

# **DoD UNIFIED FACILITIES CRITERIA PROGRAM**

## **FY 2016 Program Review**



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# 1 EXECUTIVE SUMMARY

The Department of Defense (DoD) is streamlining government criteria by eliminating duplication and increasing reliance on private sector standards. Since 1998, the Unified Facilities Criteria Program, under the leadership of the Engineering Senior Executive Panel (ESEP), implements these requirements for facility planning, design, construction, and maintenance.

Unified Facilities Criteria (UFC), Facility Criteria (FC), and Unified Facilities Guide Specifications (UFGS) are technical manuals and specifications used for planning, design, construction, and maintenance of all DoD facility projects. Highlights and accomplishments for FY 2016 include:

- Achieved 71% unification rate for all UFC documents compared with 9% in 1998 (baseline year).
- Sustained 100% unification rate and 100% currency rate (up to date) for all core UFC documents.
- Published 14 new or revised UFC including *Cybersecurity of Facility-Related Control Systems* (UFC 4-010-06) that details requirements for incorporating cybersecurity measures into the design of facility-related control systems.
- Published 38 new UFGS, 152 revised UFGS, and 25 changed UFGS.
- Continued bundling of UFGS for more cost-effective and efficient updates.

In addition to criteria document improvements, the program provides technical expertise and guidance on many key DoD issues. Major accomplishments in FY 2016 include:

- Sponsored the first DWG Training Workshop to provide better program alignment and direction across DWGs to improve consistency and efficiencies.
- The Technology Coordinating Panel (TCP) launched the Building Technology Vendor Portal to assist vendors and manufacturers in matching their technology and product(s) to DoD criteria and specifications.
- Held the 3<sup>rd</sup> joint session between members of the UFC program and the DoD corrosion prevention and control program team to improve the transition of corrosion prevention technologies into facilities criteria.
- Oversaw continued improvement to the Criteria Management System (CMS) including the shift from email document approvals to approvals using CMS.
- Supported a revised report to Congress on the use of reflective glass beads used in airfield pavement markings.
- Approved 62 projects (29 UFC projects; 33 UFGS projects) for FY 2017 with a funding request of \$3.8 million.

## 2 PROGRAM OVERVIEW

### 2.1 Program Authority

Public Law 104-113 (the National Technology Transfer and Advancement Act) and OMB Circular A119 (1998) require agencies to streamline government criteria by eliminating duplication of information and increasing reliance on private sector standards. For facility planning, design, construction and maintenance, the Department of Defense (DoD) complies with these requirements through the Unified Facilities Criteria (UFC) Program. The UFC program is implemented through Military Standard (MIL-STD) 3007F, "Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications" in compliance with DoD Instruction 4120.24, "Defense Standardization Program," and directed by DoD Directive 4270.5, "Military Construction." The program objectives are:

- Streamline the military criteria by eliminating duplication of information
- Increase reliance on private sector standards
- Create a more efficient criteria development and publishing process

