC 2018 Section 801.4 Prescriptive Option
• IgCC 2018 Section 801.5 Performance Option

4.c Indoor Air Quality

4.c.1
Take actions to ensure optimal indoor air quality, including (each of the following):

4.c.1 Requirements:

4.c.1.1 - Radon: Test for radon in buildings and mitigate high levels.

4.c.1.2 - Moisture Control: Establish policy and implement a moisture control strategy to prevent building materials damage, minimize mold growth, and reduce associated health risks.

4.c.1.2 Required Documentation:
  Conceptual and final design or construction reports demonstrate (meet item #’s 1-5):
  #1:
  ▪ A) ASHRAE 189.1 Section 10.3.1.5 Moisture Control
  OR
  ▪ B) ASHRAE 90.1 with local/regional amendments that impact moisture control or indoor air quality
  OR
  ▪ C) IgCC Section 801.3.6 Moisture Control
  AND
  ▪ ASHRAE 62.1 OR 62.2 (IgCC 2018 Sections 801.3.1 can be substituted for ASHRAE 62)
4.c.1.2 References:
- ASHRAE 55 Thermal Environmental Conditions for Human Occupancy
- ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality
- ASHRAE 62.2 Ventilation for Acceptable Indoor Air Quality in Low-Rise Residential Buildings
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- ASHRAE 189.1 Standard for the Design of High-Performance Green Buildings
- IgCC 2018 Sections 801.3.1 Indoor Air Quality
- IgCC 2018 Sections 801.3.2 Thermal Environmental Conditions for Human Activity
- IgCC 2018 Section 801.3.6 Moisture Control

4.c.1.3 - Low-Emitting Materials: Use low emitting materials for building construction, modifications, maintenance, and operations. Specify materials and products with low or no pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings. Meeting the requirements of ASHRAE 189.1 Section 8.4.2, IgCC Section 801.5.2 Materials, or current comparable ASHRAE standard will meet this requirement.

4.c.1.3 Assessment Guidance: In particular, specify the following materials and products to have low pollutant emissions: composite wood products, adhesives, sealants, interior paints and finishes, solvents, carpet systems, janitorial supplies, and furnishings.

4.c.1.3 Required Documentation:
- Narrative and/or spreadsheet including reported emissions or VOC contents for each of the below:
  - Adhesives and Sealants
  - Emissions Requirements
  - VOC Content Requirements
  - Paints and Coatings
  - Floor Covering Materials
  - Composite Wood, Wood Structural Panel and Agrifiber Products
  - Office Furniture Systems and Seating
  - Ceiling and Wall Systems

4.c.1.3 References:
4.c.1.4 - Indoor Air Quality During Construction: Establish a policy and implement necessary protocols to protect indoor air quality during construction and in the finished building.


4.c.1.4 Required Documentation:
- IAQ construction procedures in an Indoor Air Quality/Indoor Environmental Quality Plan or Division 01 specifications
- General Contractors’ Environmental Management System
- IAQ Management Plan

4.c.1.4 References:
- ASHRAE 189.1 Section 10.3.1.4 Indoor Air Quality (IAQ) Construction Management
- IgCC 2018 Section 1001.3.1.5 IAQ Construction Management

4.c.1.5 - Environmental Smoking Control: Prohibit smoking in any form within the building and within 25 feet of all building entrances, operable windows, and building ventilation intakes.

4.c.1.5 Required Documentation:
- Final design reports or maintenance and operations documents
- No smoking signage

4.c.1.5 References:
- ASHRAE 189.1 Section 8.3.1.4 Environmental Tobacco Smoke
- IgCC 2018 Section 801.3.1.7 Environmental Tobacco Smoke

4.c.1.6 - Integrated Pest Management: Use integrated pest management techniques as appropriate to minimize pesticide usage.

4.c.1.6 Assessment Guidance: An Integrated Pest Management (IPM) Plan must demonstrate the following pest management techniques:
- An IPM team (may be third-party) with defined team roles;
- A plan to identify and monitor pests;
- Thresholds for taking pest control actions;
- Methods to be used for each pest when action thresholds are exceeded;
- Non-chemical pest control methods that are low-risk to the applicator, building occupants, and the environment compares to other options;
Application of least-risk EPA-registered pesticides only when non-chemical approaches fail;
A reporting mechanism by which building occupants can report pest problems;
Notification of application of pesticides when they are not least-risk, if requested by a building occupant.

4.c.1 Links:
- Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing (U.S. Environmental Protection Agency):
- Safer Choice Standard Product Search (U.S. Environmental Protection Agency):
  https://www.epa.gov/saferchoice/products
- Integrated Pest Management (IPM) Principles (U.S. Environmental Protection Agency):
  https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles

4.d Occupant Health and Wellness

4.d.1
Promote opportunities for occupants to voluntarily increase physical movement such as making stairwells a desirable option for circulation, active workstations, fitness centers, and bicycle commuter facilities. Support occupant health by considering options such as providing convenient access to healthy dining options, potable water, daylight, plants, and exterior views.

