



GUIDING PRINCIPLES COMPLIANCE FOR **NEW CONSTRUCTION** TECHNICAL REFERENCE MANUAL

VERSION 2.5 | 2022

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Table of Contents

LEGAL NOTICE	2
Guiding Principles Compliance Overview	5
Introduction	5
GPC NC Program Materials	5
Environmental Topic Areas	5
Compliance Validation	6
GPC NC Survey and Process	6
GPC NC Scoping Checklist	6
GPC NC Survey	6
Survey - Base Requirements, Options, Life Cycle Cost Analysis (LCCA), and Tracking	7
CORE and NON-CORE Requirements	8
Criteria Reference Key: (S), (S*), (Std), and [C/I]	9
Performing Life-Cycle Cost Analysis (LCCA)	9
Required Documentation & Comments	10
Design Submittal Review	10
Final Assessment Options	11
Final Assessment Option 1: Onsite Assessment	11
Final Assessment Option 2: Post-Construction Document Review	11
i. LIFE-CYCLE COST ANALYSIS (LCCA)	13
i.a LCCA Format	13
1. EMPLOY INTEGRATED DESIGN PRINCIPLES	15
1.1 Integrated Design and Management	15
1.2 Sustainable Siting	16
1.3 Stormwater Management	17
1.4 Infrastructure Utilization and Optimization	18
1.5 Commissioning	20
2. OPTIMIZE ENERGY PERFORMANCE	24
2.1 Energy Efficiency	24
2.1A New Construction Projects	24
2.1B Modernization Projects	25
2.2 Energy Metering	27
2.3 Renewable Energy	28



2.4 Benchmarking	30
3. PROTECT AND CONSERVE WATER	32
3.1 Indoor Water Use	32
3.1A <i>New Construction Projects</i>	32
3.1B <i>Modernization Projects</i>	33
3.2 Water Metering	34
3.3 Outdoor Water Use	35
3.4 Alternative Water	37
4. ENHANCE INDOOR ENVIRONMENTAL QUALITY	39
4.1 Ventilation and Thermal Comfort	39
4.2 Daylighting and Lighting Controls	40
4.3 Low-Emitting Materials and Products	41
4.4 Radon Mitigation	42
4.5 Moisture and Mold Control	43
4.6 Indoor Air Quality During Construction	44
4.7 Environmental Smoking Control	45
4.8 Integrated Pest Management	45
4.9 Occupant Health and Wellness	47
5. REDUCE ENVIRONMENTAL IMPACT OF MATERIALS	49
5.1 Materials - Recycled Content	49
5.2 Materials - Biobased Content	50
5.3 Products	51
5.4 Ozone Depleting Substances	52
5.5 Hazardous Waste	53
5.6 Solid Waste Management	54
6. ASSESS AND CONSIDER BUILDING RESILIENCE	56
6.1 Risk Assessment	56
6.2 Building Resilience and Adaptation	58

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 *Guiding Principles for Sustainable Federal Buildings and Associated Instructions*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, and buildings qualify towards an agency's sustainable building progress when meeting the requirements as specified within GBI's GPC NC Survey and 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.
3. **GPC NC Technical Reference Manual:** A reference supplemental to the survey, the Technical Reference Manual includes guidance for criteria, references, and links to pertinent websites.

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 Building Resilience

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).

¹ U.S. Council on Environmental Quality (CEQ). *Guiding Principles for Sustainable Federal Buildings and Associated Instructions* December 2020. Available from: <https://www.sustainability.gov/resources.html>

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 - Base Requirements, Options, Life Cycle Cost Analysis (LCCA), and Tracking

The GPC NC Survey and this GPC NC Technical Manual are organized according to each of the Guiding Principles, sections, and criteria². Within this format are requirements, and fields Life-Cycle Cost Analysis and Tracking (where applicable). Guiding Principles criteria now include a new format depending on the requirement in question:

Base Requirement: Many criteria begin with a Base Requirement that must be met.

Example 1: Base requirement for 1.1 Integrated Design and Management (outlined)

1.0 EMPLOY INTEGRATED DESIGN PRINCIPLES			
1.1 Integrated Design and Management		CORE	(Std)
<i>Base Requirement</i>	Establish sustainability goals as part of the project to meet the Guiding Principles and incorporate those goals into the design document and process, such as the Owner's Project Requirements (OPR), Basis of Design (BOD), Conceptual Design Report (CDR), or relevant design documents.	(pick from drop down list)	
AND ONE OF THE FOLLOWING OPTIONS:			
<i>Option 1</i>	Use a collaborative, integrated process and team tailored to the size and function of the building to plan, program, design, construct, commission, and transition to operation the building project or modernization. Identify team members and roles. Ensure energy, water, materials, indoor environmental quality, recycling and composting, occupant health and wellness, transportation (including public transit, safety, parking, and electric vehicle charging), siting and landscape, the protection of historic properties and other cultural resources, community integration, and building resilience are considered while balancing the building's function and mission throughout the design and construction of the building and into operations plans, where feasible.	(pick from drop down list)	
<i>Option 2</i>	Use an integrated design process consistent with 2018 International Green Construction Code (IgCC) Appendix F Integrated Design, including F101.1.1 (F1.1.1) Charrette Process (excluding F101.1.2 (F1.1.2) Design Charrette Matrix).	(pick from drop down list)	

The following criteria *do not* have a Base Requirement:

- 2.4 Benchmarking
- 3.2 Water Metering
- 3.4 Alternative Water
- 4.1 Ventilation and Thermal Comfort
- 4.3 Low-Emitting Materials and Products
- 4.4 Radon Mitigation
- 4.5 Moisture and Mold Control
- 4.6 Indoor Air Quality During Construction
- 4.9 Occupant Health and Wellness
- 5.3 Products
- 5.4 Ozone Depleting Substances
- 5.6 Solid Waste Management
- 6.1 Risk Assessment
- 6.2 Building Resilience and Adaptation

Options: The majority of criteria include different options for compliance. Only one of the options must be met for compliance.

² *Guiding Principles for Sustainable Federal Buildings and Associated Instructions, Appendix A (Council on Environmental Quality, December 2020)*



Example 2: Options for 1.1 Integrated Design and Management (outlined)

1.0 EMPLOY INTEGRATED DESIGN PRINCIPLES			
1.1	Integrated Design and Management	CORE	(Std)
<i>Base Requirement</i>	Establish sustainability goals as part of the project to meet the Guiding Principles and incorporate those goals into the design document and process, such as the Owner's Project Requirements (OPR), Basis of Design (BOD), Conceptual Design Report (CDR), or relevant design documents.	(pick from drop down list)	
AND ONE OF THE FOLLOWING OPTIONS:			
<i>Option 1</i>	Use a collaborative, integrated process and team tailored to the size and function of the building to plan, program, design, construct, commission, and transition to operation the building project or modernization. Identify team members and roles. Ensure energy, water, materials, indoor environmental quality, recycling and composting, occupant health and wellness, transportation (including public transit, safety, parking, and electric vehicle charging), siting and landscape, the protection of historic properties and other cultural resources, community integration, and building resilience are considered while balancing the building's function and mission throughout the design and construction of the building and into operations plans, where feasible.	(pick from drop down list)	
<i>Option 2</i>	Use an integrated design process consistent with 2018 International Green Construction Code (IgCC) Appendix F Integrated Design, including F101.1.1 (F1.1.1) Charrette Process (excluding F101.1.2 (F1.1.2) Design Charrette Matrix).	(pick from drop down list)	

The following criteria *do not* have Options, and only contain a Base Requirement:

- 2.1A Energy Efficiency (New Construction projects)
- 2.2 Energy Metering
- 4.8 Integrated Pest Management
- 5.1 Materials - Recycled Content
- 5.2 Materials - Biobased Content
- 5.5 Hazardous Waste

Note that there are differing requirements for New Construction projects versus Modernization projects for the following two criteria:

- 2.1 Energy Efficiency
- 3.1 Indoor Water Use

For these two criteria, only complete requirements based on the type of project, and leave the other requirements unanswered.

Many Options refer to 2018 International Green Construction Code (IgCC) while others require the submission of specific documents or adherence to certain criteria. Unless otherwise specified by agency directive, instructions and requirements in the GPC NC Survey apply to **all federal agencies**.

