

DOD Force Protection Construction Standards and Guidance

LTC Debra Lewis
Joint Chiefs of Staff

DRAFT



*Department of Defense Antiterrorism
Construction Standards*

XX , 2001

*Supersedes 16 December 1999 Interim Department of Defense Antiterrorism /
Force Protection Construction Standards*

The Under Secretary of Defense (Acquisition, Technology, and Logistics)

FOR OFFICIAL USE ONLY

DRAFT

FOREWORD

1
2
3
4 **This document is issued under the authority of DoD Instruction Number 2000.16, "DoD Combating**
5 **Terrorism Program Standards," which requires DoD Components to adopt and adhere to common criteria**
6 **and minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats.**
7

8 **This document applies to the Office of the Secretary of Defense (OSD); the Military Departments (including**
9 **their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint Staff; the**
10 **Combatant Commands; the Office of the Inspector General of the Department of Defense; the Defense**
11 **Agencies; the Department of Defense Field Activities; and all other organizational entities within the**
12 **Department of Defense (hereafter referred to collectively as "the DoD Components").**
13

14 **The standards established by this document are minimums set for DoD. Each DoD Component**
15 **may set more stringent antiterrorism construction standards to meet the specific threats in their**
16 **areas of responsibility.**
17

18 **This document is effective immediately and is mandatory for use by all the DoD Components.**
19

20 **This document supersedes "Interim Department of Defense Antiterrorism/Force Protection**
21 **Construction Standards," 16 December 1999, except that the Interim Standards will remain in**
22 **effect for the Fiscal Year 2002 and 2003 Military Construction programs.**
23

24 **Users in the field are highly encouraged to submit comments on this document. Send recommended changes**
25 **to:**
26

27 **Deputy Under Secretary of Defense (Installations and Environment)**
28 **3400 Defense Pentagon**
29 **Washington, DC 20301-3400**
30

31 **These comments should address content (accuracy, usefulness, consistency, and organization),**
32 **writing, and appearance.**
33
34

35 **The DoD Components may obtain copies of this document through the U.S. Army Engineer District, Omaha,**
36 **ATTN: CENWO-ED-ST, 12565 West Center Road, Omaha, NE 68144-3869.**
37 **Other Federal Agencies may obtain copies from Department of the Army, U.S. Army Corps of Engineers,**
38 **ATTN: CECW-EI, Washington, DC 20314-1000. Information in this document is exempt from mandatory**
39 **public disclosure under provisions of FOIA, para. 5 USC 552(b)(2). Distribution of this document is restricted**
40 **to U.S. Government agencies and their contractors only.**
41

DRAFT

1

TABLE OF CONTENTS

	<u>Page</u>	
Foreword	1	
Table of Contents	2	
References	3	
Definitions	4	
CHAPTER 1 – INTRODUCTION		
C1.1. General	7	
C1.2. Standards and recommendations	7	
C1.3. Intent	7	
C1.4. Levels of protection	8	
C1.5. Applicability	8	
C1.6. Programming	10	
C1.7. Information sensitivity	10	
CHAPTER 2 – PHILOSOPHY, ASSUMPTIONS, AND DESIGN STRATEGIES		
C2.1. General	12	
C2.2. Philosophy	12	
C2.3. Assumptions	12	
C2.4. Design strategies	18	
APPENDICES		
AP1. DoD Antiterrorism Minimum Construction Standards for New and Existing Buildings	20	
AP2. Recommended Additional Antiterrorism Measures for New and Existing Buildings	29	
AP3. DoD Construction Standards for Expeditionary and Temporary Structures	31	
FIGURES		
<u>Figure</u>	<u>Title</u>	<u>Page</u>
AP1.1.	Standoff Distances and Building Separations – Controlled Perimeter	24
AP1.2.	Standoff Distances and Building Separations – No Controlled Perimeter	24
AP3.1.	Standoff Distances and Structure Separations for Expeditionary Structures	34
TABLES		
<u>Table</u>	<u>Title</u>	<u>Page</u>
C2.1.	Levels of Protection – New Construction	15
C2.2.	Levels of Protection – Existing Construction	16
C2.3.	Levels of Protection – Expeditionary and Temporary Construction	17
AP1.1.	Minimum Standoff Distances and Building Separations for New and Existing Construction	23
AP3.1	Minimum Standoff and Separation Distances for Expeditionary and Temporary Structures	33

DRAFT

REFERENCES

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

- (a) Department of Defense Interim Antiterrorism / Force Protection Construction Standards, December 16, 1999 (hereby cancelled).
- (b) DoD Instruction 2000.16, DoD Antiterrorism Standards, June 14, 2001.
- (c) DoD Handbook 2000.12-H, Protection Of DoD Personnel and Activities Against Acts of Terrorism and Political Turbulence, February 1993.
- (d) American Society of Civil Engineers Standard (ANSI/ASCE) 7-98, Minimum Design Loads for Buildings and Other Structures, January 2000.
- (e) Unified Facility Criteria (UFC) 4-010-01. DoD Security Engineering Manual (Draft)
- (f) Sections 2805(a)(1) and 2805(c)(1) of Title 10, US Code
- (g) Security Engineering Working Group website (<http://sewg.nwo.usace.army.mil>)

DRAFT**DL1. DEFINITIONS**

1
2
3 **DL1.1. Access road.** Any roadway within a controlled perimeter such as a maintenance, delivery,
4 service, emergency, or other special limited use road that that is necessary for the operation of the
5 building within that perimeter.
6

7 **DL1.2. Billeting.** Any building or portion of a building in which 5 or more unaccompanied DoD
8 personnel are routinely housed. For the purposes of these standards, billeting will also include Temporary
9 Lodging Facilities and military family housing permanently converted to unaccompanied housing with 13
10 or more units per building. Billeting also applies to expeditionary and temporary structures with similar
11 population densities and functions.
12

13 **DL1.3. Building hardening.** Enhanced conventional construction that mitigates limited standoff
14 distance. Building hardening may also be considered to include the prohibition of certain building
15 options.
16

17 **DL1.4. Building separation.** The distance between closest points on the exterior walls of adjacent
18 buildings.
19

20 **DL1.5. Collateral damage.** Injury to personnel or damage to buildings that are not the primary target of
21 an attack.
22

23 **DL1.6. Container structures.** Structures built using shipping containers that are designed to withstand
24 structural loadings associated with shipping, including CONEX and ISO containers.
25

26 **DL1.7. Controlled perimeter.** A physical boundary at which personnel and vehicle access is controlled
27 at the perimeter of an installation, an area within an installation, or another area with restricted access.
28 Where the controlled perimeter includes a shoreline and there is no defined perimeter beyond the
29 shoreline, the boundary will be at the mean high water mark.
30

31 **DL1.8. Conventional construction.** Building construction that is not specifically designed to resist
32 weapons or explosives effects. Conventional construction is designed only to resist common loadings and
33 environmental effects such as wind, seismic, and snow loads. Unreinforced masonry is excluded from
34 conventional construction for the purposes of these standards.
35

36 **DL1.9. Design Basis Threat.** The threat (aggressors, tactics, and associated weapons, tools, or
37 explosives) against which assets within a building must be protected and upon which the security
38 engineering design of the building is based.
39

40 **DL1.10. DoD building.** Any building or portion of a building owned, leased, privatized, or otherwise
41 occupied, managed, or controlled by or for DoD.
42

43 **DL1.11. DoD Components.** The Office of the Secretary of Defense (OSD); the Military Departments
44 (including their National Guard and Reserve Components); the Chairman, Joint Chiefs of Staff and Joint
45 Staff; the Combatant Commands; the Office of the Inspector General of the Department of Defense; the
46 Defense Agencies; the Department of Defense Field Activities; and all other organizational entities within
47 the Department of Defense.
48

49 **DL1.12. DoD personnel.** Any U.S. military, DoD civilian, or family member, host nation employees
50 working for DoD, or contractors occupying DoD buildings.

DRAFT

1
2
3 **DL1.13. Expeditionary structures.** Those structures intended to be inhabited for no more than 1 year
4 after they are erected. This group of structures typically include tents, Small and Medium Shelter
5 Systems, Expandable Shelter Containers (ESC), ISO and CONEX containers, General Purpose Shelters,
6 aircraft and vehicle maintenance, etc.

7
8 **DL1.14. Fabric Covered/Metal Frame construction.** A construction type that can be identified by a
9 metal, load-bearing frame (usually aluminum) with some type of fabric (such as canvas) stretched or
10 pulled over the frame. Examples of the types of structures that should be considered under this
11 classification of structures include Frame-Supported Tensioned Fabric Structures (FSTFS), “Dome”
12 Shelters, TEMPER Tents, Small and Medium Shelter Systems (SSS and MSS), General Purpose (GP)
13 Medium Tents, and GP Large Tents.

