

LANL 2020 Guiding Principles Handbook

New Construction and Modernization

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Introduction

The LANL 2020 Guiding Principles Handbook is a tool to assist project teams in meeting the intent of the [Guiding Principles for Sustainable Federal Buildings](#) (GP). **All new¹, renovated, and modernized² LANL buildings over 5,000 GSF, are required to meet the 2020 GP**, per DOE O 430.1C (included in LANL's prime contract via NNSA SD 430.1C). Buildings that are **exempt** from tracking compliance with the GP:

- a. are 5,000 GSF or less, or
- b. are non-building assets, or
- c. are leased, or
- d. have a status indicator of ROE submitted or accepted, Determination to Dispose, or Surplus, or
- e. meet all of the following conditions:
 - i. Unoccupied: The building is occupied 1 hour or less per person per day on average,
 - ii. Low/No Energy Use: Total usage from all sources is less than 12.7 kBtu/GSF/year, and
 - iii. Low/No Water Use: Consumption is less than 2 gal/day on average.

If a project does not meet one of the conditions in a-e above, request a project compliance checklist from the [Utility Resource Management Team](#) and track compliance throughout the project. The existing building checklist differs from the new building checklist. If working on a renovation project which is less than 5,000 GSF, please request the checklist for existing buildings and work with the Utility Resource Management (URM) Program to integrate as many Guiding Principles as possible. Recommendations for renovations are available with the Chapter 14 References and Resources section of LANL's Engineering Standards Manual web posting.

The guidance contained in this document represents the LANL URM Program's understanding of the intent of the GP as presented by the DOE, FEMP, and other governmental agencies. It is the responsibility of the project team to demonstrate the project is meeting the intent of each Guiding Principle criterion. For additional assistance, please contact the [Utility Resource Management Team](#) and include someone from the URM Program on the IPT.

The 2020 GP contain 30 criteria for agencies to assess and demonstrate achievement. All criteria should be considered as part of the initial assessment process, throughout design, and until construction is finished, even if the building is not expected to comply with the minimum number of criteria. If the building's inherent function, mission, safety, or designation precludes it from meeting the minimum threshold of requisite criteria in a life cycle cost-effective manner, the building would not qualify as a Sustainable Federal Building. Instead the building will be designated as a Federal high-performance building ([42 U.S.C. § 17061\(13\)](#)). All Federal statutes applicable to the project or building must be met, regardless of whether the building is able to achieve the minimum criteria to be qualified as a Sustainable Federal Building.

To comply, meet all 18 of the core criteria, and 75 percent (9 of 12) of non-core criteria.

Core Criteria: These core criteria, supported by statutory and regulatory requirements and green building industry standards, are considered fundamental principles for any Federal high-performance building.

Non-Core Criteria: Projects have flexibility to focus on the criteria that are most applicable to the building and account for life cycle cost effectiveness, mission requirements, and unique project scopes.

Life cycle cost analysis is required for all energy consuming systems; renewable energy generating systems; or when LCCE is selected as the reason a criterion is not pursued and met. The term "cost-effectiveness" should include the use of benefit-cost analysis in accordance with [OMB Circular, A-11, Capital Programming Guide, 10 CFR Part 436, Subpart A](#), and [National Institute of Standards and Technology \(NIST\) and Federal Energy Management Program \(FEMP\) "Life Cycle Costing Manual for the Federal Energy Management Program" Handbook 135](#).

Appendix C of the GP allows for compliance using Third-Party Building Certification Systems. A project may certify

¹ Includes joined transportables when over 25,000 square feet.

² Modernization is when an existing building undergoes a comprehensive replacement of all major systems, interior work, and building elements and features.

using LEED® v4 for Building Design and Construction (BD+C), Silver, Gold, or Platinum Levels or Green Globes® for New Construction, version 2013, 2 Globes. HOWEVER, these Third-Party certifications may or may not contain references to the statutory and regulatory requirements and a project must ensure that these are met **in addition to the Third-Party Certification**. If planning this path for compliance, contact the [Utility Resource Management Team](#) and a separate statutory/regulatory checklist will be provided for the project.

The GP are similar to LEED in terms of applying set criteria to the siting, design, construction, commissioning, and operation of new facilities and modernization of existing facilities. **While a project might also be required to certify in LEED, LEED certification does not substitute for GP certification.** Project management must ensure a plan (e.g., contract wording, budgeting, etc.) for project completion including the following tasks related to GP:

- Assign a member of the URM Program to the Integrated Project Team. Email [Utility Resource Management Team](#) to determine which team member to assign to the IPT and confirm the current practice for tracking compliance.
- Review the GP in the project planning phase and determine necessary measures to achieve compliance. Assign responsible parties from the A/E, contractor, or project management team to ensure compliance with each criterion selected.
- Complete the GP checklist during the design process and update as needed through design and construction. (This document is NOT the checklist used to track compliance but corresponds with the LANL checklist found with the other Chapter 14 References and Resources or available from the URM Program SME on the project IPT (see a above).)
- Sustainability should be integrated into the process as is life safety, accessibility, design changes, etc.
- Collect and store documents for submission at project completion. If a URM member is on the IPT and included in the design reviews at each stage, they may collect the data needed to verify compliance with some GP, but criteria that the constructor is responsible for will need to be documented.
- Prior to project closeout, review and complete documentation and assist the URM Program in brokering approval by DOE/NNSA. **A project is not considered complete until the project is certified.**

Reference Key:

Criteria in the GP include design elements, construction requirements, and operational procedures that can be used to demonstrate continued operation as a sustainable Federal building after construction.

Criteria are identified in the checklist and handbook in accordance with the table below:

S	Criteria that are based on and reference statutory or regulatory requirements are indicated with “S” on the checklist.
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].

Notes in purple below each GP are intended to offer explanations and notes in yellow offer ideas about what might be submitted as verification. These are suggestions and not necessarily the only items needed nor the only way to show compliance. Photos, pdf drawings, cut sheets, policies, calculations, written narratives, or reports are encouraged. Additionally, including an SME from the URM Program is the best way to ensure successful verification of compliance.

Guiding Principles: Criteria by Criteria Guidance

1.0 - Employ Integrated Design Principles	
NC&M Criteria 1.1 (Core, Std)	Integrated Design and Management
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.	
<i>And select ONE of the following options to meet this Guiding Principle.</i>	
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.	
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).	
Guidance: In the project planning phase, prepare an Integrated Project Team (IPT) Roster showing who will be involved in the design phase and who will be part of making the environmentally impactful decisions regarding: energy efficiency, water efficiency, metering, water quality protection, stormwater management, materials selections, operations and maintenance, indoor air quality (HVAC & exhaust), health and wellness of occupants, and resiliency. Include a LANL URM Program representative and, if applicable, a LEED Accredited Professional. The IPT should work to find synergy between different principles. For example: Modern, variable speed, air cooled chillers are considerably more efficient than cooling towers, and our climate is favorable for cooling with air economizers, so these chillers save both water and energy. Another example is occupancy sensors that can control lighting and HVAC simultaneously, to save energy. The A/E Team shall have relevant experience with cost effective environmentally sustainable design, whole building energy modeling, and commissioning. Schedule an IPT design charrette with the team and use the Guiding Principles checklist to facilitate discussions about how to meet the required metrics. Sustainability does not have to be the only topic discussed, but	Suggested Documentation: Throughout the project, continue to address GP and update any documentation. For example: After the design charrette, submit or archive a copy of the IPT Roster, preliminary checklist, and narrative of the sustainability related decisions made during the design charrette. During the design phase, submit a GP checklist to the URM Program. The 60% design should incorporate all sustainable building features. If a URM Program representative is not included on the IPT, email a GP Checklist to Utility Resource Management Team at the 30% design phase. During Construction, route contractor submittals to the sustainability team, to ensure compliance. Also track items such as construction activity pollution prevention, indoor air quality management, sustainable building materials, and monthly construction demolition waste recycling. The URM Program will be reviewing 30-60-90-100% design documents, as well as submittals throughout the project. In this way some metrics will be verified before project completion. Obviously waiting until after project completion to collect and share the verification

sustainable goals should be discussed regularly throughout the project. A "simple box" energy model using orientation, envelope properties, etc., should be used as early as possible, either by the development team or by the A/E team, to verify that the design is on the right track to achieve the goals for energy and water use. Consider and document the need for electric vehicle charging infrastructure for LANL fleet vehicles, as well as employees.	documentation is difficult as information may be hard to locate. A regular check-in with the sustainability team member is beneficial to securing certification quickly and easily during project close-out. For more information: See the DOE Guide to High Performance Sustainable Buildings for critical decision timelines and deliverables.
NC&M Criteria 1.2 (Core, S, C/I)	Sustainable Siting
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.	
<i>And select ONE of the following options to meet this Guiding Principle.</i>	
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.	
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.	
Guidance: Generally a project site is determined prior to an A/E or constructor selection process. It can be assumed that the PRID process was followed and the appropriate Subject Matter Experts (SME) identified requirements under 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, 16 U.S.C. 470 et seq.	Suggested Documentation: Use of the LANL PAR system should identify requirements and ensure compliance so no verification is needed for this criterion.
NC&M Criteria 1.3 (Core, S, C/I)	Stormwater Management

Select ONE of the following options to meet this Guiding Principle.

1. 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.
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.
3. Conform to 2018 IgCC [Section 501.3.4 \(5.3.4\) Stormwater Management](#).