CORE and NON-CORE Requirements

The Guiding Principles and Associated Instructions Appendix A checklist contains 30 criteria for assessing whether a building is compliant. These criteria are split into two categories: CORE and NON-CORE criteria.

CORE Criteria: There are 18 CORE criteria, **all of which must be met** to qualify as a sustainable Federal building (aka "compliant with the Guiding Principles"). For all CORE criteria, there are two options available for selecting within the GPC NC Survey:

- In Progress
- Compliant

NON-CORE Criteria: There are 12 NON-CORE criteria, of which agencies **must meet a minimum of 75% (9 of 12)**, but otherwise have freedom in selecting which criteria will be met. **This means that agencies have a maximum of three “Not Applicable’s” per project.** For all NON-CORE criteria, there are three options available for selecting within the GPC NC Survey:

- In Progress
- Compliant
- Not Applicable (aka N/A)

For New Construction and Modernization-only requirements, an additional option is provided:

- This is a New Construction project
- This is a Modernization project

If the requirement does not match the project type, those requirements do not count towards the total N/As allowed per project.

Criteria Reference Key: (S), (S*), (Std), and [C/I]

The Guiding Principles Instructions Appendix A includes the following references for further details on the nature of Guiding Principles criteria, and which are reflected in both the GPC NC Survey and Technical Reference Manual:

(S), (S*): Criteria that are based on and reference statutory or regulatory requirements are indicated with “S” on the checklist. “S*” indicates NDAA-aligned criteria that are applicable to the U.S. Department of Defense (DoD).

(Std): Criteria that are based on green building industry standards, rather than statutory or regulatory requirements, are indicated with “Std” on the checklist.

[C/I]: Criteria where campus-wide or installation-wide protocols, policies, contracts can be used to demonstrate, upon assessment, that the criteria were met at the building level are indicated on the checklist with a [C/I].

Performing Life-Cycle Cost Analysis (LCCA)

Agencies should apply all criteria within the Guiding Principles where determined to be life cycle cost-effective (LCCE) and in alignment with agency mission and budget, and building or project scope. Certain statutory mandates reiterated through the Guiding Principles criteria also have requirements for life cycle cost-effectiveness.

There are six Guiding Principles criteria that specify life cycle cost-effectiveness (LCCE), including several criteria that are statutory mandates (denoted by “(S)”). Wherever the term, “cost-effectiveness” is specified, the benefit-cost analysis must be performed in accordance with the criteria listed in section **i.a LCCA Format.**

The following Guiding Principles criteria specify “cost-effective:”

- 2.1 Energy Efficiency, Option 5 - (S)
- 2.3 Renewable Energy, base requirement, Option 1, Option 2 - (S)
- 3.1 Indoor Water Use, base requirement - (S)
- 3.4 Alternative Water, Option 1, Option 2
- 4.9 Occupant Health and Wellness, Option 1
- 6.2 Building Resilience and Adaptation, Option 1, Option 2 - (S*)

Required Documentation & Comments

After selecting an answer, reference the corresponding supporting documentation and add 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 when 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, 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://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: Onsite 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 Onsite Assessment is a third-party assessment of the project's completed construction. A completed Design Review is required prior to an Onsite 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 Onsite 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 Onsite 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 Onsite 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 Base Requirement

Agencies should apply all criteria within the Guiding Principles where determined to be life cycle cost-effective (LCCE) and in alignment with agency mission and budget, and building or project scope. Certain statutory mandates reiterated through the Guiding Principles criteria also have requirements for life cycle cost-effectiveness. The term “cost-effectiveness” should include the use of benefit-cost analysis in accordance with the following:

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

i.a.1: Prepare the LCCA in accordance with CFR Title 10 Part 436, Subpart A and NIST Handbook 135 "Life-Cycle Costing Manual for the Federal Energy Management Program."

i.a.2: Prepare the LCCA using the Building Life-Cycle Costing (BLCC) program from NIST.

Use the implied long-term inflation rate and discount rates identified in the Annual supplement to NIST Handbook 135.

i.a Assessment Guidance:

There are six Guiding Principles criteria that specify life cycle cost-effectiveness (LCCE), including several criteria that are statutory mandates (denoted by “(S)”). Wherever the term, “cost-effectiveness” is specified, the benefit-cost analysis must be performed in accordance to the criteria listed above (i.a.1 and i.a.2).

The following Guiding Principles criteria specify “cost-effective:”

- 2.1 Energy Efficiency, Option 5 - (S)
- 2.3 Renewable Energy, base requirement, Option 1, Option 2 - (S)
- 3.1 Indoor Water Use, base requirement - (S)
- 3.4 Alternative Water, Option 1, Option 2
- 4.9 Occupant Health and Wellness, Option 1
- 6.2 Building Resilience and Adaptation, Option 1, Option 2 - (S*)

i.a Required Documentation:

- LCCA report from Building Life Cycle Costing (BLCC) program.
- Narrative describing estimated building life (UFC 1-200-02: LCCA Individual Component or System Alternatives Analysis).
- LCCA reports comparing a minimum of three individual component or system alternatives.

i.a References:



- 10 CFR Part 436, Subpart A
- 42 U.S.C. § 8254: Establishment and Use of Life Cycle Cost Methods and Procedures, <https://www.govinfo.gov/app/details/USCODE-2017-title42/USCODE-2017-title42-chap91-subchapIII-partB-sec8254>
- NIST Handbook 135, "*Life-Cycle Costing Manual for the Federal Energy Management Program*"

i.a Links:

- Building Life Cycle Cost Programs (U.S. Department of Energy): <http://energy.gov/eere/femp/building-life-cycle-cost-programs>

1. EMPLOY INTEGRATED DESIGN PRINCIPLES

1.1 Integrated Design and Management

- **CORE**
- **(Std)**

1.1 Base Requirement

Establish sustainability goals as part of the project to meet the Guiding Principles and incorporate those goals into the design document and process, such as the Owner's Project Requirements (OPR), Basis of Design (BOD), Conceptual Design Report (CDR), or relevant design documents.

Meet the Base Requirement and one of the following options:

Option 1

Use a collaborative, integrated process and team tailored to the size and function of the building to plan, program, design, construct, commission, and transition to operation the building project or modernization. Identify team members and roles. Ensure energy, water, materials, indoor environmental quality, recycling and composting, occupant health and wellness, transportation (including public transit, safety, parking, and electric vehicle charging), siting and landscape, the protection of historic properties and other cultural resources, community integration, and building resilience are considered while balancing the building's function and mission throughout the design and construction of the building and into operations plans, where feasible.

Option 2

Use an integrated design process consistent with 2018 International Green Construction Code (IgCC) Appendix F Integrated Design, including F101.1.1 (F1.1.1) Charrette Process (excluding F101.1.2 (F1.1.2) Design Charrette Matrix).

1.1 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.

1.1 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
- Design choices
- Conceptual and final design reports or Owner's Project Requirements

1.1 References:

- 2018 IgCC Informative Appendix F, Integrated Design, <https://codes.iccsafe.org/content/IGCC2018P3/informative-appendix-f-integrated-design>
- Circular No. A-11 - Preparation, Submission, and Execution of the Budget (Office of Management and Budget), <https://www.whitehouse.gov/wp-content/uploads/2018/06/a11.pdf>
- Planning and Conducting Integrated Design (ID) Charrettes, Joel Ann Todd and Gail Lindsey (Whole Building Design Guide), <http://www.wbdg.org/resources/planning-and-conducting-integrated-design-id-charrettes>

1.2 Sustainable Siting

- **CORE**
- **(S)**
- **[C/I]**

1.2 Base Requirement

Follow all relevant requirements of 41 CFR § 102-76.20 of the Federal Management Regulation to make a positive contribution to the surrounding landscape, and comply with the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 et seq., and the National Historic Preservation Act of 1966, as amended, 54 U.S.C. Subtitle III, Division A.