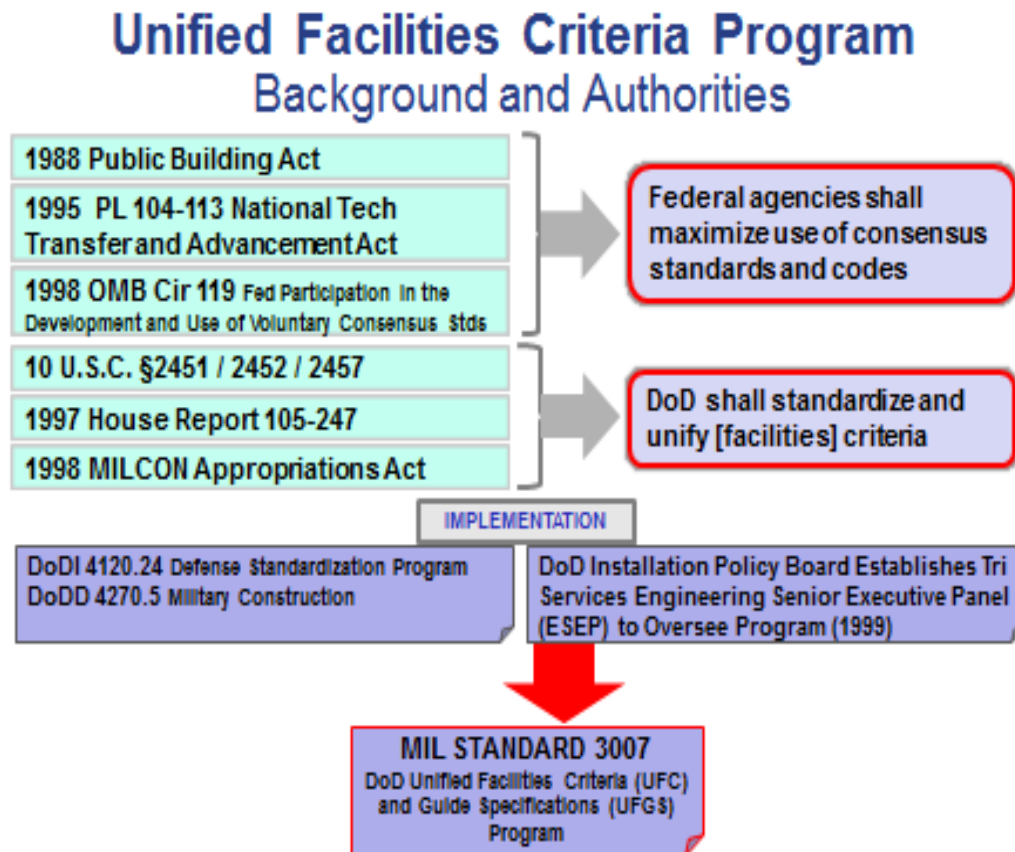
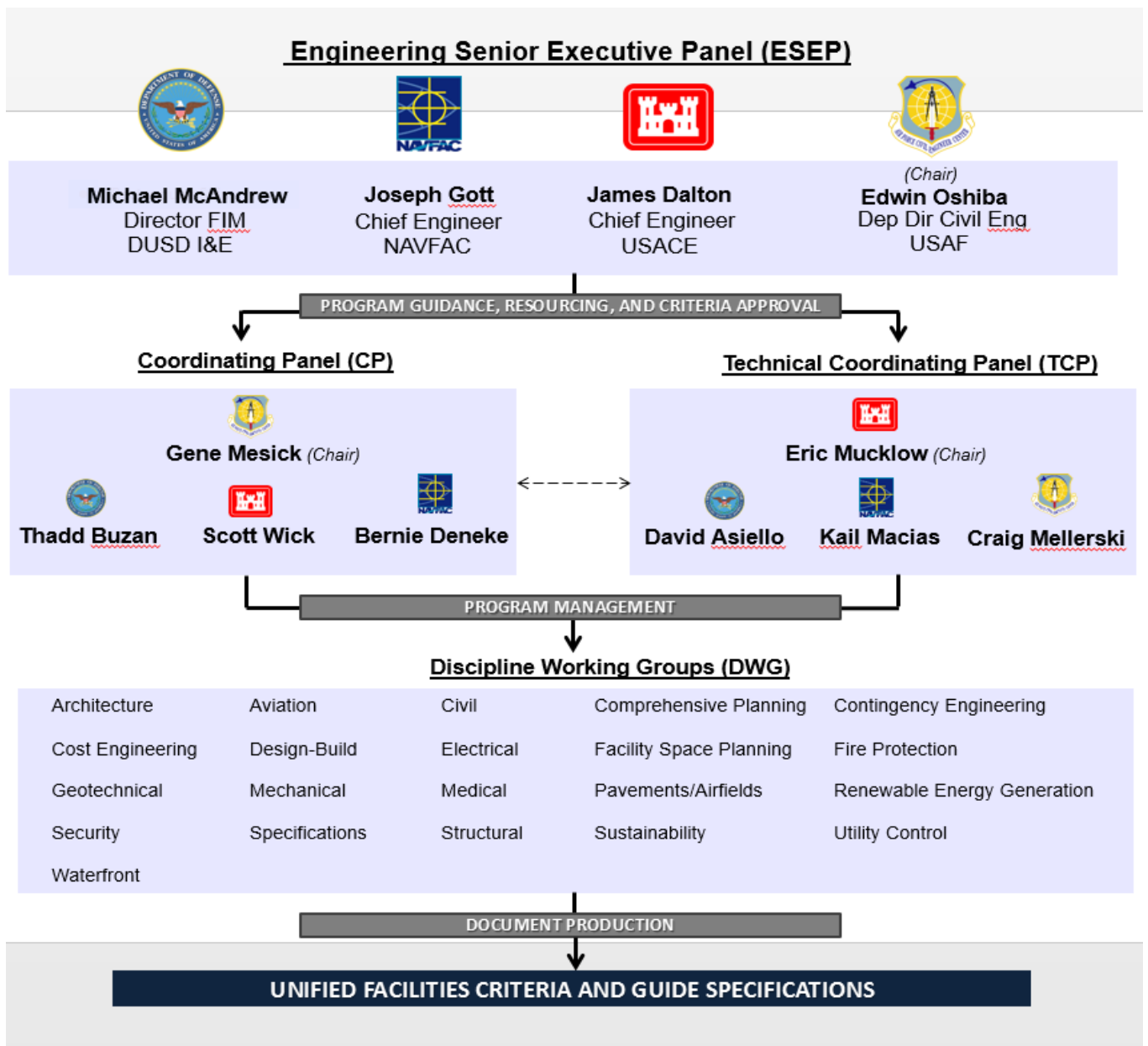


