



Federal Facilities Council Presentation

WELCOME!

The High Performance and Sustainable Building Requirements UFC Webinar

Speakers:

- **Paula Loomis, FAIA, LEED BD&C, PMP, APA, CPHC, Sustainability Program Manager, USACE**
- **Nadja Turek, P.E., LEED AP BD+C, Director, Sustainable Design Services, Woolpert, Inc.**





High Performance and Sustainable Building Requirements Unified Facilities Criteria 1-200-02





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- UFC Background
- Requirements
- Compliance and Policy
- Future



•Wilderness Road Complex
Ft Carson, CO, LEED Platinum





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Purpose of the UFC

- To drive transformation in the performance of the DoD facility inventory
- To require greater efficiency and water conservation measures that demonstrate a strong return on investment
- To balance building performance with occupant comfort, health, safety and productivity
- To guide compliance with higher level mandates, policies and standards
- Provide minimum unified requirements
- To consolidate UFCs 4-030-01 Sustainable Development and 3-400-01 Energy Conservation

Consolidation was driven by ESEP, Coordinating Panel and UFC system





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Tri-Service Sustainability Discipline Working Group (DWG) was responsible for development

- UFC organized in same manner as High Performance Sustainable Building Guiding Principles
- For each sustainability category the DWG compared Guiding Principles, federal laws, executive orders, DoD Policy Directives, other UFC Criteria, ASHRAE 90.1, 189.1 and LEED criteria.



Community Emergency Services Center
Ft Bragg, NC, LEED Platinum





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- Referenced mandatory guidance and highlighted most stringent federal/tri-service guidance.
- If mandatory guidance did not exist used non-mandatory guidance most appropriate for military
- Other DWGs participated in the process including architecture, mechanical, electrical, etc.



Fitness Center
Tyndall AFB, FL, LEED Platinum





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Use/applicability of the UFC

- Chapter 2 - New construction and major renovations
- Chapter 3 – Minor renovations
- Chapter 4 – Existing buildings
- Chapter 5 – HPSB assessment requirements for existing buildings
- Chapter 6 – Sustainable installations

How it will be used in Federal contracting?

- A requirement on projects.
- A consideration in planning documents





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General requirements

ASHRAE 189.1.. its relationship to this document

- ASHRAE 189.1 serves as a compliance option in the 2012 International Green Construction Code™ (IgCC) published by the International Code Council.
- The Sustainability DWG carefully compared applicable criteria. In many cases the Guiding Principles contained references to ASHRAE 189.1 and were included in UFC 1-200-02. In some cases references from ASHRAE 189.1 were included as best option for compliance path
- Many of ASHRAE references were incorporated.





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UFC Requirements:

Chapters 2-4 and 6

- **Highlight any changes from current practice**
- **Give guidance for practitioners**





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CHAPTER 2: New Construction and Major Renovation Projects

- Integrated Design
- Commissioning
- Site Selection
- Mitigate Heat Island Effect
- Reduce Light Pollution
- Stormwater Management
- **Energy Efficiency**
- On-site Renewable Energy
- Energy Compliance Analysis
- Measurement & Verification
- Benchmarking
- Indoor & Outdoor Water Use Reduction
- Water used for heating and cooling
- Measurement of water
- Ventilation and Thermal Comfort
- Moisture Control
- Daylighting
- Low-emitting Materials
- Protect IAQ during construction
- Env. Preferable Products
- Recycled Content
- Biologically-based Products
- Waste and Materials Management
- Ozone Depleting Substances





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Key Changes for Design/Construction:

- Commissioning – requires building envelope Cx and plumbing/irrigation systems
- Heat Island Effect – new requirement for walls
- Energy Efficiency - requirement to perform 30% better than ASHRAE 90.1-2007 remains*. Army gives an option to alternatively do 12% better than 90.1-2010
- On-site Renewables – Army requires “renewable ready” building design per 189.1 Section 7.3.2
 - 6 kBtu/ft² for single story bldgs and 10 kBtu/ft² times the roof area for all other bldgs





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Key Changes for Design/Construction :

- “Energy Compliance Analysis” – not new, but more robustly described than before
 - ASHRAE 90.1 Appendix G compliant modeling (ECB Compliance Report)
 - A “separate, concise LCCA narrative” from:
 - Architect, Mechanical Engineer, Electrical Engineer
 - Describe conservation features and provide supporting LCCA calculations
 - Due at “Concept Design”





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- Indoor and Outdoor Water Use
 - Adopts IPC/LEED baseline values as maximums (i.e. new WC's can only be 1.28 gal/flush or less)
 - Sets max water usage for clothes & dish washers
 - HVAC (cooling towers, evap coolers, etc.) water use restrictions, only if LCC effective
 - Limits turf grass to 40% of “improved landscape”
 - No potable water use on golf courses/driving ranges
 - Only 1/3rd of “improved landscape” can be irrigated with irrigation design standards; OR only 35% of irrigation water can be potable





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Key Changes for Design/Construction :