Meet the Base Requirement and one of the following options:

Option 1

In alignment with sustainable siting best practices, assess all relevant opportunities for enhancements to the site sustainability and engage building occupants and other stakeholders utilizing the site. The specific actions of the site selection and planning stage should reflect the complexity of the proposed building and include, as appropriate, the following: 1) avoid development of prime farmland; 2) preserve areas with permeable soils; 3) avoid or, if not possible, minimize potential harm to or within the floodplain; 4) protect and conserve existing landscapes, wetlands, forest, and wilderness areas; 5) minimize site disturbance; 6) preserve threatened or endangered species and their habitats, including pollinators' habitats; 7) improve linkages and connections to surrounding destinations and neighborhoods; 8) use historic properties, especially those located in central business districts; and 9) incorporate appropriate security design parameters. Incorporate these environmental considerations through a systematic interdisciplinary approach, and balance these concerns with cost and security. Agencies can reference additional siting resources, including GSA'S Sustainable Facilities Tool (SFTool) and the Environmental Protection Agency (EPA's) Smart Growth–Location and Green Building site, the U.S. Department of Agriculture's (USDA) pollinators resources, and for projects involving historic properties, the Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings.



Option 2

Conform to 2018 IgCC Section 501.3.1 (5.3.1) Site Selection and 501.3.2 (5.3.2) Predesign Site Inventory and Assessment.

1.2 Required Documentation:

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

1.2 References:

- Implementing Instructions - Sustainable Locations for Federal Facilities: https://www.sustainability.gov/pdfs/sustainable_locations_federal_facilities.pdf (PDF)
- General Service Administration (GSA) Sustainable Facilities Tool: <https://sftool.gov/>
- Environmental Protection Agency (EPA) Smart Growth: <https://www.epa.gov/smartgrowth>
- U.S. Department of Agriculture (USDA) Pollinators: <https://www.usda.gov/pollinators>
- Walk Score®: www.walkscore.com
- 2018 IgCC Section 501.3.1: https://codes.iccsafe.org/content/IGCC2018P3/chapter-5-site-sustainability#IGCC2018P3_Ch5_Sec5.3.1
- 2018 IgCC Section 501.3.2: https://codes.iccsafe.org/content/IGCC2018P3/chapter-5-site-sustainability#IGCC2018P3_Ch5_Sec5.3.2

1.3 Stormwater Management

- **CORE**
- **(S)**
- **[C/I]**

1.3 Base Requirement

For new construction or modernization projects disturbing a surface area of 5,000 or more square feet, use planning, design, construction, and maintenance strategies to maintain or restore the predevelopment hydrology of the property in terms of temperature, rate, volume, and duration of flow, in accordance with statutory requirements (42 U.S.C. § 17094). Low impact development (LID) infrastructure solutions can be utilized to help achieve this criteria.

Meet the Base Requirement and one of the following options:

Option 1

For new construction or modernization projects disturbing a surface area fewer than 5,000 square feet, use site planning, design, construction, and maintenance strategies such as low impact development (LID) to manage on-site stormwater and to maintain or restore hydrologic conditions after development, to the maximum extent that is technically practicable.

Option 2

For new construction or modernization projects disturbing a surface area fewer than 5,000 square feet, use site planning, design, construction, and maintenance strategies such as low impact development (LID) to manage on-site stormwater and to maintain or restore hydrologic conditions after development, to the maximum extent that is technically practicable.

Option 3

Conform to 2018 IgCC Section 501.3.4 (5.3.4) Stormwater Management.

1.3 Assessment Guidance

Stormwater management examples include:

- Reduced impervious surfaces
- Previous paving materials
- Bio-swales
- Onsite filtration
- Rain gardens
- Green roofs
- Retention ponds and rainwater collection systems

1.3 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.

1.3 References:

- Energy Independence and Security Act (EISA), Section 438
- 2018 IgCC Section 501.3.4: https://codes.iccsafe.org/content/IGCC2018P3/chapter-5-site-sustainability#IGCC2018P3_Ch5_Sec5.3.4

1.4 Infrastructure Utilization and Optimization

- **NON-CORE**
- **(Std)**
- **[C/I]**

1.4 Base Requirement

Evaluate and prioritize transportation strategies and associated infrastructure improvements that promote and support alternative transportation, including walking, cycling, alternative fuel and electric vehicles, and public transit over the life of the building, as feasible and consistent with the mission of the facility.

Meet the Base Requirement and one of the following options:

Option 1

Locate any functional entry of the project within a ¼-mile (400-meter) walking distance of existing or planned bus, streetcar, shuttle, or informal transit stops, or within a ½-mile (800-meter) walking distance of existing or planned bus rapid transit stops, light or heavy rail stations, commuter rail stations or ferry terminals, except for those facilities where their mission and function prevents mass transportation access.

Option 2

Install electric vehicle charging stations for a minimum of two percent of the parking spaces created as part of the project or designated for the building occupants, where on-site vehicle parking is provided.

Option 3

Designate at least five percent of the parking spaces created as part of the project or designated for the building occupants as preferred parking for alternative fuel vehicles (may include parking for agency fleet alternative fuel vehicles).

Option 4

Provide an alternative transportation program to reduce congestion and the need for parking. The program may include transit services; walkability improvements including connections to transit, sidewalks, pathways, and bicycle trails; alternative transit education; designated rideshare areas; transit subsidies; telecommuting incentives; or bicycle racks and showers.

Option 5

Prior to and during the space decision process, engage planning officials at the state, metropolitan, or municipal level to identify ways proposed agency actions can support community sustainability and potentially align with local and regional long range plans and objectives. Support and integrate proposed actions into the project.

Option 6

Conform to 2018 IGCC Section 1001.3.2.4 (10.3.2.4) Transportation Management Plan and Section 501.3.7.3 (5.3.7.3) Site Vehicle Provisions.

1.4 Assessment Guidance

"Robust transportation options" include walking, biking, and public transit as a few examples.

The guidance included in *Implementing Instructions - Sustainable Locations for Federal Facilities* highlights the need to strike the appropriate balance.

1.4 Required Documentation:

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

1.4 References:

- Implementing Instructions - Sustainable Locations for Federal Facilities: https://www.sustainability.gov/pdfs/sustainable_locations_federal_facilities.pdf (PDF)
- Walk Score®: www.walkscore.com
- 2018 IGCC Section 1001.3.2: https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.2
- 2018 IgCC Section 501.3.7: https://codes.iccsafe.org/content/IGCC2018P3/chapter-5-site-sustainability#IGCC2018P3_Ch5_Sec5.3.7

1.5 Commissioning

- **CORE**
- **(S)**

1.5 Base Requirement

Employ commissioning, as defined per Section 432 of the Energy Independence and Security Act of 2007 ((42 U.S.C. 8253(f)(1)(A)), and tailored to the size and complexity of the building.

Meet the Base Requirement and one of the following options:

Option 1

Document through a commissioning process that the building and its commissioned components, assemblies, and systems (including any renewable energy systems, thermal storage, district heating and cooling system, and cooling towers) comply with the owner's project requirements. Conduct commissioning in accordance with the U.S. Department of Energy (DOE) Federal Energy Management Program's (FEMP) Commissioning for Federal Facilities guidance, using ANSI/ASHRAE/IES Standard 202 or other generally accepted engineering standards, guidelines, and nationally recognized organizations.

For less complex buildings, commissioning should be performed with generally accepted engineering standards acceptable to the agency.

A certified commissioning provider (may include a qualified agency employee), independent of the design and construction or operating team, should provide, within one year of project completion, a final commissioning report.



1.5 Option 1 References:

- ANSI/ASHRAE/IES Standard 202, *Commissioning Process for Buildings and Systems*

Option 2

Conform to 2018 IgCC Section 1001.3.1.2 (10.3.1.2) Building Project Commissioning (Cx) Process.

1.5 Option 2 References:

- 2018 IgCC Section 1001.3.1.2 Building Project Commissioning (Cx) Process:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.1.2

1.5 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.

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.

