



P100 2021

The Facilities
Standards for the
Public Buildings
Service

Training





General Requirements

1

GENERAL REQUIREMENTS



Figure 4: Sydney R. Yates
Federal Building
Washington, DC

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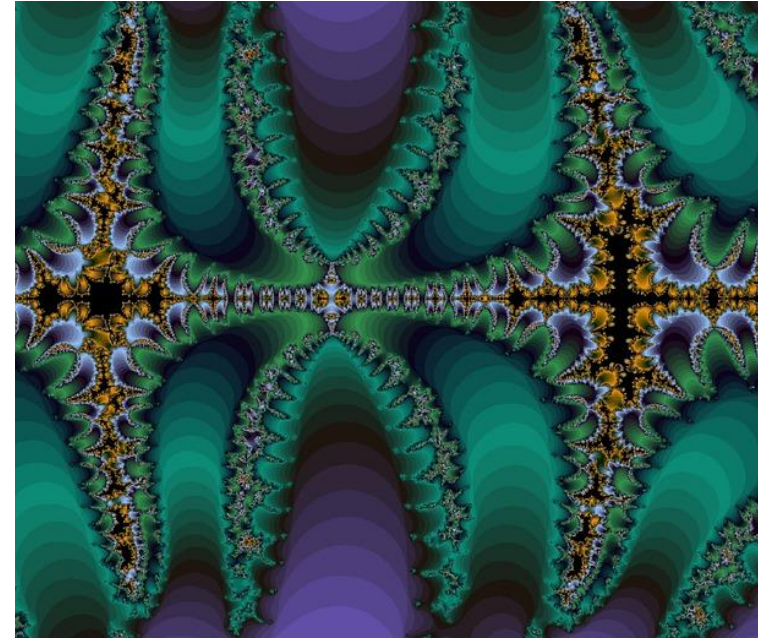
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A grab bag of requirements

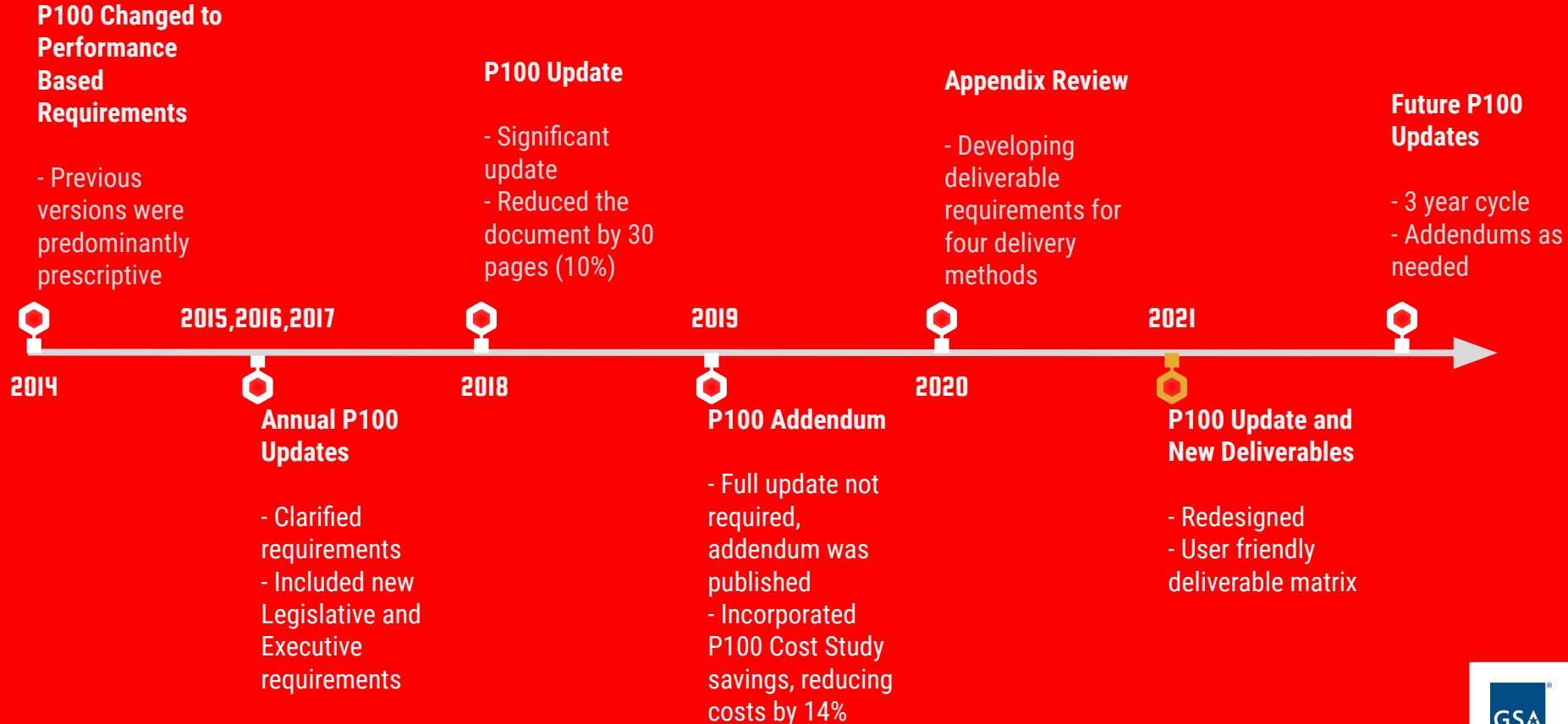
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01 P100 Process