Guidance:

EISA 438 requires establishing or maintaining pre-development (i.e. greenfield site) hydrology and managing runoff through Green Infrastructure/Low Impact Development methods. EISA 438 establishes two ways to meet design objectives: Option 1 is to design to capture 100% of a 95th percentile rainfall and Option 2 is site specific hydrologic analysis. For more general information:

<https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf> For LANL specific information see ESM, Ch. 3 G20.

LANL has also developed a Storm Water Best Management Practices Manual and guidance on Low Impact Development (LID) controls:

<https://int.lanl.gov/environment/water/assets/docs/LA-UR-11-10371.pdf> Also see <https://int.lanl.gov/environment/water/storm-water/index.shtml> Reduce impervious surfaces, add pervious paving materials, bio-swales, on-site filtration, rain water collection systems, or other methods to reduce storm water runoff from the site.

Suggested Documentation:

Submit a storm water plan, calculations, and a narrative to explain the following: measures implemented, soils analysis, constraints of the site, water flow calculations, volume of water managed by each BMP, and demonstration of compliance with EISA 438 requirements as specified in the LANL ESM. Include operations and maintenance requirements for a building maintenance manual.

NC&M Criteria 1.4
(Non-Core, Std, C/I)

Infrastructure Utilization and Optimization

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.

And select ONE of the following options to meet this Guiding Principle.

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.

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.	
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).	
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.	
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.	
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 .	
Guidance: LANL will continue to add Electric Vehicles (EV) to the fleet. To prepare for this, installing EV charging for Government Owned Vehicles is required in Chapter 14 of the Engineering Standards Manual if parking is part of the scope of the project.	Suggested Documentation: If the project is located to take advantage of existing infrastructure such as transit stops or within walking distance to other services such as in TA03 (Option 1), provide a map to show distances to services.
NC&M Criteria 1.5 (Core, S)	Commissioning
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.	
<i>And select ONE of the following options to meet this Guiding Principle.</i>	
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.	
2. Conform to 2018 IgCC Section 1001.3.1.2 (10.3.1.2) Building Project Commissioning (Cx) Process .	
Guidance: Project budget, schedule, and construction contracts must include money, time, and necessity for cooperation and coordination for the full commissioning (Cx) process to run to completion. The Cx agent should be on the	Suggested Documentation: Use ESM Chapter 15 as a top-level guide to Cx. Determine if Cx will be entirely by LANL, or a subcontractor, if LANL does not have qualified personnel. Commissioning should be consistent with the

integrated team, whether LANL or subcontracted person. The A/E team will also be a member of the commissioning team to review and approve the plan, witness selected testing, provide design basis and design narratives documentation for the O&M Manual, among other responsibilities.

To be compliant with the 4-year recommissioning, all buildings over 10,000 square feet should install a BAS on the yellow network. In this way it will be part of an ongoing Cx (OCx) process. If a building installs a BAS on the red network, a plan for providing the energy and water use data to the URM Program may need to be coordinated, and a plan for O&M OCx should be undertaken.

Federal Energy Management Program (FEMP) commissioning guidance:

<https://www.energy.gov/eere/femp/commissioning-federal-buildings>.

Provide a Cx plan, a copy of the construction schedule that includes commissioning activities, and the final Cx report to the URM Program representative along with the final GP checklist. Some portions of the Cx report may help to verify other GPs as well.

2.0 – Optimize Energy Performance

NC&M Criteria 2.1
(Core, S)

Energy Efficiency

For New Construction:

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](#).

Guidance:

Consider using passive heating and cooling before engaging mechanical systems, harvest natural light and waste heat if possible. Design sun shades and plant shade trees. Next consider upgraded building envelopes and efficient equipment to reduce size of equipment needed.

Include money in the project budget for energy modeling, and include time in the schedule for evaluating efficient design options. For guidance on energy modeling refer to ASHRAE 209 Energy Simulation-Aided Design Standard. The current ASHRAE 90.1 version, for this criterion is 2019. The **Performance Rating Method (PRM)** must be used, but the building should meet ASHRAE 90.1 as a minimum.

If a 30% reduction is not life cycle cost effective (LCCE), the design of the proposed building or addition shall be as efficient as possible up to the point it is no longer life cycle cost effective. Analysis of different combinations of efficiency measures should be conducted to find the most efficient combination of measures which combine to create the greatest energy savings in a LCCE manner.

NOTE: efficient equipment or appliances that are required by 10CFR436 subpart C **should not count toward the cost of efficiency measures because they are required by law:** <https://www.energy.gov/eere/femp/search-energy-efficient-products> **However their efficiency still counts toward the increased energy performance.** On-site renewable energy systems also count toward the energy efficiency, so be sure to check the LCCE of these systems, especially for buildings with significant roof area available (or even south facing wall area, for thermal collection).