Figure 2-1  
UFC Program Background and Authorities

## 2.2 Program Organization

The Engineering Senior Executive Panel (ESEP) provides program guidance, resourcing, and criteria approval. The Coordinating Panel (CP) provides program management and oversees the criteria discipline and functional working groups. The Discipline and Functional Working Groups are responsible for criteria development and production. Program organization highlights for FY16:

- ESEP Chair – Edwin H. Oshiba, U.S. Air Force
- CP Chair – Gene Mesick, Air Force Civil Engineering Center
- Technical Coordinating Panel (TCP) Chair – Eric Mucklow, U.S. Army Corps of Engineers
- 21 Discipline/Functional Working Groups



**Figure 2-2  
UFC Program Organization**

## 2.3 Program Administration

The ESEP assigns personnel within USACE, NAVFAC, AFCEC, and ODUSD (I&E) to participate on the CP and the 21 discipline and functional working groups. The working groups are responsible for development and maintenance of the criteria documents by in-house staff or by architect-engineering contracts.

## 2.4 Program Resources

The ESEP resources the UFC program administration through U.S. Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), Air Force Civil Engineering Center (AFCEC), and the Office of the Undersecretary of Defense for Installations and Environment (ODUSD-I&E). As such, the CP and the discipline and functional working groups are responsible for program management, development and maintenance of the criteria documents. Additional funding is also allocated by each service component to augment criteria work which requires resources outside of the working group. The breakout of funding allocated to criteria development and updates is shown in Table 2-1.

Service Component	FY 2013	FY 2014	FY 2015	FY 2016
USACE	\$2,000,000	\$2,000,000	\$1,400,000	\$1,500,000
NAVFAC	\$1,114,000	\$1,114,000	\$855,000	\$1,250,000
AFCEC	\$0	\$150,000	\$800,000	\$1,000,000
OASD-EI&E	\$0	\$0	\$0	\$600,000
<b>Total</b>	<b>\$3,114,000</b>	<b>\$3,264,000</b>	<b>\$3,055,000</b>	<b>\$4,350,000</b>

**Table 2-1  
Criteria Development Funding**

In addition to direct funding for development and maintenance of DoD criteria, funding is required for DoD access to non-government standards (industry consensus standards), management and distribution of DoD standards on the Whole Building Design Guide (WBDG), and administration and maintenance of SPECSINTACT. Significant cost savings are realized for these services by procurement through DoD bulk service contracts. The costs have been steady over the history of the program with the exception of minor adjustments accounting for inflation and have been funded by ODUSD (I&E). The breakout of FY 2016 Costs is shown in Table 2-2.

SPECSINTACT	\$0
SPECSINTACT/Windows® Compatibility (update)	\$0
NIBS/WBDG	\$602,808
Non-Government Standards/IHS Support	\$2,212,281
Criteria Management System Improvements	\$149,226
UFC and UFGS Program Administration	\$162,912
<b>TOTAL</b>	<b>\$3,127,227</b>

**Table 2-2  
Criteria Access and Distribution – FY 2016 Funding**

## 3 KEY INITIATIVES AND ACCOMPLISHMENTS

### 3.1 UFC/UGS Highlights

- Achieved 71% unification rate for all UFC documents compared with 9% in 1998 (baseline year).
- Sustained 100% unification rate and 100% currency rate (up to date) for all core UFC documents.
- Published 15 new or revised UFC.
- Published 38 new UFGS, 152 revised UFGS, and 25 changed UFGS.
- Continued bundling of UFGS for more cost-effective and efficient updates.

### 3.2 Cybersecurity UFC Published

In September 2016 DoD released *Cybersecurity of Facility-Related Control Systems* (UFC 4-010-06) that details requirements for incorporating cybersecurity measures into the design of facility-related control systems. This UFC provides criteria for the inclusion of cybersecurity in the design of control systems in order to address appropriate Risk Management Framework (RMF) security controls during design and subsequent construction. It defines a process based on RMF suitable for control systems of any impact rating, and provides specific guidance suitable for control systems assigned low or moderate impact levels.

### 3.3 Discipline Working Group Training Workshop

In April 2016 the ESEP and the CP sponsored the first DWG Training Workshop. All 21 DWGs participated in the two-day workshop. The workshop's purpose was to provide better program alignment and direction across DWGs to improve consistency and efficiencies. Workshop organizers provide training on the tools supporting UFC program management and development. The focus of the workshop was on the FY17 and out-year program workload within each of the DWGs.

Workshop survey results indicated tremendous support for DWG training. A second workshop is planned for May 2017.

### 3.4 Technology Coordination Panel

In 2015 the ESEP established the new Technology Coordinating Panel (TCP) to accelerate the adoption of new technologies across the DoD into the DoD built environment. Similar to the Coordinating Panel, the TCP reports directly to the ESEP and consists of a single representative each from OSD-ATL, USACE, NAVFAC and AFCEC. The purpose of the TCP is to share and leverage Service efforts across DoD in the areas of technology evaluation and validation to accelerate transition to standards and criteria for facilities and infrastructure.