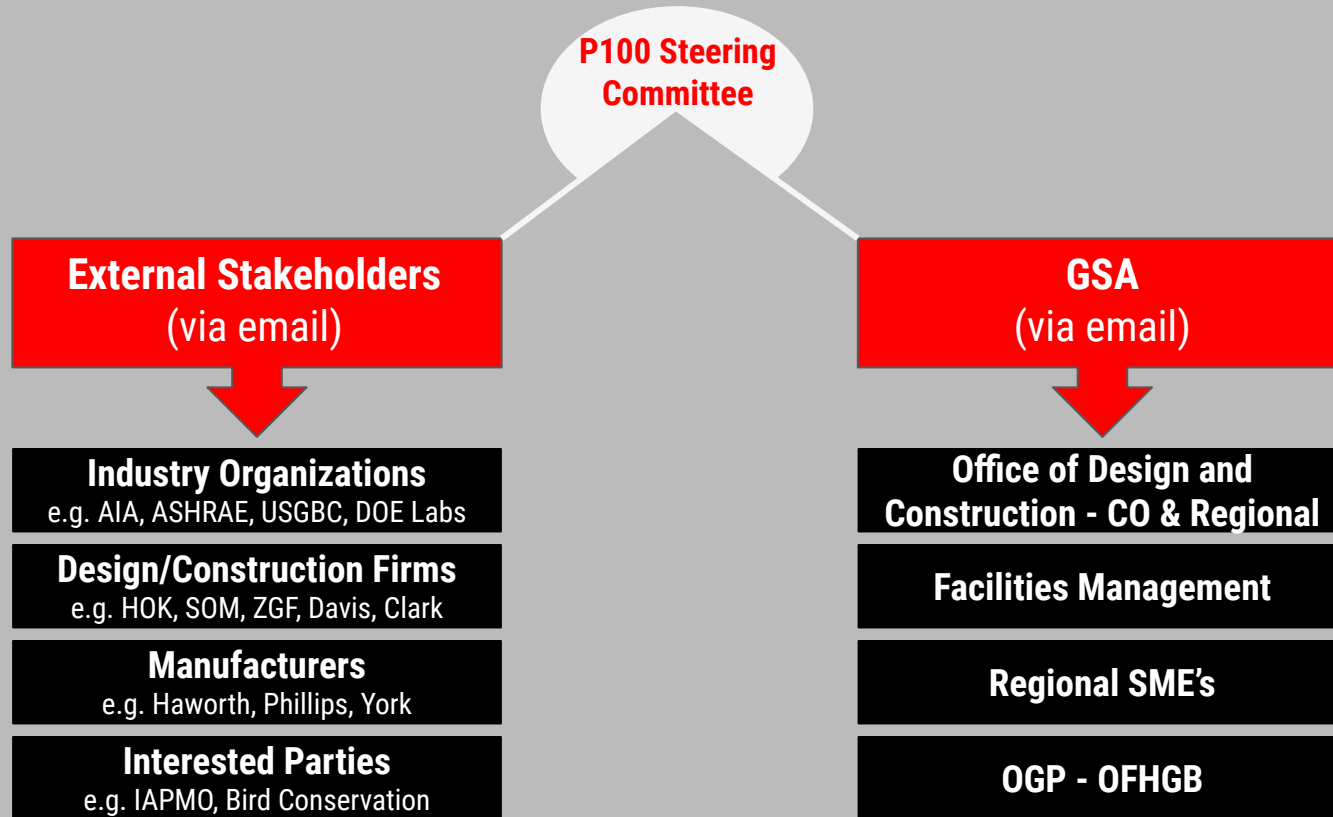
How is the P100 edited?



P100 Update History



P100 Change Request Call Distribution



P100 Annual Revision and Publication Process





2021 P100 UPDATES

What is in the latest version

Change Proposals and Updates

Sustainability

- Clarified the role of the commissioning agent to ensure that Total Building Commissioning is executed correctly
- Updated the Waste Net 0 requirements to address collection and ventilation
- Updated the energy use targets to include the GSA Energy Use Target Guidance
- Updated the requirements for the Guiding Principles Optimize Energy to require the most stringent option
- Major overhaul of the Landscape performance requirements to better address sustainability
- Updated requirements in the enclosure performance tables to better address sustainability
- Updated the use of the P100 performance matrix to ensure project managers are utilizing P100 requirements and achieving sustainable performance