14
15 **DL1.15. Family housing.** DoD owned or contracted quarters for DoD personnel and their dependents.
16

17 **DL1.16. Glazing.** The part of a window or door assembly that normally transmits light, but not air.
18

19 **DL1.17. Inhabited building.** Buildings or portions of buildings routinely occupied by five or more
20 DoD personnel and with a population density of greater than one person per 40 gross square meters (430
21 gross square feet.) This density generally excludes industrial, maintenance, and storage facilities except
22 for more densely populated portions of those buildings such as administrative areas. It also excludes
23 family housing with 12 or fewer units per building. The inhabited building designation also applies to
24 expeditionary and temporary structures with similar population densities.

25
26 **DL1.18. Laminated glass.** Multiple sheets of glass bonded together by a bonding interlayer.
27

28 **DL1.19. Level of protection.** The degree to which an asset (person, equipment, object, etc.) is protected
29 against injury or damage from an attack.
30

31 **DL1.20. Mass notification.** Capability to provide real-time information to all building occupants or
32 personnel in the immediate vicinity of a building during emergency situations.
33

34 **DL1.21. Medical transitional structures and spaces.** Structures that are erected or leased for
35 temporary occupancy to maintain mission critical medical care during construction, renovation,
36 modification, repair or restoration of an existing medical structure. Examples include urgent, ambulatory,
37 and acute care operations.
38

39 **DL1.22. Parking.** Areas designated where vehicles may be left unattended.
40

41 **DL1.23. Primary gathering building.** Inhabited buildings or portions thereof where 50 or more DoD
42 personnel routinely gather, and family housing with 13 or more family units per building. The primary
43 gathering building designation also applies to expeditionary and temporary structures with similar
44 population densities.
45

46 **DL1.24. Progressive collapse.** A chain reaction failure of building members to an extent
47 disproportionate to the original localized damage. Such damage may result in upper floors of a building
48 collapsing onto lower floors.
49

50 **DL1.25. Roadways.** Any surface intended for motorized vehicle traffic.
51

DRAFT

1 **DL1.26. Routinely occupied.** For the purposes of these standards, an established or predictable pattern
2 of activity within a building that terrorists could recognize and exploit.
3

4 **DL1.27. Security engineering.** The process of identifying practical, risk managed short and long term
5 solutions to reduce and/or mitigate dynamic man-made hazards by integrating multiple factors, including
6 construction, equipment, manpower, and procedures.
7

8 **DL1.28. Specific threat.** Known or postulated aggressor activity focused on targeting a particular asset.
9

10 **DL1.29. Standoff distance.** A distance maintained between an exterior wall of a building and the
11 potential location for an explosive detonation.
12

13 **DL1.30. Structure group.** A cluster of expeditionary or temporary structures consisting of multiple
14 rows of individual structures.
15

16 **DL1.31. Structural glazed window systems.** Window systems in which glazing is bonded to the
17 window frame using a high-strength, high performance silicone sealant.
18

19 **DL1.32. Superstructure.** The supporting elements of a building above the foundation.
20

21 **DL1.33. Temporary structures.** Those structures that are erected with an expected occupancy of 3
22 years or less. This group of structures typically includes, but is not limited to, such things as Southeast
23 Asia (SEA) Huts, hardback tents, ISO and CONEX containers, pre-engineered buildings, trailers, and
24 stress tensioned shelters.
25

26 **DL1.34. TNT equivalent weight.** The weight of TNT (trinitrotoluene) that has an equivalent energetic
27 output to that of a different weight of another explosive compound.
28

29 **DL1.35. Wood Frame/Rigid Wall construction.** Structure types composed of wood frames or rigid
30 wall construction using other than wood such as honeycomb panels and stressed skins. Examples include
31 Expandable Shelter Containers (ESC), General Purpose (GP) Shelters, Aircraft Hangers (ACH), UBK
32 Kabins, Southeast (SEA) Huts, trailers, and hardback tents.
33
34
35
36
37
38
39
40
41
42

DRAFT**C1. CHAPTER 1****INTRODUCTION**

1
2
3
4
5 **C1.1. GENERAL.** This document represents a significant commitment by DoD to seek effective ways
6 to minimize the likelihood of mass casualties from terrorist attacks against our personnel in the buildings
7 in which they work and live.

8
9 **C1.1.1. Dynamic threat environment.** Terrorism is real, evolving, and continues to increase in
10 frequency and lethality throughout the world. The unyielding, tenacious, and patient nature of the
11 terrorists targeting DoD interests forces us to closely examine existing policies and practices for deterring,
12 disrupting, and mitigating potential attacks. Today, terrorist attacks can impact anyone, at any time, at
13 any location, and can take many forms. Deterrence against terrorist attacks begins with properly trained
14 and equipped DoD personnel employing effective procedures. While terrorists have many tactics
15 available to them, they frequently use explosive devices when they target large numbers of DoD
16 personnel. Most existing DoD buildings offer little protection from terrorist attacks. By applying the
17 DoD Antiterrorism Construction Standards described in this document, we become a smaller target of
18 opportunity for terrorists.

19
20 **C1.1.2. Responsibility.** The heads of the DoD Components shall ensure compliance with these standards,
21 but it is ultimately the commanders' responsibility to manage and mitigate the risk of DoD personnel being killed or
22 injured in a terrorist attack. All DoD personnel have an inherent responsibility to minimize opportunities for
23 terrorists to target them, their co-workers, and their families. Other critical DoD assets must also be identified and
24 similarly safeguarded, but protection of those assets is beyond the scope of these standards. Within the range of
25 potential threats and site specific issues and constraints, available personnel and resources must be properly focused,
26 synchronized, and integrated before effective measures can be identified, implemented, and refined for each
27 installation and activity.

28
29 **C1.1.3. Planning and integration.** When the best procedures, proper training, and appropriate equipment
30 fail to deter terrorist attacks, adherence to these standards goes far in mitigating the possibility of mass casualties
31 from terrorist attacks against DoD personnel in the buildings in which they work and live. Although predicting the
32 specific threat to everyone is not possible, proper planning and integration of those plans provides a solid foundation
33 for preventing, and if necessary reacting, when terrorist incidents or other emergencies unfold. An effective
34 planning process facilitates the necessary decision making, clarifies roles and responsibilities, and ensures support
35 actions generally go as planned. This planning process is executed by a team consisting of people from the chain of
36 command and key personnel from all appropriate functional areas who have an interest in the building and its
37 operation. The team should include, as a minimum, intelligence, security, and facility engineering personnel. This
38 team is responsible for identifying requirements for the project, facilitating the development of supporting
39 operational procedures, obtaining adequate resources, and properly supporting all other efforts needed to prudently
40 enhance protection of the occupants of every inhabited DoD building. For further information on planning and
41 integration, refer to the DoD Security Engineering Manual.

42
43 **C1.2. STANDARDS AND RECOMMENDATIONS.** Mandatory DoD antiterrorism construction standards for
44 new and existing inhabited buildings are contained in Appendix AP1. Additional recommended measures for new
45 and existing inhabited buildings are included in Appendix AP2. Mandatory DoD antiterrorism construction
46 standards for expeditionary and temporary structures are contained in Appendix AP3.

47
48 **C1.3. INTENT.** The intent of these standards is to minimize the possibility of mass casualties in buildings or
49 portions of buildings owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD.
50 These standards provide appropriate, implementable, and enforceable measures to establish a level of protection
51 against terrorist attacks for all inhabited DoD buildings where no known threat of terrorist activity currently exists.
52 While complete protection against all potential threats for every inhabited building is cost prohibitive, the intent of
53 these standards can be achieved through prudent master planning, real estate acquisition, and construction practices.
54 Where the minimum standoff distances detailed in these standards are met, most conventional construction

DRAFT

1 techniques can be used with only marginal impact on the total construction or renovation cost. The financial impact
2 of these standards will be significantly less than the economic and intangible costs of a mass casualty event.
3

4 **C1.4. LEVELS OF PROTECTION.** The levels of protection provided by these standards meet the intent
5 described above and establish a foundation for the rapid application of additional protective measures in a higher
6 threat environment. These standards may be supplemented where specific terrorist threats are identified, where
7 more stringent local standards apply, or where local commanders dictate additional measures. Detailed descriptions
8 of the levels of protection are provided in Chapter 2 and the DoD Security Engineering Manual.
9

10 **C1.4.1. DoD Component standards.** Where DoD Component standards such as geographic CINC
11 standards address unique requirements, those standards will be incorporated in accordance with their implementing
12 directives, but not to the exclusion of these standards.
13

