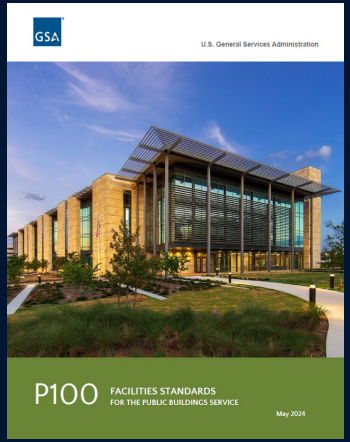
2024 P100 Training



This session is being recorded.

P100 A+E Training Series Ground Rules

- Attendance will be taken automatically; there is no sign-in sheet
- GSA Participants who attend 75% of the session will be provided CLPs
- If you join by phone, please email your name and the phone number you joined with so we can record your attendance. Address email to: mark.kutchi@gsa.gov & benjamin.pisarcik@gsa.gov
- Mute microphone when not speaking
- Use Q & A to ask questions; “raise hand” for urgent questions

P100 A+E Training Series Ground Rules

- Approach each topic in a positive and constructive manner
- Slides and recordings will be made available after the session internally on Insite and publicly on: www.gsa.gov/p100.
- Slides will be added in a few days but recordings will take a few weeks.
- We are starting the meeting recording, please leave the meeting if you do not consent to being recorded.

Training

Sustainability

This session is being recorded.

Presenters

Lance Davis
Sustainability Architect

Ernie Sarino
Sustainability Mechanical Engineer

Walter Tersch
Sustainability Program Manager

01

Significant Changes

02

Performance Table and Attributes

03

Sustainability Requirements

04

Resilience

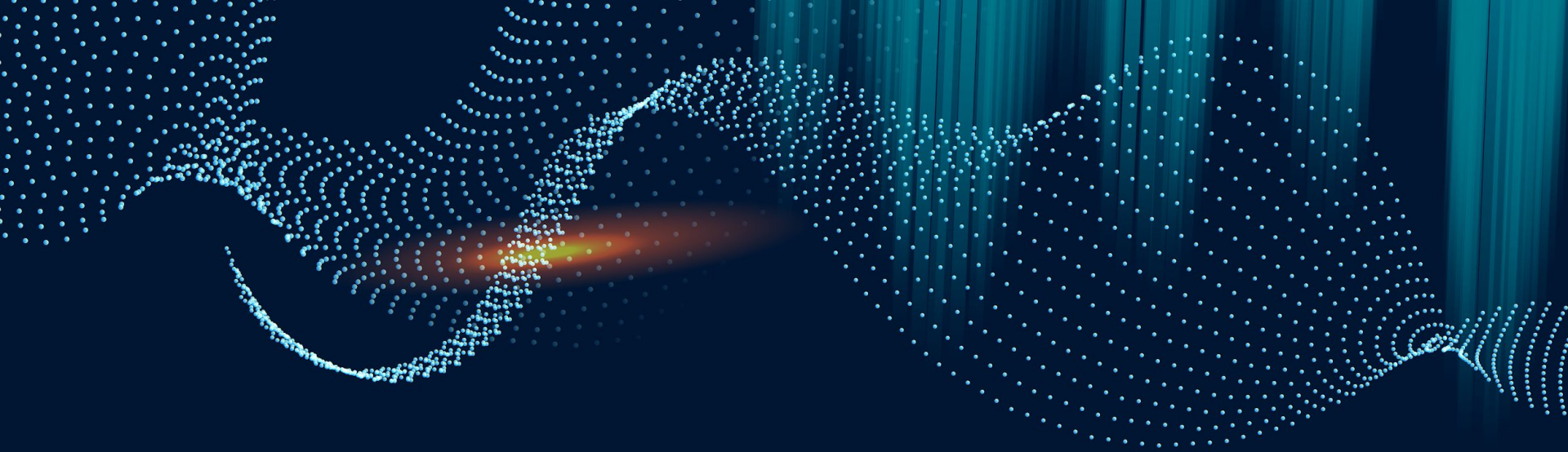
Outline

1. **Significant Changes**
   a. Significant clean up and reorganization of the chapter
      i. Performance table
      ii. Performance Attributes
      iii. Sustainability Requirements

2. **Performance Table and Attributes**
   a. Energy Net Zero
   b. Water Net Zero
   c. High Performance Building Technologies

3. **Sustainability Requirements**
   a. CONSERVATION, EFFICIENCY, RENEWABLES
   b. Guiding Principles
   c. LEED Certification
   d. Decarbonization
   e. Electrification
   f. Energy Usage
      i. EPACT
      ii. Guiding Principles
      iii. Energy Models
   g. Life Cycle Costing
   h. Grid Interactive Efficient Buildings
   i. Waste Net Zero
   j. Sustainable Materials
      i. Regenerative Materials
      ii. Salvaged
      iii. LEC Concrete
      iv. Asphalt
      v. Wood
      vi. PFAS
   k. Sustainable Construction

4. **Resilience**
   a. Risks
   b. Thermal Resilience



01 Significant Changes

Official 2024 P100 effective dates:

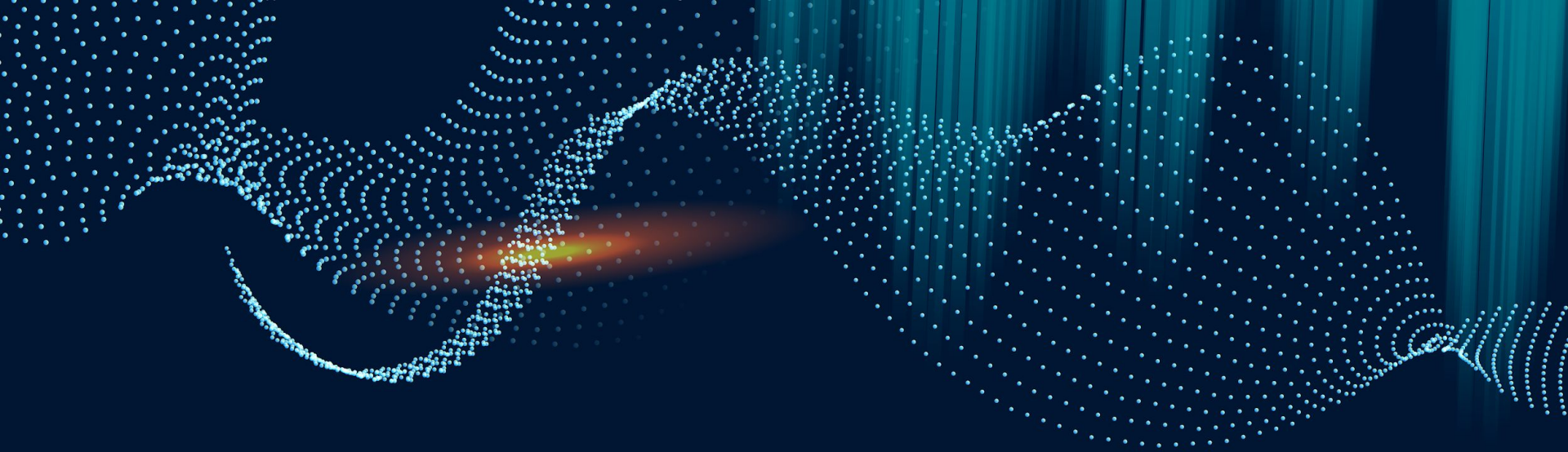
Studies, BER, O&M, repair and alteration, task orders	Prospectus and all other projects
Soliciting for services on or after July 1, 2024	Soliciting for design services on or after Aug 1, 2024

- BIL and IRA majority funded - review for applicability, but not required
- Existing projects can utilize the new standards (“incorporate as feasible”)

Significant Chapter Changes

Consistency, clarity, and ease of use.