Suggested Documentation:

Submit copies of the Performance Rating Method reports showing the percentage better than ASHRAE 90.1-2013 and life cycle cost reports to support design decisions. **These calculations are due at 30% review.** The formula for calculating the performance is:

Percentage Improvement = $100 \times (1 - \text{PCI}/\text{PCIt})$

Where

PCI = Performance Cost Index calculated in accordance with Section G1.2 of ASHRAE Standard 90.1–2019

PCIt = Performance Cost Index Target calculated by formula in Section 4.2.1.1 of ASHRAE Standard 90.1–2019

Document the analysis for any energy efficiency choices that were deemed not to be LCCE.

For Modernization Projects:

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\(a\)](#).

And select ONE of the following options to meet this Guiding Principle.

1. Ensure building energy use is 20 percent below a FY 2015 energy use baseline.
2. Ensure building energy use is 30 percent below a FY 2003 energy use baseline.
3. Ensure the building has an [ENERGY STAR](#) score of 75 or higher.
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.
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.

Guidance:

Before deciding upon a particular method of compliance, email the [Utility Resource Management Team](#) to determine if historic energy data will be available.

1 & 2) Energy use baseline information can be used to show compliance compared to new usage. Use bills, metering results, consumption history and computer analysis to document the savings below baselines.

3) For building types that are in Portfolio Manager, data can be entered to show the building is achieving a rating of 75. Portfolio Manager data must be no more than 1 year old and for the **full 12-month period**. This option will be time-consuming for someone on the project team to track in Portfolio Manager. The year of data also means not proving compliance for one year after building construction is complete.

4 & 5) For other types of buildings, ASHRAE calculations (See 3A above) may be needed, or if other benchmarking data is available, this can be used to show how the building compares to others of that type. If other national labs have similar building types and they can share energy use data, this might be a way to show compliance.

Suggested Documentation:

1 & 2) Submit energy modeling analysis to show projected energy use vs. baseline.

3) Submit a copy of the ENERGY STAR report showing the score of 75.

4) Submit benchmarking data for the comparable buildings, and the energy modeling analysis to show the projected energy use vs. the benchmark baseline.

5) Submit copies of the Performance Rating Method reports showing the percentage better than ASHRAE 90.1.

NC&M Criteria 2.2
(Core, S)

Energy Metering

Install building-level meters for electricity and advanced meters to the maximum extent practicable, as required by EPAct 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\(e\)\(1\)](#)).

Guidance: See LANL Engineering Standards Manual Chapter 14 Attachment 2 – Utility Metering Requirements	Suggested Documentation: Submit confirmation from UI's Metering Program Administrator, at umetering@lanl.gov, that the meters are installed and communicating properly over the yellow network.
NC&M Criteria 2.3 (Non-Core, S, C/I)	Renewable Energy
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.]	
<i>And select ONE of the following options to meet this Guiding Principle.</i>	
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.	
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).	
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.	
Guidance: The URM Program will provide the current price of our electricity and natural gas for analysis. Email the Utility Resource Management Team for information and assistance. Other options are to use renewable credits from another building that has more PV than it uses, or jointly locating PV with another project. <i>Remember to meter renewable systems separately from the building, so LANL can report and receive credit for renewable energy generation.</i>	Suggested Documentation: Providing documentation of the LCC analysis and if installing include a separate meter in accordance with LANL Engineering Standards Manual Chapter 14 Attachment 2 – Utility Metering Requirements.
NC&M Criteria 2.4 (Core, S)	Benchmarking
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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).	
2. Conform to 2018 IgCC Section 1001.3.2.1.3.2 (10.3.2.1.3.2) Track and Assess Energy Consumption.	
Guidance: Benchmarking will be completed by the URM Program, however, meters are required in accordance with the	Suggested Documentation: No additional documentation is required beyond the

LANL Engineering Standards Manual Chapter 14 Attachment 2 – Utility Metering Requirements. New buildings over 10,000 square feet shall install Building Automation Systems (BAS) which allows for a secondary way to monitor buildings, but is not a substitution for meters. Existing buildings should consider adding BAS if feasible.	metering verification documents. Submit confirmation from UI's Metering Program Administrator, at umetering@lanl.gov, that the meters are installed and communicating properly over the yellow network.
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3.0 – Protect and Conserve Water

NC&M Criteria 3.1 (Core, S)

Indoor Water Use

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.

For New Construction:

And select ONE of the following options to meet this Guiding Principle.

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.
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).

For Modernization Projects:

And select ONE of the following options to meet this Guiding Principle.

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.
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).

Guidance:

Designs should optimize cooling tower operations and **may not use single pass cooling**. In fact, cooling towers are only appropriate for new buildings if the cooling load is very large, on the order of 1,000 tons or 500,000 SF of office space. Modern variable speed, air cooled chillers are considerably more efficient, and our climate is very favorable for cooling with air economizers.

Carefully select water fixtures to meet the requirements.