14 **C1.4.2. Threat specific requirements.** Where a design basis threat is identified whose mitigation requires
15 protective measures beyond those required by these standards or DoD Component standards, those measures will be
16 developed in accordance with the provisions of the DoD Security Engineering Manual. The provisions of the DoD
17 Security Engineering Manual include the design criteria that will be the basis for the development of the protective
18 measures, estimates of the costs of those measures, and detailed guidance for developing the measures required to
19 mitigate the identified threat. The design criteria include the assets to be protected, the threat to those assets, and the
20 desired level of protection. Use of the DoD Security Engineering Manual will ensure uniform application,
21 development, and cost estimation of protective measures throughout DoD.
22

23 **C1.5. APPLICABILITY.** These standards apply to all DoD Components, to all DoD inhabited buildings, and to
24 all DoD expeditionary and temporary structures in accordance with the following:
25

26 **C1.5.1. New construction.** Implementation of these standards is mandatory for all new construction
27 regardless of funding source in accordance with the following:
28

29 **C1.5.1.1. Military Construction (MILCON).** These standards apply to MILCON projects
30 starting with the Fiscal Year 2004 Program. Projects programmed or designed under the DoD Interim Antiterrorism
31 / Force Protection Construction Standards do not have to be reprogrammed or redesigned to meet the requirements
32 of these standards. The provisions of the Interim Standards will apply to those projects. Due to minor changes
33 between these standards and the Interim Standards, projects prior to the Fiscal Year 2004 Program should comply
34 with these standards where possible.
35

36 **C1.5.1.2. Other funding sources.** These standards apply to all new construction projects funded
37 by sources other than MILCON (including host nation and other foreign government funding) starting with Fiscal
38 Year 2004. Projects funded prior to that fiscal year should comply with these standards where possible.
39

40 **C1.5.2. Existing buildings.** These standards will apply to existing facilities starting with the Fiscal Year
41 2004 program when triggered as specified below, regardless of funding source. Projects funded prior to that fiscal
42 year should comply with these standards where possible.
43

44 **C1.5.2.1. Major investments.** Implementation of these standards to bring an entire building into
45 compliance is mandatory for all DoD building renovations, modifications, repairs, and restorations where those costs
46 exceed 50% of the replacement cost of the building except as otherwise stated in these standards. The 50% cost is
47 exclusive of the costs identified to meet these standards. Where the 50% threshold is not met, compliance with these
48 standards is recommended.
49

50 **C1.5.2.2. Conversion of use.** Implementation of these standards is mandatory any time a
51 building or portion thereof is modified from its current use to use as an inhabited building, billeting, or a primary
52 gathering building. Examples would be a warehouse (uninhabited) being converted to administrative (inhabited)
53 use and an uninhabited administrative building being converted to a primary gathering building or billeting.
54

DRAFT

1 **C1.5.2.3. Glazing replacement.** Implementation of the glazing provisions of these standards is
2 mandatory for existing inhabited buildings whenever there is a planned window or door glazing replacement project.
3 Such replacements may require window frame modification or replacement.
4

5 **C1.5.3. Building additions.** Additions to existing inhabited buildings shall comply with the standards for
6 new construction. If the addition is 50% or more of the gross area of the existing building, the existing building
7 shall comply with the standards for existing construction. All additions to inhabited buildings shall be structurally
8 independent of the existing buildings.
9

10 **C1.5.4. Leased buildings.** Implementation of these standards is mandatory for all facilities leased for DoD
11 use and for those buildings in which DoD receives a space assignment from another government agency. This
12 requirement is intended to cover all situations, including General Services Administration space, privatized
13 buildings, and host-nation and other foreign government buildings. This requirement is applicable for all new leases
14 executed after 1 October 2003. This requirement also applies to renewal or extension of any existing lease after 1
15 October 2006. Leases executed prior to the above fiscal years will comply with these standards where possible.
16

17 **C1.5.4.1. Partial occupancy.** These standards only apply where DoD personnel occupy leased or
18 assigned space constituting at least 25 percent of the total floor area, and they only apply to that portion of the
19 building that is occupied by DoD personnel.
20

21 **C1.5.4.2. New buildings.** Buildings that are built to lease to DoD as of the effective
22 date established above shall comply with the standards for new construction.
23

24 **C1.5.4.3. Existing buildings.** For new leases of existing buildings or renewals of leases,
25 the standards for existing buildings shall apply in accordance with the effective dates established above.
26 For those existing buildings, protective measures other than those specified in this standard may be used
27 if they provide similar levels of protection to those required by this standard. An example would be using
28 fragment retention film on existing glass instead of replacing it with laminated glass. Refer to the DoD
29 Security Engineering Manual for guidance on mitigating measures.
30

31 **C1.5.5. Expeditionary and Temporary Structures.** Implementation of these standards is mandatory for
32 all expeditionary and temporary structures that meet the occupancy criteria for inhabited or primary gathering
33 buildings or billeting. See Appendix AP3 for structure types that meet the expeditionary and temporary structures
34 criteria.
35

36 **C1.5.5.1. New structures.** These standards apply to all new expeditionary sites effective
37 immediately.
38

39 **C1.5.5.2. Existing structures.** These standards will apply to all existing expeditionary activities
40 beginning in Fiscal Year 2004.
41

42 **C1.5.6. Exemptions.** Unless DoD components dictate otherwise, the following buildings are exempt from
43 requirements of these standards as specified below. However, compliance with these standards for those buildings is
44 recommended where possible. Exemptions to elements of individual standards are included in the text of those
45 standards in appendix AP1. The rationale for all exemptions is detailed in chapter 2.
46

47 **C1.5.6.1. Stand-alone franchised food operations.** These buildings are exempt from standoff
48 distances to parking and roadways. All other standards apply.
49

50 **C1.5.6.2. Stand alone shoppettes, mini marts and similarly sized commissaries.** These
51 buildings are exempt from standoff distances to parking and roadways. All other standards apply.
52

53 **C1.5.6.3. Family housing with 12 units or fewer per building.** These buildings are exempt
54 from all provisions of these standards.
55

DRAFT

1 **C1.5.6.4. Medical transitional structures and spaces.** These structures are exempt from all
2 provisions of these standards.

3
4 **C1.5.6.5. Gas stations and car care centers.** These facilities are exempt from all provisions of
5 these standards.

6
7 **C1.6. PROGRAMMING.**

8
9 **C1.6.1. Documentation.** The inclusion of these standards into DoD construction or the inclusion of
10 protective measures above the requirements of these standards will be incorporated into the appropriate construction
11 programming documents (such as the DD Form 1391) in accordance with DoD Component guidance. Refer to the
12 DoD Security Engineering Manual for guidance on the costs for implementing these standards and for providing
13 protective measures beyond these standards.

14
15 **C1.6.2. Funding Thresholds.** For existing construction, DoD AT construction standards are intended
16 solely to correct design deficiencies to appropriately address life-threatening terrorist risks. As a result, funding
17 thresholds for Unspecified Minor Military Construction and Operations and Maintenance funding may be increased
18 in accordance with 10 USC Sections 2805(a)(1) and 2805 (c)(1).

19
20 **C1.7. INFORMATION SENSITIVITY.** Some information in this standard is exempt from mandatory disclosure
21 under the Freedom of Information Act. The sensitive information that is exempt is the explosive weights upon
22 which the minimum standoff distances are based. Allowing potential aggressors to know the minimum explosive
23 weights that all DoD inhabited buildings are designed to resist could constitute a vulnerability. To minimize the
24 possibility of that information being used against DoD personnel, the following provisions apply:

25
26 **C1.7.1. Distribution.** Follow governing DoD and Component guidance for specific requirements for
27 handling and distribution of For Official Use Only information. In general, distribution of this document is
28 authorized only to U.S. Government agencies and their contractors, although portions of the document that are not
29 indicated to be For Official Use Only can be removed from the document and may be distributed to the public
30 without limitation. In addition, where it is within Status of Forces Agreements (SOFA) or other similar information
31 exchange agreements, the information in this standard may be distributed to host nation elements for the purposes of
32 their administration and design of host nation funded or designed construction.

33
34 **C1.7.2. Posting to the Internet.** Because this document is For Official Use Only it cannot be posted in its
35 entirety to any web site that is accessible to the general public. It can, however, be posted if the For Official Use
36 Only information is removed (Tables AP1.1. and AP3.1.) In addition, other documents that include information
37 from this standard that is identified as For Official Use Only cannot be posted to web sites accessible to the general
38 public. For Official Use Only information may be posted to protected, non-publicly accessible web sites that
39 comply with standards established by DoD for administration of web sites.

40
41 **C1.7.3. Plans and specifications.** Construction plans and specifications should include only that
42 information from this document that is necessary for a contractor to develop a bid on a project. The explosive
43 weights used in these standards shall not be entered into the plans and specifications unless the plans and
44 specifications are properly safeguarded. Plans and specifications may be posted to the Internet in accordance with
45 existing Component guidance, but such documents will not include For Official Use Only information. All plans
46 and specifications for inhabited buildings shall include an annotation that cites the version of this standard that was
47 used for design.

