Revised Antiterrorism/Force Protection Standards

Newly updated antiterrorism/force protection criteria for Department of Defense buildings includes a number of significant clarifications and critical changes.

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The Department of Defense (DOD) first published its Unified Facilities Criteria (UFC) 4-010-01, DoD Antiterrorism Standards for Buildings, on July, 31 2002. Approved for public distribution, the document represented the first widely available guidance for mitigating the threat of terrorism against buildings. Revisions released in October 2003 and January 2007 further refined the requirements while incorporating lessons learned from implementation of earlier versions. On Feb. 9, 2012, DOD published the latest edition. Once again, the document includes a number of significant clarifications and critical changes that will impact design and construction of DOD buildings.

UFC 4-010-01 remains mandatory for four categories of DOD buildings: inhabited, primary gathering, billeting and high-occupancy family housing. Although there seems to have been a misconception to the contrary, there are no waivers from the requirements of UFC 4-010-01. The new version states: “Commanders cannot deviate from these standards or accept risk based on their own authorities.” Instead, any anticipated deviations must be evaluated and approved in accordance with service- or agency-specific guidance and accompanied by “plans, procedures, and compensatory measures to mitigate the risks associated with those situations.”

WHAT IS IMPACTED

The document affects all new construction and existing buildings under certain circumstances—major investments, change of occupancy level, window replacement and building additions. If a project programmed or designed in accordance with previous editions of UFC 4-010-01 had already proceeded past the 35 percent completion stage as of Feb. 9, 2012, or if a design-build request for proposals had already been issued, the work need not be redesigned. However, even in these situations, adherence to the revised version is encouraged wherever possible.

The simplest strategy for protecting a building from a vehicle bomb—the most common tactic of terrorists—is to maximize the standoff distance between the building and the postulated location of the explosion. UFC 4-010-01 has always specified two types of conventional construction standoff distances (CCSD), each corresponding to a different explosive weight that serves as the design basis threat:

- CCSD₁ is associated with Explosive Weight I (larger) and is measured to parking and roadways in a controlled perimeter, and to trash containers.
- CCSD₂ is associated with Explosive Weight II (smaller) and is measured to parking and roadways where there is no controlled perimeter.

A controlled perimeter is “a physical boundary . . . with sufficient means to channel vehicles to the access control points” where there is a “demonstrated capability to search for and detect explosives.” This is usually the installation fence; in some cases, rugged or densely wooded terrain may qualify. The actual magnitudes of Explosive Weights I and II are specified in UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings (which is available only to government agencies and their contractors).
EMERGENCY PREPAREDNESS AND HOMELAND SECURITY

The operative principle in UFC 4-010-01 is that providing all applicable CCSDs means that the building’s exterior components can be designed for the usual environmental loads without any special analysis and hardening for blast effects. CCSDs were standardized in previous editions. In the revised version, they depend on the exterior wall construction. Wall and roof systems that do not fall within prescribed ranges of parameters for each construction type must be analyzed for blast even when CCSDs are provided. The absolute minimum standoff distance is now 18-ft (5.5-M) for Explosive Weight I and 12-ft (3.6-M) for Explosive Weight II.

EVALUATING NEW CRITERIA

Initially, it may seem that greatly reduced standoff distances are now permissible for certain materials. Reinforced concrete and reinforced masonry for instance. While this is true with respect to the wall and roof systems, it is important to recognize that glazing systems and their supporting structural elements must still be designed for blast effects from the appropriate explosive weight at the actual standoff distance. Design teams need to evaluate the tradeoff between the benefits of smaller standoff distances (especially for buildings with constrained sites) and the additional cost of hardening exterior windows and glazed doors.

One solution is to recognize that the industry’s “standard” glazing systems for DOD primary gathering buildings have been designed for Explosive Weight I at a standoff distance of 148-ft (45-M), which controlled over Explosive Weight II at a standoff distance of 82-ft (25-M).

The revised version of UFC 4-010-01 states that Explosive Weight I need not be considered when the standoff distance to the controlled perimeter exceeds 200-ft (60-M). Explosive Weight II at a standoff distance of about 63-ft (19-M) produces blast effects comparable to those of Explosive Weight I at a standoff distance of 148-ft (45-M).

Therefore, glazing systems and their supporting structural elements in primary gathering buildings located at least 200-ft (60-M) within a controlled perimeter and at least 63-ft (19-M) away from parking, roadways and trash containers will not require hardening beyond what has been typical for such facilities in recent years.

NOTEWORTHY CHANGES

Additional significant revisions include, but are not limited to, the following:

- Design submittals are required to include a narrative explaining how each individual standard is met; calculations or test results for all glazing systems and any structural elements where CCSDs are not provided; and progressive collapse analysis where applicable.
- It is now explicit that “vehicle barriers provided to meet these standards are not required to stop moving vehicles,” and that “parking areas and roadways do not require physical barriers.”
- Parking areas are now defined as including “roadways within or accessing parking areas,” which means that there cannot be any parking spaces associated with an access road or other paved area that approaches within CCSD, unless the building is analyzed and hardened accordingly.
- Parking areas located closer than CCSD to existing buildings must be controlled for pedestrian and vehicle access.
- Instead of being set at 33-ft (10-M), the unobstructed space now extends out from the building to the applicable value of CCSDp. A smaller unobstructed space may be validated through blast analysis.
- Occupied overhangs and breezeways are still discouraged, but are now permitted without hardening as long as the areas underneath them qualify as unobstructed space.
- Exterior stairwells, covered or enclosed walkways, vestibules and foyers are “not considered to be routinely occupied.” As a result, their outer construction (including glazing) does not need to be analyzed or hardened for blast. The inner building components behind them, though, must be capable of mitigating any hazards resulting from their failure.
- Exterior doors, even without glazing, must now be tested in accordance with ASTM F2247 using an equivalent static pressure based on the characteristics of the specified blast loading and the structural properties of the door itself. Alternatively, untested doors may be positioned so they will not be propelled into inhabited areas or in front of walls with sufficient strength to withstand their impact. This solution is mandatory for overhead doors since it is “impractical” to harden them.
- Mail rooms are no longer required to be sealed.
- Where equipment rooms have air intakes for cooling that could admit blast pressures, the interior walls must be designed for the same blast loads as the exterior walls.
- Emergency air distribution shutoff switches must be located on each floor with a maximum travel distance of 200-ft (60-M). Exhaust systems may continue to operate where shutting them down would violate building or fire codes, such as in kitchens.
- The requirements for utility distribution and installation have been deleted.

CONCLUSION

The revised UFC 4-010-01 offers greater flexibility when it comes to establishing standoff distances that do not require blast analysis and hardening of exterior wall and roof components. However, exterior glazing systems and their supporting structural elements must still be evaluated and may become quite expensive at reduced standoff distances.

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