Suggested Documentation:

Provide specifications, cut-sheets, photos, contracts, or construction drawings showing compliance with either option.

NC&M Criteria 3.2 (Core, Std)	Water Metering
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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 .	
2. Conform to 2018 IgCC Section 601.3.4.1 (6.3.4.1) Consumption Management .	
Guidance: See LANL Engineering Standards Manual Chapter 14 Attachment 2 – Utility Metering Requirements	Suggested Documentation: Submit confirmation from UI's Metering Program Administrator, at umetering@lanl.gov , that the meters are installed and communicating properly over the yellow network.
NC&M Criteria 3.3 (Non-Core, Std, C/I)	Outdoor Water Use
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.	
<i>And select ONE of the following options to meet this Guiding Principle.</i>	
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.	
2. If installing landscaping, utilize xeriscaping techniques or do not irrigate beyond the establishment of plantings.	
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).	
Guidance: The design should consider what budgets will be available, and the commitments for maintenance that will be made after the project is finished. The goal should be to create attractive and functional landscapes, some of which will require water (even a permanent drip or water-efficient spray system) to remain healthy and create quality environments for users. Consider where irrigation might be needed to create maintenance zones as described in ESM STD 341-100 Chapter 4 Section G2050 5.0 and IV.C.6 of the LANL Site + Architectural Design Principles. Where temporary irrigation is planned, use native and drought tolerant plants that, after establishment, can	Suggested Documentation: Submit water use calculations, landscape plans, and plant lists that demonstrate that the designed/installed landscape will comply For Option 1, either document that there is no irrigation system, or if the irrigated area is more than 25,000 ft ² , install advanced meters. For Option 2, If no permanent irrigation system will be installed, choose all xeric, native, and drought tolerant plants. Where a permanent irrigation system will be installed, choose at least 60% xeric, native, and drought tolerant plants. Provide a plant list. For Option 3: Use a baseline water use for cool season

survive on available rainfall and are adapted in local growing conditions. Design any permanent irrigation with hydro-zoning and install smart irrigation controllers, or ones certified by WaterSense. Consult UI's Metering Program Administrator for details about irrigation meter specifications.	turf (annual period or peak), to show 50% less water use as described above, AND if the landscape is over 25,000 ft², show compliance with the 2018 IgCC Section 601.3.1.2.1 - Irrigation System Design and 601.3.1.2.2 Controls.
NC&M Criteria 3.4 (Non-Core, Std, C/I)	Alternative Water
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	
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.	
Guidance: Generally, if the building does not have permanent irrigation, it will not be life-cycle cost effective to collect rainwater or other alternative sources. However, if considering alternative sources of water, such as gray water, rainwater, fire pump test water, condensate capture, discharge from processes, for landscape irrigation, toilet flushing, cooling water make-up or process uses, conduct LCCE analysis to show feasibility. Consult New Mexico Environment Department for requirements: https://www.env.nm.gov/wp-content/uploads/sites/14/2017/08/2073NMACIntegratedApprovedAL-2014.pdf	Suggested Documentation: Submit a feasibility report investigating the possible sources and uses and submit life cycle cost analysis to support design decisions.

4.0 – Enhance the Indoor Environment

NC&M Criteria 4.1 (Core, S)	Ventilation and Thermal Comfort
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Select ONE of the following options to meet this Guiding Principle.

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 [Enhancing Health with Indoor Air](#) resources on enhancing indoor air quality.
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](#).

Guidance:

The current ASHRAE versions are: 55-2017 and 62.1-2016. 55 defines the acceptable temperatures and 62.1 defines the amount of fresh air exchanges needed for a healthy indoor environment.

BAS should be installed to monitor and offer controls to the heating, air conditioning, and ventilation systems. Consider installing a BAS system in existing buildings to comply with this and GP 1.5.

Suggested Documentation:

Submit calculations from the Engineer of Record that show compliance in the form of air flow calculations, heat loss/heat gain, and equipment sizing to show that the building will meet the requirements.

NC&M Criteria 4.2 (Non-Core, S)	Daylighting and Lighting Controls
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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.

And select ONE of the following options to meet this Guiding Principle.

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.
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](#).