48
49 **C1.7.4. Design – build contracts.** Where design – build contracts are employed, prospective contractors
50 will be responsible for developing a design proposal for that project that may be impacted by provisions of these
51 standards. Where that is the case, consider alternate means to provide sufficient information to support their
52 proposals. Consider for example, either specifying specific design loads or specifying the required standoff distance
53 and providing candidate structural systems that would allow for mitigation of the applicable explosive if that
54 standoff was less than the minimum. Once the design – build contract is awarded the contractor will be eligible to
55 receive this complete document for use in the development of the final design package, but that contractor will be

DRAFT

1 responsible for protecting the integrity of the information throughout the contract and through any subcontracts into
2 which that contractor might enter.
3
4
5

DRAFT**C2. CHAPTER 2****PHILOSOPHY, ASSUMPTIONS, AND DESIGN STRATEGIES**

C2.1. GENERAL. The purpose of this chapter is to clarify the philosophy on which these standards are based, the assumptions inherent in their provisions, and the design strategies that are their foundation. Effective implementation of these standards depends on a reasonable understanding of the rationale for them. With this understanding, engineers and security and force protection personnel can maximize the efficiency of their solutions for complying with the standards while considering site-specific issues and constraints.

C2.2. PHILOSOPHY. The overarching philosophy upon which this document is based is that comprehensive protection against the range of possible threats may be cost prohibitive, but that an appropriate level of protection can be provided for all DoD personnel at a reasonable cost. That level of protection is intended to lessen the risk of mass casualties resulting from terrorist attacks. Full implementation of these standards will provide some protection against all threats and will significantly reduce injuries for the threats upon which these standards are based. The costs associated with those levels of protection are assumed to be less than the physical and intangible costs associated with incurring mass casualties. Furthermore, given what we know about terrorism, all DoD decision makers must commit to making smarter investments with our scarce resources, and stop investing money in inadequate buildings that DoD personnel will have to occupy for decades, regardless of the environment. There are three key elements of this philosophy that influence the implementation of these standards.

C2.2.1. Time. Protective measures needed to provide the appropriate level of protection must be in place prior to the initiation of a terrorist attack. Incorporating those measures into DoD buildings is least expensive at the time those buildings are either being constructed or are undergoing major renovation, repair, restoration, or modification.

C2.2.2. Master planning. Many of these standards significantly impact master planning. The most significant such impact will be in standoff distances. If standoff distances are not “reserved” they will be encroached upon and will not be available should they become necessary in a higher threat environment. The master planning implications of these standards are not intended to be resolved overnight. They should be considered to be a blueprint for facilities and installations that will be implemented over decades as those facilities and installations evolve.

C2.2.3. Design practices. The philosophy of these standards is to build greater resistance to terrorist attack into all inhabited structures. That philosophy affects the general practice of designing inhabited buildings. While these standards are not based on a known threat, they are intended to provide the easiest and most economical methods to minimize injuries and fatalities in the event of a terrorist attack. The primary methods to achieve this outcome are to maximize standoff distance, to reduce flying debris hazards, and to construct superstructures to avoid progressive collapse. These and related design issues are intended to be incorporated into standard design practice in the future.

C2.3. ASSUMPTIONS. Several assumptions form the foundation for these standards.

C2.3.1. Baseline threat. The location, size, and nature of terrorist threats are unpredictable. These standards are based on a specific range of assumed threats that provides a reasonable baseline for the design of all inhabited DoD buildings. Designing to resist baseline threats will provide general protection today and will establish a foundation upon which to build additional measures where justified by higher threats or where the threat environment increases in the future. While those baseline threats are less than some of the terrorist attacks that have been directed against U.S. personnel in the past, it would be cost prohibitive to provide protection against the worst-case scenario in every building. The terrorist threats addressed in these standards are further assumed to be directed against DoD personnel. Threats to other assets and critical infrastructure are beyond the scope of these standards, but they are addressed in the DoD Security Engineering Manual. The following are the terrorist tactics upon which these standards are based:

C2.3.1.1. Explosives. The baseline explosive weights are identified in Tables AP1.1 and AP3.1 as explosive weights I, II, and III. Their means of delivery are discussed below.

DRAFT

1
2
3 **C2.3.1.1.1. Vehicle bombs.** For the purposes of these standards, the vehicle
4 bomb is assumed to be a stationary vehicle bomb. The sizes of the explosives in the vehicle bombs are based on
5 studies that have shown that quantities of explosives associated with explosive weight I (in equivalent weight of
6 TNT) are likely to be detected in a vehicle during a search. Therefore, explosive weight I is the basis for the
7 standoff distances associated with the controlled perimeter. The quantity of explosives associated with explosive
8 weight II is assumed to be able to enter the controlled perimeter undetected; therefore, explosive weight II is the
9 basis for the standoff distances for roadways and parking. Explosive weight II was selected because it represents a
10 tradeoff between likelihood of detection and the risk of injury or damage.

11 **C2.3.1.1.2. Waterborne vessel bombs.** For the purposes of these standards,
12 waterborne vehicles will also be assumed to contain quantities of explosives associated with explosive weight I.
13 That weight was selected because areas beyond the shoreline are assumed not to be controlled perimeters.
14

15 **C2.3.1.1.3. Placed bombs.** Hand carried explosives placed near buildings can
16 cause significant localized damage, potentially resulting in injuries or fatalities. It is assumed that aggressors will
17 not attempt to place explosive devices in areas near buildings where those devices could be visually detected by
18 building occupants casually observing the area around the building. It is also assumed that there will be sufficient
19 controls to preclude placed bombs being brought into buildings. Explosive weight II is assumed to be placed by
20 hand either in trash containers or in the immediate vicinity of buildings. That quantity of explosives is further
21 assumed to be built into a bomb 150 millimeters (6-inches) or greater in height.
22

23 **C2.3.1.1.4. Mail bombs.** Explosives in packages delivered through the mail
24 can cause significant localized damage, injuries, and fatalities if they detonate inside a building. No assumption as
25 to the size of such explosives is made in these standards. Provisions for mail bombs are limited to locations of
26 mailrooms so that they can be more readily hardened if a specific threat of a mail bomb is identified in the future.
27

28 **C2.3.1.2. Indirect fire weapons.** For the purpose of these standards, indirect fire weapons are
29 assumed to be military mortars with fragmentation rounds with explosive contents equivalent to explosive weight III
30 in Tables AP1.1 and AP3.1. Protection against the effects of such rounds on an individual building is not considered
31 practical as a minimum standard; therefore, these standards are intended to limit collateral damage to adjacent
32 buildings from these weapons.
33

34 **C2.3.1.3. Small arms.** Small arms include weapons that fire rounds of a wide variety of calibers.
35 Some standards in this document are predicated on a small arms threat. Provisions of those standards are based on
36 the assumption that those weapons will be fired from vantage points outside the control of an installation or facility.
37 Obscuration or screening that minimizes targeting opportunities is assumed to be the primary means of protecting
38 DoD personnel from these weapons in these standards.
39

40 **C2.3.1.4. Chemical, biological, and radiological weapons.** For the purposes of these standards
41 these weapons are assumed to be improvised weapons containing airborne agents employed by terrorists. These
42 standards do not assume comprehensive protection against this threat. They provide means to reduce the potential
43 for widespread dissemination of such agents throughout a building in the event of an attack.
44

45 **C.2.3.2. Controlled perimeter.** These standards assume that procedures are implemented that would limit
46 the likelihood that a vehicle carrying quantities of explosives equivalent to explosive weight I in Tables AP1.1 and
47 AP3.1 could penetrate a controlled perimeter undetected. It is further assumed that any entry control point will
48 include provisions to reject vehicles without penetrating the controlled perimeter.
49

50 **C2.3.3. Levels of protection.** The potential levels of protection are described in Tables C2.1, C2.2, and
51 C2.3. These standards provide a **Low** level of protection for billeting and primary gathering buildings and a **Very**
52 **Low** level of protection for other inhabited buildings. Greater protection is provided for primary gathering buildings
53 and billeting because of the higher concentration of personnel and the more attractive nature of the target. If the
54 minimum standoff distances are provided, or if mitigating measures are provided to achieve an equivalent level of
55 protection, and if the threats are no greater than those indicated in Tables AP1.1 and AP3.1, the risk of injuries and
56 fatalities will be minimized. Threats higher than those envisioned in Tables AP1.1 and AP3.1 will increase the

DRAFT

1 likelihood of injuries and fatalities, regardless of the level of protection. Refer to the DoD Security Engineering
2 Manual for detailed guidance on levels of protection and how to achieve them for a wide range of threats.
3