- Performance table
- Performance Attributes
- Sustainability Requirements



02 Performance Table

And Performance Attributes

1.9.1.1 and 1.9.2.1 Energy Net-Zero

Energy Net Zero

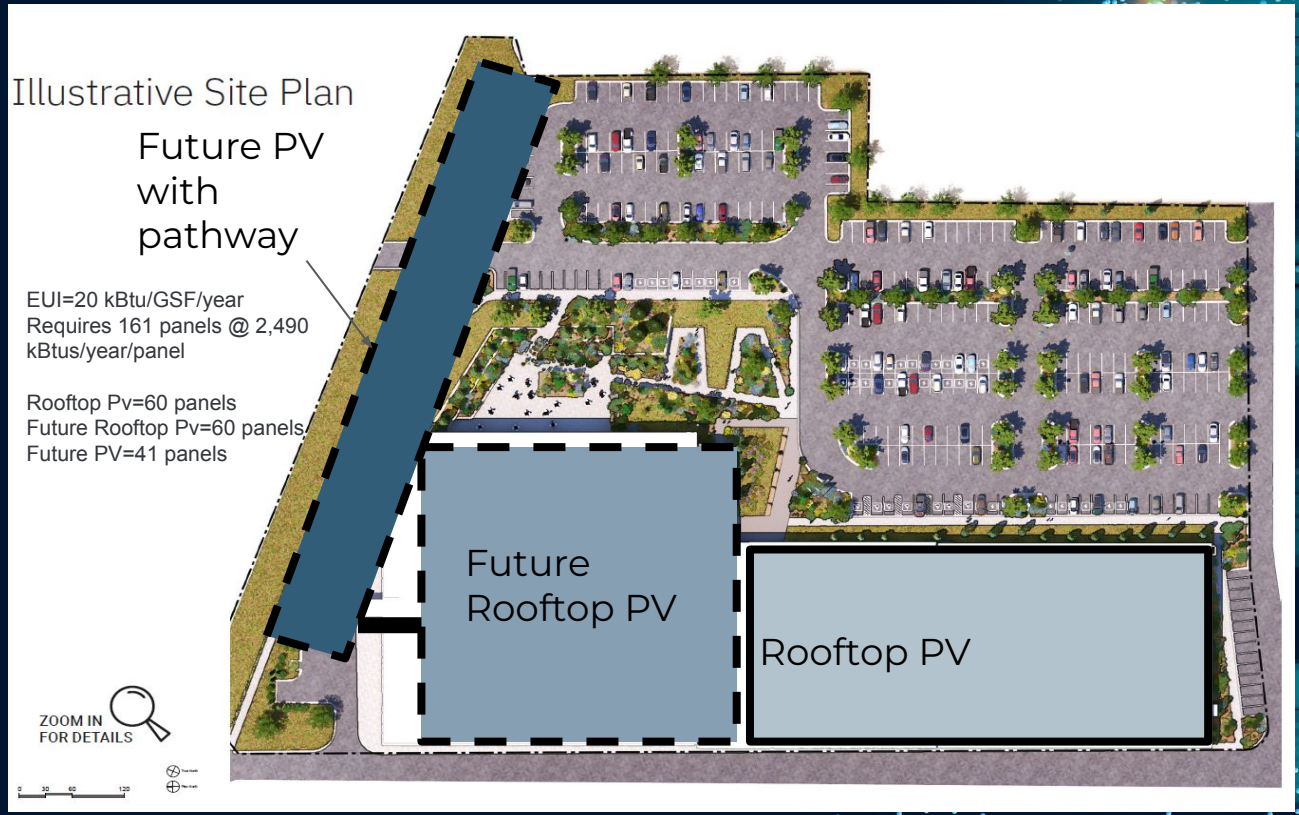
Baseline: Energy Net Zero Ready

Plan and Show Renewables on Plans

Tier 1: 25% Renewables + igCC 7.4.1.1

Tier 2: Tier 1+ 50% Renewables

Tier 3: Tier 1+ 100% Renewables



1.9.1.2 and 1.9.2.2 Water Net Zero

Water Net Zero

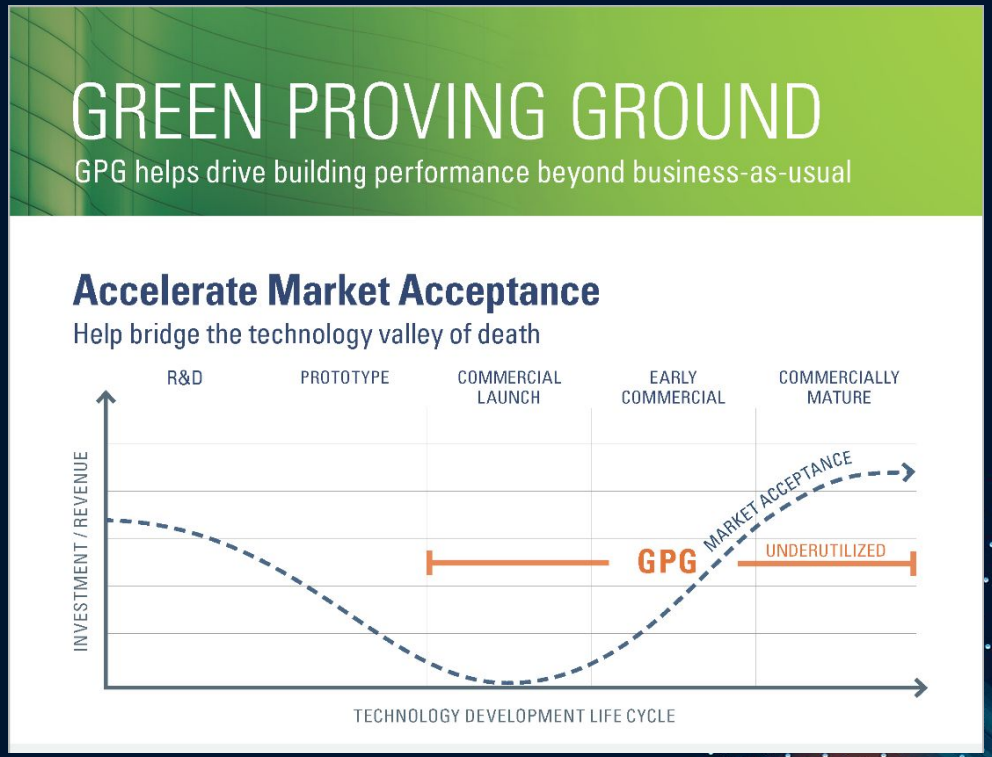
Baseline: New Construction must have 15% potable water reused or infiltrated on site. All projects meet current policies including EISA 438

Tier 1: New Construction increase to 40%; Major Modernization must have 15% water reuse/ infiltration

Tier 2: New Construction increase to 75%; Major Modernization increase to 40% water reuse/ infiltration

Tier 3: New Construction increase to 100%; Major Modernization increase to 75% water reuse/ infiltration

1.9.1.3 and 1.9.2.3 High Performance Building Technology



GPG Pilot to Portfolio Program (P2P) cont'd.