Guidance:

For new buildings, orient on site to allow for passive solar heat gain and daylight distribution. Lighting strategies should include ambient daylighting, glare reduction strategies, task lighting at workspaces, and daylight

Suggested Documentation:

Document that these strategies were used or considered through a narrative of the analysis, or show compliance with the appropriate sections of the 2018 IgCC with

sensors to turn off or dim electric lights. Comply with the following sections of the 2018 IgCC: 2018 IgCC Sections 801.3.7 Glare Control, 801.4.1 Daylighting, 801.4.1.2 Minimum Side Lighting Effective Aperture for Office Spaces and Classrooms, 801.4.1.3 Shading for Offices and/or 801.5.1 Daylight Simulation including 801.5.1.1 Minimum Daylight and 801.5.1.2 Excessive Sunlight. Existing buildings should assess if lighting sensors can or should be added, or if glare or excessive heat gain control is needed. Blinds, shades, exterior louvers, even trellis with deciduous vines can control excessive heat gain. Consider adding skylights if more daylighting is needed.	drawings, specifications, and daylight calculations. For a modernization, document the lighting assessment and any mitigation strategies used. Use narratives, calculations, measurements, daylight modeling, etc. to demonstrate compliance.
NC&M Criteria 4.3 (Non-Core, Std, C/I)	Low-Emitting Materials and Products
Select ONE of the following options to meet this Guiding Principle.	
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.	
2. Conform to 2018 IgCC Section 801.4.2 (8.4.2) Materials or Section 801.5.2 (8.5.2) Materials.	
Guidance: Use low pollutant emitting products (e.g. low VOC, non-toxic, no or low formaldehyde products) whenever possible.	Suggested Documentation: Document the specifications used and products selected.
NC&M Criteria 4.4 (Core, S, C/I)	Radon Mitigation
Select ONE of the following options to meet this Guiding Principle.	
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).	
2. Conform to 2018 IgCC Section 1001.3.1.9 (10.3.1.9) Soil-Gas Control.	
Guidance: Test data from existing buildings show low radon levels, therefore, soil testing prior to construction nor testing after construction is complete will be required.	Suggested Documentation: This has been done by LANL, and no testing will be required by the project.

NC&M Criteria 4.5 (Non-Core, Std)	Moisture and Mold Control
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	
2. Conform to 2018 IgCC Section 801.3.6 (8.3.6) Moisture Control .	
Guidance: While ongoing moisture control, in the form of humidity, in the building may not be an issue for NM, detailing for continuous air and water barriers is important to resilience and efficiency. Also plan to protect materials from water damage during construction to prevent future mold issues. Evaluate existing buildings for leaks and evidence of mold, and make repairs as needed. In existing buildings, protect the existing ductwork from dust/contamination during construction.	Suggested Documentation: Building/wall sections should indicate the water barriers as well as continuous air barriers meeting ASTM E 2178. Use commissioning reports of existing buildings to show that the desired ventilation outcomes have been met and inspections were made for evidence of leaks and mold. Document any ongoing maintenance requirements in an Operations and Maintenance manual.
NC&M Criteria 4.6 (Non-Core, Std)	Indoor Air Quality during Construction
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
1. Develop and implement a plan to protect indoor air quality during construction.	
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 .	
Guidance: The Constructor shall submit and follow a written plan to protect indoor air quality during construction including plans for protecting materials from water damage during construction to prevent future mold issues, and for protecting ductwork from dust and contamination during construction.	Suggested Documentation: Submit the constructors plan or evidence of metrics used to conform to IgCC sections.
NC&M Criteria 4.7 (Core, S, C/I)	Environmental Smoking Control
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	
2. Conform to 2018 IgCC Section 801.3.1.7 (8.3.1.7) Environmental Tobacco Smoke .	

Guidance: Post signage about no-smoking policies at entrances to the building.	Suggested Documentation: No further verification is needed (LANL Policy P909).
NC&M Criteria 4.8 (Core, S, C/I)	Integrated Pest Management
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 SFTool Pest Management resources for additional program guidance.	
Guidance: This criteria is compliant through LANL operations.	Suggested Documentation: No additional verification is needed.
NC&M Criteria 4.9 (Core, Std)	Occupant Health and Wellness
Select ONE of the following options to meet this Guiding Principle.	
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; (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. Health and Sustainability Guidelines for Federal Concessions and Vending Operations where appropriate.	
2. Achieve certification utilizing any Health & Wellness Standards and Rating System identified by GSA, under its authorities per 42 U.S.C. § 17092.	
Guidance: For new construction make stairways visible and consider using open stairwells between intermediate levels,	Suggested Documentation: While 3rd party certifications such as Fitwel or Well Building Standard can demonstrate compliance,