Building Enclosures

- Updated requirements for enclosure air tightness of all six sides of a building
- Updated requirements for enclosure thermal performance to better address thermal breaks and dew point
- Updated building enclosure commissioning to better address commissioning agent requirements and new standards

Workplace and Interiors

- Updated the acoustic performance of spaces to the latest information in the IGCC (International Green Construction Code)
- Updated many interior material choices to new sustainable standards and the IGCC
- Updated and clarified requirements for workplace performance

Mechanical, Electrical and Plumbing (MEP)

- Updated plumbing performance requirements to the IGCC
- Updated lighting performance requirements to better address the quality of light, circadian rhythm, controls and efficiency
- Updated EV requirements to address accessibility

Executive Orders and Legislation

Executive Orders
on sustainability
and climate
including
EO14008 and
13990

Energy Act of
2020 rebates

Energy Act of
2020 electrical
updates



NEW SECTIONS

Covid and IAQ
Improve safety and maintenance

Key Sustainable Products
Better address purchasing and carbon

Building Decarbonization
Introduced carbon and its reduction

Green Roofs
Updated requirements per IG audit

Energy Models
Expanded use of early modeling

Civil Design
Focused on flooding and geologic hazards

Bird Safe Design
New industry standard

Designing for Daylight
All requirements in one place

Operational Excellence
Require the use of operational design guide

Resiliency
Better planning for events

New Style Format

CHAPTER 1 • GENERAL REQUIREMENTS

The A/E must specify that operation and maintenance manuals be provided in electronic format (MP4 files) with training videos for the startup and maintenance of all major equipment. Training videos must include the detailed instruction of all operational and maintenance aspects of any new Building Automation System software. See the GSA Commissioning Guide for additional information.

At the conclusion of design, the A/E must provide an electronic document describing the design intent for all building systems. These instructions must be developed during the design phase and incorporated into the comprehensive training for operations and maintenance personnel.

1.9 SUSTAINABILITY

Sustainability is the conditions under which humans and nature can exist in productive harmony, and that permit fulfilling the social, economic, and other requirements of present and future generations.

Sustainable design seeks to ensure that future generations are not disadvantaged by the depletion of natural or nonrenewable resources by the current generation.

1.9.1 SUSTAINABLE PERFORMANCE TABLE

Energy	
Energy Net-Zero	
Baseline	Designs must be Energy Net-Zero ready on a source energy basis with onsite renewables that are designated on the plan for future installation including pathways, conduits, or other means of getting the power in the building.
Tier 1	Designs must be Energy Net-Zero ready with 25% onsite renewables installed and the remainder designated on the plan for future installation. At a minimum, comply with IGCC-2018 Section 701.4.1.1 (7.4.1.1) On-Site Renewable Energy Systems, however Exception 2 shall not apply.
Tier 2	Tier 1 + 50% onsite renewables installed.
Tier 3	Tier 1 + 100% renewables installed.
M & V	Report the projects ongoing energy performance in a sustainability benchmarking platform
Plans & Specs	Y
Calculations & Analysis	Provide 90.1 Appendix G energy model and calculations for proposed and installed renewable energy.
References	
Basis of Design	Show project is energy net-zero ready, on a source energy basis, and achieves actual annual delivered energy less than or equal to the on-site and/or proposed renewable exported energy.
Construction Verification	CX agent to confirm installed renewables supply the required power to meet the high-performance tiers.
Water	
Water Net-Zero	
Baseline	Meet current policy including EISA sec. 438.
Tier 1	Designs must be Water Net-Zero ready with 50% potable water returned to the original water source on site.
Tier 2	Designs must be Water Net-Zero ready with 75% potable water returned to the original water source on site.
Tier 3	Comply with IGCC-2018 Chapter 6, Water Use Efficiency. In addition, all sites shall comply with Section 501.3.4.1 (5.3.4.1) Projects on Greenfields.
M & V	Report the project's ongoing water performance in a sustainability benchmarking platform
Plans & Specs	Y
Calculations & Analysis	Provide calculations for water-use baseline. Show all methods of water conservation, reuse, and the amount of water returned to the original water source.

CHAPTER 1 - GENERAL REQUIREMENTS

generation. Sustainable designs follow an integrated, systematic approach, in which all phases of the facility lifecycle are considered. Following sustainable design principles (efficient building performance, promote the health and comfort of building occupants, minimize environmental impacts, and support natural resource availability). The result must be an optimal energy of cost, environmental, societal, and human benefits while meeting the mission and function of the intended facility or infrastructure. Subsequent chapters of the P100 include requirements and recommendations to meet these objectives.

The essential principles of sustainable design and development are:

- Optimize the potential
- Minimize nonrenewable energy consumption
- Protect and conserve water
- Use environmentally preferable products and resources
- Enhance indoor environmental quality
- Optimize operations and maintenance practices

These principles must serve as the basis for planning, programming, design, building, construction, commissioning, operation, maintenance, and disposal of all new facilities, major renovations, and existing building

alternatives. These principles must be applied as appropriate to every project phase. Applicable strategies and opportunities to improve sustainable performance must be included in all projects. New construction and major renovations of GSA buildings, as well as appropriate work on existing GSA buildings, must comply with the Guiding Principles for Sustainable Federal Buildings. Strategies to meet the Guiding Principles are included in each appropriate chapter of the P100. For the best guidance on implementing the Guiding Principles, see www.sustainability.gov/resources.html.