- Permanent outdoor airflow monitoring/alarm is required
- Increased filtration requirements over ASHRAE 62.1 if in an area with poor air quality
- Entrance mats with scraper, absorption, and finish surfaces
- Building envelope minimums (R-, U-, F-values, SHGC) that are more stringent than 90.1 (except for AF projects)
- Daylighting hand-calculation or model required
 - Note: calculations are different from LEED 2009 or v4
- Furniture, Seating, Ceiling and Wall system have low-emission requirements (same as LEED for Schools v2009)





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Key Changes for Design/Construction :

- Building flush out of at least 72 hours is required – longer flush out or air quality testing is required before occupancy
 - Note: these are different calculations from LEED





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Key Take-aways:

- UFC 1-200-02 \neq LEED
 - LEED is mentioned once – OUSD (Installations & Environment) Memo dated 10 Nov 2013 sets UFC 1-200-02 as the standard
 - Mostly references ASHRAE 189.1
- ASHRAE 189.1 \neq LEED
 - They are **complementary** but not identical
 - You could document similar design strategies one way for ASHRAE 189.1 and another way for LEED certification



UFC vs LEED: An Example

Requirement	UFC	Design Strategy	LEED NC v2009	LEED NC v4
Mitigate Heat Island Effect	Site Hardscapes: 189.1 Section 5.3.2.1 <i>50% of hardscapes provided with shade, cover, or reflective or permeable materials</i>	Concrete sidewalks, permeable parking areas, shade trees in parking islands	SS credit 7.1 HIE-non-roof: <i>Almost identical to ASHRAE 189.1</i>	SS credit "HI Reduction": <i>New combined roof and non-roof calculation</i>
	Walls: 189.1 Section 5.3.2.2 <i>E/W facing walls will be shaded or reflective in certain climate zones</i>	Reflective wall materials and/or shade trees within 50 feet of E/W walls	<i>Not addressed by LEED</i>	<i>Not addressed by LEED</i>
	Roofs: UFC 3-110-03 referenced, which references ASHRAE 90.1 <i>no HIE requirement</i>	Reflective roofing material	SS credit 7.2 HIE roof: <i>Different (more stringent) than ASHRAE 90.1</i>	<i>See above</i>

UFC vs LEED: An Example

Requirement	UFC	Design Strategy	LEED NC v2009	LEED NC v4
Measurement and Verification	Utility advanced meter installed for each service (DODI requirement)	Install basic or advanced meters	EA credit 5: M&V <i>Prepare M&V plan that meets requirements of IPMVP</i>	New EA prerequisite: <ul style="list-style-type: none"> • <i>Install building-level energy metering</i>
	Sub-meter when authorized by installation per 189.1 Section 7.3.3 <i>Gives thresholds for sub-metering</i>	Sub-meter key loads	<ul style="list-style-type: none"> • <i>Sub-meter or measure loads for ECMs</i> • <i>Compare design vs. operational performance 1 year post occupancy</i> • <i>Calibrate design energy model post occupancy</i> 	New EA credit <ul style="list-style-type: none"> • <i>Sub-meter energy uses that are more than 10% of total load</i> • <i>Record and transmit data</i>
Benchmarking	Track energy use in Energy Star portfolio manager or similar	Track energy performance and/or do analysis required by IPMVP		New EA prerequisite: <ul style="list-style-type: none"> • <i>Track and share energy data for 5 yrs</i>



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CHAPTER 3: Minor Renovation Projects

- Applies to “all projects with the exception of New Construction and Major Renovations”
- Includes “repair, maintenance, and equipment installations”
- Projects do NOT need to meet all requirements
 - Must meet requirements relative to the scope of work for each project





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CHAPTER 3: Minor Renovation Projects

- **Integrated Assessment, Operation, and Management**
- **Commissioning, Re-Cx, or Retro-Cx**
- **Max. Use of Existing Workplaces**
- **Integrate with Local Planning**
- Mitigate Heat Island Effect
- Reduce Light Pollution
- Stormwater Management
- **Energy Efficiency**
- On-site Renewable Energy
- Measurement & Verification
- Benchmarking
- **Indoor & Outdoor Water Use Reduction**
- Water used for heating and cooling
- Measurement of water
- **Water-Efficient Products and Services**
- Ventilation and Thermal Comfort
- Moisture Control
- **Daylighting**
- Low-emitting Materials
- Env. Preferable Products
- Recycled Content
- **Biologically-based Products**
- Waste and Materials Management
- Ozone Depleting Substances

Black: Same/Similar Rqmt as Chapt 2

Red: Different from Chapt 2





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Key Changes for Minor Renovations :

- Employ Cx (Re-Cx or Retro-Cx) tailored to the scope
 - Can be done in-house or by contractor but **MUST** be documented to comply
- Energy Efficiency – three compliance options:
 1. Receive and ENERGY STAR score > 75
 2. Reduce measured energy use by 20% compared to a 2003 baseline*
 3. Reduce modeled energy use by 20% compared to an ASHRAE 90.1 baseline building
- Document LCCA for energy conservation features

* Or year thereafter with metered energy use data





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Key Changes for Minor Renovations :