1.5 Required Documentation (as applicable):

- 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
- Preliminary commissioning report
- Design review report
- Final Cx report (within one year)
- Construction checklist and verification
- Contract documentation
- Systems manual &/or electric O&M Manual (hard copy optional)



1.c.1 Links:

- Commissioning in Federal Buildings (U.S. Department of Energy):
<https://www.energy.gov/eere/femp/commissioning-federal-buildings>
- Guidance for the Implementation and Follow-Up of Identified Energy and Water Efficiency Measures in Covered Facilities (U.S. Department of Energy):
<https://www.energy.gov/eere/femp/downloads/guidance-implementation-and-follow-identified-energy-and-water-efficiency>

2. OPTIMIZE ENERGY PERFORMANCE

2.1 Energy Efficiency

- **CORE**
- **(S)**

2.1A *New Construction Projects*

2.1A Base Requirement

Ensure compliance with Federal energy efficiency performance requirements for new construction in accordance with § 109 of the Energy Policy Act of 2005 (42 U.S.C. § 6834(a)(3)(A)) and DOE's regulations as established under 10 CFR parts 433, subpart A, and 10 CFR parts 435, subpart A.

Ensure installation of ENERGY STAR® and FEMP-designated products in all procurements involving energy-consuming products and services, in accordance with 42 U.S.C § 8259b and 10 CFR § 436.40-436.43.

2.1A Assessment Guidance

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).

2.1A Required Documentation:

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

2.1A References:

- ENERGY STAR® Qualified Product Lists: <http://www.energystar.gov>

- Federal Energy Management Program (FEMP) - Energy and Water Efficient Products: <http://www1.eere.energy.gov/femp>
- 10 C.F.R. § 433: Energy Efficiency Standards For The Design And Construction Of New Federal Commercial And Multi-Family High-Rise Residential Buildings
- 10 C.F.R. § 435: Energy Efficiency Standards For The Design And Construction Of New Federal Low-Rise Residential Buildings
- 10 C.F.R. § 436.40: Federal Energy Management and Planning Programs
- 42 U.S.C. § 6834: Federal Building Energy Efficiency Standards
- 42 U.S.C. § 8253: Energy Management Requirements
- 42 U.S.C. § 8259b: Federal procurement of energy efficient products
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings: <https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards>

2.1B Modernization Projects

2.1B Base Requirement

Ensure installation of ENERGY STAR and FEMP-designated products in all procurements involving energy-consuming products and services, in accordance with 42 U.S.C § 8259b and 10 CFR § 436.40-436.43.

Employ strategies to improve energy performance and reduce energy usage in accordance with 42 U.S.C. § 8253(a).

Meet the Base Requirement and one of the following options:

Option 1

Ensure building energy use is 20 percent below a FY 2015 energy use baseline.

Option 2

Ensure building energy use is 30 percent below a FY 2003 energy use baseline.

2.1B Options 1 & 2 Assessment Guidance

Submit energy model showing the proposed building alternatives to achieve the targeted reduction in building energy use.

2.1B Options 1 & 2 Required Documentation:

- Summary of the proposed energy model's inputs and outputs
- Modeling report



Option 3

Ensure the building has an ENERGY STAR score of 75 or higher.

2.1B Option 3 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.

2.1B Option 3 Required Documentation:

- ENERGY STAR Data Verification Checklist
- Printout from Portfolio Manager account displaying ENERGY STAR score

Option 4

For building types not eligible to receive an ENERGY STAR score and where adequate benchmarking data exists, demonstrate that the building is in the top quartile of energy performance for its building type.

2.1B Option 4 Assessment Guidance

Submit energy model showing the proposed building alternatives that demonstrate the building is in the top quartile of energy performance for its building type. Include the software program or other documentation as applicable to the building type that is not eligible for an ENERGY STAR score (e.g., laboratories).

2.1B Option 4 Required Documentation:

- Methodologies and/or computer programs used to determine savings
- Summary of the proposed energy model's inputs and outputs
- Modeling report

Option 5

Follow the Federal energy performance requirements established under 10 CFR Parts 433 and 435 by designing to exceed ANSI/ASHRAE/IES Standard 90.1 by at least 30 percent, where life cycle cost-effective.

2.1B Option 5 Assessment Guidance

ASHRAE 90.1 version is applicable per the following

- (i) **90.1-2019**: Design for construction began on or after April 7th, 2023
- (ii) **90.1-2013**: Design for construction began on or after November 6, 2016, but before April 7th, 2023
- (iii) **90.1-2010**: Design for construction began on or after July 9, 2014, but before November 6, 2016

(iv) **90.1-2007**: Design for construction began on or after August 10, 2012, but before July 9, 2014

2.1B Option 5 Required Documentation:

- Summary of the baseline case energy model's inputs and outputs
- Modeling report

2.1B References - all options:

- ENERGY STAR Portfolio Manager (U.S. Environmental Protection Agency):
<https://portfoliomanager.energystar.gov/pm/login.html>
- ENERGY STAR® Qualified Product Lists: <http://www.energystar.gov>
- Federal Energy Management Program (FEMP) - Energy and Water Efficient Products:
<http://www1.eere.energy.gov/femp>
- 10 C.F.R. § 433: Energy Efficiency Standards For The Design And Construction Of New Federal Commercial And Multi-Family High-Rise Residential Buildings
- 10 C.F.R. § 435: Energy Efficiency Standards For The Design And Construction Of New Federal Low-Rise Residential Buildings

2.2 Energy Metering

- **CORE**
- **(S)**

2.2 Base Requirement

Install building-level meters for electricity and advanced meters to the maximum extent practicable, as required by EAct 2005 § 103 (42 U.S.C. § 8253(e)). Install standard or advanced meters for natural gas and steam to the maximum extent practical, in accordance with the DOE's Federal Building Metering Guidance and EISA 2007 § 434 (42 U.S.C. § 8253(e)(1)).

Meet the Base Requirement.

2.2 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).

Note that the requirement specifies installing standard or advanced meters for natural gas and steam "the maximum extent practical." Where there is no natural gas and/or steam, this requirement is compliant.

2.2 Required Documentation:

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

2.2 References:

- 42 U.S.C. § 8253(3), Metering of Energy Use
- Federal Building Metering Guidance (Per U.S.C. 8253(e), Metering of Energy Use):
<https://www.energy.gov/eere/femp/downloads/federal-building-metering-guidance-usc-8253e-metering-energy-use>
- Submetering Wizard, Sustainable Facilities Tool (U.S. General Services Administration):
<https://sftool.gov/plan/submetering>

2.3 Renewable Energy

- **NON-CORE**
- **(S)**
- **[C/I]**

2.3 Base Requirement

Evaluate applicable renewable electric energy strategies related to the project or building that could support, as needed, agency progress toward renewable energy goals where cost-effective, per 42 U.S.C. § 15852(a).

[Campus/Installation-wide approach can be utilized if the agency has assessed and can verify that the building will directly benefit from the renewable energy system. Alternatively, the agency should develop an internal energy accounting or tracking system to apportion renewable energy or attributes to the building to avoid any double counting.]

Meet the Base Requirement and one of the following options:

Option 1

Implement, as appropriate, life cycle cost-effective on-site renewable electric or thermal energy projects.

Alternatively, utilize alternative energy systems such as waste heat, combined heat and power (CHP), or fuel cell energy systems, where life cycle cost-effective.

If on-site renewable energy or alternative energy systems are not technically feasible or life cycle cost-effective, the agency should establish an internal energy accounting or tracking system to apportion power purchases from off-site renewable sources or renewable energy certificates (RECs) to the building, as aligned with agency plans.

Option 2

Where appropriate and life cycle cost-effective, not less than 30 percent of the hot water demand is to be met through the installation and use of solar hot water heaters, per 42 U.S.C § 6834(a)(3)(A)(iii).

Option 3

Conform to 2018 IgCC Section 701.4.1.1 (7.4.1.1) On-Site Renewable Energy Systems or equivalent, with the exception that there is no minimum energy production (kBtu/ft²) requirement.

2.3 Assessment Guidance: Pending findings of onsite 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 Onsite Renewable System was followed or 2018 IgCC 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.

2.3 Required Documentation:

- Onsite renewable energy feasibility studies or Life-Cycle Cost Analysis (LCCA).
- Renewable energy design documents plans and specifications, and sub-contract, if applicable.

