LANL 2020 Guiding Principles Handbook
New Construction and Modernization

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). The GP direct new or renovation projects to consider and adopt, when appropriate, the following "green" building concepts: energy and water efficiency; protection of air and water quality; health and wellness of building occupants; facility durability and longevity; waste reduction; and environmentally friendly products. **All new, and modernized* LANL buildings over 5,000 GSF, are required to meet the 2020 GP, per DOE O 430.1C.**

IF the project is unoccupied AND has a projected energy use less than 12.7 kBtu/GSF/year, AND water use below 2 gallons/day - the project may be exempt. OTHERWISE, request a project compliance checklist from site-sustainability@lanl.gov. The existing building checklist differs from the new buildings checklist. If working on a partial renovation project which is less than 5,000 GSF, please request the checklist for existing buildings and work with the Sustainability Program to integrate as many Guiding Principles as possible to make future existing building certification more efficient.

The guidance contained in this document represents the LANL Sustainability 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. Additional guidance about Sustainable Design (SD) can be found in Chapter 14 of the LANL Engineering Standards Manual. For additional assistance, please contact the Sustainable Program at site-sustainability@lanl.gov and include someone from the Sustainability Program on the IPT.

The 2020 GP contain 30 criteria for agencies to assess in order to demonstrate that the building meets the GP. 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, below. 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 qualify as a sustainable Federal building it must 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 green 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 criteria is not compliant. 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 using LEED® v4 for Building Design and Construction (BD+C), Silver Level 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 the building-level statutory and regulatory requirements are met **in addition to the Third-Party Certification.** For more information about alignment of third-party credits with statutory and regulatory requirements, see the crosswalks found on GSA's SFTool: Guiding Principles for Sustainable Federal Buildings. If planning this path for compliance, contact site-sustainability@lanl.gov and a separate statutory/regulatory checklist will be provided for the project. Note that both Green Globes and USGBC (LEED) offer a service to verify the GP. **If a project is required to be LEED Gold, there may be an efficiency in providing all the documentation to USGBC to facilitate certification in both GP and LEED.** Project teams should identify which party is responsible for registering, documenting, and obtaining certifications in the Requirement Criteria Document (RCD).

This is NOT the checklist used to track compliance, but corresponds with the checklist created to track compliance. Notes in purple below each GP are intended to offer explanations and notes in yellow offer ideas about what might be submitted to show compliance. These are suggestions and not necessarily the only items needed nor the only way to show compliance. Photos, pdf drawings, cut sheets, policies, written narratives or reports, are encouraged. Additionally, including a SME from the Sustainability Program is the best way to ensure compliance and documentation.

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

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].

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.

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

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 climate change resiliency. Include a LANL Sustainability Program representative and, if applicable, a LEED Accredited Professional. The IPT should work to find synergy between GPs. 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, 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 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,

Suggested Documentation:

Throughout the project, continue to address GPs 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 an HPSB checklist to the sustainability program. The 60% design should incorporate all sustainable building features. If a Sustainability Program representative is not included on the IPT, email a GP Checklist to site-sustainability@lanl.gov 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 Sustainability 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 compliance 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

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.	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.

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

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:	*Suggested Documentation:*
Generally a project site is determined prior to an A/E or constructor selection process. It can be assumed that LANL planning organizations have followed 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. Alternatively, the project could comply with 2018 IgCC Section 501.3.1 Site Selection and 501.3.2 Predesign Site Inventory and Assessment.	Provide a plan that shows the location of the nearest floodplain, wetland, or endangered species habitats, to show that the project has not been sited in one or address how the design of the site will mitigate the disturbance. Alternatively, drawings or narratives can be submitted that show compliance with the IgCC sections.

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:	*Suggested Documentation:*
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.	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 ISA 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:	*Suggested Documentation:*
Much like site selection, the alternatives available to a project for meeting this criterion may be limited by decisions made prior to the A/E or constructor's involvement. Mission and function may also limit a project's ability to meet some option. Because of recent changes to DOE/NNSA policies, LANL will be adding many Electric Vehicles (EV) to the fleet. To prepare for this, consider installing EV charging. At the least, plan for the need if Fleet vehicles will be parked at the project, by installing conduit and ensuring space in the electrical panel. This alone can save LANL considerable costs in the future. LANL also has alternative fuel vehicles, so providing reserved spaces can meet current requirements, but also be planned for future EV charging spaces.	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. If the project is selecting Option 2 or 3, note the appropriate spaces on the site plan.