especially when occupants may be part of the same work group and have frequent interaction. Open stairwells, which promote use over elevators, can also be used to daylight the interior of multiple levels. Also consider designs that allow open office space to have views/natural light instead of lining the entire perimeter with private offices. Consider translucent partitions to borrow light from one space to light another while still providing sound and visual privacy, allowing more spaces to benefit from daylighting. Although LANL has food service options, fitness center, and trails available to staff, depending on the distance of the project site from these amenities, satellite areas, or new trails may be provided. Regardless of distance, a break room with a refrigerator, eating area, and sink should be provided. Provide a water bottle refill station if no space for a break room with sink. Install bicycle racks or lockers, and plan for easily accessible routes to existing trails and sidewalks where available. Design showers and/or changing areas in bathrooms, or combined with a lactation/wellness room, for easy mid-day or morning commute exercise. A lactation/wellness room should provide privacy in a lounge area with services such as a work surface and network connections.	verification for this criterion is not necessary. Dining and fitness options are available and flexible workstations purchased institutionally. If the project wishes to document other designs, submit a narrative, photos, specifications, or other construction documents.
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5.0 – Reduce the Environmental Impact of Materials	
NC&M Criteria 5.1 (Core, S, C/I)	Materials – Recycled Content
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.	
NC&M Criteria 5.2 (Core, S, C/I)	Materials – Biobased Content
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 .	
Guidance: Products for construction, building finishes, appliances, landscaping, parks & recreation equipment, safety equipment, grounds maintenance, and more may be required to contain recycled or biobased content. Chapter 14 Attachment 1's "Required Attribute" column indicates the requirement. Utilize the USDA Biobased site to filter for the required Federal products and the EPA CPG Directory for information about comprehensive procurement guideline product categories and subcategories. Compliance is required when the product in question: 1. is reasonably available in a reasonable time frame, 2. meets the performance standard, and 3. is available at a reasonable price.	Suggested Documentation: Submit a list of compliant products for each product category, specifications, and cut sheets. Consider a comprehensive purchasing specification or procurement policy document for the project that will meet several Guiding Principle metrics: ENERGY STAR, FEMP-designated, WaterSense, low emitting, recycled content, biobased content, environmentally preferable, and ozone-depleting compounds.
NC&M Criteria 5.3 (Non-Core, Std)	Products
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
1. Use construction products and building supplies recommended under EPA's Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing, as appropriate and applicable. 2. Conform to 2018 IgCC Section 901.4.1.4 (9.4.1.4) Multiple-Attribute Product Declaration or Certification.	
Guidance: Specify and purchase products that have recommended labels, or use standard specifications to guide in the selection of products.	Suggested Documentation: Submit a list of compliant products for each product category, specifications, and cut sheets. Consider a comprehensive purchasing specification or procurement policy document for the project that will meet several Guiding Principle metrics.

NC&M Criteria 5.4 (Core, S, C/I)	Ozone Depleting Substances
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	
2. Conform to 2018 IgCC Section 901.3.3 (9.3.3) Refrigerants.	
Guidance: Manage refrigerants by avoiding substances that deplete the ozone or that have Global Warming Potential. Refer to ESM Chapter 6, Section D30, 3.1, C and the EPA websites in the resources section for more information. LANL approval of equipment should be obtained: https://int.lanl.gov/services/procurement/designated-procurement-representative/non-catalog.shtml	Suggested Documentation: Provide a copy of approval for refrigerants used in HVAC equipment, ice machines, refrigerators, and ice/water machines. All equipment must be approved by refrig_approval@lanl.gov before purchase and installation.
NC&M Criteria 5.5 (Core, S)	Hazardous Waste
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).	
Guidance: This criteria is not necessarily met through LANL operations, however, Per 20.9.1 NMAC, Construction and demolition debris is not hazardous. If construction will produce hazardous waste, consult a LANL waste management specialist during design to plan for waste disposal.	Suggested Documentation: If no hazardous waste is produced, no further verification is necessary.
NC&M Criteria 5.6 (Non-Core, Std)	Solid Waste Management
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	

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.	
Guidance: Per LANL Policy P409, waste diversion is required at LANL. EPC-ES-GUIDE-016 provides resources for waste prevention. Individual projects only need to provide infrastructure for collection points in and at the building.	Suggested Documentation: Document with building and site plans showing interior and exterior collection points. If collection points are at a nearby building, supply a narrative explaining where collection points are. Waste, including construction and demolition waste, is managed institutionally and no further verification is necessary. HOWEVER, off-site modular or prefabricated construction is an exception. In this case, waste management must be documented by the supplier of the modular building or components of the building to achieve credit. Submit a copy of a waste management plan as well as amounts of waste diverted from landfill for construction, or if no hazardous waste is produced during construction, make note of this on the Guiding Principles checklist.

6.0 – Assess and Consider Building Resilience	
NC&M Criteria 6.1 (Non-Core, S*, C/I)	Risk Assessment
<i>Select ONE of the following options to meet this Guiding Principle.</i>	
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.	
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.	
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, FEMP's Technical Resilience Navigator, or any other Federal agency-developed climate resilience or adaptation planning tools that become available.	
Guidance: A site-wide Vulnerability and Resiliency Assessment and Planning (VARP) is complete. While new buildings were not evaluated, a project can assess the need to design features that will increase resilience from these hazards: Using this process, the VARP identified 141 critical assets and 10 climate change hazards: • Heat wave: Increased average annual temperature • Heat wave: Increased frequency and intensity of extreme heat events • Precipitation: Changes to average and total annual precipitation	Suggested Documentation: No additional verification is necessary for this criteria.