Accomplishments in FY 2016 include:

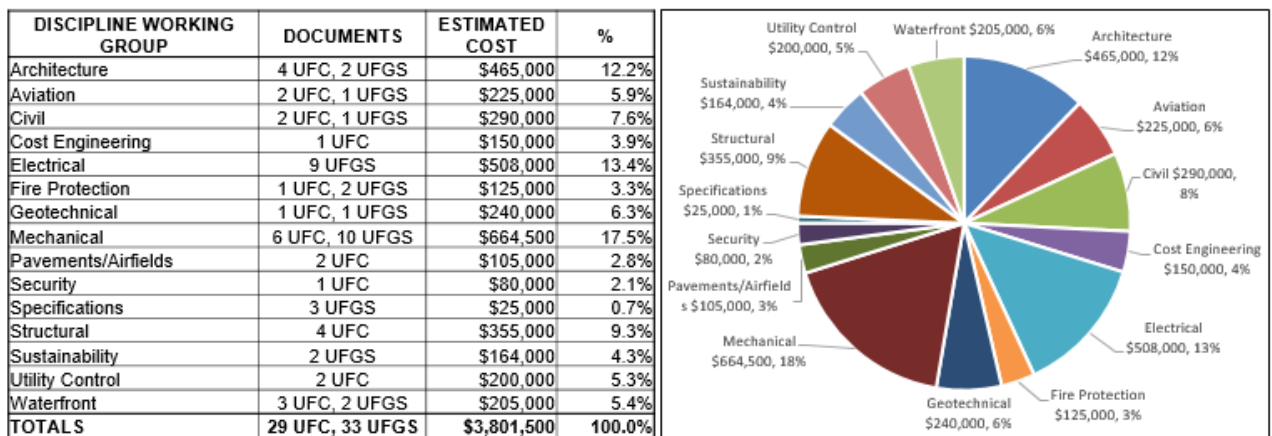
- Launched of the Building Technology Vendor Portal. This web-based Vendor Portal, accessed via the Whole Building Design Guide is designed to assist vendors and manufacturers in matching their technology and product(s) to DoD criteria and specifications and to facilitate the introduction of these products to DoD agencies.
- Evaluated 57 applications for duplicative efforts, identifying two research proposals as redundant.
- Established team collaboration webpage on milSuite, DoD's online applications for improving secure collaboration.

### 3.5 Criteria Tools Enhancements

During FY 2016, the CP oversaw continued initiatives to improve the Criteria Management System (CMS) and expand its use among all UFC stakeholders. The principal change was the shift from email document approvals to approvals using CMS.

### 3.6 Project Prioritization for FY17

During FY 2016, the CP conducted an in-depth project prioritization for FY 2017 UFC/UFGS projects. All 21 DWGs were notified with a call for projects; input was received from 15 DWGs. Ninety-nine UFC and UFGS criteria efforts were proposed; these included new starts, revisions, and changes. The CP approved 62 of the 99 projects (29 UFC projects; 33 UFGS projects) after CP evaluation using the Criteria Project Periodization Scoring system (described in detail in the FY 2015 Program Report). The total funding request for FY 2017 projects is approximately \$3.8 million.



**Table 3-1  
FY 2017 Criteria Projects--Estimated Cost by DWG**

### 3.7 Other Technical Support

As the definitive resource for department-wide technical guidance for facilities and infrastructure, the criteria Discipline Working Groups (DWGs) regularly provide support in response to requirements from Congress, GAO, OMB, or other agencies or organizations. DWGs (acting through the Coordinating Panel) provided key technical content for the DoD Report to Congress on the use of reflective glass beads used in airfield pavement markings.

The CP and the DoD Corrosion Prevention Office held the 3<sup>rd</sup> joint session between members of the UFC program and the DoD corrosion prevention and control program team to improve the transition of corrosion prevention technologies into facilities criteria.



## 4 UNIFIED FACILITIES CRITERIA (UFC)

### 4.1 Introduction

UFC and FC documents are technical manuals used for planning, design, construction, and maintenance of DoD facilities. The majority of UFC and FC are design manuals that define design requirements and best practices for DoD construction projects. A smaller percentage of UFC provide planning requirements, maintenance guidance, and handbook-type information used by field personnel.

### 4.2 Criteria Strategy

Industry codes and standards provide minimum consensus safety and performance requirements and are the basis of DoD criteria. UFC 1-200-01, General Building Requirements, implements the International Building Code and other consensus codes and standards. UFC 1-200-01 also references 27 other "core" UFC documents and other DoD special requirements to implement legislation and policy, and provide criteria associated with unique DoD functions. These documents collectively comprise the "DoD Building Code."