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.

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

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:	*Suggested Documentation:*
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 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	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 Federal Energy Management Program (FEMP) commissioning guidance: https://www.energy.gov/eere/femp/commissioning-

testing, provide design basis and design narratives documentation for the O&M Manual, among other responsibilities. To be compliant with the 4-year recommissioning, a building 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 Sustainability program may need to be coordinated, and a plan for O&M OCx should be undertaken.	federal-buildings. Provide a Cx plan, a copy of the construction schedule that includes commissioning activities, and the final Cx report to the Sustainability 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:	*Suggested Documentation:*
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. Be sure the budget includes money for energy modeling, and schedule includes time 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 metric is 2013, however check with the Sustainability Program to verify as updates are expected. The **Performance Rating Method (PRM)** must be used without plug and process loads. A total energy use projection should still include the plug and process loads. 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. Improving the building envelope is almost always LCCE. **NOTE: efficient equipment or appliances** that are required	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 × ((Baseline building consumption − Receptacle and process loads)− (Proposed building consumption − Receptacle and process loads))/(Baseline building consumption − Receptacle and process loads) (which simplifies as follows): Percentage improvement = 100 × (Baseline building consumption − Proposed building consumption)/(Baseline building consumption − Receptacle and process loads). Document the analysis for any energy efficiency choices that were deemed not to be LCCE.

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).	

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:	*Suggested Documentation:*
Before deciding upon a particular method of compliance, email site-sustainability@lanl.gov 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.	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:	*Suggested Documentation:*
Follow LANL ESM and the Metering Program Administrator's direction for appropriate meter types. Be aware that all utility tie-ins shall be approved by the UI FOD, and can be refused if the improvement does not meet minimum LANL standards. **Natural Gas:** LANL shall provide the natural gas design up to and including the building regulator station for installation by the constructor. The gas meter assembly, gas regulator, and the ethernet gateway will be specified by LANL and will require dedicated power and a yellow network drop. LANL shall provide fabrication of the gas regulator, meter assemblies, and perform the final tie-in with all materials provided by the constructor. The constructor installs the gas pipe to within 5 feet of the tie in to the existing gas line and the stub up 1 foot above grade. The natural gas crew builds the regulator/meter station and ties it into the pipeline and facility piping. LANL gas crew performs the final tie in at the existing gas line. **Electric:** The meter and applicable enclosure shall be provided and installed by the constructor. A door-in-door enclosure shall be provided if the meter is planned to be installed outside. If the meter is located on the inside of the building, provide a standard enclosure. LANL UI will program the meter. Include LANL Specification 26 2713 Electricity Metering edited to meet project requirements.	The electrical meter assembly shall be submitted to umetering@lanl.gov for approval. Submit confirmation from UI's Metering Program Administrator 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. Contact site-sustainability@lanl.gov to inquire if the project can be assigned renewable energy generation from an on-site source.]

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

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:	*Suggested Documentation:*
Evaluating options for both Option 1 and 2 is required, so life-cycle cost analysis must be done, and if LCCE, a renewable system must be installed. "Option" 2 is required for new Federal buildings or Federal buildings undergoing a major renovation by EISA 523, *if LCCE*. Therefore, it is **required to assess the use of solar hot water for every project.** FEMP makes it easy: https://www.eere.energy.gov/femp/solar_hotwater_system/ The Sustainability Program may be able to provide the current price of our electricity for analysis, email site-sustainability@lanl.gov 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. *Remember to meter renewable systems separately from the building, so LANL can report and receive credit for renewable energy generation.*	Providing documentation of the LCC analysis for 42 U.S.C § 6834(a)(3)(A)(iii) is **mandatory**, regardless of selecting this criterion as one of the 9 non-core criteria for the project. If purchasing, provide REC certificates stating length of contract and location of generation or LCC analysis showing its effectiveness.