4.d.1 Requirements:

4.d.1.1: Submit documentation demonstrating at least two of the following:
   a) Active design principles for staircases;
   b) Active workstations;
   c) Bicycle commuter facilities;
   d) Corporate wellness plan(s);
   e) Daylighting and glare control;
   f) Exterior views;
   g) Fitness center;
   h) Healthy dining;
   i) Onsite fitness programs;
   j) Outdoor walking opportunities;
   k) Other
4.d.1 Required Documentation:

- Meeting minutes from the design Charrette that indicate how the occupant health and wellness criteria were included in the design.
- Cut sheets, site plans, construction documents, and other documentation as applicable to the occupant health and wellness criteria incorporated into the project.

4.d.1 Assessment Guidance:

These efforts should be evaluated and documented during the Integrated Design Process.

a) **Active design principles for staircases**: Examples include conveniently locating stairs and making them visibly appealing and comfortable, plus signage to encourage use of stairs; OR Active design principles for staircases, such as a convenient location, comfortability, safety and visual appeal, and signage to encourage use of stairs or staircases are accessible to regular building occupants during all regular business hours and regularly used to travel between floor(s).

b) **Active workstations**: Must be for at least 50% of workstations. Examples include, but are not limited to, treadmill or bicycle desks, adjustable standup desks, standing mats that encourage movement, and desks with active sitting chairs.

c) **Bicycle commuter facilities**: Bike storage for regular occupants and visitors and onsite shower(s) with changing facilities for regular building occupants.

d) **Corporate wellness plan(s)**: Activity incentive programs such as reimbursement of gym memberships or corporate wellness plans that offer incentives and subsidies for physical activity available to all employees.

e) **Daylighting and glare control**: Daylighting must be available in a majority of occupied spaces (excluding spaces where daylighting would hinder work performed, or mission), and there are glare control devices for all transparent glazing in regularly occupied spaces.

f) **Exterior views**: A direct line of site to exterior views unimpeded by glazing features such as patterned glazing or tint, for a majority of all regularly occupied spaces.

g) **Fitness center**: Should be in the building or on-site and offer cardiovascular and weight training exercise opportunities available to majority of occupants (excluding visitors).

h) **Healthy dining**: A cafeteria (in building or on-site) that supports offering a variety of fresh food options, or the building is located within walking distance of fresh food options.

i) **Onsite fitness programs**: Structured, reoccurring on-site fitness and training programs or related education available to all employees.

j) **Outdoor walking opportunities**: Trails or tracks must be adjacent or close to the building.

k) **Other**: Any other exercise or fitness opportunities.
5. REDUCE ENVIRONMENTAL IMPACT OF MATERIALS

5.a Material Content and Performance

5.a.1
Procure construction materials and building supplies that have a lesser or reduced effect on human health and the environment over their life cycle when compared with competing products or services that serve the same purpose, including:

5.a.1 Requirements:

5.a.1.1 - Recycled Content and Comprehensive Procurement Guidelines: Procure products that meet RCRA Section 6002.

5.a.1.1 Assessment Guidance: Use Resource Conservation and Recovery Act (RCRA) section 6002 compliant products that meet or exceed EPA’s recycled content recommendations for building construction, modifications, operations, and maintenance.

It is recommended to create a comprehensive sustainability acquisition program that meets all product procurement requirements, including ENERGY STAR and FEMP-designated products.

5.a.1.1 Required Documentation:
Choose from the following:

A) ASHRAE: Conceptual and final design reports demonstrate ASHRAE 189.1 Section 9.4.1.1 Recycled Content and Salvaged Material Content;
OR

B) IgCC: Conceptual and final design reports demonstrate IgCC 2018 Chapter 9 Materials and Resources (mandatory provisions of Section 901.3 and either prescriptive based provisions of Section 901.4 or the performance-based provisions of Section 901.5)
OR

C) Product Specifications: Building design and purchasing specifications, procurement documents, product disclosure declarations and/or contracts specifically require recycled content per RCRA.

5.a.1 References:

- 42 U.S.C. § 6962, Federal procurement
- ASHRAE 189.1 Section 9.4.1.1 Recycled Content and Salvaged Material Content
- EPA’s Comprehensive Procurement Guideline (CPG) program: https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program
- IgCC 2018 Section 901.4.1.1 Recycled Content and Salvaged Material Content
- RCRA Section 6002 Solid Waste Disposal Act
5.a.1.2 - Biobased Content: Procure products that meet FSRIA Section 9002.