• Precipitation: Increased frequency, intensity and duration of extreme precipitation events • Drought: Decreased water availability • Drought: Increased frequency, intensity and duration of extreme drought events • Thunderstorm: combined precipitation, wind and lightning • Flooding: Increased flooding and erosion events • Wildfire: Increased wildfire frequency • Strong wind: Increased severe windstorm events	
NC&M Criteria 6.2 (Non-Core, S*, C/I)	Building Resilience and Adaptation
Select ONE of the following options to meet this Guiding Principle.	
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.	
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.)	
Guidance: Address any risks within the scope of work and for which there is minimal cost. Create a phased adaptation plan to mitigate risks that are not addressed in a modernization if necessary.	Suggested Documentation: Provide narrative describing the risk assessment and any design features to mitigate risks, and copy of the phased adaptation plan.

Additional Resources

General Information:	https://www.sustainability.gov/ https://www.energy.gov/eere/femp/guiding-principles-sustainable-federal-buildings LANL LCCA: https://engstandards.lanl.gov/esm/general/Ch1-Z10-AttE-R3.pdf and https://engstandards.lanl.gov/Ch14-and-Ch1-LCCA.shtml and email the Utility Resource Management Team about a new LCC Analysis tool coming soon! FEMP LCCA: https://www.energy.gov/eere/femp/building-life-cycle-cost-programs
3rd Party Certification	Green Building Initiative: Guiding Principles Compliance United States Green Building Council: Only available for DOE projects.
Guiding Principle 1: Employ Integrated Design Principles	Commissioning: https://www.energy.gov/sites/prod/files/2014/07/f17/commissioning_fed_facilities.pdf EISA Assessment: https://www.energy.gov/sites/prod/files/2016/09/f33/campus_eisa_assessments.pdf Building Commissioning Association: http://www.bcx.org/
Guiding Principle 2: Optimize Energy Performance	Energy Codes and link to COMcheck: www.energycodes.gov ASHRAE 90.1: https://www.ashrae.org/technical-resources/bookstore/standard-90-1 (The PRM is in Appendix G) ASHRAE 90.1 software tools: https://www.energy.gov/eere/buildings/qualified-software-calculating-commercial-building-tax-deductions equipment: https://energy.gov/eere/femp/search-efficient-technologies-and-products-federal-facilities renewable and alternative energy: https://maps.nrel.gov/femp/ and https://www.nrel.gov/reopt/projects/ and https://reopt.nrel.gov Metering: https://www.energy.gov/femp/metering-federal-buildings
Guiding Principle 3: Protect and Conserve Water	WaterSense: https://www.epa.gov/watersense alternative water sources: https://www.energy.gov/eere/femp/best-management-practice-14-alternative-water-sources planning: http://energy.gov/eere/femp/water-efficiency-federal-buildings-and-campuses and https://www.energy.gov/eere/femp/developing-water-management-plan single pass cooling: http://energy.gov/eere/femp/best-management-practice-9-single-pass-cooling-equipment cooling tower management: http://energy.gov/eere/femp/best-management-practice-10-cooling-tower-management storm water: https://www.epa.gov/greeningepa/stormwater-management
Guiding Principle 4: Enhance the Indoor Environment	ASHRAE: https://www.ashrae.org/ 2018 IgCC: https://shop.iccsafe.org/2018-international-green-construction-coder-igccr-1.html ENERGY STAR: https://www.energystar.gov/buildings/tools-and-resources/energy-star-guide-licensed-professionals daylighting: https://www.wbdg.org/resources/daylighting low emitting products: https://www.epa.gov/sites/default/files/2017-01/documents/how_to_find_compliant_low_emission_products_508.pdf integrated pest management: https://www.epa.gov/ipm/introduction-integrated-pest-

	management indoor air quality: https://store.smacna.org/iaq-guidelines-for-occupied-buildings-under-construction/
Guiding Principle 5: Reduce the Environmental Impact of Materials	Building for Environmental and Economic Sustainability software: https://www.nist.gov/services-resources/software/bees preferable products: https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program and https://www.epa.gov/rcra and http://www.epa.gov/epp/ ozone: https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances and https://www.epa.gov/ghgemissions/understanding-global-warming-potentials and https://www.epa.gov/snap bio-preferred: https://www.biopreferred.gov/BioPreferred/faces/catalog/Catalog.xhtml purchasing: https://www.epa.gov/saferchoice/products and https://www.gsa.gov/governmentwide-initiatives/federal-highperformance-buildings/highperformance-building-clearinghouse/procurement
Guiding Principle 6: Assess and Consider Building Resilience	https://www.nist.gov/topics/community-resilience/planning-guide https://www.epa.gov/greeningepa/facility-resiliency-epa https://trn.pnnl.gov/