Baseline: Two (2) GPG P2P Technologies

Tier 1: Four (4) GPG P2P Technologies

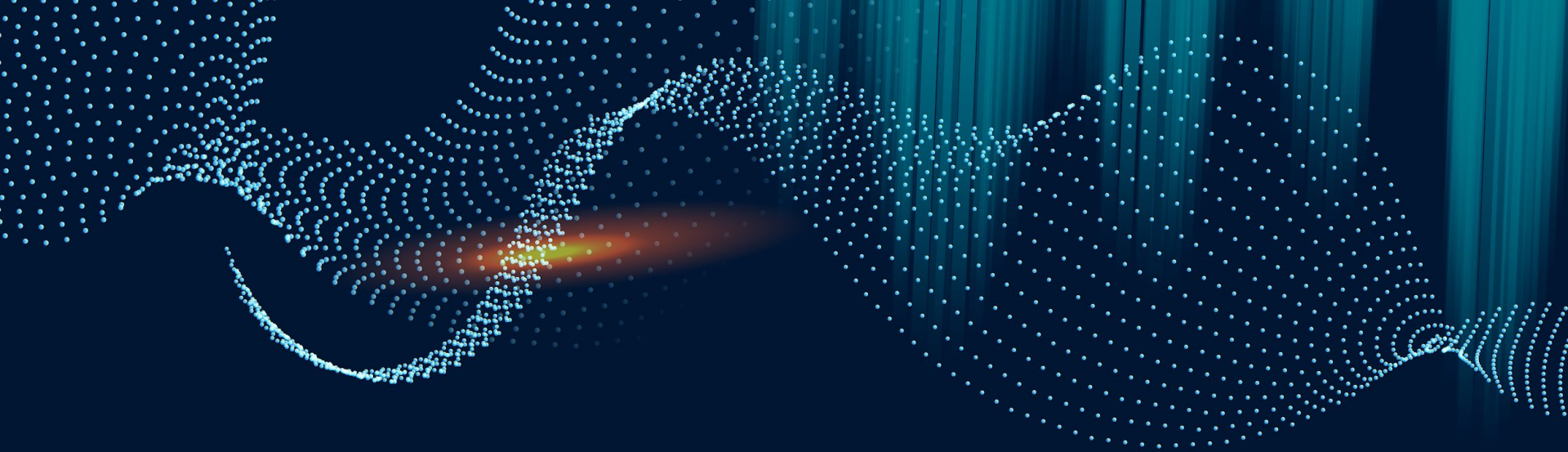
Tier 2: Five (5) GPG P2P Technologies

Tier 3: Six (6) GPG P2P Technologies

www.gsa.gov/gpg

P2P Program Manager:

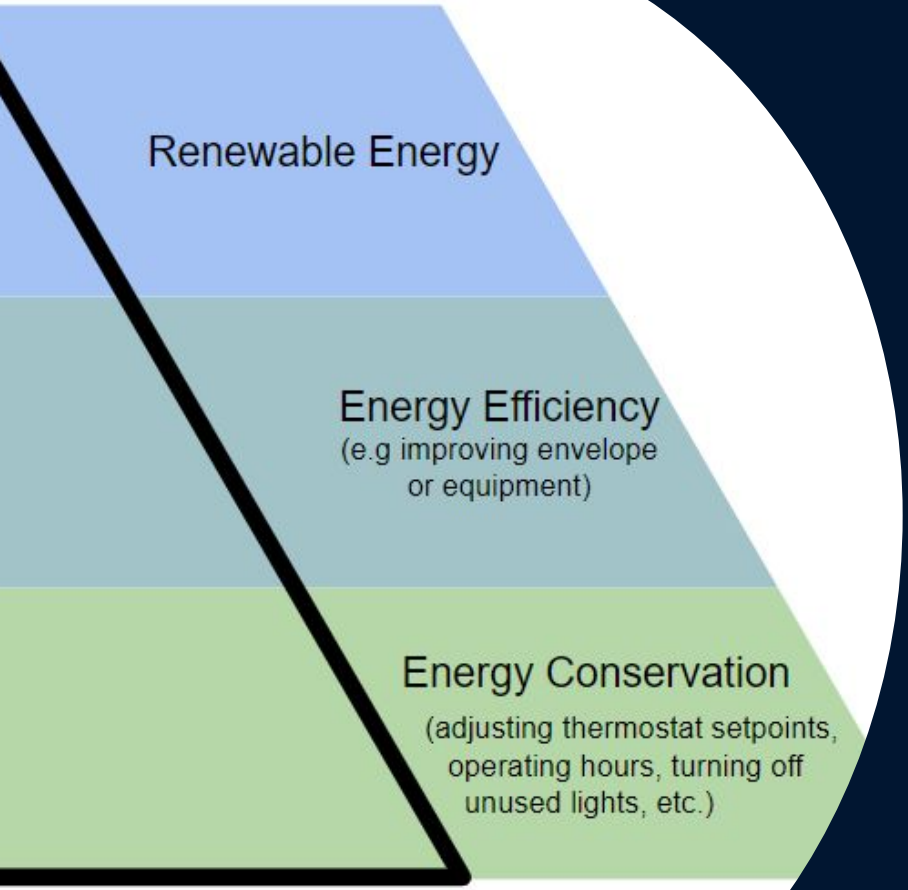
Christie-Anne Edie; Christie.Edie@gsa.gov