4 **C2.3.4. Minimum standoff distances.** The minimum standoff distances identified in Tables AP1.1 and
5 AP3.1 were developed to provide survivable structures for a wide range of conventional buildings and
6 expeditionary/temporary structures. These buildings range from tents and wood framed buildings to reinforced
7 concrete buildings. The standoff distances in the “Conventional Construction Without Analysis” column in Table
8 AP1.1 are based on explosive safety considerations that have been developed based on years of experience and
9 observation. Those standoff distances may be conservative for heavy construction such as reinforced concrete or
10 reinforced masonry; however, they may be just adequate for lighter weight construction. The standoff distances in
11 Table AP3.1 are based on blast testing conducted against TEMPER Tents, SEA Huts, General Purpose Shelters, and
12 Small Shelter Systems. With adequate analysis those distances may be able to be reduced without requiring
13 mitigating measures. For a more detailed discussion of this issue, refer to the DoD Security Engineering Manual.
14

15 **C2.3.5. Exempted building types.** The rationale for some building types being exempted from these
16 standards or elements of these standards is detailed below:
17

18 **C2.3.5.1. Shoppettes, mini marts, similarly sized commissaries and stand-alone franchised**
19 **food operations.** These facilities by the nature of their operation require parking in close proximity; therefore, they
20 are exempted from the minimum standoff distances for parking and roadways. Applying other upgrades required by
21 these standards is feasible, however, and will lessen the risk of mass casualties.
22

23 **C2.3.5.2. Family housing.** The exemption of family housing with 12 units or fewer in a single
24 building acknowledges that the density of such units is generally low, reducing the likelihood of mass casualties. It
25 also acknowledges the fact that family housing has rarely been directly targeted by terrorists. A further assumption
26 for existing family housing with 13 or more units per building is that by designating parking spaces for specific
27 residents or residences, the risk of parking vehicle bombs in those parking areas is reduced due to increased
28 awareness of the vehicles that are authorized to park there.
29

DRAFT

1

Table C2.1 Levels of Protection – New Construction

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Very Low	Heavily damaged - onset of structural collapse: Major deformation of primary and secondary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Major deformation of non-structural elements and secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely.	Glazing will break, but fall within 1 meter of the wall or otherwise not present a significant fragment hazard. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

2

DRAFT

1

Table C2.2 Levels of Protection – Existing Construction

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Very Low	Heavily damaged - onset of structural collapse: Major deformation of primary structural members, but progressive collapse is unlikely. Collapse of secondary structural members and non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Major deformation of secondary structural members and minor deformation of primary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, but should result in survivable glazing fragment injuries. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor deformations of secondary structural members and no permanent deformation in primary structural members. Major deformation of non-structural elements.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

2

3

DRAFT1
2

Table C2.3 Levels of Protection – Expeditionary/Temporary Construction		
Level of Protection	Potential Structural Damage	Potential Injury
Very Low	Heavily damaged. Major portions of the structure will collapse (over 50%). A significant percentage of secondary structural members will collapse (over 50%)	Majority of personnel suffer serious injuries. There are likely to be a limited number (10% to 25%) of fatalities.
Low	Damaged – unrepairable. Some sections of the structure may collapse or lose structural capacity (10 to 20% of structure).	Majority of personnel suffer significant injuries. There may be a few (<10%) fatalities.
Medium	Damaged – repairable. Minor to major deformations of both structural and non-structural. Some secondary debris will be likely, but the structure remains intact with collapse unlikely.	Some minor injuries, but no fatalities are likely.
High	Superficially damage. No permanent deformation of primary and secondary structural members or non-structural elements.	Only superficial injuries are likely.

3

DRAFT

1 **C2.3.5.3. Gas stations and car care centers.** These facilities are exempted from these standards
2 because, by the nature of their operation, cars must be allowed to be in close proximity to them. Other measures
3 included in these standards would be ineffective in the absence of any control on vehicles. In addition, these
4 facilities are not routinely occupied by 5 or more personnel.
5

6 **C2.3.5.4. Medical transitional structures and spaces.** These structures and spaces may be
7 required for limited durations to maintain mission critical operations during construction that require close proximity
8 or physical connection to the existing building undergoing construction. This may make compliance with these
9 standards impractical during the limited construction duration.
10

11 **C2.3.6. Policies and procedures.** Policies and procedures are a critical adjunct to construction standards.
12 It is assumed that there are means to control access to controlled perimeters, underground parking, and other
13 locations where vehicle access needs to be limited. It is further assumed that unusual packages or containers or
14 improperly parked vehicles will be recognized as potential terrorist threats and appropriate reactive measures will be
15 implemented to reduce the potential for casualties. Finally, it is assumed that policies and procedures will be
16 developed to support these and other related issues and that those policies and procedures will be incorporated into
17 antiterrorism plans, training, and exercises.
18

19 **C2.3.7. Training.** It is assumed that key security and facility personnel will receive training in security
20 engineering, antiterrorism, and related areas. Refer to the Security Engineering Working Group website for
21 available training and to DoD 2000.12-H for additional information on training issues. It is further assumed that all
22 DoD personnel have been trained in basic antiterrorism awareness in accordance with DODI 2000.16, that they are
23 able to recognize potential threats, and that they know the proper courses of action should they detect a potential
24 threat.
25

26 **C2.3.8. Design codes.** It is assumed that the provisions of these standards will be coordinated with all
27 other applicable building and design codes and Federal building policies. Nothing in these standards should be
28 interpreted to supercede the provisions of any other applicable building or design code. Where other codes mandate
29 more stringent requirements it is assumed that the provisions of those codes will be followed.
30

31 **C2.3.9. Expeditionary and temporary structures.** Expeditionary and temporary structures are
32 commonly built of either combinations of metal frames and fabric or wood frames and rigid walls.
33 It is assumed that most expeditionary and temporary structures cannot be retrofitted or hardened sufficiently for
34 higher threats; therefore, unless adequate planning is done to obtain the needed space to achieve appropriate
35 standoff, DoD personnel will be highly vulnerable to terrorist attack.
36

37 **C2.4. DESIGN STRATEGIES.** There are seven major design strategies that are applied throughout these
38 standards. They do not account for all of the measures considered in the standards, but they were the most effective
39 and economical in protecting DoD personnel from terrorist attacks. These strategies are summarized below.
40

41 **C2.4.1. Maximize standoff distance.** The primary design strategy is to keep terrorists as far away from
42 inhabited DoD buildings as possible. The easiest and least costly opportunity for achieving the appropriate levels of
43 protection against terrorist threats is to incorporate sufficient standoff distance into project designs. While sufficient
44 standoff distance is not always available to provide the minimum standoff distances required for conventional
45 construction, maximizing the available standoff distance always results in the most cost effective solution.
46 Maximizing standoff distance also ensures that there is opportunity in the future to upgrade buildings to meet
47 increased threats or to accommodate higher levels of protection.
48

49 **C2.4.2. Prevent building collapse.** Provisions relating to preventing building collapse and building
50 component failure are essential to effectively protecting building occupants. Designing those provisions into
51 buildings during new construction or retrofitting during major renovations, repairs, restorations, or modifications of
52 existing buildings is the most cost effective time to do that.
53

54 **C2.4.3. Minimize hazardous flying debris.** In past explosive events where there was no building
55 collapse, a high number of injuries resulted from flying glass fragments and debris from walls, ceilings, and fixtures
56 (non-structural features.) The glass used in most windows breaks at very low blast pressures resulting in hazardous,

DRAFT

1 dagger-like shards. Minimizing those hazards has a major effect on limiting mass casualties. Window and door
2 designs must treat glazing, frames, connections, and the structural components to which they are attached as an
3 integrated system. Hazardous fragments may also include secondary debris such as those from concrete barriers and
4 site furnishings.

5
6 **C2.4.4. Provide effective building layout.** Simple changes in building layout and orientation can
7 significantly reduce opportunities for terrorists to target building occupants or injure large numbers of people.

8
9 **C2.4.5. Limit airborne contamination.** Simple changes to heating, ventilation, and air conditioning
10 (HVAC) systems can significantly reduce the potential for chemical, biological, and radiological agents being
11 distributed throughout buildings.

12
13 **C2.4.6. Provide mass notification.** Providing a timely means to notify building occupants of threats and
14 what should be done in response to those threats reduces the risk of mass casualties.

15
16 **C2.4.7. Facilitate future upgrades.** Many of the provisions of these standards facilitate opportunities to
17 upgrade building protective measures in the future if the threat environment changes.
18

DRAFT**AP1. APPENDIX 1****DoD ANTITERRORISM MINIMUM CONSTRUCTION STANDARDS
FOR NEW AND EXISTING BUILDINGS**

AP1.1. SITE PLANNING. Operational, logistic, and security requirements must be integrated in the overall design of buildings, equipment, landscaping, parking, roads, and other features. The most cost-effective solution to mitigating explosive effects on buildings is to keep explosives as far as possible from them. Standoff distance must be coupled with appropriate building hardening to provide the necessary level of protection to DoD personnel. The following standards detail minimum standoff distances that when achieved will allow for buildings to be built with minimal additional construction costs. Where these standoff distances cannot be achieved because land is unavailable, the standards allow for building hardening to mitigate the blast effects. Costs and requirements for building hardening are addressed in the DoD Security Engineering Manual.