The remaining UFC and FC documents generally fall into two categories: facility-type or specialty-type. Facility-type UFC documents provide space and functional requirements for facilities built frequently (such as fitness centers) or have unique DoD requirements (such as aircraft hangars and Navy piers). Specialty-type UFC documents are used on projects that require the use of that specialty system or component (such as cathodic protection, boiler control systems, and dockside utilities).

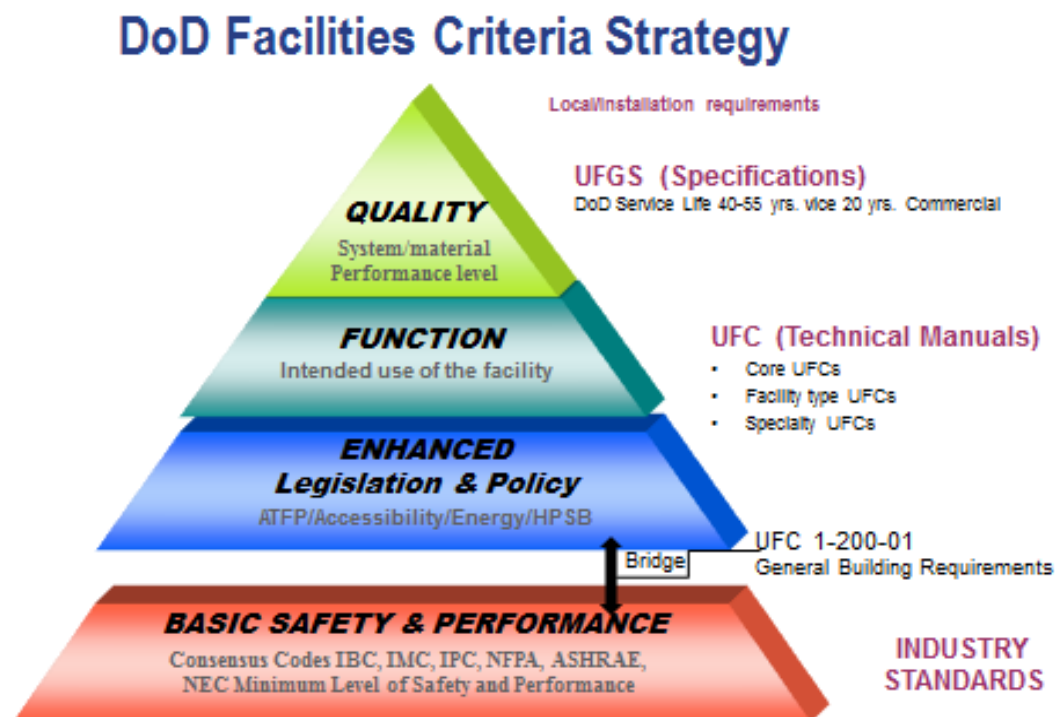
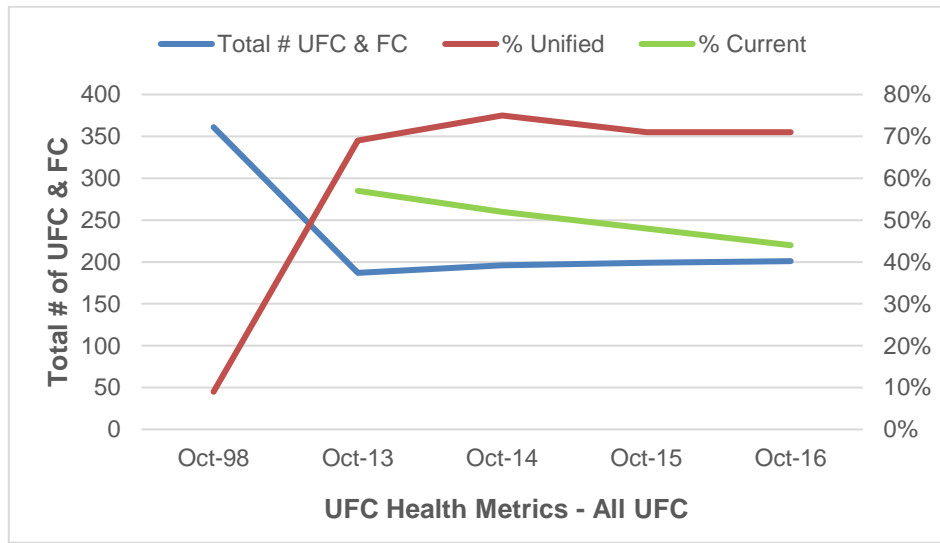