- Two Options for Indoor Water Use Reduction
 1. Reduce water use to \leq IPC/UPC 2006 fixture usage
 2. Reduce measured water usage by 20% compared to a 2003 baseline*
- Two Options for Outdoor Water Use Reduction
 1. Reduce potable water use by 50%
 2. No potable water use for irrigation
- Provide daylight in 50% of reg. occupied spaces OR provide occupant individual control of lighting
 - And provide automated lighting control (UFC 3-530-01)

* Or year thereafter with metered water use data





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Key Changes for Minor Renovations :

- Biobased product section includes preference for “certified sustainable wood products” when available and at a “reasonable cost”
 - Note: this language is not included in Chapter 2





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CHAPTER 4: High Performance And Sustainable Buildings (HPSB) Requirements for Existing Buildings

- Describes the requirements if an agency wants to count an existing building as an HPSB towards its 15% by 2015 goal*
- An existing building must be assessed according to Chapter 4's requirements prior to reporting HPSB status (yes or no)





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CHAPTER 4: Existing Buildings – HPSB Reqmts

- **Integrated Assessment, Operation, and Management**
- Commissioning, Re-Cx, or Retro-Cx
- **Reduce Transportation-Related GHG Emissions**
- Integrate with Local Planning
- Energy Efficiency
- On-site Renewable Energy
- Measurement & Verification
- Benchmarking
- Indoor & Outdoor Water Use Reduction
- Water used for heating and cooling
- Measurement of water
- Ventilation and Thermal Comfort
- Moisture Control
- Daylighting
- **Low-emitting Materials**
- **Integrated Pest Management**
- **Env. Tobacco Smoke Control**
- Env. Preferable Products
- Recycled Content
- Biologically-based Products
- **Waste and Materials Management**
- **Ozone Depleting Substances**

Black: Same/Similar Rqmt as Chapt 3

Red: Different from Chapt 3





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Key Changes for Building Managers:

- Building managers need to have:
 - A “building management plan” for sustainable building O&M
 - Get occupant feedback on workplace satisfaction “as needed”
 - Disseminate information about alternative transportation, amenities within walking distance, and alternative workplace arrangements





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Key Changes for Building Managers:

- Benchmarking required – compare year over year data using tools such as:
 - EPA's ENERGY STAR Portfolio Manager
 - Labs21 Benchmarking tool
- Moisture Control - existing buildings should meet the requirements of UFC 3-101-01 Chapter 3, Building Envelope Requirements
- Low Emitting materials requirements include janitorial supplies and furniture





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Key Changes for Building Managers:

- Provide recycling services for paper, cardboard, glass, plastic, and metals at a minimum and salvage/reuse/recycle O&M-generated waste “where markets or on-site recycling exist”
 - Many installations do not offer all these services any more





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CHAPTER 6: Sustainable Installations

- Section titled “Guiding Principles for Federal Leadership in High Performance and Sustainable **Installations**”
- Guiding Principles can* be met installation wide
- Reference to the DOD’s Strategic Sustainability Performance Plan (SSPP)

* And in some cases probably SHOULD (Nadja’s opinion only!)





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Guiding Principles can* be met installation wide

- Stormwater
- Outdoor water use reduction
- Renewable energy
- Process water
- Maximizing efficient use of workspaces
- Integrate with local and regional planning
- Mitigate the heat island effect
- Integrated pest management
- Env. Tobacco Smoke Control
- **Missing: Reduce light pollution as per UFC 3-530-01**

* And in some cases probably SHOULD (Nadja's opinion only!)





Compliance and Policy: Chapter 5

- **How to demonstrate compliance?**
- **What is its relationship to other policy?**
- **How will it be updated over time?**





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How to demonstrate compliance?

- See Chapter 5
- Each service has a HPSB checklist (p29)
- Services are working toward a tri-service checklist
- These checklists will feed into the Annual Energy Management Report & OMB GP HPSB reporting
- Existing Building - Same questions that are in checklist will be in BUILDER



1st BDE, 4th ID Brigade & Battalion HQ
Fort Carson, Colorado, LEED Gold





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Relationship to OSD and services' sustainability policies

- OSD OUSD (Installations and Environment) Memorandum 10 Nov 2013, DoD Sustainable Buildings Policy
- OSD OUSD AT&L Memorandum 19 Jan 2010, DoD Implementation of Storm Water Requirements.
- Army – Assistant Secretary of the Army (Installations, Energy & Environment) Memorandum dated 16 Dec 2013
- AF Sustainable Design and Development Implementation Guide 02 Jun 2011
- Navy NAVFAC ECB no 2011-01 “Navy Shore Energy Building Standard” (pending ECB 2014 Sustainable Rqmnts)

Overseas applies considering host nation agreements





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Updates to the UFC 1-200-01 coming

- Comments – submit a criteria change request
- See Whole Building Design Guide
- “Guru” within DoD and each service
 - OSD – Col (sel) Keith Welch
 - Army – Paula Loomis, FAIA, PMP, FSAME, LEED BD&C, PMP, CPHC
 - Navy – Julie Kephart-Jones, RA, LEED AP
 - Air Force – Paula Shaw, PE, LEED AP



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Questions?



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