03

Sustainability Requirements

Including electrification, life cycle costing, and sustainable materials



1.9.3.1 Conservation is the Foundation

First: optimize daylighting, setpoints, schedules, and enclosure

Next: use technology to maximize benefit from the energy used

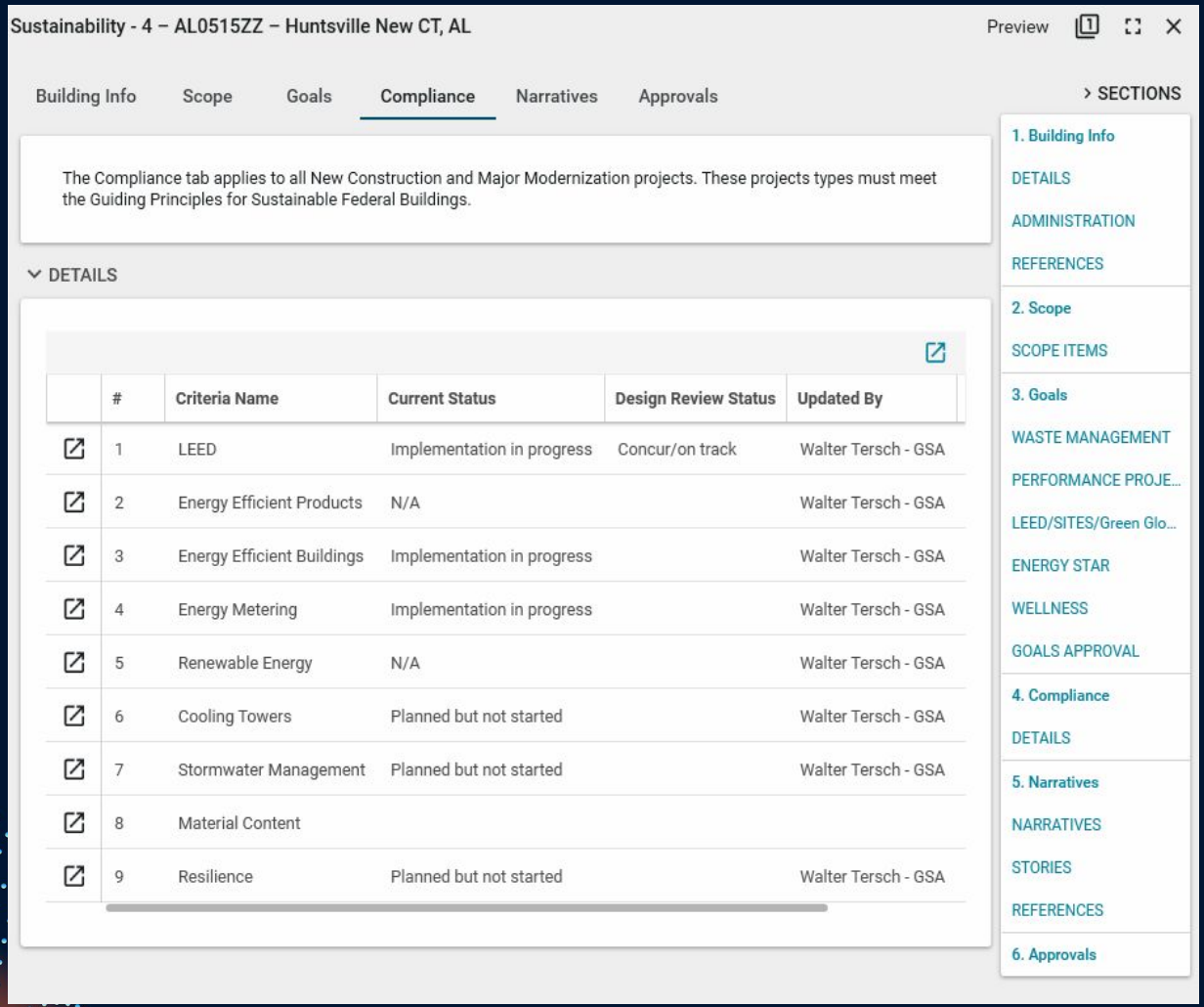
Finally: consider onsite renewables

1.9.3.2 Guiding Principles for Sustainable Federal Buildings

- Help integrate sustainable design best practices into projects starting from concept design through operation
- Required for new construction and major modernization (R&A projects by EO 14057 § 205(c)(iii).

GSA Sustainable Design Checklist

- Leverages LEED certification to lighten the lift
- Is available at gsa.gov/sustainabledesign
- Is populated (along with scope details and performance goals) in GSA's Kahua Sustainability app



1.9.3.3. LEED Certification

LEED Gold has been required since 2010 for all BA51 (new construction) and BA55 (major repairs and alterations that affect a majority of the engineering systems)

- V4 or v4.1 BD+C
- V5 is coming soon (optional but encouraged -- GSA will do a final study)

Limited scope and partial renovation projects should contact central office (LEED Fellow Lance Davis) to discuss the appropriate rating level and system based on project scope before contracting.

Renewable energy credits (RECs) may be used to achieve LEED certification, but must (a) be paid for with project funds; and (b) meet GSA's Carbon Pollution Free Electricity (CFE) requirements (e.g. be a new source and produced on same regional grid where the energy is consumed).

1.9.3.4 Decarbonization

- “The process of achieving a net-zero emissions building or portfolio”
- Requires eliminating scope 1 (onsite combustion) and scope 2 (purchased energy) GHG emissions from building operations by prioritizing **energy efficiency** and **electrification**.
- Can encompass decisions related to the embodied carbon of materials and carbon sequestration
- Evaluate whether high-carbon items like concrete and steel can be replaced with alternate materials that have lower embodied carbon such as wood or biobased materials

Whole Building Life Cycle Assessment (WBLCA)

GSA's Whole-Building Embodied Carbon Reduction measure requires our new construction and major modernization projects to:

1. **Target a 20% reduction in the project's whole-building embodied carbon from materials,** compared to an equivalent conventional building project, using a GSA-approved estimation tool; and

2. Earn at least one **Building Life-Cycle Impact Reduction LEED BD+C: New Construction point**, using *whole-building life-cycle assessment* to conduct cradle-to-grave life-cycle assessment of structure and enclosure. Service life must be at least 60 years.

Resource: SF Tool Decarbonization Module

Building Decarbonization

As the threat of climate change becomes more pressing, a range of strategies are evolving to equip the government and other entities to mitigate the intensity of climate change, while preparing for and adapting to the dangers it creates.

Climate change mitigation refers to measures to reduce the amount and speed of future climate change by reducing emissions of greenhouse gases or by increasing their removal from the atmosphere.[1]

Greenhouse gases (GHGs) trap heat in the atmosphere. They include Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF_6) and Nitrogen Trifluoride (NF_3). They are sometimes grouped together as "carbon" (see "What is the difference between 'Carbon', CO_2, and CO_2e?" below).

Building decarbonization is the process of reducing GHG emissions from buildings, including reduction of GHG emissions from the materials and products used in buildings (embodied carbon) as well as from building operations (operational carbon).

Similar, sometimes overlapping, terms may be used when referring to decarbonization, but they tend to point toward similar strategies that include energy efficiency, the use of renewable energy and other operational carbon pollution-free electricity (CFE) sources, the replacement of fossil fuel combustion equipment with electric models (electrification), and specification of low carbon materials. This module is focused on the decarbonization of federal buildings, through both embodied carbon and operational carbon reduction strategies.

Embodied Carbon ›
The Embodied Carbon page outlines embodied carbon reduction strategies

Operational Carbon ›
The Operational Carbon page outlines building decarbonization strategies