1.7.1 LEED CERTIFICATION

Through rigorous design and application of sustainable design principles, all new construction projects and substantial renovations must achieve, at a minimum, a Gold rating through the certification in Energy and Environmental Design (LEED) version 4 Green Building Rating System of the U.S. Green Building Council. GSA uses LEED to measure and quantify building performance achievements in relation to its lifecycle and goals. Federal LEED credits that align with the Guiding Principles for Sustainable Federal Buildings and are appropriate to the goals of GSA and the type of project being designed. For more information, see GSA's Guiding Principles Checklist at www.gsa.gov/USGSustainability.

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CHAPTER 1 - GENERAL REQUIREMENTS

1.7.3 SUSTAINABLE PERFORMANCE REQUIREMENTS

Baseline	Tier 1	Tier 2	Tier 3	M & V	Plans & Specs	Calculations & Analysis	References
Designs must be Energy Net-Zero ready on a source energy basis with onsite renewables that are designated on the plan for future installation including pathways, conduits, or other means of getting the power in the building.	Designs must be Energy Net-Zero ready with 25% onsite renewables installed and the remainder designated on the plan for future installation. At a minimum, comply with IGCC-2018 Section 701.4.1.1 (7.4.1.1) On-Site Renewable Energy Systems, however Exception 2 shall not apply.	Tier 1 + 50% onsite renewables installed.	Tier 1 + 100% renewables installed.	Report the project's ongoing energy performance in a sustainability benchmarking platform	Y	Provide 90.1 Appendix G energy model and calculations for proposed and installed renewable energy.	
Show project is energy net-zero ready, on a source energy basis, and achieves actual annual delivered energy less than or equal to the on-site and/or proposed renewable exported energy.	CX agent to confirm installed renewables supply the required power to meet the high-performance tiers.						
Meet current policy including EISA sec. 438.	Designs must be Water Net-Zero ready with 50% potable water returned to the original water source on site.	Designs must be Water Net-Zero ready with 75% potable water returned to the original water source on site.	Comply with IGCC-2018 Chapter 6, Water Use Efficiency. In addition, all sites shall comply with Section 501.3.4.1 (5.3.4.1) Projects on Greenfields.	Report the project's ongoing water performance in a sustainability benchmarking platform	Y	Provide calculations for water-use baseline. Show all methods of water conservation, reuse, and the amount of water returned to the original water source.	

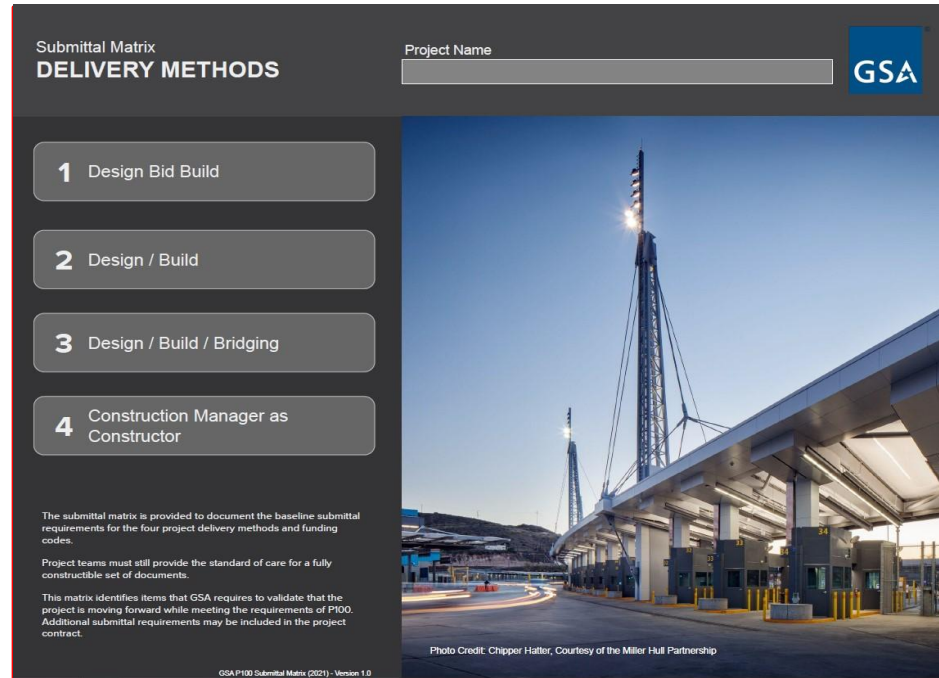
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P100 SUBMITTAL MATRIX

New user friendly matrix that shows the deliverables for each delivery type and phase.