NC&M Criteria 2.4 (Core, S)	Benchmarking

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

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:	*Suggested Documentation:*
New buildings shall install Building Automation Systems (BAS) which allows the UI BAS Team to use SkySpark for continuous building monitoring or Ongoing Commissioning (OCx). Existing buildings should consider adding BAS if feasible.	Advanced or "Smart" Meters will be required for new facilities so that energy and water use data can be collected and reported. If network connections are not feasible in an existing building, make new meters accessible for easy data collection.

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

NC&M Criteria 3.2 (Core, Std)	Water Metering

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

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:	*Suggested Documentation:*
Potable water (excluding fire protection water) shall be metered with an advanced digital meter that requires an Ethernet gateway, yellow net connection, and a dedicated power supply. For more information, see the guidance posted with Chapter 14.	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.

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

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:	*Suggested Documentation:*
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 survive on available rainfall and are adapted in local	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 will be 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 turf (annual period or peak), to show 50% less water use

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.	as described above, AND if the landscape is over 25,000 ft^2, 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

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

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:	*Suggested Documentation:*
Consider 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	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

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 GSA's SFTool 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:	*Suggested Documentation:*
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.	Submit documentation from the Engineer or Architect that shows compliance in the form of air flow calculations, heat loss/heat gain, and equipment sizing to show that the building will meet the requirements. An ENERGY STAR certification can also be used as documentation for an existing building, but this is time

Consider installing a BAS system in existing buildings to comply with this and GP 1.5.	consuming for the project.

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

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:	*Suggested Documentation:*
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 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.	Document that these strategies were used or considered through a narrative of analysis, or show compliance with the appropriate sections of the 2018 IgCC with 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:	*Suggested Documentation:*
Use low pollutant emitting products (e.g. low VOC, non-toxic, no or low formaldehyde products) whenever possible.	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:	*Suggested Documentation:*
Radon levels in a new building must be tested upon completion. Check with the Sustainability Program IPT member to verify if this testing will be completed by LANL. In a modernization levels should be tested prior to the start of construction in case mitigation must be done as part of the scope of work.	Copy of final radon test.

NC&M Criteria 4.5 (Non-Core, Std)	Moisture and Mold Control

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

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:	*Suggested Documentation:*
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.	Building/wall sections should indicate the water barriers as well as air barriers. Use commissioning reports of existing buildings to show that the desired ventilation outcomes have been met 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

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

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:	*Suggested Documentation:*
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.	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

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

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:	*Suggested Documentation:*
Post signage about no-smoking policies at entrances to the building.	Document signage requirement in specifications and drawings.

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

Guidance:	*Suggested Documentation:*
This criteria is compliant through LANL operations.	Make note of the institutional compliance in the GP checklist.

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, following the U.S Department of Health and Human Services (HHS) / GSA *Health and* Designing stairwells as a desirable option for circulation to support active occupants;
(3) 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;
(4) Installing bicycle parking with safe, secure storage;
(5) Providing adjustable-height desks or computer risers for 25 percent of the regular occupied spaces; and
(6) 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. *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, 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.

Suggested Documentation:

To document, consider 3rd party certifications such as Fitwel or Well Building Standard, or demonstrate compliance with a narrative, photos, specifications, or other construction documents.

Document workstation furniture: optional standing desks, standing mats, and active sitting chairs, for at least 50% of the stations, to allow movement while working.

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:	*Suggested Documentation:*
Investigate recycled content products for construction, building finishes, appliances, landscaping, parks & recreation equipment, and more. Utilize biobased products in categories such as construction, safety equipment, grounds maintenance, and more. https://www.biopreferred.gov/BioPreferred/faces/pages/PurchasingBiobased.xhtml lists products and can be filtered for the required Federal products. https://sftool.gov/greenprocurement gives information about all the Federal green purchasing categories, subcategories (look for the **red asterisks which indicate Federal requirements**). https://sftool.gov/greenprocurement/sample-contract-language#cpg has sample contract and specification language that might be helpful. 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.	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

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

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:	*Suggested Documentation:*
Specify and purchase products that have recommended labels, or use standard specifications to guide in the selection of products. https://sftool.gov/greenprocurement gives information	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

about recommended Federal green purchasing categories and subcategories (categories without the red asterisks). https://sftool.gov/greenprocurement/sample-contract-language#cpg has sample contract and specification language that might be helpful.	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 5.4 (Core, S, C/I)	Ozone Depleting Substances

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

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:	*Suggested Documentation:*
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	Provide a copy of approval for refrigerants used in HVAC equipment, ice machines, refrigerators, and ice/water machines.