5.a.1.2 Assessment Guidance: Per section 9002 of the Farm Security and Rural Investment Act (FSRIA), for USDA-designated products, use products with the highest content level per USDA’s biobased content recommendations.

Specify products composed of the highest percentage of biobased content consistent with the USDA BioPreferred Program if products meet performance and are available at a reasonable cost.

It is recommended to create a comprehensive sustainability acquisition program that meets all product procurement requirements, including ENERGY STAR and FEMP-designated products.

5.a.1.2 Required Documentation:

Choose from the following:

A) ASHRAE: Conceptual and final design reports demonstrate ASHRAE 189.1 Section 9.4.1.3 Biobased Products.

OR

B) IgCC: Conceptual and final design reports demonstrate IgCC 2018 Chapter 9 Materials and Resources (mandatory provisions of Section 901.3 and either prescriptive based provisions of Section 901.4 or the performance-based provisions of Section 901.5).

OR

C) Product Specifications: Building design and purchasing specifications, procurement documents, product disclosure declarations and/or contracts specifically require biobased content per FSRIA; and

   • Narrative detailing research, analysis, and final determination of bio-based products in the project, including any deviation from using biobased product procurement

5.a.1.2 References:

- 7 U.S.C. § 8102 - Biobased markets program
- ASHRAE 189.1 Section 9.4.1.3 Biobased Products
- Farm Security and Rural Investment Act (FSRIA) Section 9002
- IgCC 2018 Section 901.4.1.3 Biobased Products
- USDA BioPreferred (R) Program: https://www.biopreferred.gov

5.a.1.3 - Other Green Products: Procure products that meet Federally Recommended Specifications, Standards and Ecolabels, or are on the Federal Green Procurement Compilation.

5.a.1.3 Assessment Guidance: Provide written narrative detailing research, analysis, and final determination of exclusion or inclusion of considered environmentally preferable products in project.
It is recommended to create a comprehensive sustainability acquisition program that meets all product procurement requirements, including ENERGY STAR and FEMP-designated products.

5.a.1.3 Required Documentation:
Choose from the following:
A) ASHRAE: Conceptual and final design reports demonstrate ASHRAE 189.1 Section 9.4.1.4 Multiple-Attribute Product Declaration or Certification; OR
B) IgCC: Conceptual and final design reports demonstrate IgCC 2018 Chapter 9 Materials and Resources (mandatory provisions of Section 901.3 and either prescriptive based provisions of Section 901.4 or the performance-based provisions of Section 901.5) OR
C) Product Specifications: Building design and purchasing specifications, procurement documents, product disclosure declarations and/or contracts specifically require:
   ▪ Products that use Federal ecolabels (if no statutory mandate or EPA standard exist for a product, then document purchase of products using non-federal labels);
   ▪ Documents demonstrating, to the maximum extent practicable, no ozone depleting compounds and high GWP chemicals where EPA's SNAP has identified acceptable substitutes or where other environmentally preferable products are available.

5.a.1.3 References:
   ▪ ASHRAE 189.1 Section 9.4.1.4 Multiple-Attribute Product Declaration or Certification
   ▪ IgCC 2018 Section 901.4.1.4 Multiple-Attribute Product Declaration or Certification
   ▪ SF Tool, Green Procurement Compilation: https://sftool.gov/greenprocurement

5.a.1.4 - Ozone Depleting Compounds and High Global Warming Potential Chemicals:
Avoid ozone depleting compounds and high GWP chemicals.

5.a.1.4 Assessment Guidance: Do not use ozone depleting compounds and high GWP chemicals where EPA's Significant New Alternative Policy (SNAP) has identified acceptable substitutes or where other environmentally preferable products are available during construction, repair, or replacement at the end of life.

It is recommended to create a comprehensive sustainability acquisition program that meets all product procurement requirements, including ENERGY STAR and FEMP-designated products.

5.a.1.4 Required Documentation:
Choose from the following:

A) **ASHRAE**: Conceptual and final design reports demonstrate ASHRAE 189.1 Section 9.3.3 Refrigerants.
   OR

B) **IgCC**: Conceptual and final design reports demonstrate IgCC 2018 Chapter 9 Materials and Resources (mandatory provisions of Section 901.3 and either prescriptive based provisions of Section 901.4 or the performance-based provisions of Section 901.5).
   OR

C) **Product Specifications**: Building design and purchasing specifications, procurement documents, product disclosure declarations and/or contracts demonstrating, to the maximum extent practicable, no ozone depleting compounds and high GWP chemicals where EPA’s SNAP has identified acceptable substitutes or where other environmentally preferable products are available.