Figure 4-1  
DoD Facilities Criteria Strategy

### 4.3 Health Metrics

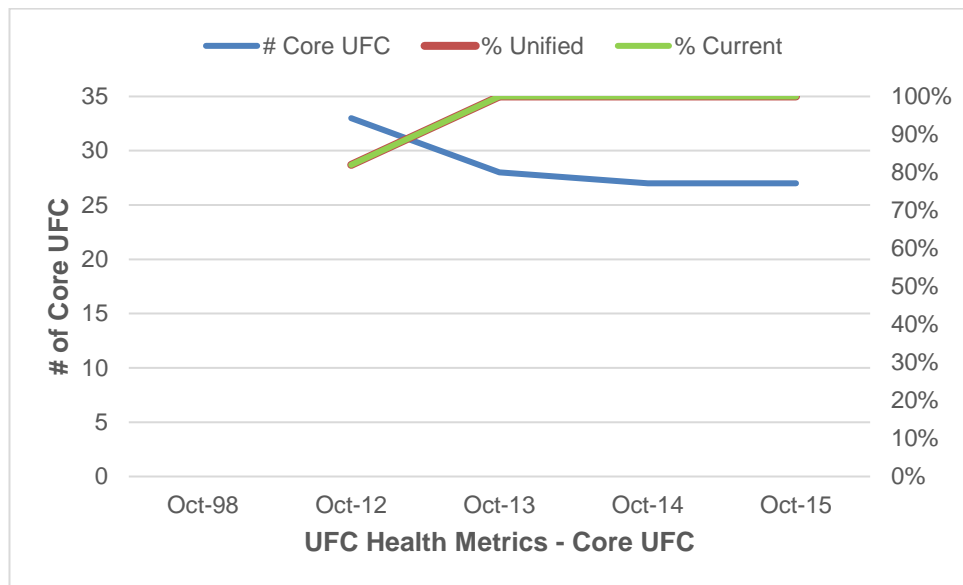
The primary indicators of UFC health are “% Unified” and “% Current.” % Unified represents the percentage of total UFC documents used by all three Military Departments that are unified, and indicates progress toward reducing duplicate criteria. % Current represents the percentage of all UFC documents that have been revised within a specified target timeframe or refresh rate. Refresh rates are assigned as 6 years, 9 years, or 12 years. UFC documents can be kept current on an interim basis by incorporating minor changes and publishing as a “change” (without updating the publication date) rather than a full revision. UFC changes are not captured in the % Current calculation. Data collection for % Current began in FY 2011. The baseline for % Unified data is extracted from the March 1998 report to the Congressional Defense Committees titled “Unified Design Guidance.”

In FY 2016, 100% of the 27 Core UFC were current and unified.



All UFC	Oct 1998	Oct 2013	Oct 2014	Oct 2015	Oct 2016
Total # UFC & FC	361	187	196	199	201
Unified	9%	69%	75%	71%	71%
Current	Unknown	57%	52%	48%	44%

Table 4-1  
UFC Health Metrics – All UFC



#### 4.4 FY 2016 Publications and Highlights

UFC 4-010-06 Cybersecurity of Facility-Related Control Systems

UFC 3-550-01 Exterior Electrical Power Distribution

UFC 3-600-01 Fire Protection Engineering for Facilities

UFC 4-133-01N Air Traffic Control and Air Operations Facilities

UFC 1-200-01 DoD Building Code (General Building Requirements)

UFC 4-023-10 Security Engineering Design for Safe Havens

UFC 3-580-01 Telecom Interior Infrastructure

UFC 4-510-01 Design: Medical Military Facilities

UFC 3-810-01N Navy and Marine Corps Environmental Engineering for Facility Construction

UFC 3-501-01 Electrical Engineering

UFC 3-520-01 Interior Electrical Systems

UFC 4-023-10, Safe Havens

FC 4-610-04F Air Force Legal Facilities

FC 3-260-18F Air Force Aircraft Arresting Systems (AAS) Installation, Operation, and Maintenance

FC 4-218-01F Air Force Criteria for Precision Measurement Equipment Laboratory Design and Construction

## **4.5 FY 2017 UFC Projects**

### **Architecture**

UFC 3-120-10: Interior Design  
UFC 4-730-10: Fire Stations  
UFC 4-740-02: Fitness Centers  
UFC 2-201-02: Landscape Architecture

### **Aviation**

UFC 3-260-01: Airfield and Heliport Planning and Design (F-35 JSF and MV-22)  
UFC 3-260-01: Airfield and Heliport Planning and Design (F-35B STO)  
UFGS 32 13 13.43: High Temperature Concrete for Airfields

### **Civil**

UFC 3-230-02: O&M: Water Supply Systems  
UFC 3-240-03: O&M: Wastewater Treatment Systems

### **Cost Engineering**

UFC 3-710-01: Parametric Cost Estimating for Facilities Construction

### **Fire Protection**

UFC 3-601-02: O&M: Inspection, Testing and Maintenance of Fire Protection Systems

### **Geotechnical**

UFC 3-220-01: Geotechnical Engineering (Phase II)

