



Summary of Changes

2018 UFC 4-010-01

A Stone Security Engineering White Paper

January 18, 2019

Richard Galli, PE

Hollice Stone, PE

Jason Florek, Ph.D., PE



Background

A new version of Unified Facilities Criteria (UFC) 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings* was released on December 12, 2018. This document supersedes UFC 4-010-01 Change 1, dated October 2013, and cancels UFC 4-010-02 (FOUO). The document represents a significant and systemic change to the standards which may translate to changes in design and construction for DoD inhabited structures in the years to come. This article summarizes the changes in applicability and some of the major changes to the standards themselves.

Philosophical Change

The 2013 version of UFC 4-010-01 established minimum levels of protection (LOPs) against terrorist attacks for all inhabited DoD buildings. Baseline Design Basis Threats (DBTs) were also established and specified in the FOUO UFC 4-010-02 document.

The basis for the majority of the changes in the 2018 Version is that it no longer assumes baseline DBTs and LOPs for projects where no known threat of terrorist activity currently exists. Since the previous versions of UFC 4-010-01 had a combination of threat based and threat independent design requirements, where the threat based requirements were inherently tied to the DBT/LOP, the requirements of the standards are now threat independent only.

Overall Impacts

These changes will greatly simplify UFC 4-010-01 implementation in projects where *“no identified threat or level of protection has been determined in accordance with UFC 4-020-01”*. The application of the 2018 version of UFC 4-010-01 allows much more site layout latitude and will reduce construction costs for buildings with no identified threat or level of protection. However, the facility planning and UFC 4-020-01 evaluation process becomes an even more critical element of the project development process since the UFC 4-010-01 no longer provides a Low or Very Low Level of Protection.

Challenges for Project Teams

As with all updates to UFC 4-010-01, the first group of projects which implement the latest version will have to be very aware that the design is not a ‘business-as-usual’ ATEP design and great attention must be paid to the changes in the standards. This will also mean that one of the keys to a successful project is a well-developed and current UFC 4-020-01 assessment, the results of which are clearly transmitted to the design team.



Implementation

These standards apply to all DoD Components, to all DoD inhabited buildings and high occupancy family housing, to all inhabited tenant buildings on DoD installations, and to all DoD expeditionary structures.

“Due to major changes between these standards and previous editions, projects currently under design and beyond 35% completion may consider complying with these standards where possible.”

Temporary Sections of UFC 4-010-01

Several sections of the 2018 UFC 4-010-01 will be removed once updates in-progress UFC documents are released. These sections noted below and not discussed in greater detail herein.

Chapter 4- Standards for Expeditionary Structures: This chapter provides the minimum antiterrorism standards for expeditionary structures. It will be removed when the new version of UFC 4-027-01 *Design to Mitigate Terrorist Attacks in Expeditionary Environments* is published.

Appendix B- Best Practices: This section retains much of the site and blast related design information from the 2013 version of UFC 4-010-01. It is explicitly stated that these measures are not required in the current standard. This chapter will be removed when the new version of UFC 4-020-02 *Security Engineering Facilities Design Manual* is published.

Appendix C- Representative Standoff Distance for Conventional Construction and Expeditionary Structures: This section provides CCSDs for various construction types at each level of protection for use in planning (but not in design). The information will be included in new version of UFC 4-020-02 *Security Engineering Facilities Design Manual* when it is published. Although not explicitly stated, since the contents are outside the scope of UFC 4-010-01 (i.e. it is only applicable when a threat and level of protection have been identified) it may be removed when the new version of UFC 4-020-02 is published.

Summary of Changes to the Standards

The systemic changes in document intent are mirrored in changes to the actual standards.

- Standards 3 and 4 have been removed and no longer apply.
- Standards 11, 13, 14, 15, 17, 19, and 20 have no substantive changes.

An overview of the changes to the remaining standards is provided below:

Standard 1- Standoff Distances

2013 Version: Provided Minimum Standoff Distances and Conventional Construction Standoff Distances (CCSDs). The standoff distances were applicable for both new and existing buildings to controlled perimeters, parking areas, roadways, trash containers, and other obstructions.



Varying distances were provided based on type of construction and applicable level of protection. For standoff distances between the Minimum Standoff Distance and CCSDs or for construction which did not match the construction types mentioned, a description of the design approach based on the DBTs was provided.

2018 Version: The minimum standoff distances in the updated standard only applies to the distance from new construction or building additions to the installation perimeter; existing construction is now exempt.

The minimum standoff distance is now 20 feet where there is a suitable “Clear Zone” at the perimeter or 50 feet where there is not a suitable “Clear Zone”. The requirement for the suitable Clear Zone is a 50-foot aggregate area at the perimeter (including both inside and outside the perimeter) “free of all obstacles, topographical features, and vegetation exceeding 8 inches in height that could impede observation or provide cover and concealment of an aggressor.”