5.a.1.4 References:
- ASHRAE 189.1 Section 9.3.3 Refrigerants (Construction Waste Management)
- IgCC 2018 Section 901.3.3 Refrigerant
- U.S. Environmental Protection Agency, Significant New Alternative Policy (SNAP) Program: [https://www.epa.gov/snap](https://www.epa.gov/snap)

5.a.1 Links:
- Comprehensive Procurement Guideline (CPG) Program (U.S. Environmental Protection Agency): [https://www.epa.gov/sgm/comprehensive-procurement-guideline-cpg-program](https://www.epa.gov/sgm/comprehensive-procurement-guideline-cpg-program)
- Significant New Alternatives Policy (SNAP) Program (U.S. General Services Administration): [https://www.epa.gov/snap](https://www.epa.gov/snap)

5.b Waste Diversion and Materials Management

5.b.1

Incorporate appropriate space, equipment, and transport accommodations for collection, storage, and staging of recyclable and, as appropriate, compostable materials in building
design, construction, renovation, and operation. During construction, where markets or on-site recycling exist, divert at least 50% (by weight) of construction and demolition materials, excluding land clearing debris and material used as alternative daily cover, from landfills. Maximize reuse or recycling of building materials, products, and supplies wherever possible. Provide reuse and recycling services, including composting, for building occupants, where markets or on-site recycling exist, and divert at least 50% of non-hazardous and non-construction related materials (by weight), from landfills.

5.b.1 Requirements:

5.b.1.1 - Provide reuse and recycling services for building occupants and divert at least 50% of non-hazardous, non-construction related materials from landfills.

5.b.1.1 Assessment Guidance: Where markets exist.

5.b.1.1 Required Documentation:

- Design documents demonstrate the inclusion of sufficient infrastructure (including specific areas designated to collection and storage) to stage materials for salvage, reuse, and recycling.

5.b.1.2 - Divert at least 50% of construction and demolition materials from landfills.

5.b.1.2 Assessment Guidance: Where markets exist. If a diversion rate of 50% cannot be met because markets don’t exist, divert 50% of what can be diverted, focus on reducing waste at the point of generation, and monitor markets for available streams.

5.b.1.2 Required Documentation:

- Construction Waste Management Plan, including Waste Minimization Plan, or policy to divert construction and demolition waste
- Calculations by either weight or volume (must be consistent throughout)
6. ASSESS AND CONSIDER CLIMATE CHANGE RISKS

6.a Address Climate Change Risks

6.a.1 Assess potential impacts and vulnerabilities, from both acute weather events and chronic climate changes, to inform the design of new construction and modernization and facility operations to increase climate resilience, including:

6.a.1 Requirements:

6.a.1.1 - Mission Criticality: Determine long-term mission criticality of the physical asset and operations to be housed in the facility.

6.a.1.1 Assessment Guidance: Design building solutions that respond to government provided climate change projections and determination of acceptable risk.

6.a.1.2 - Floodplain Considerations (New Construction): Avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and avoid floodplain development whenever there is a practicable alternative.

6.a.1.2 Assessment Guidance: If located in a floodplain of concern, provide design solutions which mitigate floodplain impact and impact on building function and occupants, consistent with mission criticality. Design building solutions that respond to government provided climate change projections and determination of acceptable risk.

6.a.1.2 Required Documentation:

- For buildings located in a floodplain of concern: LCCA results and/or documentation.
  - Design strategies to mitigate impact on floodplain.
  - Designed flood event, including its impact on building function and occupants, consistent with mission criticality.

6.a.1.3 - Facility Design (New Construction): Determine key potential climate change impacts for the project location, identify projected climate changes, where feasible, during the useful life of the building, and incorporate those projections as performance targets for project design.

6.a.1.3 Assessment Guidance: Required for new construction only. Base key potential climate change impacts on the most recent National Climate Assessment. Consider fire-resistant design and construction to enhance resilience to the impacts of wildfires and reduce risks to the lives of occupants in the event of a wildfire. Balance options to address predicted climate change impacts against mission criticality, cost, and security to determine design parameters. At a minimum, include low and no cost resilience measures to address predicted climate conditions.
Not applicable for modernization projects (see 6.a.1.4 Facility Adaptation).

6.a.1.4 - Facility Adaptation (Modernization): Take action to mitigate identified physical risks, considering mission criticality, potential climate change impacts, security, and cost.

6.a.1.4 Assessment Guidance: Focus on the resilience of the physical facility. Consider phased adaptation over time. Not applicable for new construction projects (see 6.a.1.3 Facility Design).

6.a.1 Required Documentation:

- Documentation of long-term mission criticality.
- Excerpt of Charrette discussion of climate change impact evaluation (including wildfire), based on mission criticality and cost, when part of project.
- Documentation identifying implementation of actions to increase climate resilience, including building design solutions, Government-provided climate change projections, and determination of acceptable risk.

6.a.1 References:


6.a.1 Links:

Contact Us

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