Table of Contents

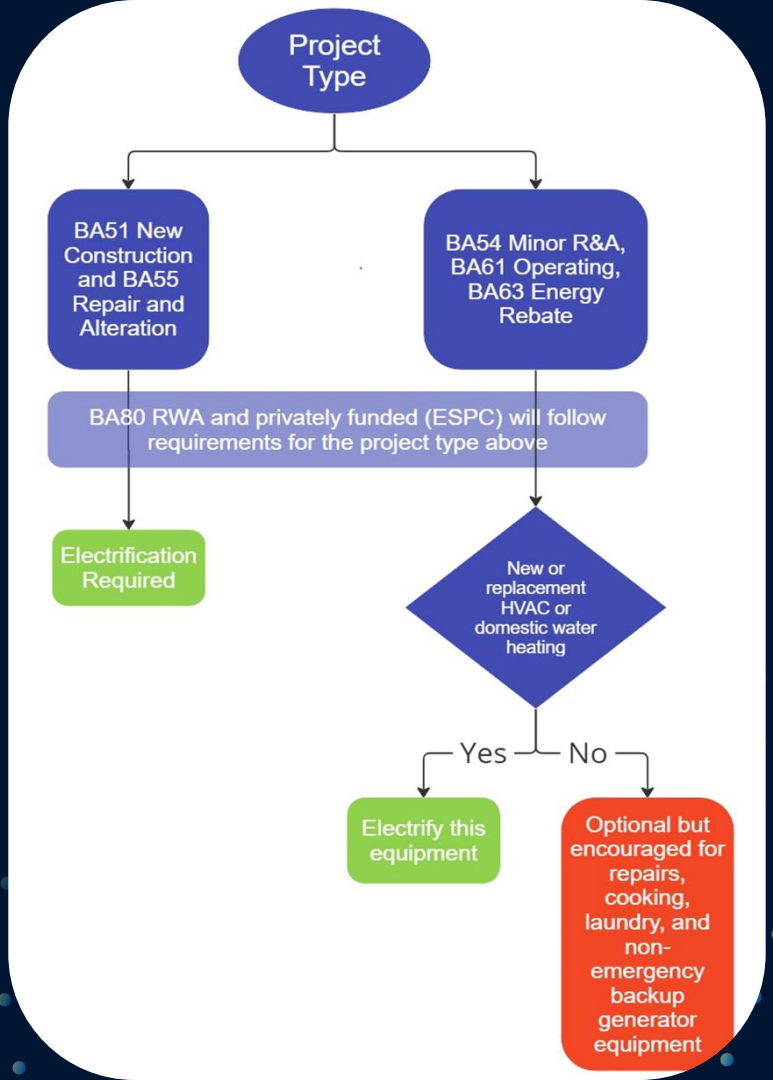
Embodied Carbon Components

Whole Building | Interior

1.9.3.5 Electrification

GSA defines building electrification of its owned inventory as the elimination of emissions generated directly by heating, ventilation, and air conditioning (HVAC), and by domestic water heating, cooking, laundry, and demand-response generators powered on site.

Table 1.2 Electrification			
Project Type Per Funding Code	BA51 New Construction and BA55 Repair and Alteration projects	BA54 Minor Repairs and Alterations, BA61 Operating Funds, and BA63 Energy Rebate Projects	Other funding legislation or sources including BA80 Reimbursable Work Authorization and privately funded projects (e.g. ESPCs)
Electrification	Required	Required for any new or replacement HVAC or domestic water heating equipment. Optional but encouraged for repairs, cooking, laundry, and non-emergency backup generator equipment.	Follow the electrification requirements for the project type (e.g. major R&A or limited scope) that aligns with funded scope


Project Type
BA51 New Construction and BA55 Repair and Alteration
BA54 Minor R&A, BA61 Operating, BA63 Energy Rebate
BA80 RWA and privately funded (ESPC) will follow requirements for the project type above
Electrification Required
New or replacement HVAC or domestic water heating
Yes
No
Electrify this equipment
Optional but encouraged for repairs, cooking, laundry, and non-emergency backup generator equipment

Exceptions Require P100 Waiver!!

- Any fossil fuel equipment when electric required
- Steam, hot water, or chilled water from a primarily fossil fuel source (on or off-site or district)
- Equipment that is not the most life-cycle effective option

Waivers must include:

- Life Cycle Cost Analysis (include heat pump option)
- Confirmation project does not exceed fossil fuel use per 10 CFR 433 subpart B

  (Clean Energy Rule: 90% onsite fossil fuel reduction starting in FY2025, compared to CBECS 2003 baseline)

WAIVER FORM for P100 or GSA PROGRAM REQUIREMENTS

WAIVER #24-20

Building/Project Name_ Mickey Leland Federal Buildings Parking Garage Install EVSE Charging Stations
Building Number_TX0298ZZ
City, State__Houston, TX 77002
Date Submitted _5/9/2024
Project Manager_Ali Barton
Signed regional waivers should be sent to Mark Kutchi, mark.kutchi@gsa.gov

1	**P100 Version (year)**	Click here to enter text.
2	**P100 paragraph/section number (or other GSA program requirement) requesting to be waived**	Section 6.5.7.8 EVSE Last Paragraph page 236
3	**Proposed Waiver**	Envirospark is requesting to install a 1" raceway from the newly installed EVSE dedicated branch circuit panelboard to each EVSE pedestal mounted on the rooftop of the Mickey Leland's Parking Garage. See attached request
4	**Background, Explanation, and Justification for Waiver**	See attached request
5	**Impact on Project's Budget, Schedule, Scope, and Quality if Waiver Is Granted**	No impact on budget
6	**Impact on Project Risk if Granted**	None
7	**Other Supporting Material**	See attached request

GSA encourages Electrification

Some existing projects in ASHRAE zones 6, 7, and 8 may require supplemental fossil fuel for peak heating

1.9.3.6 Energy Usage

Determine a life cycle cost-effective EUI

1.9.3.6.1 EPAct

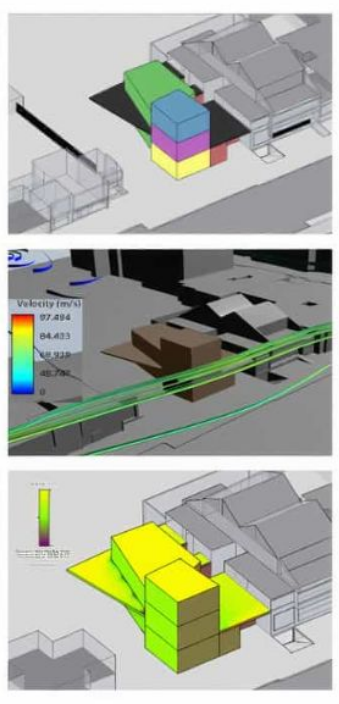
- At least 30% better than ASHRAE 90.1 baseline