2.3 References:

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

- 42 U.S.C. § 15852: Federal Purchase Requirement
- ASHRAE Standard 189.1: <https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards>
- 2018 IgCC Chapter 7: <https://codes.iccsafe.org/content/IGCC2018P3/chapter-7-energy-efficiency>

2.4 Benchmarking

- **CORE**
- **(S)**

Choose one of the following options:

Option 1

Benchmark building performance at least annually, preferably using ENERGY STAR Portfolio Manager, and regularly monitor building energy performance against historic performance data and peer buildings, in accordance with criteria established by DOE's Federal Building Energy Use Benchmarking Guidance per 42 U.S.C. § 8253(f)(8).

Option 2

Conform to 2018 IgCC Section 1001.3.2.1.3.2 (10.3.2.1.3.2) Track and Assess Energy Consumption.

2.4 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:

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

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:

1. Energy usage reports
2. Energy performance tracking
3. Energy performance assessing (benchmarking)

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

2.4 Required Documentation (as applicable per option):

- ENERGY STAR Portfolio Manager documents
- Documents demonstrate 2018 IgCC Section 1001.3.2.1.3.2 (10.3.2.1.3.2) Track and Assess Energy Consumption

2.4 References:

- ENERGY STAR Portfolio Manager: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>
- 2018 IgCC Section 1001.3.2.1.3.2 (10.3.2.1.3.2) Track and Assess Energy Consumption: https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.2.1.3.2
- 42 U.S.C. § 8253(f): Use of Energy and Water Efficiency Measures in Federal Buildings
- Federal Building Energy Use Benchmarking Guidance (U.S. Department of Energy): https://www.energy.gov/sites/prod/files/2014/09/f18/benchmarking_guidance08-2014.pdf

3. PROTECT AND CONSERVE WATER

3.1 Indoor Water Use

- **CORE**
- **(S)**

3.1 Base Requirement

For new construction where water is used to achieve energy efficiency, water conservation measures must be applied to the extent that they are life cycle cost-effective in accordance with 10 CFR Parts 433 and 435. In addition to the use of water conservation technologies otherwise required by 42 U.S.C. § 6834, water conservation technologies are to be applied to the extent that the technologies are life cycle cost-effective for new construction and modernization projects, in accordance with 42 U.S.C. § 6834(a)(3)(D)(vii).

Eliminate the use of single-pass (also called "once-through") cooling equipment using potable water and optimize cooling tower operations to minimize makeup water.

Agencies should refer to EPA's WaterSense, GSA's SFTool: Water, and DOE-FEMP's Water Efficiency in Federal Buildings and Campuses resources for additional details on available water conservation technologies and best management practices.

Meet the Base Requirement and one of the following options based on project type:

3.1A New Construction Projects

Option 1

Install WaterSense equipment or equivalent alternatives, where available, for all fixtures that are designed to be used more than once per day on average over a month. For all fixtures and fittings using potable water with planned use of more than once per day, compile cut sheet or product declarations or plumbing schedule showing flush or flow rate performance meeting WaterSense or equivalent.

Option 2

Conform to 2018 IgCC Section 601.3.2.1 (6.3.2.1) Plumbing Fixtures and Fittings or 601.3.2.6 (6.3.2.6) Medical and Laboratory Facilities (if applicable).

3.1 Assessment Guidance

Water efficient products can be WaterSense or products with performance equivalent to WaterSense.

Documentation can be compiled cut sheets, product declarations, and/or plumbing fixture and fittings schedule showing flush or flow rate performance consistent with 2018 IgCC or WaterSense or equivalent.



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

3.1 Required Documentation (as applicable per option):

- For all fixtures that are designed to be used more than once per day on average over a month, final design or construction documents specify WaterSense equipment or equivalent alternatives, where available..
- For all fixtures and fittings using potable water with planned use of more than once per day, cut sheets, product declarations, plumbing schedule showing flush or flow rate performance meeting WaterSense or equivalent.
- Final design or construction documents specify 2018 IgCC sections 601.3.2.1 or 601.3.2.6 (as applicable).

3.1 References:

- U.S. EPA WaterSense: <https://www.epa.gov/watersense>
- 2018 IgCC Section 601.3.2.1 Plumbing Fixtures and Fittings: https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.2.1
- 2018 IgCC Section 601.3.2.6 Medical and Laboratory Facilities: https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.2.6

3.1B Modernization Projects

Option 1

Install WaterSense equipment or equivalent alternatives to demonstrate at least a 20 percent reduction when comparing installed fixture performance to a base case representing the code-minimum, using the FEMP Water Evaluation Data Tool or other water fixture performance calculator. For all fixtures and fittings using potable water with planned use of more than once a day, compile cut sheet or product declarations or plumbing schedule showing flush or flow rate performance consistent with WaterSense or equivalent.

Option 2

Conform to 2018 IgCC Section 601.3.2.1 (6.3.2.1) Plumbing Fixtures and Fittings or 601.3.2.6 (6.3.2.6) Medical and Laboratory Facilities (if applicable).

3.1B Assessment Guidance

Water efficient products can be WaterSense or products with performance equivalent to WaterSense.

Documentation can be compiled cut sheets, product declarations, and/or plumbing fixture and fittings schedule showing flush or flow rate performance consistent with 2018 IgCC or WaterSense or equivalent.

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

3.1B Required Documentation (as applicable per option):

- For all fixtures that are designed to be used more than once per day on average over a month, final design or construction documents specify WaterSense equipment or equivalent alternatives, where available.
- For all fixtures and fittings using potable water with planned use of more than once per day, cut sheets, product declarations, plumbing schedule showing flush or flow rate performance meeting WaterSense or equivalent.
- FEMP Water Evaluation Data Tool (or other water fixture performance calculator).
- Final design or construction documents specify 2018 IgCC sections 601.3.2.1 or 601.3.2.6 (as applicable).

3.1B References:

- U.S. EPA WaterSense: <https://www.epa.gov/watersense>
- FEMP Water Evaluation Data Tool: <https://www.energy.gov/eere/femp/articles/water-evaluation-tools>
- 2018 IgCC Section 601.3.2.1 Plumbing Fixtures and Fittings: https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.2.1
- 2018 IgCC Section 601.3.2.6 Medical and Laboratory Facilities: https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.2.6

3.2 Water Metering

- **CORE**
- **(Std)**

Choose one of the following options:

Option 1

Install building level water meters (standard or advanced) and monitor to ensure optimized management of water use during occupancy, including detection of leaks in accordance with DOE's Federal Building Metering Guidance.

Option 2

Conform to 2018 IgCC Section 601.3.4.1 (6.3.4.1) Consumption Management.

3.2 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).

3.2 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).
- Design drawings

3.2 References:

- 2018 IgCC Section 601.3.4 Water Consumption Measurement:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.4
- Federal Building Metering Guidance (U.S. Department of Energy) (per 42 U.S.C. § 8253(3), Metering of Energy Use):
<https://www.energy.gov/eere/femp/downloads/federal-building-metering-guidance-usc-8253e-metering-energy-use>

3.3 Outdoor Water Use

- **NON-CORE**
- **(Std)**

3.3 Base Requirement

Evaluate and implement, as applicable, water efficient landscaping best practices that incorporate native, non-invasive, drought tolerant, and low maintenance plant species. Utilize and follow, as appropriate, landscaping best practices provided by GSA's SFTool - Water resources, DOE-FEMP's Water Efficiency in Federal Buildings and Campuses resources, EPA's WaterSense - Outdoors resources, or an agency-approved tool.

Meet the Base Requirement and one of the following options:

Option 1

Employ water efficient irrigation strategies to reduce outdoor potable water consumption. Where installed, demonstrate that the permanent irrigation system uses 50 percent or less of the amount of potable water used in conventional practices, assuming typical annual baseline water use. Refer to DOE-FEMP's Water Efficiency in Federal Buildings and Campuses resource on establishing a baseline. Install water meters for irrigation systems serving more than 25,000 square feet of landscaping.

Option 2

If installing landscaping, utilize xeriscaping techniques or do not irrigate beyond the establishment of plantings.

Option 3

Conform to 2018 IgCC Section 601.3.1.1 (6.3.1.1) Landscape Design.

If irrigation is used, conform to Section 601.3.1.2 (6.3.1.2) Irrigation and Section 601.3.4.1 (6.3.4.1) Consumption Management (for irrigated landscaped areas greater than 25,000 square feet).