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:	*Suggested Documentation:*
This criteria is not necessarily met through LANL operations. If construction will produce hazardous waste, consult a LANL waste management specialist during design to plan for waste disposal.	Submit a copy of a waste management plan for construction, or if no hazardous waste is produced during construction, make note of this on the Guiding Principles checklist.

NC&M Criteria 5.6 (Non-Core, Std)	Solid Waste Management

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

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:	*Suggested Documentation:*
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.	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.

6.0 – Assess and Consider Building Resilience

NC&M Criteria 6.1 (Non-Core, S*, C/I)	Risk Assessment

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

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, 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.

Guidance:	*Suggested Documentation:*
A site-wide vulnerability assessment is underway. New projects may be able to use the information for compliance with option 1. Check with the Sustainability	Provide narrative describing the risk assessment and any design features to mitigate risks, a climate resilience plan, and copy of the phased adaptation plan.

Program IPT member for more information. Otherwise, conduct a risk assessment. Utilize and follow the U.S. Climate Resilience Toolkit framework or the NIST Community Resilience Planning Guide.	

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:	*Suggested Documentation:*
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.	Provide narrative describing the risk assessment and any design features to mitigate risks, a climate resilience plan, and copy of the phased adaptation plan.

Resources	
General Information:	https://www.sustainability.gov/ http://www.energy.gov/eere/femp/articles/council-environmental-quality-issues-2016-guiding-principles-sustainable-federal https://www.energy.gov/eere/femp/guiding-principles-sustainable-federal-buildings https://www.gsa.gov/real-estate/real-estate-services/leasing-policy-procedures/green-lease-policies-and-procedures https://www.gsa.gov/about-us/organization/office-of-governmentwide-policy/office-of-federal-highperformance-buildings/policy/highperformance-building-certification-system-review LANL LCCA: https://engstandards.lanl.gov/esm/general/Ch1-Z10-AttE-R3.pdf and https://engstandards.lanl.gov/Ch14-and-Ch1-LCCA.shtml FEMP LCCA: https://www.energy.gov/eere/femp/building-life-cycle-cost-programs
3rd Party Certification	Green Building Initiative: https://www.thegbi.org/guiding-principles-compliance-certification/overview United States Green Building Council: https://guidingprinciples.gbci.org/
Guiding Principle 1: Employ Integrated Design Principles	Commissioning: https://www.energy.gov/sites/prod/files/2014/07/f17/commissioning_fed_facilities.pdf and https://www.gsa.gov/cdnstatic/GSA_Commissioning%20Guide_Sept_2020_Final_0.pdf EISA Assessment: https://www.energy.gov/sites/prod/files/2016/09/f33/campus_eisa_assessments.pdf Building Commissioning Association: http://www.bcxa.org/ https://energy.gov/eere/femp/search-efficient-technologies-and-products-federal-facilities
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://reopt.nrel.gov/projects/ and https://reopt.nrel.gov Metering: http://www.energy.gov/eere/femp/downloads/federal-building-metering-guidance-usc-8253e-metering-energy-use
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: http://www.wbdg.org/resources/daylighting.php low emitting products: https://www.wbdg.org/resources/evaluating-and-selecting-green-products

	integrated pest management: https://www.epa.gov/ipm/introduction-integrated-pest-management indoor air quality: https://www.smacna.org/store/product/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 https://www.epa.gov/greenerproducts/epas-recommendations-specifications-standards-and-ecolabels purchasing: https://www.epa.gov/saferchoice/products and https://sftool.gov/greenprocurement and https://www.epa.gov/greenerproducts/recommendations-specifications-standards-and-ecolabels-federal-purchasing WBDG, Green Specifications: www.wbdg.org/design/greenspec.php
Guiding Principle 6: Assess and Consider Building Resilience	https://toolkit.climate.gov/ https://www.nist.gov/topics/community-resilience/planning-guide https://www.epa.gov/greeningepa/facility-resiliency-epa https://trn.pnnl.gov/ and https://femp.energy.gov/resilience/