### **Mechanical**

UFC 3-440-05N: Tropical Engineering (study to relocate information to other UFCs)  
UFC 3-410-02: LonWorks Direct Digital Control for HVAC and Other Local Building Systems  
UFCs Various: Legionella Requirements General UFC Updates  
UFC 3-430-11: Boiler Control Systems  
UFC 3-430-08: Central Heating Plants  
UFC 3-460-01: Design: Petroleum Fuel Facilities

### **Pavements/Airfields**

UFC 3-260-04: Airfield and Roadway Marking  
UFC 3-230-05: Surface Drainage

### **Security**

UFC 4-026-01: Design of Buildings to Resist Forced Entry

### **Structural**

UFC 3-301-01: Structural Engineering (combines 2 UFCs)  
UFC 3-301-01: Structural Engineering (provides inundation mapping)  
UFC 3-340-02: Structures to Resist the Effects of Accidental Explosions  
UFC 3-320-06A: Concrete Floor Slabs on Grade Subjected to Heavy Loads

**Utility Control**

UFC 4-141-05N: Navy and Marine Corps Industrial Controls Systems Monitoring Stations

UFC TBD: Cybersecurity

**Waterfront**

UFC 4-159-03: Design: Moorings

UFC 4-150-06: Military Harbors and Coastal Facilities

UFC 4-150-02: Dockside Utilities for Ship Service

## 5 UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

### 5.1 Introduction

UFGS are technical master guide specifications used in construction projects. UFGS reference industry-consensus test and material standards and are mostly prescriptive in nature. UFGS are edited by the designer for each project and speak to the construction contractor. Sections are numbered and titled in accordance with Construction Specifications Institute's (CSI) Masterformat™ 2012 (<http://www.csinet.org/mfnumber>). Sections are organized into 3 parts in accordance with UFC 1-300-02:

#### Part 1 – GENERAL

References  
Submittals

#### Part 2 – PRODUCTS

System Performance  
Materials

#### Part 3 – EXECUTION

How to install  
Field Quality Control and Testing

### 5.2 Criteria Strategy

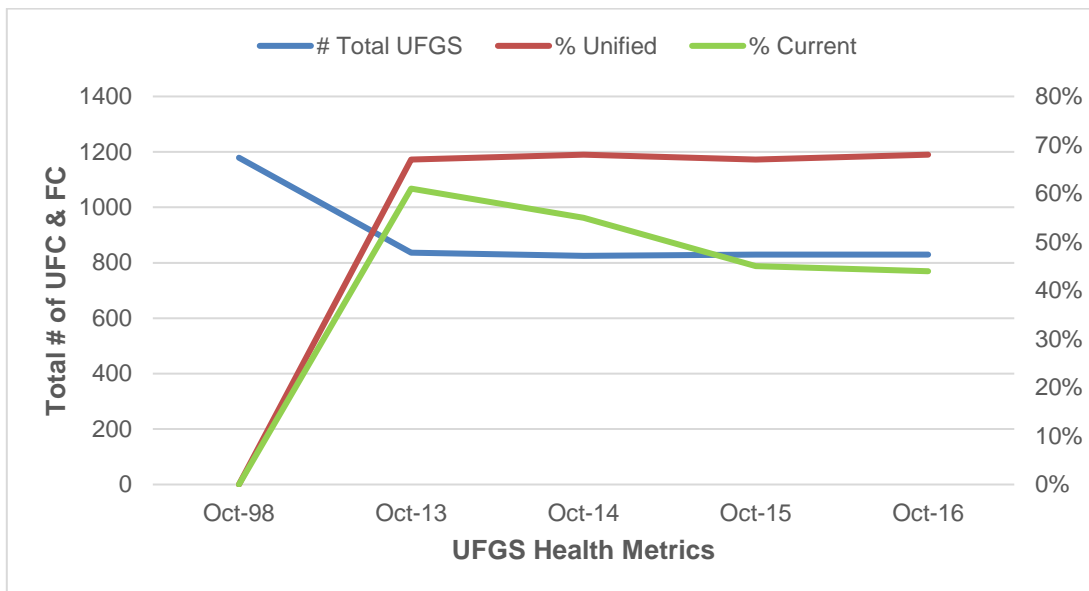
UFGS provide the level of quality and performance to provide best life-cycle cost sustainment for DoD facilities over a 45-55 year service life. UFGS are editable in order to adjust quality and level of performance based on project specific factors such as climate zone, site factors, structural loading, corrosion potential, durability requirements, facility criticality, and appearance requirements. DWGs identify the primary UFC tied to their UFGS, and its relationship in content (low, medium, or high) as part of this effort; CMS is being programmed to show the UFC and UFGS relationship fields in the document screens.

### 5.3 Health Metrics

The primary indicators of UFGS health are “% Unified” and “% Current”. % Unified represents the percentage of total UFGS used by all three Military Departments that are unified and indicates progress toward reducing duplicate criteria. % Current represents the percentage of all UFGS that have been revised within a specified target timeframe or refresh rate. Refresh rates are assigned as 3 years, 5 years, or 7 years.