3.3 Assessment Guidance

Must be for a minimum of 60% of areas that will be/are landscaped, consistent with 2018 IgCC Section 601.3.1.1 Landscape Design.

Compare results to a baseline building, preferably using the EPA WaterSense landscape water budget tool version 1.01 or later.

3.3 Required Documentation:

- Irrigation system design and short narrative describing that no potable water is used for irrigating new landscaping (other than for plant establishment).
- Utility invoices or comparable for the irrigation system meter
- Contract documents: plans and specifications
- Landscape design document
- Contract documents: plans and specifications
- Copy of the WaterSense Water Budget Tool, with the following completed worksheets:
 - Part 1 - Baseline & LWA
 - Part 2 - LWR
 - Part 3 - Results

3.3 References:

- 2018 IgCC Section 601.3.1.1 Landscape Design:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-6-water-use-efficiency#IGCC2018P3_Ch6_Sec6.3.1.1
- Federal Building Metering Guidance (U.S. Department of Energy) (per 42 U.S.C. § 8253(3), Metering of Energy Use):
<https://www.energy.gov/eere/femp/downloads/federal-building-metering-guidance-usc-8253e-metering-energy-use>
- EPA's WaterSense Water Budget Tool: www.epa.gov/watersense/water_budget

3.4 Alternative Water

- **NON-CORE**
- **(Std)**
- **[C/I]**

Choose one of the following options:

Option 1

Implement life-cycle cost-effective methods to utilize alternative sources of water for indoor or outdoor use, such as harvested rainwater, treated wastewater, air handler condensate capture, grey water, and reclaimed water, where permitted by local laws and regulations.

Option 2

Implement life-cycle cost-effective methods to utilize alternative sources of water that conform to the 2018 IgCC Definition of Water, Alternative on-site sources.

3.4 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.

3.4 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.

3.4 References:

- 2018 IgCC Definitions: https://codes.iccsafe.org/content/IGCC2018P3/chapter-3-definitions-abbreviations-and-acronyms#IGCC2018P3_Ch3_Sec3.2



4. ENHANCE INDOOR ENVIRONMENTAL QUALITY

4.1 Ventilation and Thermal Comfort

- **CORE**
- **(S)**

Choose one of the following options:

Option 1

In accordance with 41 CFR §§ 102-74.195 and 102-74.185 of the Federal Management Regulation, comply with all ventilation and thermal comfort requirements. Utilize the most current version of ASHRAE "Ventilation for Acceptable Indoor Air Quality" Standard 62.1 or 62.2 and ASHRAE 55 "Thermal Environmental Conditions for Human Occupancy" as specified by the Federal Management Regulation. Agencies should refer to the GSA's SFTool Enhancing Health with Indoor Air resources on enhancing indoor air quality.

Option 2

Conform to 2018 IgCC Sections 801.3.1 (8.3.1) Indoor Air Quality and 801.3.2 (8.3.2) Thermal Environmental Conditions for Human Occupancy.

4.1 (Assessment Guidance):

Check with the Authority Having Jurisdiction (AHJ) for the current versions of ASHRAE 62.1/62.2 and ASHRAE 55.

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.

4.1 Required Documentation:

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

4.1 References:

- ASHRAE Standard 55, 62.1, and 62.2: <https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards>

- 2018 IgCC Section 801.3.1 Indoor Air Quality: https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.3.1
- 2018 IgCC Section 801.3.2 Thermal Environmental Conditions for Human Occupancy: https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.3.2
- SF Tool, Enhancing Health with Indoor Air: <https://sftool.gov/learn/about/626/enhancing-health-indoor-air>

4.2 Daylighting and Lighting Controls

- **NON-CORE**
- **(S)**

4.2 Base Requirement

Design and construct the building to meet and maintain all required illumination levels, in accordance with 41 CFR § 102-74.180 of the Federal Management Regulation, and maximize the use of automatic dimming controls or accessible manual controls in regularly occupied spaces.

Meet the Base Requirement and one of the following options:

Option 1

Improve access to and benefits from daylight by ensuring regularly occupied spaces along the exterior wall have fenestration, and control solar gain, daylight transmittance, and glare. If the building cannot achieve adequate daylighting due to mission or security needs, utilize circadian-effective lighting based on computer analysis or simulation tools to design optimal lighting conditions for the regularly occupied spaces. Evaluate and assess occupant workplace to allow more open space around windows, except where not appropriate because of building function, mission, or structural constraints.

Option 2

Conform to 2018 IgCC Sections 801.3.7 (8.3.7) Glare Control, 801.4.1.1.1 (8.4.1.1.1) Minimum Daylight Area, and 801.4.1.2 (8.4.1.2) Minimum Sidelighting Effective Aperture for Office Spaces and Classrooms, and 801.4.1.3 (8.4.1.3) Shading for Offices; or 801.5.1 (8.5.1) Daylight Simulation.

4.2 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.
- 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.

4.2 References:

- 2018 IgCC Section 801.3.7 (8.3.7) Glare Control:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.3.7
- 2018 IgCC Section 801.4.1.1.1 (8.4.1.1.1) Minimum Daylight Area:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.4.1.1.1
- 2018 IgCC Section 801.4.1.2 (8.4.1.2) Minimum Sidelighting Effective Aperture for Office Spaces and Classrooms:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.4.1.2
- 2018 IgCC Section 801.4.1.3 (8.4.1.3) Shading for Offices:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.4.1.3
- 2018 IgCC Section 801.5.1 (8.5.1) Daylight Simulation:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.5.1

4.3 Low-Emitting Materials and Products

- **NON-CORE**
- **(Std)**
- **[C/I]**

Choose one of the following options:

Option 1

Utilize low-emitting (low or no volatile organic compound (VOC)) materials, on at least 75 percent of interior products by cost or surface area, for the following materials and products: composite wood products, flooring and carpet systems, wall panels, insulation, adhesives, sealants, interior paints and finishes, solvents, janitorial supplies, and furnishings. Agencies should refer to EPA's Volatile Organic Compounds' Impact on Indoor Air Quality resources for information on low-emitting products.

Option 2

Conform to 2018 IgCC Section 801.4.2 (8.4.2) Materials or Section 801.5.2 (8.5.2) Materials.

4.3 Assessment Guidance

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.

4.3 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

4.3 References:

- 2018 IgCC Section 801.4.2 Materials:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.4.2
- 2018 IgCC Section 801.5.2 Materials:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.5.2

4.4 Radon Mitigation

- **CORE**
- **(S)**
- **[C/I]**

Choose one of the following options:

Option 1

In accordance with 41 CFR § 102-80.20 of the Federal Management Regulation, test for radon and mitigate high levels to maintain a level at or below 4 pCi/L (picocuries/liter).

Option 2

Conform to 2018 IgCC Section 1001.3.1.9 (10.3.1.9) Soil-Gas Control.

4.2 Assessment Guidance

Radon testing must be performed for all buildings regardless of the EPA Radon Zone Map. “Radon mitigation measures” include installation of passive or active radon mitigation systems. All projects must indicate how testing for radon was conducted.

Per ANSI/AARST MALB, “It is recommended that ALL buildings be tested regardless of the area of the country and that maps should not be used to determine whether to test.”

4.2 Required Documentation:

- Radon test results
- Radon mitigation where necessary

4.2 References:

- 2018 IgCC Section 1001.3.1.9 (10.3.1.9) Soil-Gas Control:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.1.9
- ANSI/AARST MALB (2014 with 1/21 revisions) Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings:
<https://standards.aarst.org/MALB-2014/index.html>

4.5 Moisture and Mold Control

- **NON-CORE**
- **(Std)**

Choose one of the following options:

Option 1

Implement a moisture control strategy (may be part of the operations and maintenance protocols) for controlling moisture flows and condensation to prevent building damage, minimize mold contamination, and reduce health risks related to moisture.

Option 2

Conform to 2018 IgCC Section 801.3.6 (8.3.6) Moisture Control.