There are no requirements for installation parking areas, roadways, etc. The associated operational solutions for these standoffs which were previously allowed for existing buildings are inherently no longer applicable.

Standard 2- Unobstructed Space

2013 Version: Included unobstructed space requirements for the standoff distances associated with the WII DBT. The unobstructed space was defined as an area free of “obstructions or building features that might allow for concealment from observation of explosive devices with dimensions of no less than 6 inches.” The unobstructed space was required to extend the same distance around the building as the CCSDs or performance-based design standoff distances, or the design standoff distance for the WII DBT was required to be reduced to match the unobstructed space.

2018 Version: Retains the definitions for unobstructed space from the previous version with a required distance of 33 feet. The conventional/minimum standoffs and performance-based design methods for reduced standoffs are no longer applicable due to removal of the baseline DBTs. Additionally, parking within the unobstructed spaces is permitted without additional consideration.

Standard 5- Parking Beneath Buildings or on Rooftops

2013 Version: Provided instruction to avoid parking beneath buildings or on rooftops. Where limitations on available real estate made this unavoidable, the standard provided mitigation measures. These measures included access control and design of structural elements for the WII DBT.



2018 Version: Provides the same instruction to avoid parking beneath buildings or on rooftops. The mitigation measures where limitations on available real estate make this unavoidable have been reduced solely to access control measures (i.e. structural measures are no longer required).

Standard 6- Progressive Collapse

2013 Version: Required implementation of progressive collapse mitigation measures for buildings three stories or greater. The standard referenced UFC 4-023-03 requirements for Occupancy Category II. It noted that perimeter access control did not constitute access control for individual buildings (for the purpose of defining requirements for interior columns/walls) and provided additional requirements for access control for individual buildings.

2018 Version: Retains the requirement for implementation of progressive collapse mitigation measures for buildings three stories or greater and the reference to UFC 4-023-03 requirements for Occupancy Category II. It no longer includes the access control requirements for individual buildings and limits the applicability of the interior column provisions to building areas with parking beneath or above inhabited areas.

Standard 7- Structural Isolation

2013 Version: Required that building additions be structurally independent from existing buildings or that analysis be provided showing that the collapse of the existing building or structure would not result in collapse of the remainder of the building. It similarly required that either:

- Low occupancy portions of inhabited buildings be structurally independent from inhabited portions;
- Analysis be provided showing that collapse of the low occupancy portion of the building would not result in collapse of the remainder of the building; or
- The low occupancy portion of the building met the standoff and unobstructed space requirements of an inhabited building.

2018 Version: Retains the majority of the 2013 requirements, except that existing buildings built to any of the previous UFC 4-010-01 standards are exempt, and that the structural isolation/analysis for low occupancy portions of existing buildings is not mandatory.

Standard 8- Building Overhangs and Breezeways

2013 Version: Provided instruction to avoid building overhangs and breezeways with occupied spaces above them. Where these elements were necessary, it provided:

- Provisions for inclusion of the area beneath the overhang/breezeway as an extension of the unobstructed space;



- Provisions related to access control of parking/roadways beneath existing overhang/breezeway elements.

2018 Version: Retains the instruction to avoid building overhangs and breezeways with occupied spaces above them and the provisions for extension of the unobstructed space when these elements are necessary. The provisions related to parking/roadways are no longer applicable based on other changes to the document.

Standard 9- Exterior Masonry Walls

2013 Version: Prohibited the use of unreinforced masonry in new construction. It provided specific requirements for horizontal and vertical reinforcement ratios. It also provided parameters to apply exceptions for unreinforced masonry as a cladding on wood/metal studs or as European masonry construction. It required that unreinforced masonry of existing buildings not meeting the CCSDs be evaluated/retrofitted to provide the appropriate level of protection for the actual standoff distance.

2018 Version: Retains the requirements, definitions, and exceptions for new construction from the previous version. Removed requirements for existing construction.

Standard 10- Glazing (previously Windows and Skylights)

2013 Version: Provided performance-based requirements for window and skylight systems (glazing, framing, and connections). The standard was applicable for window replacement projects even if the overall application of UFC 4-010-01 requirements was not triggered. The performance requirements were based on the applicable level of protection, the baseline DBTs, and the actual standoff distances for the building. Proof of performance by dynamic analysis, static analysis, or testing was required.

Exterior stairwells and covered/enclosed walkways were exempted from the performance based requirements. However, the interior wall of these elements required design per windborne debris resistances requirements.

The standard also prohibited use of alternative window treatments to meet the requirements.

2018 Version: Removes the performance-based requirements for glazing and all requirements for framing and connections. Prescriptive minimum layups, including an inner laminated or polycarbonate pane, are provided. Both the interior and exterior walls of exterior stairwells, vestibules, and covered/enclosed walkways must meet the minimum layup requirement. The standard retains the prohibition on the use of alternative window treatments to meet the requirements.