AP1.1.1. Standard 1. Minimum Standoff Distances. The minimum standoff distances apply to all new and existing (when triggered) DoD buildings covered by these standards. The minimum standoff distances are presented in Table AP1.1 and illustrated in Figures AP1.1 and AP1.2. Where the standoff distances in the “Conventional Construction Without Analysis” column of Table AP1.1 can be met, conventional construction may be used for the buildings without a specific analysis of blast effects, except as otherwise required in these standards. Where those distances are not available, the building must be analyzed by a qualified engineer and hardened as necessary to mitigate the effects of the explosives indicated in Table AP1.1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each building category are shown in Table AP1.1 and are described in Tables C2.1 and C2.2 and in the DoD Security Engineering Manual. Standoff distances of less than those shown in the “Conventional Construction With Analysis” column in Table AP1.1 are not allowed.

AP1.1.1.1. Controlled perimeter. The standoff distance will be measured from the closest point on the building exterior to the controlled perimeter.

AP1.1.1.2. Parking and roadways. Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with parking and roadways in Table AP1.1 apply. If there is no controlled perimeter, it must be assumed that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table AP1.1.) can access parking and roadways near buildings. Therefore, where there is no controlled perimeter, standoff distances from parking and roadways will be in accordance with the distances and the explosive weight associated with controlled perimeters in Table AP1.1. In addition the following apply:

AP1.1.1.2.1. All inhabited buildings. The standoff distance will be measured from the closest point on the building exterior to the closest edge of parking areas and roadways. The minimum standoff for all buildings regardless of hardening or analysis will be 10 meters for both parking areas and roadways.

AP1.1.1.2.2. Existing inhabited buildings. Where possible, move parking and roadways away from existing buildings in accordance with the standoff distances and explosive weights in Table AP1.1. It is recognized, however, that moving existing parking areas and roadways or applying structural retrofits may be impractical; therefore, the following operational options are provided for existing inhabited buildings:

AP1.1.1.2.2.1. Surface parking areas. Establish entry control to portions of surface parking areas that are closer than the required standoff distance to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary gathering buildings and billeting if entry control is provided to prevent unauthorized parking within the required standoff distance, controlled surface parking may be permitted as close as 10 meters (33 feet) without hardening or analysis.

AP1.1.1.2.2.2. Roadways. Eliminate parking on roadways within the required standoff distances along roads adjacent to existing buildings covered by these standards.

DRAFT

1 **AP1.1.1.2.3. Family housing.** For existing family housing with 13 or more units per
2 building within a controlled perimeter, parking within the required standoff distances may be allowed where
3 designated parking spaces are assigned for specific residents or residences. Where there are existing standoff
4 distances less than the required standoff distances, those existing distances shall not be encroached upon.
5

6 **AP1.1.1.3. Parking and roadway projects.** Where practical, all roadway and parking area
7 projects should comply with the standoff distances from inhabited buildings in Table AP1.1. Where parking or
8 roadways that are within the standoff distances in Table AP1.1 from existing buildings are being constructed,
9 expanded, or relocated, those parking areas and roadways shall not be allowed to encroach on the existing standoff
10 distances of any existing inhabited building. That applies even where such projects are not associated with a
11 building renovation, modification, repair, or restoration requiring compliance with these standards
12

13 **AP1.1.1.4. Trash containers.** The standoff distance will be measured from the closest point on
14 the building exterior to the nearest point of the trash container or trash container enclosure. Where the standoff
15 distance is not available, hardening of trash enclosures to mitigate the direct blast effects and secondary fragment
16 effects of the explosive on the building is acceptable if the applicable level of protection can be proven by analysis.
17 If trash enclosures are completely enclosed on all sides and the top to preclude introduction of objects into the
18 enclosures and the enclosures are secured so that unauthorized personnel cannot access them, they can be located
19 closer to the building as long as they do not violate the unobstructed space provisions of Standard 3. Openings in
20 screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater
21 than 150 mm (six inches).
22

23 **AP1.1.2. Standard 2. Building separation.** Building separation requirements are established to
24 minimize the possibility that an attack on one building causes injuries or fatalities in adjacent buildings. The
25 separation distance is predicated on the potential use of indirect fire weapons.
26

27 **AP1.1.2.1. Billeting and primary gathering buildings.** For all new billeting and primary
28 gathering buildings ensure that adjacent inhabited buildings are separated by at least the distances in Table AP1.1.
29 Where it is necessary to encroach on those building separations, analyze the structure and provide hardened building
30 components as necessary to mitigate the effects of the explosive indicated in Table AP1.1 to the appropriate level of
31 protection shown in Table AP1.1. Levels of protection are described in Table C1.1 and in the DoD Security
32 Engineering Manual.
33

34 **AP1.1.2.2. Other inhabited buildings.** There are no minimum separation distances required for
35 antiterrorism purposes for inhabited buildings.
36

37 **AP1.1.3. Standard 3. Unobstructed space.** It is assumed that aggressors will not attempt to place assets
38 in areas near buildings where their explosive devices could be visually detected by building

DRAFT

1 occupants observing the area around the building. Therefore, ensure that obstructions within 10 meters (33 feet) of
 2 buildings covered by these standards do not allow for concealment from observation of explosive devices 150 mm
 3 (six inches) or greater in height. This does not preclude the placement of site furnishings or plantings around
 4 buildings. It only requires conditions such that any explosive devices placed in that space would be observable by
 5 building occupants.

6
 7 **AP1.1.3.1. Electrical and mechanical equipment.** The preferred location of electrical and
 8 mechanical equipment such as transformers, air cooled condensers, and packaged chillers is outside the unobstructed
 9 space or on the roof, but this standard does not preclude placement within the unobstructed space as long the
 10 equipment provides no opportunity for concealment of explosive devices.

11
 12 **AP1.3.1.2. Equipment enclosures.** If walls or other screening devices with more than two sides
 13 are placed around electrical or mechanical equipment within the unobstructed space, the equipment will be enclosed
 14 on all four sides and the top. Openings in screening materials and gaps between the ground and screens or walls
 15 making up an enclosure will not be greater than 150 mm (six inches). Any surfaces of the enclosures that can be
 16 opened will be secured so that unauthorized personnel cannot gain access through them.

17
 18 **AP1.1.4. Standard 4. Drive-up / drop-off and access roads.** Some facilities require access to areas
 19 within the required standoff distance for dropping off or picking up people or loading or unloading packages and
 20 other objects. Examples that may require drive-up / drop off include, but are not limited to, medical facilities,
 21 exchanges and commissaries, child care centers, and schools.

22
 23 **AP1.1.4.1. Marking.** Where operational or safety considerations require drive-up or drop-off
 24 areas, drive through lanes, or other access roads near buildings, ensure those areas or lanes are clearly defined and
 25 marked and that their intended use is clear to prevent parking of vehicles in those areas.

26
 27 **AP1.1.4.2. Unattended vehicles.** Do not allow unattended vehicles in drive-up or drop-off areas
 28 or drive through lanes.

29
 30 **AP1.1.4.3. Access control.** Ensure that access control measures are implemented to prohibit
 31 unauthorized vehicles from using access roads within the applicable standoff distances in Table AP1.1.

32
 33 **AP1.1.4.4. Location.** Do not allow drive-up / drop-off, drive through lanes, or other access roads
 34 to be located under any inhabited portion of a building.

35
 36 *AP1.1.5. Standard 5. Parking beneath buildings. **Eliminate parking beneath buildings.***
 37 ***Where very limited real estate makes parking beneath buildings unavoidable, the following***
 38 ***measures must be incorporated into the design for new buildings or mitigating measures must***
 39 ***be incorporated into existing buildings to achieve an equivalent level of protection.***

40
 41 **AP1.1.5.1. Access control.** Ensure that personnel and vehicle access at personnel and vehicle
 42 entrances to parking areas is physically controlled.

43
 44 **AP1.1.5.2. Floors.** Ensure that the floors beneath inhabited areas will not breach from the
 45 detonation in the parking area of an explosive equivalent to explosive weight II in Table AP 1.1.

46
 47 **AP1.1.5.3. Superstructure.** All structural elements within and adjacent to the parking area will
 48 be subject to the progressive collapse provisions of Standard 6, including the provision for loss
 49 of lateral support for vertical load carrying elements.