4.5 Required Documentation:

- Moisture control strategy
- Conceptual and final design or construction reports demonstrate compliance with 2018 IgCC Section 801.3.6 Moisture Control
- Absorptive materials and all materials stored onsite are protected from moisture damage, and no materials showing visible evidence of mold are installed

4.5 References:

- 2018 IgCC Section 801.3.6 Moisture Control:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.3.6

4.6 Indoor Air Quality During Construction

- **NON-CORE**
- **(Std)**

Choose one of the following options:

Option 1

Develop and implement a plan to protect indoor air quality during construction.

Option 2

Conform to 2018 IgCC Sections 1001.3.1.5 (10.3.1.5) IAQ Construction Management, and 1001.3.1.8 (10.3.1.8) Construction Activity Pollution Prevention: Protection of Occupied Areas.

4.6 Assessment Guidance

For renovation of occupied existing buildings, meet the requirements of SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008-2008.

4.6 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

4.6 References:

- 2018 IgCC Section 1001.3.1.5 IAQ Construction Management:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.1.5

- 2018 IgCC Section 1001.3.1.8 IAQ Construction Activity Pollution Prevention: Protection of Occupied Areas: https://codes.iccsafe.org/content/IGCC2018P3/chapter-10-construction-and-plans-for-operation#IGCC2018P3_Ch10_Sec10.3.1.8

4.7 Environmental Smoking Control

- **CORE**
- **(S)**
- **[C/I]**

Choose one of the following options:

Option 1

In accordance with 41 CFR § 102-74.315 and 102-74.330 of the Federal Management Regulation, prohibit smoking in any form inside and within 25 feet of all building entrances, operable windows, and building ventilation intakes. Ensure signage is installed as appropriate.

Option 2

Conform to 2018 IgCC Section 801.3.1.7 (8.3.1.7) Environmental Tobacco Smoke.

4.7 Required Documentation:

- Final design reports or maintenance and operations documents
- No smoking signage

4.7 References:

- 2018 IgCC Section 801.3.1.7 Environmental Tobacco Smoke:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-8-indoor-environmental-quality-ieq-#IGCC2018P3_Ch8_Sec8.3.1.7

4.8 Integrated Pest Management

- **CORE**
- **(S)**
- **[C/I]**

4.8 Base Requirement

In accordance with 41 CFR § 102-74.35 of the Federal Management Regulation, ensure effective and environmentally sensitive integrated pest management (IPM) services

including the planning, development, operations, and maintenance for pest control, removal, and prevention in both indoor and outdoor spaces. Ensure that pest management contracts are effectively coordinated with the activities of other building service programs that have a bearing on pest activity, such as food service, landscaping, child care, waste management, and repairs and operations.

Refer to GSA's IPM definition, EPA's IPM resources, and GSA's SFTool Pest Management resources for additional program guidance.

Meet the Base Requirement.

4.8 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.

4.8 Required Documentation:

- Integrated Pest Management Plan

4.8 References:

- Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing (U.S. Environmental Protection Agency):
<https://www.epa.gov/greenerproducts/recommendations-specifications-standards-and-ecolabels-federal-purchasing>
- 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>
- GSA's IPM definition, EPA's IPM resources, and GSA's SFTool Pest Management resources for additional program guidance

4.9 Occupant Health and Wellness

- **CORE**
- **(Std)**

Choose one of the following options:

Option 1

Evaluate the feasibility of implementing occupant health and wellness efforts and promote two or more strategies that are cost-effective and applicable to the building mission.

Agencies are encouraged to assess and promote universally accepted workplace occupant health and wellness strategies most appropriate to their building and mission. Agencies should refer to GSA's SFTool for additional strategies and guidance on health and wellness in Federal facilities.

Examples of common health and wellness strategies include, but are not limited to:

- 1) Implementing biophilic design strategies that connect a majority of interior spaces with nature, using views, finishes, plants, daylighting, outdoor access, or other strategies;
- 2) Providing healthy dining options in the building or on campus that support offering a variety of fresh food options for occupants, following the U.S Department of Health and Human Services (HHS) / GSA Health and Sustainability Guidelines for Federal Concessions and Vending Operations where appropriate;
- 3) Designing stairwells as a desirable option for circulation to support active occupants;
- 4) Implementing a fitness program, including constructing or providing access to a fitness center or multi-use space for exercise in the building, on-site, or on campus;
- 5) Installing bicycle parking with safe, secure storage;
- 6) Providing adjustable-height desks or computer risers for 25 percent of the regular occupied spaces; and
- 7) Providing water bottle-refilling stations, establish a process to test water quality annually, and ensure proper maintenance of the stations. Refer to EPA's Drinking Water resources for additional guidelines.

Option 2

Achieve certification utilizing any Health & Wellness Standards and Rating System identified by GSA, under its authorities per 42 U.S.C. § 17092.

4.2 Assessment Guidance

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

- **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).

- **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.
- **Bicycle commuter facilities:** Bike storage for regular occupants and visitors and onsite shower(s) with changing facilities for regular building occupants.
- **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.
- **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.
- **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.
- **Fitness center:** Should be in the building or onsite and offer cardiovascular and weight training exercise opportunities available to majority of occupants (excluding visitors).
- **Healthy dining:** A cafeteria (in building or onsite) that supports offering a variety of fresh food options, or the building is located within walking distance of fresh food options.
- **Onsite fitness programs:** Structured, reoccurring onsite fitness and training programs or related education available to all employees.
- **Outdoor walking opportunities:** Trails or tracks must be adjacent or close to the building.
- **Other:** Any other exercise or fitness opportunities.

4.2 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.
- Health & Wellness Certification as recognized by GSA.

5. REDUCE ENVIRONMENTAL IMPACT OF MATERIALS

5.1 Materials - Recycled Content

- **CORE**
- **(S)**
- **[C/I]**

5.1 Base Requirement

Use Resource Conservation and Recovery Act (RCRA) section 6002 compliant products that meet or exceed EPA's Comprehensive Procurement Guideline Program, which provides recycled content recommendations for building construction, modifications, operations, and maintenance, in accordance with 42 U.S.C. § 6962 et seq.

Meet the Base Requirement.

5.1 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.

5.1 Required Documentation:

- A) IgCC: Conceptual and final design reports demonstrate 2018 IgCC 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

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

5.1 References:

- 42 U.S.C. § 6962, Federal procurement
- EPA's Comprehensive Procurement Guideline (CPG) program:
<https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>
- 2018 IgCC Section 901.4.1.1 Recycled Content and Salvaged Material Content:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.4.1.1
- RCRA Section 6002 Solid Waste Disposal Act

5.2 Materials - Biobased Content

- **CORE**
- **(S)**
- **[C/I]**

5.2 Base Requirement

Use U.S. Department of Agriculture (USDA) BioPreferred products, which are designated products with the highest content level per USDA's biobased content recommendations, in accordance with 7 U.S.C. § 8102.

Meet the Base Requirement.

5.2 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.

5.2 Required Documentation:

- A) IgCC: Conceptual and final design reports demonstrate 2018 IgCC 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

- B) 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.

5.2 References:

- 7 U.S.C. § 8102 - Biobased markets program
- Farm Security and Rural Investment Act (FSRIA) Section 9002

- 2018 IgCC Section 901.4.1.3 Biobased Products:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.4.1.3
- USDA BioPreferred (R) Program: <https://www.biopreferred.gov>

5.3 Products

- **NON-CORE**
- **(Std)**

Choose one of the following options:

Option 1

Use construction products and building supplies recommended under EPA's Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing, as appropriate and applicable.

Option 2

Conform to 2018 IgCC Section 901.4.1.4 (9.4.1.4) Multiple-Attribute Product Declaration or Certification.

5.3 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.

5.3 Required Documentation:

- A) IgCC: Conceptual and final design reports demonstrate 2018 IgCC 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

- B) 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.



5.3 References:

- EPA Website, Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing: <https://www.epa.gov/greenerproducts/epas-recommendations-specifications-standards-and-ecolabels-federal-purchasing-pdf>
- 2018 IgCC Section 901.4.1.4 Multiple-Attribute Product Declaration or Certification: https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.4.1.4
- SF Tool, Green Procurement Compilation: <https://sftool.gov/greenprocurement>

5.4 Ozone Depleting Substances

- **CORE**
- **(S)**
- **[C/I]**

Choose one of the following options:

Option 1

Ensure compliance with 42 U.S.C. § 7671k and 42 U.S.C. § 7671l, concerning the procurement of safe alternatives for ozone depleting substances. Maximize the use of safe alternatives, where EPA's Significant New Alternative Policy (SNAP) Program has identified acceptable substitutes and alternatives.