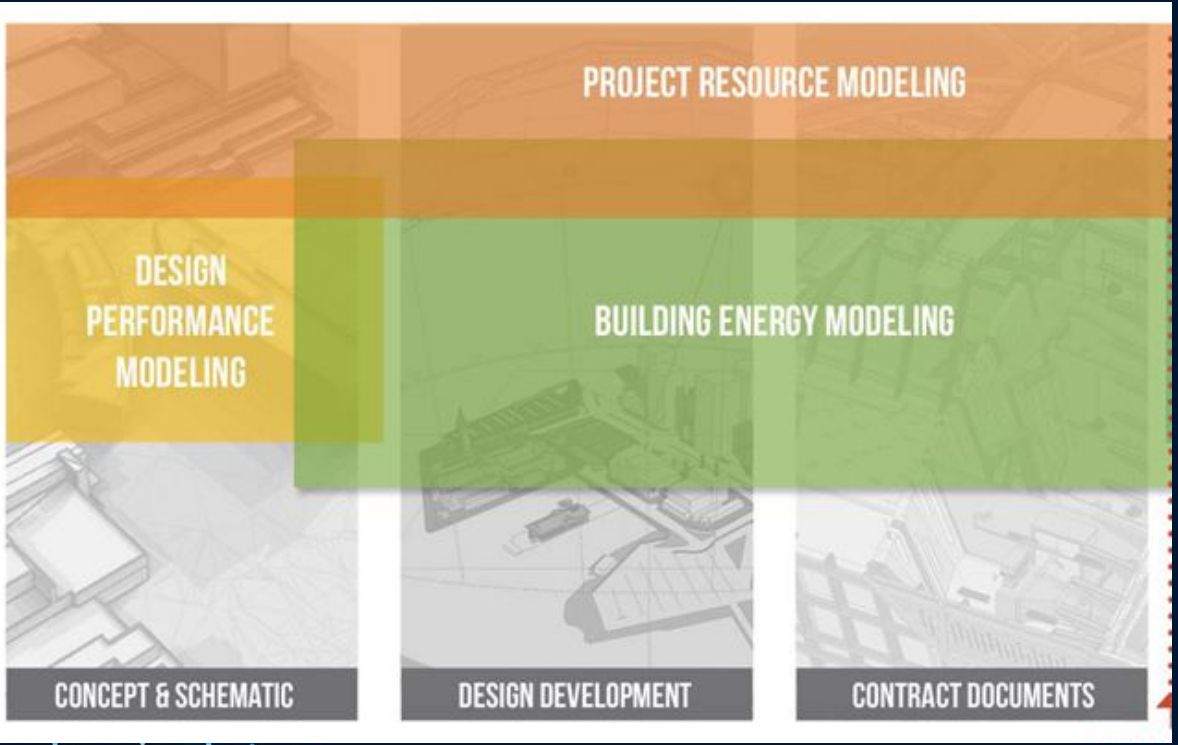
1.9.3.6.2 Guiding Principles

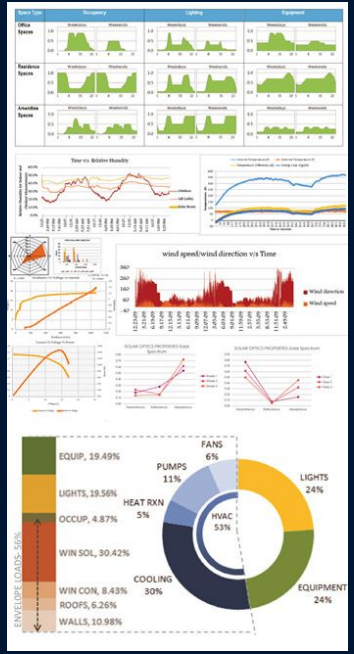
Major repairs and alterations:

- Must use the most stringent option
- May not count previous alterations
- Recommission entire HVAC if improving HVAC

1.9.3.6.3 Energy Models







1.9.3.7 Life-Cycle Costing

Federal facilities must be designed to achieve the lowest life-cycle cost

Reasonable

Define reasonable scope and performance within budget and prospectus

Alternatives

Analyze design alternatives, systems and features

Requirements

P100 Appendix 6 and P120 defines GSA's Requirements

LCC is an economic analysis method

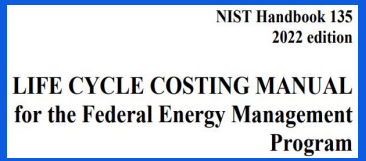
- Required by 10 CFR §436, Subpart A.
- OMB requires for systems that affect energy and water
  - Building envelope
  - Passive Solar
  - Fenestration
  - HVAC
  - Domestic Hot Water
  - Water Reuse
  - Building Automation
  - Lighting

LCC TOOLS

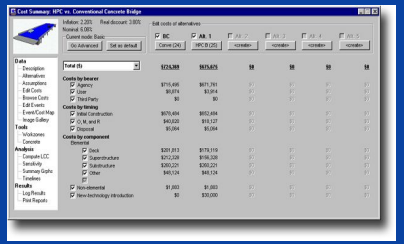
National Institute of Standards and Technology

NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY U.S. DEPARTMENT OF COMMERCE

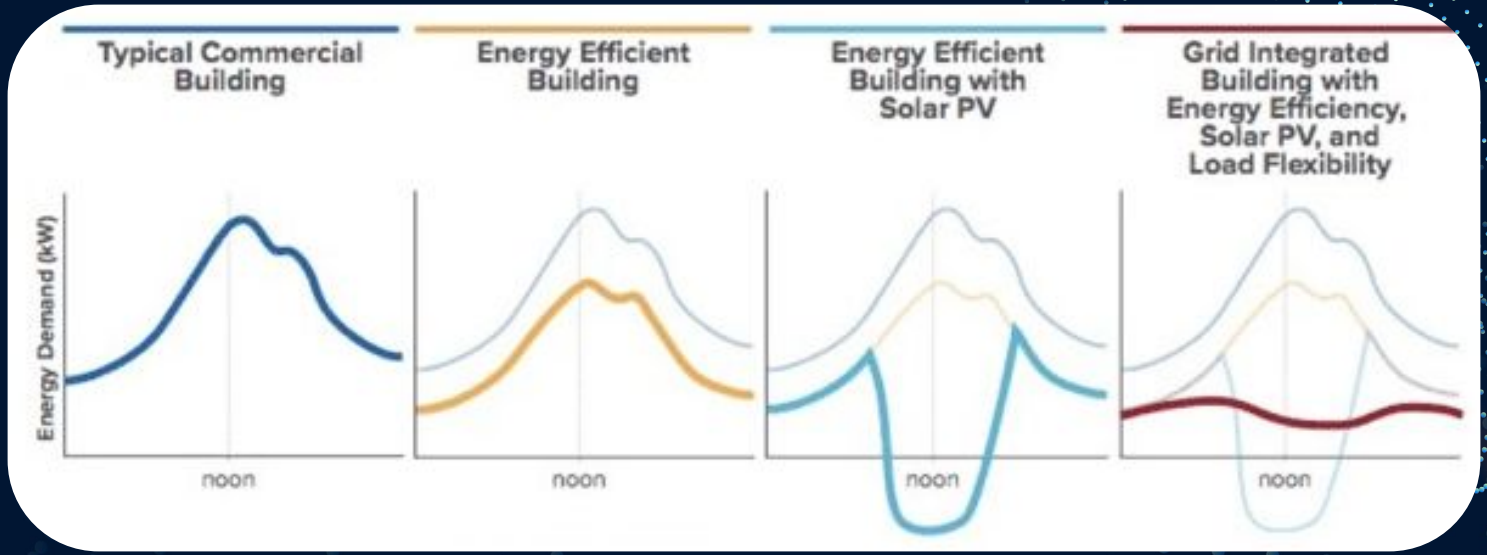
NIST Handbook 135

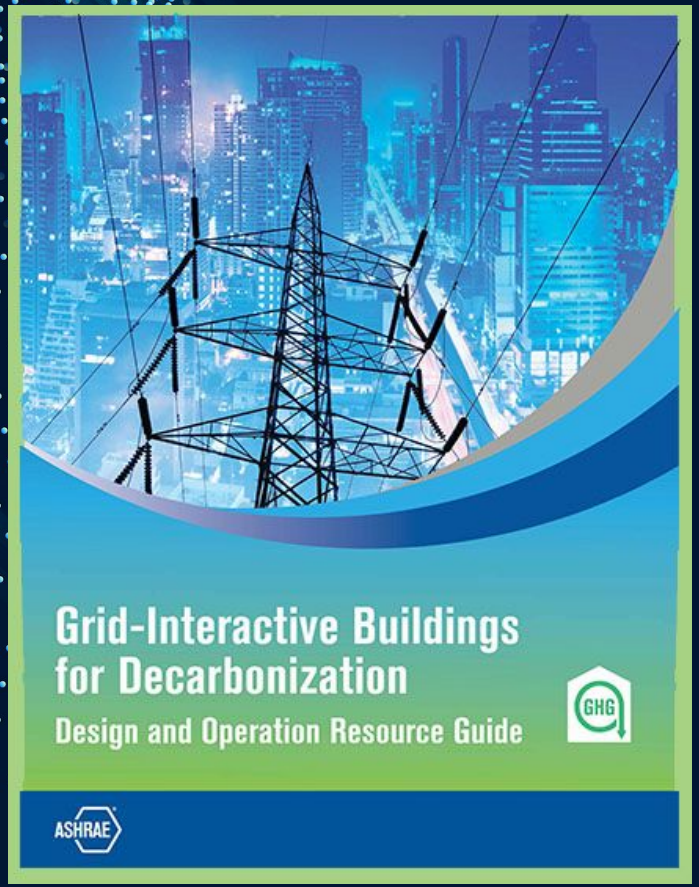


Building Life Cycle Cost Program



1.9.3.8 GRID-INTERACTIVE EFFICIENT BUILDINGS (GEBs)





Incorporate the following:

- GEB Value (e.g. reduced peak demand charges) today and in next 5 years
- Specify GEB functionality
- Engage local utility

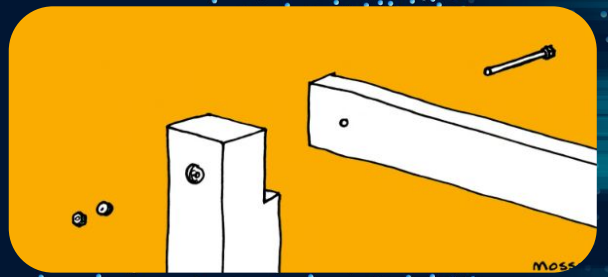
1.9.3.9 Waste Net-Zero

- Develop a solid waste management plan
- Show storage locations
- Look for ways to divert waste
- Show final collection areas
- Ventilation for collection areas

1.9.3.10 Sustainable Materials

Prioritize materials that:

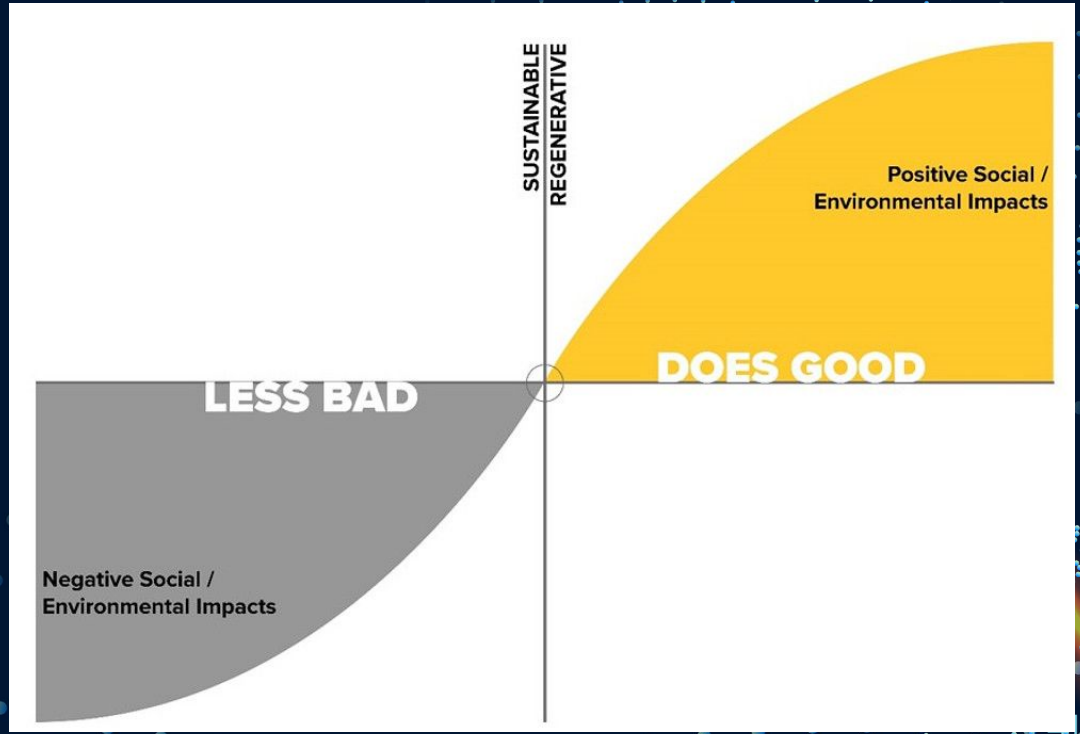
- Durably last a long time, with low maintenance;
- Are made from recycled content and/or are recyclable;
- Can be uninstalled, disassembled, and relocated, in a non-destructive fashion at the end of their first use; and
- Are locally sourced to reduce transport emissions and cost.



1.9.3.10.1 Regenerative Materials

Evaluate materials that reduce negative impacts and support:

- Human health;
- Social health & equity;
- Ecosystem health;
- Climate health; and
- The circular economy.



1.9.3.10.2 Salvaged Materials

Explore partnerships with suppliers and contractors who can take or provide materials that can be reused largely in their original form, as opposed to being processed into recycled content used in manufactured products.

- A reused, salvaged, reclaimed, repaired, refurbished, or remanufactured material/product has substantially lower embodied greenhouse gas emissions if used to displace a new material.

- Assess salvage potential for demolition projects.
  - Any recycling/ scrap proceeds revenue is retained by the contractor, and must be factored into their bids with GSA, to reduce the government's contract cost.

1.9.3.10.3 Low Embodied Carbon Concrete

- Applies to all projects that use at least ten cubic yards of a concrete mix type.
- For concrete purchased using Inflation Reduction Act funding is used, different (overall more stringent) concrete GWP limits apply.
- Environmental product declaration is needed in both cases.

- Waiver requests must include a GWP estimate

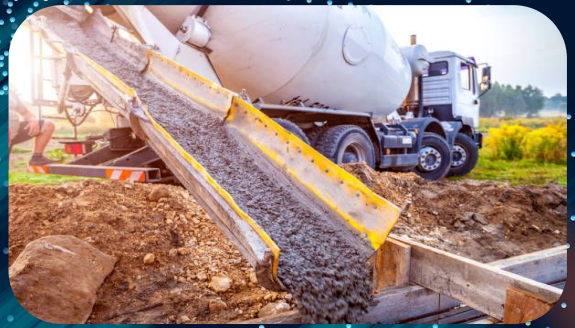


Table 1.3 Low Embodied Carbon Concrete

	Maximum Global Warming Potential Limits for GSA Low Embodied Carbon Concrete (kilograms of carbon dioxide equivalent per cubic meter - CO_2e kg/m3)		
Specified compressive strength (f'c in PSI)	Standard Mix	High Early Strength	Lightweight
up to 2499	242	314	462
2500-3499	306	398	462
3500-4499	346	450	501
4500-5499	385	500	540
5500-6499	404	526	N/A
6500 and up	414	524	N/A
These numbers reflect a 20% reduction from GWP (CO_2e) limits in proposed code language: "Lifecycle GHG Impacts in Building Codes" by the New Buildings Institute, January 2022.			

1.9.3.10.4 Environmentally Preferable Asphalt

- Applies to all projects that use at least ten cubic yards of an asphalt mix type.
  - Inflation Reduction Act-funded purchases of asphalt (or steel, glass, or concrete) are subject to IRA-specific GWP limits.
- Environmental product declaration is needed, plus at least two of the following:
  - 21% or higher reclaimed asphalt pavement (RAP) content
  - Warm mix technology (reduced onsite mix temperature)
  - Non-pavement recycled content (e.g. roof shingles, rubber, or plastic)
  - Bio-based or other alternative binders
  - Improved efficiency of plants or equipment
  - Other environmentally preferable feature or practice
- Waiver requests must include a GWP estimate

1.9.3.10.5 Sustainable Wood/ Responsible Sources

- *New for 2024:* Document that wood used in the project meets responsible sources per ASTM D7612-21 (Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources).

- Responsible sources of forest products are non-controversial sources together with certified procurement systems or from forests managed using responsible practices. Helps select low-risk wood.

- Design teams should consider low risk wood utilizing tools like the *Nature, Economy and People Connected* sourcing hub, where the country has scored 80 or higher. That is advanced by low ratings for both the CITES (Convention on International Trade in Endangered Species) (a) Wild Fauna and Flora and (b) Protected Sites and Species Sub-categories.