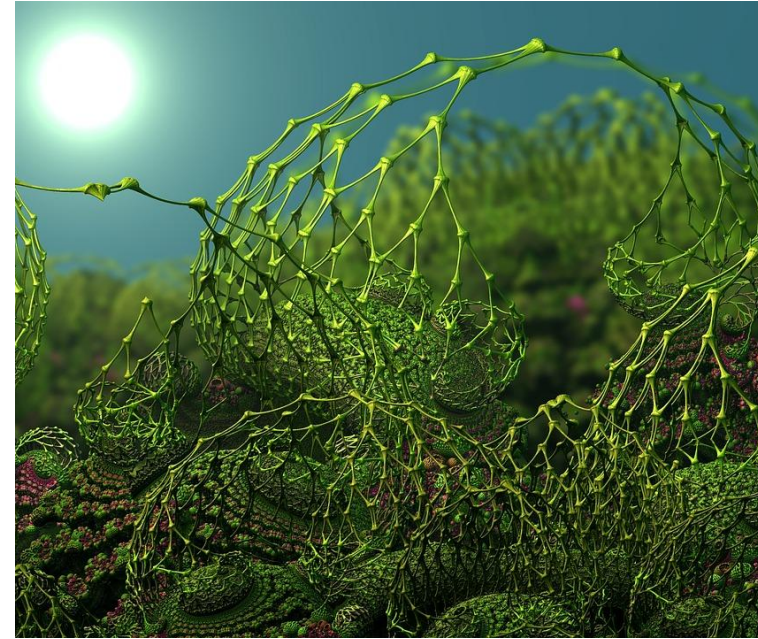
P100 and submittal matrix can be found at www.gsa.gov/p100



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02 Application

Who uses P100 and why?



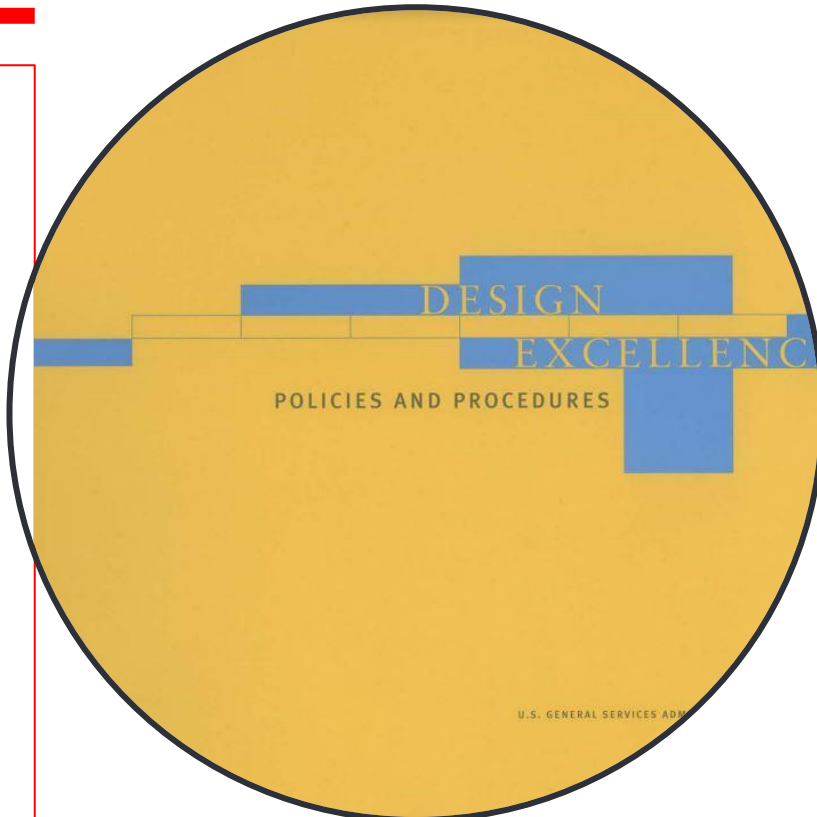
P100 is Mandatory

**Not a guide, textbook, handbook,
manual, nor a substitute for
technical competence**

WHAT GSA PROJECTS USE P100?

BA51	New Construction	YES
BA54	Minor Repair and Alteration	YES
BA55	Major Repair and Alteration	YES
BA61	Building Operations	YES
BA64	Historic Preservation	YES
BA80	Reimbursable Work Authorization	YES
ESPC	Privately financed projects such as an Energy Savings Performance Contract	YES
Lease Construction	Facilities that the Government Intends to Own or has an Option to Purchase	DEPENDS
Leases	Leases	NO

Design Excellence



P100 requires prospectus level projects to use Design Excellence Policy and Procedures

How do I use P100 for a renovation, small project, or limited scope?



**P100 applies to the new work.
“If you touch it, it must meet
P100”**

Review the codes to determine if the entire building or system must be brought into compliance.

Waiver

Written request signed by the Regional D&C Director and approved by the Office of Design and Construction.



Each waiver can take up to 15 working days to approve.
Must be submitted **BEFORE** concept submission.