Data collection for % Current began in FY 2012 for UFGS. The baseline for % Unified data is extracted from the March 1998 report to the Congressional Defense Committees titled “Unified Design Guidance.”

Before August 2012, UFGS changes that were minor in scope were considered “revisions” and allowed to reset the refresh cycle. In August 2012, this metric was adjusted so that minor changes did not count as revisions. Because of this metric adjustment, the current metric value for % Current is overstating the true health of the UFGS inventory in accordance with the new measurement standard. Many UFGS that reset their refresh cycle prior to August 2012 based on minor changes, and therefore are not yet due for revision, would be due or overdue for revision had the current rule applied previously.



All UFGS	Oct 1998	Oct 2013	Oct 2014	Oct 2015	Oct 2016
Total # UFGS	1179	836	825	830	829
Unified	0%	67%	68%	67%	68%
Current	Unknown	61%	55%	45%	44%

Table 5-1  
UFGS Health Metrics

## 5.4 FY 2016 New, Revised, and Changed UFGS

In FY 2016, 38 UFGS were new releases, 152 UFGS were revised and 25 UFGS were changed. A complete listing of UFGS can be found at: [http://www.wbdg.org/ccb/browse\\_cat.php?c=3](http://www.wbdg.org/ccb/browse_cat.php?c=3)

## 5.5 FY 2017 UFGS Projects

### Architecture

UFGS 31 21 13: Radon Mitigation

UFGS 02 82 16 20: Engineering Control of Asbestos Containing Materials

### Aviation

UFGS 32 13 13.43: High Temperature Concrete for Airfields

### Civil

UFGS 43 31 14: Trickling Filter

### Electrical

UFGS TBD: Electric Vehicle Charging Station

UFGS 26 56 00: Exterior Lighting

UFGS 26 12 19.10 Three-Phase Pad-Mounted Transformers

UFGS 33 82 00: Telecommunications Outside Plant  
UFGS 26 51 00: Interior Lighting  
UFGS 27 10 00: Building Telecommunications Cabling System  
UFGS 26 29 23: Variable Frequency Drive Systems Under 600 Volts  
UFGS 26 11 14.00: Main Electric Supply Station and Substation  
UFGS 26 32 15.00 10: Diesel Generator Set Stationary 100-2500 KW with Auxiliaries

**Fire Protection**

UFGS 21 30 00: Fire Pumps

**Geotechnical**

UFGS 31 23 00.00 20: Excavation and Fill

**Mechanical**

UFGS 23 09 00: Instrumentation and Control for HVAC  
UFGS 25 08 10: Utility Monitoring and Control System Testing  
UFGS 13 48 00: Seismic Protection for Miscellaneous Equipment  
UFGS 13 48 00.00 10: Seismic Protection for Mechanical Equipment  
UFGS 23 64 26: Chilled, Chilled-Hot, and Condenser Water Piping Systems  
UFGS TBD: Variable Frequency Drive Systems for HVAC  
UFGS 23 81 47: Water-Loop and Ground-Loop Heat Pump Systems  
UFGS 23 72 00.00: Energy Recovery Systems  
UFGS 23 71 19: Thermal Energy Storage Units: Ice-On-Coil  
UFGS 23 72 26.00: Desiccant Cooling Systems

**Specifications**

UFGS 01 57 23.00 10: Supplemental Temporary Storm Water Pollution Control  
UFGS 00 01 15: List of Drawings  
UFGS 01 14 00: Work Restrictions

**Sustainability**

UFGS 01 74 19: Construction and Demolition Waste Management  
UFGS 01 33 29: Sustainability Reporting

**Waterfront**

UFGS 35 59 13.14 20: Polymeric Fender Piles  
UFGS 03 31 29: Marine Concrete



## 6 CRITERIA CHANGE REQUESTS (CCR)

### 6.1 Introduction

Criteria Change Requests (CCR) provide a process whereby users of UFC, FC, UFGS can submit commentary on DoD criteria documents. Such commentary may warrant corrections to the documents that reflect lessons learned and/or current industry standards and work practices. Anyone with access to the internet may use Criteria Change Requests (CCR) to document and submit comments on UFC, FC, and UFGS. The CCR database was moved to the criteria management system in FY 2011 to improve working group notification, execution, and tracking of CCRs which had been all but nonexistent in prior years. The new system has improved the execution immensely. However, as a result of the open nature of the CCR commenting system, the number of comments are too numerous for current working group resources. A steady backlog of CCRs continues to accumulate as shown in Table 6-1.

### 6.2 CCR Status (as of 30 Sep 2016)

CCR	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	TOTAL TO DATE (FY 2012-FY 2016)
SUBMITTED	1116	922	682	612	635	3967
RESOLVED	959	783	478	388	385	2993
PENDING RESOLUTION	157	139	204	224	157	881

Table 6-1  
CCR Status