DRAFT

1

Table AP1.1 Minimum Standoff Distances and Building Separations
For New and Existing Construction

Location	Building Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Conventional Construction without Analysis	Conventional Construction with Analysis ⁽¹⁾	Applicable Explosive Weight (TNT) ⁽²⁾
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	45 m (148 ft.)	25 m (82 ft.)	
	Primary Gathering Building	Low	45 m (148 ft.)	25 m (82 ft.)	
	Inhabited Building	Very Low	25 m (82 ft.)	10 m (33 ft.)	
Parking and Roadways within a Controlled Perimeter	Billeting	Low	25 m (82 ft.)	10 m (33 ft.)	
	Primary Gathering Building	Low	25 m (82 ft.)	10 m (33 ft.)	
	Inhabited Building	Very Low	10 m (33 ft.)	10 m (33 ft.)	
Trash containers	Billeting	Low	25 m (82 ft.)	10 m (33 ft.)	
	Primary Gathering Building	Low	25 m (82 ft.)	10 m (33 ft.)	
	Inhabited Building	Very Low	10 m (33 ft.)	10 m (33 ft.)	
Building Separation	Billeting	Low	10 m (33 ft.)	No antiterrorism minimum	
	Primary Gathering Building	Low	10 m (33 ft.)	No antiterrorism minimum	
	Inhabited Building	Very Low	No antiterrorism minimum	No antiterrorism minimum	

1. Standoff distances less than those in this column are not allowed even with analysis.
2. When this column is moved from the table, the table is no longer For Official Use Only
3. Explosive for building separation includes fragmentation effects.

DRAFT

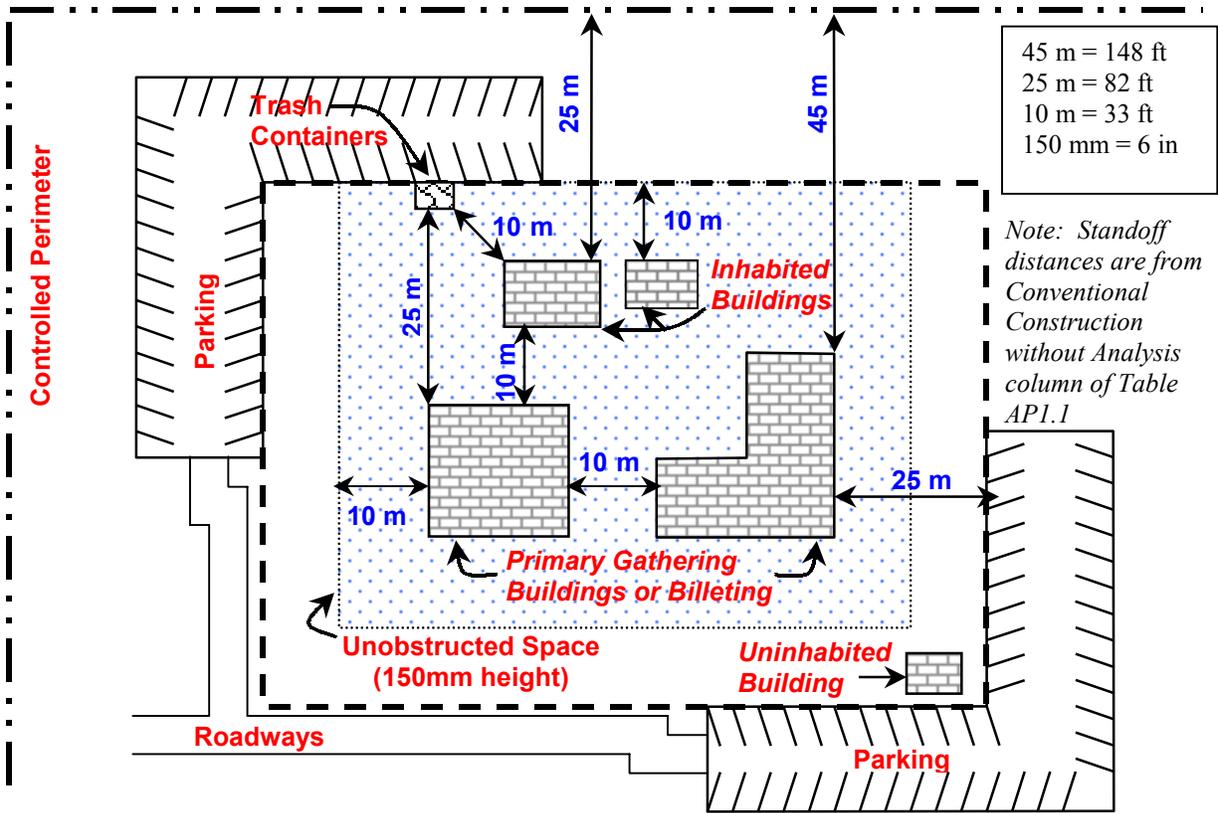


Figure AP1.1. Standoff Distances and Building Separations - Controlled Perimeter

1

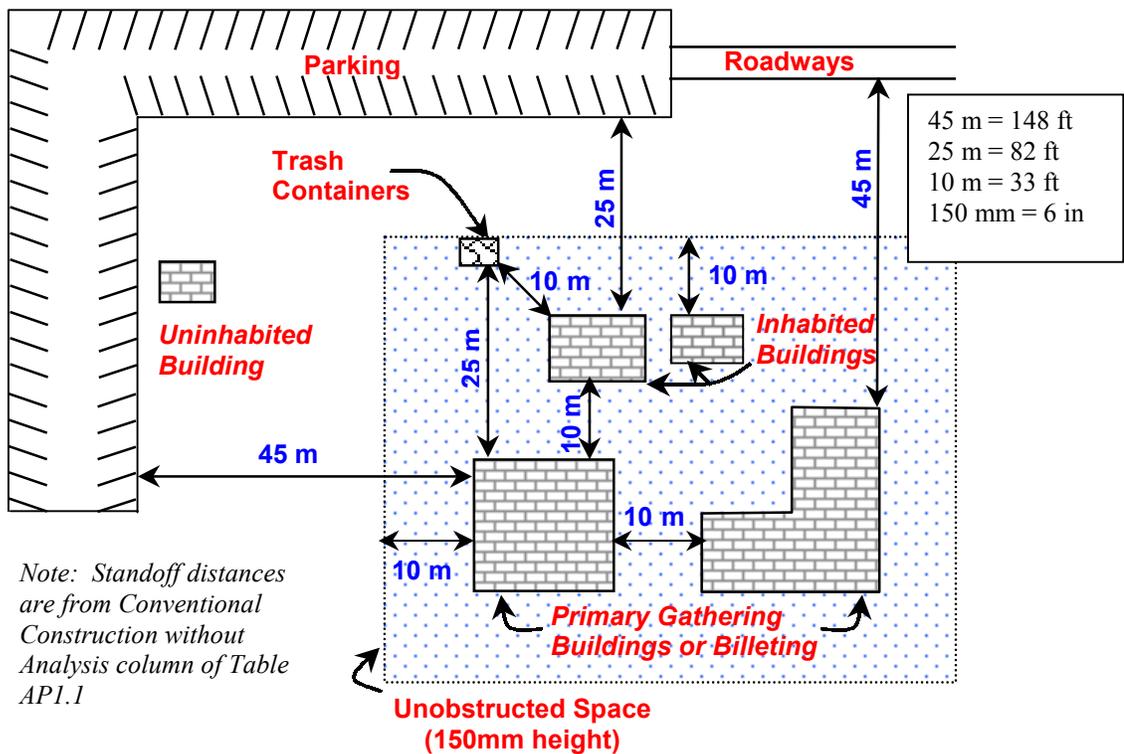


Figure AP1.2. Standoff Distances and Building Separations - No Controlled Perimeter

DRAFT

DRAFT

1 **AP1.2. STRUCTURAL DESIGN.** If the minimum standoff distances are achieved, conventional construction
2 should minimize the risk of mass casualties from a terrorist attack. Even if those standoff distances can be achieved,
3 however, there are some additional structural issues that must be incorporated into building designs to ensure that
4 buildings do not experience progressive collapse.
5

6 **AP1.2.1. Standard 6. Progressive collapse avoidance.** Progressive collapse is considered to be
7 significant risk for buildings of three stories (not including basement stories) or more. For all new and
8 existing inhabited buildings of three stories or more, design the superstructure to sustain local damage
9 with the structural system as a whole remaining stable and not being damaged to an extent
10 disproportionate to the original local damage. This shall be achieved through an arrangement of the
11 structural elements that provides stability to the entire structural system by transferring loads from any
12 locally damaged region to adjacent regions capable of resisting those loads without collapse. This shall
13 be accomplished by providing sufficient continuity, redundancy, or energy dissipating capacity (ductility),
14 or a combination thereof, in the members and connections of the structure. For further guidance, refer to
15 American Society of Civil Engineers Standard 7-98 and to detailed guidance in the DoD Security
16 Engineering Manual. In addition, the measures below apply.
17