1.2.4 Deviations from P100

**Alternative
and
Equivalent
Compliance**
Used for Fire
Protection.

**Metric
Waiver**
See GSA
Metric Order,
GSA Metric
Program, for
guidance

**Modification
of ABAAS**
Architectural
Barriers Act
Accessibility
Standard
changes must
be approved
by the PBS
Commissioner

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03

Laws/Codes

How are the rules incorporated?



Federal Laws, Regulations, and Standards

Public Buildings Amendment

Comply with a nationally recognized model building code.

National Historic Preservation Act

Utilize historic properties and follow section 106 process.

03

Laws/Codes

Environmental Protection

Comply with Federal environmental laws. GSA policy is voluntary compliance for State and local laws.

ABAAS

The Architectural Barriers Act Accessibility Standard is mandatory.

Energy Act of 2020

Pursue rebates and incentive programs at the Federal, State and local level.

OSHA

Comply with OSHA, anticipating operations, maintenance, and occupants.

Facility Definitions



Essential Facility

International Building Code defines as any building that is intended to stay operational during/after an event



Critical Action Facility

DHS defines as a facility that even a slight chance of flooding is too great. All new courthouses are critical action.



Mission Critical Facility

Defined as electrical supply interruption will cause negative impact and is designated by tenant.



GSA uses the codes of the International Code Council (ICC) and the NFPA Life Safety and National Electric Codes

- Use the latest code at time of solicitation
- GSA requirements take precedence over codes. Try to use equivalency clauses
- Use the Wildland Urban Interface to determine wildfire risk

Interagency Security Committee Risk Management Process

ISC defines the criteria used by a facilities security committee to determine its security level.

- Do a facility security assessment
- Determine countermeasures
- Included security countermeasures table as a fyi for consideration

Determination of the security level must be done early and incorporated into the program of requirements.

ASHRAE 90.1

Energy Conservation and Production Act requires DOE to publish a rule on Standard 90.1. Published in 10 CFR, Parts 433-435.

- Currently lists the 2013 version
- Check for latest version at time of project solicitation

State and Local Codes

Federal Facilities are exempt. GSA plays nice, but has final say.

- PM's must give an opportunity for local officials to review a project, especially first responders
- GSA and our contractors do not pay code review fees
- Exception to the above is for systems that impact off site terrain or infrastructure
 - Fire protection
 - Storm water runoff
 - Erosion control
 - Roads and bridges
 - Water and gas
- Construction inspections are allowed, however they are only to assist GSA in achieving code compliance

04 Guides

Integrating building specific guides.





Program Specific Guides

Many building types and customers have guides or standards.

- Federal Courthouses
- Land Ports of Entry
- Child Care Centers
- Security
- Historic Preservation
- First Impressions
- etc...



Conflicts

If there is a conflict between P100 and a program specific guide, the more stringent requirement rules. Contact ODC if requirements oppose each other.

Operational Excellence

Minimize Negative Impacts

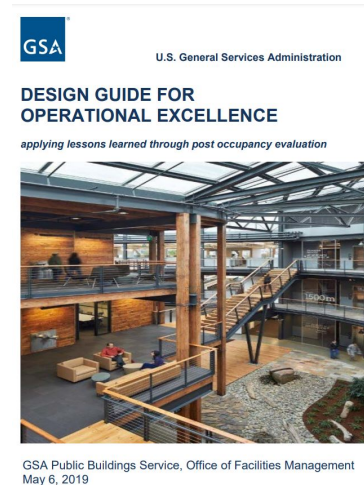
Consider building Spaces

Service Contract Performance

Reduce Periodic Maintenance

Consult Property Management

Training After Commissioning






Use of the Design Guide for Operational Excellence is required.

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05 Safety

How to make our projects safe.



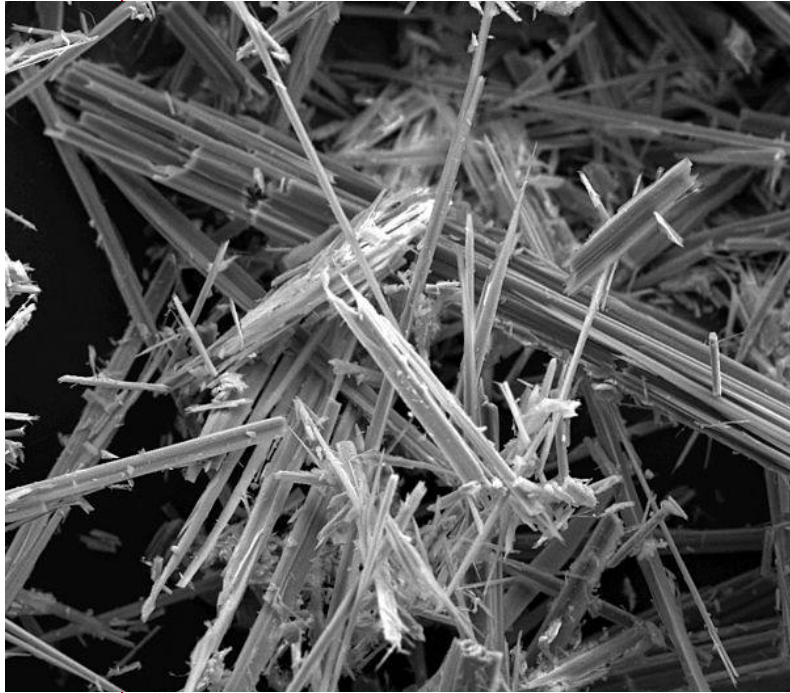


The codes provide an adequate standard for safety and health. GSA requires a systems approach to eliminate facility life-cycle risks.