Refer to EPA's SNAP regulations, 40 CFR part 82, which list substitutes that have been determined unacceptable, acceptable to use conditions, and acceptable subject to narrowed use limits.

Option 2

Conform to 2018 IgCC Section 901.3.3 (9.3.3) Refrigerants.

5.4 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.

5.4 Required Documentation:

- A) IgCC: Conceptual and final design reports demonstrate 2018 IgCC 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**

- B) 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.

5.4 References

- 2018 IgCC Section 901.3.3 Refrigerants:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.3.3
- U.S. Environmental Protection Agency, Significant New Alternative Policy (SNAP) Program:
<https://www.epa.gov/snap>
- Comprehensive Procurement Guideline (CPG) Program (U.S. Environmental Protection Agency): <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>
- BioPreferred website (U.S. Department of Agriculture): <https://www.biopreferred.gov>
- EPA's Recommendations of Specifications, Standards and Ecolabels for Federal Purchasing (U.S. Environmental Protection Agency): <https://www.epa.gov/greenerproducts/epas-recommendations-specifications-standards-and-ecolabels-federal-purchasing-pdf> (PDF)
- Green Procurement Compilation, SF Tool (U.S. General Services Administration):
<https://sftool.gov/greenprocurement>
- Significant New Alternatives Policy (SNAP) Program (U.S. General Services Administration):
<https://www.epa.gov/snap>

5.5 Hazardous Waste

- **CORE**
- **(S)**

5.5 Base Requirement

Ensure compliance with all relevant hazardous waste construction or operational activities that are covered by RCRA subtitle C and subtitle I and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), per 42 U.S.C. § 9601 et seq. and its implementing regulations at 40 CFR Parts 239-282.

This criterion is achieved so long as it can be demonstrated that the building has a program and procedure to manage hazardous waste, or the building does not generate, store, treat, or dispose of hazardous waste. (40 CFR §§ 260.10 and 261.3).

Meet the Base Requirement.

5.5 Required Documentation:

- Demonstration that building does not generate, store, treat, or dispose of hazardous waste.

- Program and procedure to manage hazardous waste (as applicable).
- Cut sheets, site plans, construction documents, and other documentation as applicable to hazardous waste construction and/or operational activities as covered.

5.5 References:

- RCRA Subtitle C and Subtitle I
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 40 CFR §§ 260.10 and 261.3).
- 42 U.S.C. § 9601

5.6 Solid Waste Management

- **NON-CORE**
- **(Std)**

Choose one of the following options:

Option 1

Develop and implement a construction and demolition waste management plan. Where markets exist, divert at least 50 percent of construction and demolition materials from landfills and non-energy generating incinerations, as defined by and in alignment with EPA's Waste Management Hierarchy.

AND

Design the building to incorporate appropriate space, equipment, and transport accommodations for collection, storage, and staging of recyclables and, as appropriate, compostable materials.

Option 2

Conform to 2018 IgCC Section 901.3.1.1 (9.3.1.1) Diversion.

AND

Conform to 2018 IgCC Section 901.3.4 (9.3.4) Areas for Storage and Collection of Recyclables and Discarded Goods.

5.6 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.

5.6 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).

5.6 References:

- 2018 IgCC Section 901.3.1.1 Diversion:
https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.3.1.1
- 2018 IgCC Section 901.3.4 Areas for Storage and Collection of Recyclables and Discarded Goods: https://codes.iccsafe.org/content/IGCC2018P3/chapter-9-materials-and-resources#IGCC2018P3_Ch9_Sec9.3.4

6. ASSESS AND CONSIDER BUILDING RESILIENCE

6.1 Risk Assessment

- **NON-CORE**
- **(S*)**
- **[C/I]**

Choose one of the following options:

Option 1

Conduct a regionally tailored risk assessment for the site that, where appropriate, aims to:

1. Assess long-term mission critical functions over the intended service life by incorporating considerations such as mission needs, building functions, occupants, and operations. Consider impacts to the surrounding community and to building operational needs.
2. Assess the localized risks to the design life of the building, which involves identifying hazards, threats, vulnerabilities, and consequences. During the hazard identification step, identify and review any known observed and expected long-term weather-related and geographical hazards to inform and enhance the resilience of the building design and operations.
3. Assess relevant stressors that could exacerbate hazards and risks to the building and operations. Account for whether the frequency is increasing, remaining the same, or decreasing in the specific region.
4. Evaluate and consider the adaptive capacity of the building and operations to cope with shocks and stressors, or ability to adjust to new situations.
5. Incorporate, as applicable, a comprehensive energy and water infrastructure assessment to ensure resilience and investigate alternative energy sources to serve as back-up power.

Option 2

Ensure that the building, as well as any planned mission critical activities housed in the building, have been evaluated and integrated as part of a recent agency, facility, installation, or campus resilience or adaptation assessment. This can include any resilience and adaptation assessment activities associated with Installation Master Plans, climate adaptation plans, or equivalent agency, installation, or campus resilience or adaptation plans.

Option 3

Utilize available Federal climate resilience planning tools to inform the decision making and design for the building project.

Available tools include the U.S. Climate Resilience Toolkit, the Naval Facilities Engineering Command's Climate Change Installation Adaptation and Resilience Planning Handbook, the NIST Community Resilience Planning Guide for Buildings and Infrastructure Systems, the NIST EDGe\$ (Economic Decision Guide Software) Online Tool, the U.S. Army Corps of Engineers climate preparedness and resilience planning tools, the U.S. Department of the Army's Climate Assessment Tool and Climate Resilience Handbook, FEMP's Technical Resilience Navigator, or any other Federal agency-developed climate resilience or adaptation planning tools that become available.

6.1 Assessment Guidance

Design building solutions that respond to government provided climate change projections and determination of acceptable risk.

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. Focus on the resilience of the physical facility. Consider phased adaptation over time.

6.1 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.

6.1 References:

- U.S. Climate Resilience Toolkit: <https://toolkit.climate.gov/>
- Naval Facilities Engineering Command's Climate Change Installation and Adaptation and Resilience Planning Handbook: <https://www.fedcenter.gov/Documents/index.cfm?id=31041>
- NIST Community Resilience Planning Guide for Buildings and Infrastructure Systems: <https://www.nist.gov/community-resilience/planning-guide>
- NIST EDGe\$ (Economic Decision Guide Software) Online Tool: <https://www.nist.gov/services-resources/software/edge-economic-decision-guide-software-online-tool>
- U.S. Army Corps of Engineers climate preparedness and resilience planning tools: https://www.usace.army.mil/corpsclimate/Climate_Preparedness_and_Resilience/
- U.S. Department of the Army's Climate Assessment Tool and Climate Resilience Handbook: https://www.asaie.army.mil/Public/ES/doc/Army_Climate_Resilience_Handbook_Change_1.pdf

- FEMP's Technical Resilience Navigator: <https://trn.pnnl.gov/>

6.2 Building Resilience and Adaptation

- **NON-CORE**
- **(S*)**
- **[C/I]**

Choose one of the following options:

Option 1

Utilize the risk assessment to determine and prioritize design parameters that should be incorporated to ensure resilient building design and operations over the intended service life of the building, considering mission criticality, cost, and security. Ensure the implementation of no cost and cost-effective climate resilience measures, and, where feasible, implement solutions that focus on operations. Consider in the operation plans of the building, facility, campus, or installation, the adaptive capacity of the building to cope with stressors and mitigate based on mission criticality and cost. Identify and implement measures, where appropriate, to support passive survivability and functionality during emergencies.

Option 2

Ensure the implementation of cost-effective strategies identified through an agency developed resilience or adaptation plans or any other Federal agency developed climate resilience or risk assessment planning tools. (For examples of available tools, refer to criteria 6.1.)

6.2 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.

6.2 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.

6.2 References:

- *See References for 6.1*



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