Standard 12- Exterior Doors

2013 Version: Provided performance-based requirements for exterior doors (both glazed and unglazed). The standard was applicable for door replacement projects even if the overall application of UFC 4-010-01 requirements was not triggered. The performance requirements were based on the applicable level of protection, the baseline DBTs, and the actual standoff distances for the building.

2018 Version: Removes the performance-based requirements for doors. Hinged doors are required to open outward. There are no requirements related to door framing or connections. Sliding and revolving doors are acceptable without considerations for support/bearing. The glazing in exterior doors is to meet the requirements of Standard 10.

Standard 16- Air Intakes

2013 Version: Required that air intakes for new buildings be located 10 feet above ground. For existing buildings, it allowed extension of existing air intakes to the 10 feet elevation by means such as a chimney. An exemption was provided for intakes within a mechanical yard. Requirements were also included for performance-based evaluation of interior walls of a mechanical room where pressures could infiltrate through air intakes. This standard was required for HVAC projects when the overall UFC 4-010-01 application was not triggered.

2018 Version: Retains the intake height requirement and applicability to HVAC projects when the overall UFC 4-010-01 application is not triggered. The exemption was modified from referencing an equipment yard to referencing any enclosure that would prevent concealment of the explosive device dimensions noted in Standard 2. The performance-based infiltration/interior wall analysis is no longer applicable and is excluded from the updated standard.

Standard 18- Emergency Air Distribution Shutoff

2013 Version: Required an emergency shutoff switch in the HVAC control system that can immediately shut down the air distribution and exhaust systems throughout the building and close all dampers leading to the outside. It also included requirements for low leakage dampers at outside air intakes, relief air, and exhaust openings. The standard provided cases where exceptions or change in the concept of operations of shutoffs were applicable (such as air servicing critical areas or cases where the noted concept of operations would violate code requirements). This standard was required for HVAC projects when the overall UFC 4-010-01 application was not triggered.

2018 Version: Retains these requirements and updated/clarified the cases where exceptions or change in the concept of operations of shutoffs were applicable.



Standard 21- Mass Notification

2013 Version: Required buildings to have mass notification systems designed per UFC 4-021-01. This requirement applied to new buildings, to existing buildings falling under the primary gathering, billeting, and high occupancy family housing classifications and was a recommendation for other inhabited buildings.

2018 Version: Requires all new and existing buildings (where UFC 4-010-01 applicability is triggered) have mass notification systems designed per UFC 4-021-01.

Applicability and Exceptions

In addition to the changes in the standards themselves, there were also several changes in the applicability of, and exceptions to, the requirements in UFC 4-010-01 with the 2018 version.

Document Organization Changes

The majority of the changes are related to document organization (and essentially do not alter the overall applicability). For example:

- Privatized buildings are now included in the applicability section whereas they were previously included as part of the definition of a DoD building;
- The applicability of HVAC requirements for HVAC modification of existing buildings where the overall applicability of UFC 4-010-01 is not triggered is now conveyed in the applicability section instead of the individual HVAC related standards;
- Applicability for visitor centers and museums and access control points have been moved to the occupancy section of the document;
- Exemptions from standoff/unobstructed space requirements for stand-alone franchised fast food operations, commercial, bank, and pharmacy facilities and for small shoppettes, mini-marts, and commissaries were moved from the exceptions to within the standard.

Applicability and Exception Changes – Consequence of Update to UFC 4-010-01 Scope/Standards

Several applicability and exception changes are a result in modification of UFC 4-010-01 scope and specific standards. For example:

- The applicability section for roadway improvement projects was removed because there is no longer any roadway associated standoff.
- The exemption for military protective construction (falling under NATO requirements or equivalent) was changed from exempt but requiring inclusion of the DBTs associated with UFC 4-010-01 to fully exempt because there are no longer DBTs associated with UFC 4-010-01.



Applicability and Exception Changes – Substantive Impact to Certain Project Types

There are a number of changes to the applicability and exceptions which have substantive implications for some types of future projects. These include:

- Gas Stations and Car Care Centers:

2013 Version: These facilities were excepted from the requirements.

2018 Version: UFC 4-010-01 is now applicable for when these facilities meet the threshold occupancy requirements.

- Enhanced Use Leases on DoD facilities:

2013 Version: These facilities were exempt if completely outside the controlled perimeter and did not require access from within the controlled perimeter. If they were within the perimeter, these facilities were required to meet the standards.

2018 Version: These facilities are exempt unless additional force protection is warranted due to specific purpose/location (requiring justification on a case-by-case basis).

- Leased Buildings:

2013 Version: Referenced Interagency Security Committee (ISC) *The Risk Management Process for Federal Facilities*.

2018 Version: References ISC *Physical Security Criteria for Federal Facilities*.