Order of Precedence

1. Eliminate Hazard
2. Isolate Hazard
3. Provide Warning
4. Procedures and Training



Asbestos

Remove ACM if:

- Potential for future disturbance
- No longer safely managed through:
 - Repair
 - Maintenance
 - Enclosure
 - Encapsulation



Lead

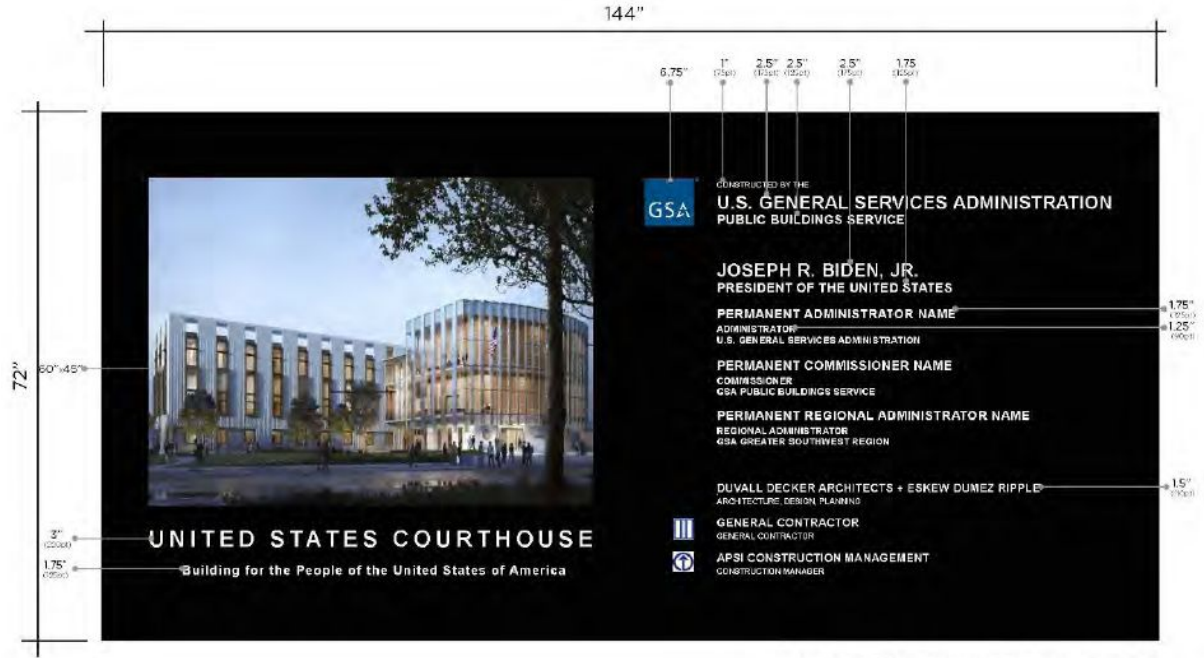
Test paint for lead content for buildings constructed prior to 1978.

06 General

A grab bag of requirements.



Moved the Construction Sign and added options

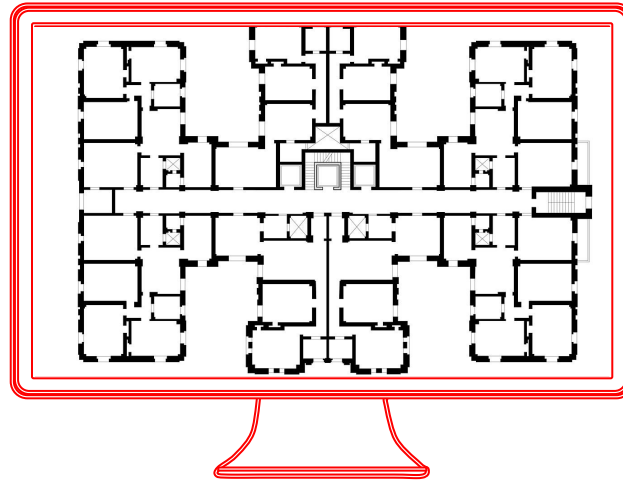


GSA CONSTRUCTION SITE SIGN (6'x12')