1.9.3.10.6 PFAS (Per- And Polyfluoroalkyl Substances)

- Avoid specifying interior finishes, construction materials, and products that contain regulated PFAS substances.
  - Require disclosure of such substances by suppliers (e.g., safety data sheets, product declarations, standards, and certifications).

- P100 prohibits the use of PFAS substances in fire suppression systems, including portable handheld fire extinguishers.

1.9.3.11 Sustainable Construction

Addresses:

- Carbon reduction
- Jobsite wellness
- Waste management
- Water management
- Material selection

Contractors are required to achieve GOOD level

Off-Site Construction

ICC Standard 1200: Planning, Design, Fabrication, and Assembly

ICC Standard 1205: Inspection and Regulatory Compliance

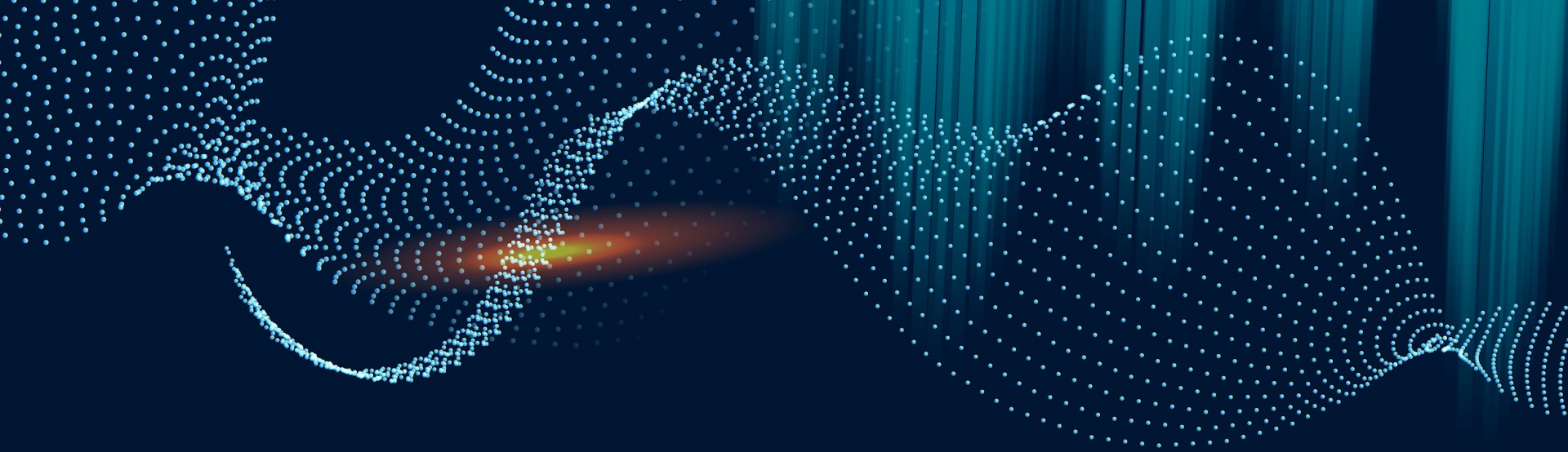
Other Construction Requirements

Construction and Demolition Waste

Divert at least 50% of non-hazardous C&D waste, and look for salvage options (1.9.3.11.3)

Green Credentialed Construction Personnel

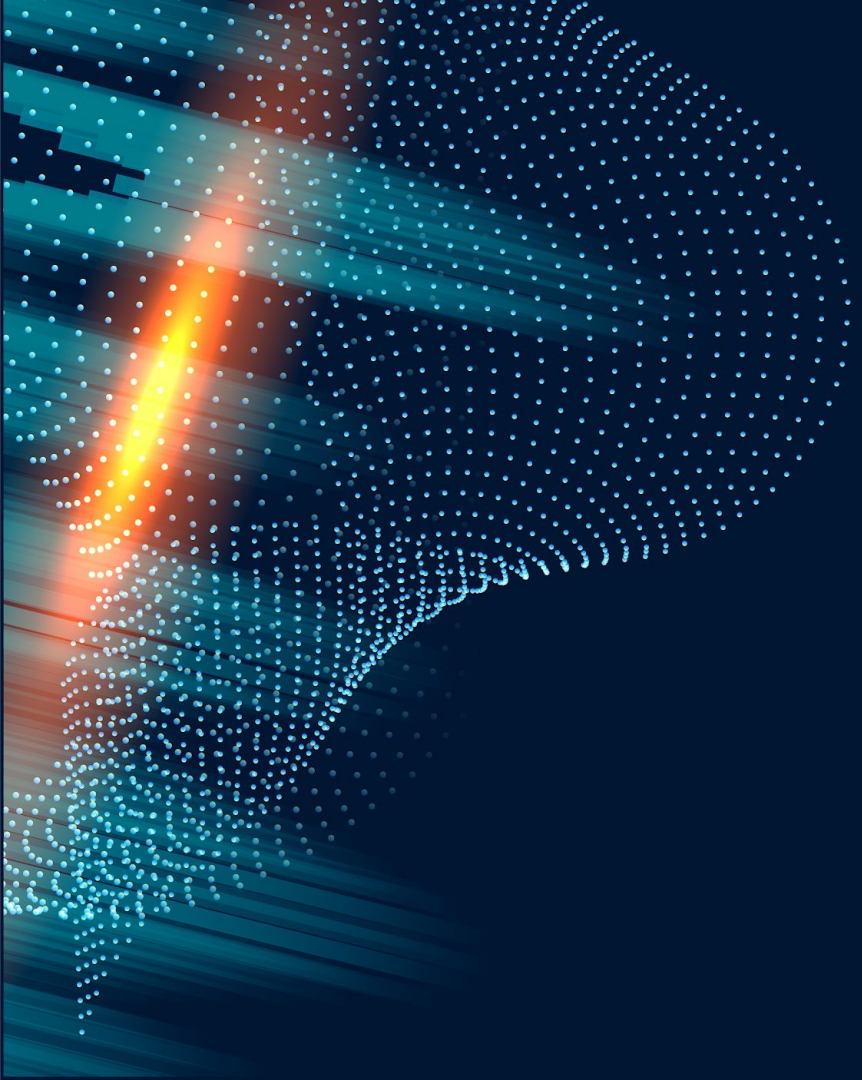
Certify construction personnel with a consensus standard



04 | Resilience

1.10.1 Managing Climate Related and Extreme Weather Risks

- Integrate observed and expected changes in climate for the asset's life
- Safeguarding assets is an iterative risk management process
- Manage energy and water surety during extended disruption
- This work requires Professional judgement and recommendations



1.10.2 Thermal Resilience

Mission Critical Facilities

- Support mission continuity in both observed and expected extreme climatic conditions
- May require thermal autonomy and passive habitability

Summary

1. **Significant Changes**
   a. Significant clean up and reorganization of the chapter
      i. Performance table
      ii. Performance Attributes
      iii. Sustainability Requirements

2. **Performance Table and Attributes**
   a. Energy Net Zero
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4. **Resilience**
   a. Risks
   b. Thermal Resilience

Questions

Contact speakers at:

- Lance Davis - lance.davis@gsa.gov
- Ernie Sarino - ernesto.sarino@gsa.gov
- Walter Tersch - walter.tersch@gsa.gov