FONTS:
 ARIAL BOLD

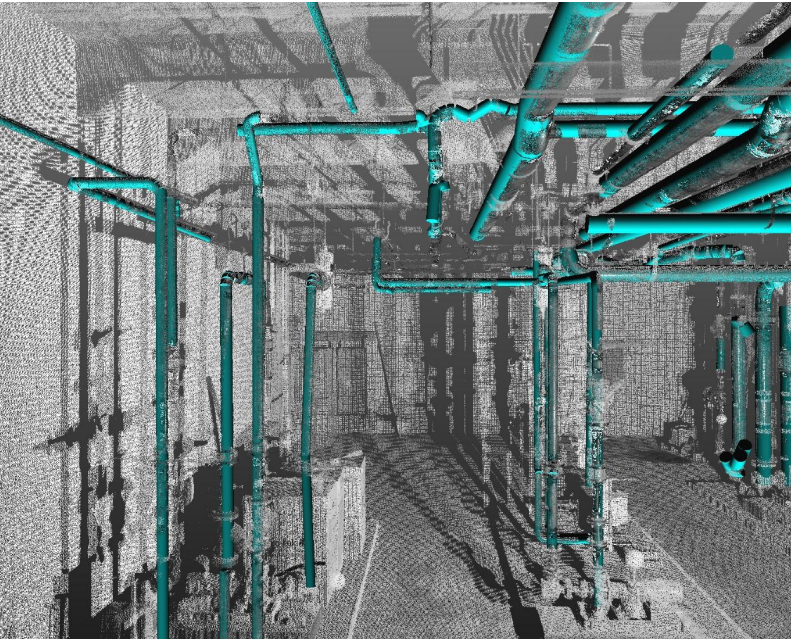
Renovations can choose a 4'x8' or the 6'x12' shown

Space Measurement



Follow GSA's National Business Space Assignment Policy

- Explains ANSI and BOMA methods
- Explains exceptions to ANSI and BOMA
- Targets usable to gross of 80% in new construction



BIM

Building Information Modeling

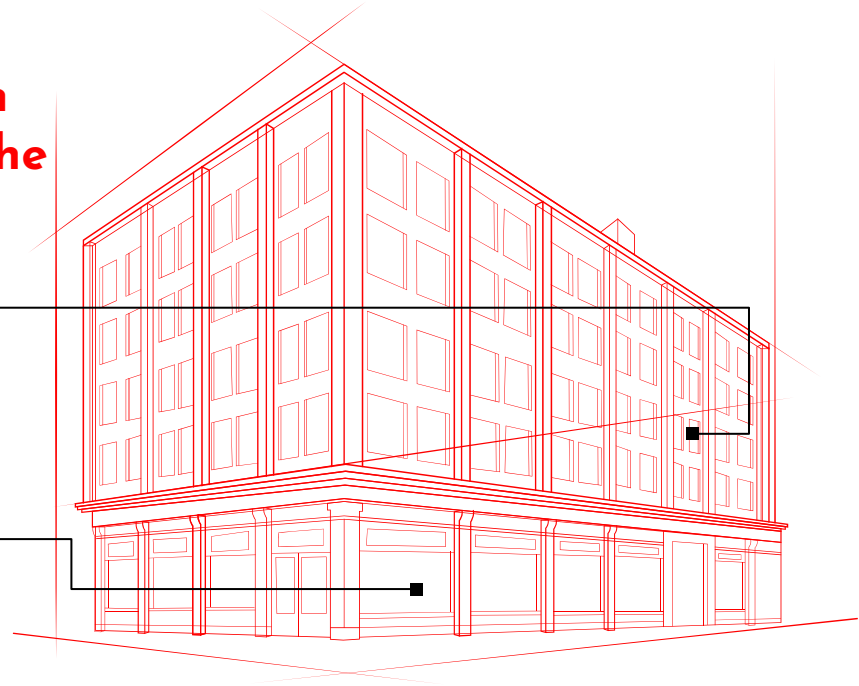
- New and major R&A require a BIM model deliverable
- Must contain maintenance management data in COBie.
- Utilize the GSA Bim Guide

Total Building Commissioning

Verification and documentation that the facility performs per the design and expectations.

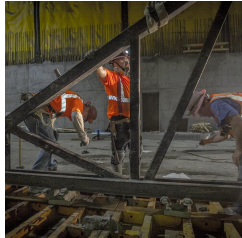
Required for all capital construction

Utilize the GSA Building Commissioning Guide



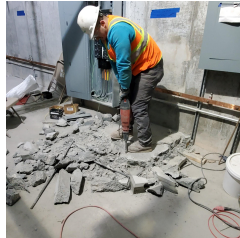
Building Operations and Maintenance

Worker Access

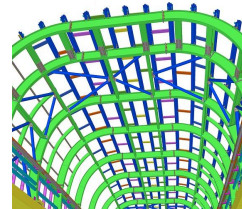


Design components for worker access per Mil-Std.

Removal/Replacement Verification



Design components for removal and replacement



Utilize BIM clash modeling to verify worker access and equipment removal/replacement.

Turnover



A/E team provides design intent
Contractor provides training videos



Thanks!

Do you have any questions?

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