18 **AP1.2.1.1. Exterior columns and walls.** Design all exterior vertical load-carrying
19 elements to sustain a loss of lateral support at any of the floor levels by adding one story height to the
20 nominal unsupported length. This standard is based on the assumption of an external threat. If an internal
21 threat is postulated, this provision will also apply for internal vertical load carrying elements.
22

23 **AP1.2.1.2. Exterior member removal.** Analyze the structure to ensure it can withstand
24 removal of one primary vertical or horizontal load-carrying element (i.e. a column or a beam) without
25 progressive collapse.
26

27 **AP1.2.1.3. Floors.** Design all floors with improved capacity to withstand load reversals
28 by designing them to withstand a net uplift equal to the dead load plus one-half the live load.
29

30 **AP1.2.2. Standard 7. Structural isolation.** Where there are areas of buildings that do not meet
31 the criteria for inhabited buildings, design the superstructures of those areas to be structurally independent
32 from the inhabited area. This will minimize the possibility that collapse of the uninhabited areas of the
33 building will affect the stability of the superstructure of the inhabited portion of the building.
34 Alternatively, verify through analysis that collapse of uninhabited portions of the building will not result
35 in collapse of any portion of the building covered by this standard. This standard is not mandatory for
36 existing structures, but it should be implemented where possible.
37

38 *AP1.2.3. Standard 8. Building overhangs. Avoid building overhangs with inhabited*
39 *spaces above them where people could gain access to the area underneath the overhang.*
40 *Where such overhangs must be used, the following measures must be incorporated into the*
41 *design for new buildings or mitigating measures must be incorporated into existing buildings*
42 *to achieve an equivalent level of protection.*
43

44 **AP1.2.3.1. Access control.** Ensure that there are no roadways or parking areas under overhangs.
45

46 **AP1.2.3.2. Floors.** Ensure that the floors beneath inhabited areas will not breach from the
47 detonation underneath the overhang of an explosive equivalent to explosive weight II in Table AP1.1.
48

49 **AP1.2.3.3. Superstructure.** All structural elements within and adjacent to the overhang will be
50 subject to the progressive collapse provisions of Standard 6, including the provision for loss of lateral support for
51 vertical load carrying elements.
52

DRAFT

1 **AP1.2.4. Standard 9. Exterior masonry walls.** Unreinforced masonry walls are prohibited for
2 the exterior walls of new buildings. A minimum of 0.05 percent vertical reinforcement with a maximum
3 spacing of 1200 mm (48 in) will be provided. For existing buildings, implement mitigating measures to
4 provide an equivalent level of protection.
5

6 **AP1.3. ARCHITECTURAL DESIGN.** There are many aspects of building layout and other
7 architectural design issues that improve overall protection of people inside buildings with little added
8 cost.
9

10 **AP1.3.1. Standard 10. Windows and glazed doors.** To minimize hazards from flying glass
11 fragments, apply the provisions for glazing and window frames below for all new and existing inhabited
12 buildings covered by these standards. Windows and frames must work as a system to ensure that their
13 hazard mitigation is effective. These provisions apply even if the minimum standoff distances are met.
14

15 **AP1.3.1.1. Glazing.** Use a minimum of 6-mm (1/4-in) nominal laminated glass for all
16 exterior windows and glazed doors. The 6-mm (1/4-in) laminated glass consists of two nominal 3-mm
17 (1/8-in) glass panes bonded together with a minimum of a 0.75-mm (0.030-inch) polyvinyl-butylal (PVB)
18 interlayer. For insulated glass units, as a minimum the inner pane must be 6-mm laminated glass. For
19 alternatives to the 6mm (1/4-in) laminated glass that meet required levels of protection, refer to the DoD
20 Security Engineering Manual.
21

22 **AP1.3.1.2. Window frames.** Provide frames and mullions of aluminum or steel. Frames,
23 mullions, and window hardware shall be designed to resist a static load of 7 kilopascals (1 lb per square in) applied
24 to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of the unsupported member
25 lengths. The glazing shall have a minimum frame bite of 9.5-mm (3/8-in) for structural glazed window systems and
26 25-mm (1-in) for window systems that are not structurally glazed. Frame connections to surrounding walls shall be
27 designed to resist a combined loading consisting of a tension force of 36-kg/cm (200-lbs/in) and a shear force of
28 13.5-kg/cm (75 lbs/in). Alternatively, use frames that provide an equivalent level of performance.
29

30 **AP1.3.1.3. Mitigation.** Where the minimum standoff distances cannot be met, provide
31 glazing and frames that will provide an equivalent level of protection to that provided by the glazing
32 above as described in Tables C2.1 and C2.2 for the applicable explosive weight in Table AP1.1.
33

34 **AP1.3.1.4. Window replacement projects.** Whenever window or door glazing is being
35 replaced in existing inhabited buildings as part of a planned window or glazing replacement, whether or
36 not the building meets the triggers in paragraph C1.5.2, install glazing that meets the requirements above.
37

38 **AP1.3.2. Standard 11. Building entrance layout.** The areas outside of installations are
39 commonly not under the direct control of the installations. Where the main entrances to buildings face
40 installation perimeters, people entering and exiting the buildings are vulnerable to being fired upon from
41 vantage points outside the installations. To mitigate those vulnerabilities apply the following measures:
42

43 **AP1.3.2.1. New buildings.** For new inhabited buildings, ensure that the main entrance
44 to the building does not face an installation perimeter or other uncontrolled vantage points with direct
45 lines of sight to the entrance.
46

47 **AP1.3.2.2. Existing buildings.** For existing inhabited buildings where the main
48 entrance faces an installation perimeter either use a different entrance as the main entrance or screen that
49 entrance to limit the ability of potential aggressors to target people entering and leaving the building.
50

DRAFT

1 **AP1.3.3. Standard 12. Exterior doors.** For all new and existing buildings covered by these
2 standards, ensure that all exterior doors into inhabited areas open outwards. By doing so the doors will
3 seat into the door frames in response to an explosive blast, increasing the likelihood that the doors will not
4 enter the buildings as hazardous debris.

5
6 **AP1.3.4. Standard 13. Mailrooms.** The following measures address the location of rooms to
7 which mail is delivered or in which mail is handled in new and existing inhabited buildings. The
8 measures involve limiting collateral damage and injuries and facilitating future upgrades to enhance
9 protection should they become necessary.

10
11 **AP1.3.4.1. Location.** Where a new or existing building covered by these standards must
12 have a mailroom, that mailroom will be on the perimeter of the building. By locating the mailroom on the
13 building perimeter there is an opportunity to modify it in the future if a mail bomb threat is identified.
14 Where mailrooms are located in the interior of buildings, few retrofit options are available for mitigating
15 the mail bomb threat.

16
17 **AP1.3.4.2. Proximity.** Mailrooms should also be located as far from heavily populated
18 areas of the building and critical infrastructure as possible. This measure will go far toward minimizing
19 injuries and damage if a mail bomb detonates in the mailroom where the mailroom is not specifically
20 designed to resist that threat.

21
22 **AP1.3.5. Standard 14. Roof access.** For all new and existing inhabited buildings covered by
23 these standards, control access to roofs to minimize the possibility of aggressors placing explosives or
24 chemical, biological, or radiological agents there or otherwise threatening building occupants or critical
25 infrastructure.

26
27 **AP1.3.5.1. New buildings.** For new buildings eliminate all external roof access by
28 providing access from internal stairways or ladders, such as in mechanical rooms.

29
30 **AP1.3.5.2. Existing buildings.** For existing buildings eliminate external access where
31 possible or secure external ladders or stairways with locked cages or similar mechanisms.

32
33 **AP1.3.6. Standard 15. Overhead mounted architectural features.** For all new and existing
34 buildings covered by these standards, ensure that all suspended ceiling systems and other overhead
35 mounted architectural features are mounted to minimize the likelihood that they will fall and injure
36 building occupants. All such systems will be mounted such that they resist forces of 0.5 times the
37 component weight in any direction and 1.5 times the component weight in the downward direction. This
38 standard does not preclude the need to design architectural feature mountings for forces required by other
39 criteria such as seismic standards.

40
41 **AP1.4. ELECTRICAL AND MECHANICAL DESIGN.** Electrical and mechanical design standards
42 address limiting damage to critical infrastructure, protecting building occupants against chemical,
43 biological, and radiological threats, and notification of building occupants of threats or hazards.

44
45 **AP1.4.1. Standard 16. Air intakes.** Air intakes to heating, ventilation, and air conditioning
46 (HVAC) systems that are designed to move air throughout a building that are at ground level provide an
47 opportunity for aggressors to easily place contaminants that could be drawn into the building.

48
49 **AP1.4.1.1. New buildings.** For all new inhabited buildings covered by this document
50 locate all air intakes at least 3 meters (10-ft) above the ground.

51

DRAFT

1 **AP1.4.1.2. Existing buildings.** The above requirement is recommended, but not
2 mandatory, for existing inhabited buildings covered by these standards.
3

4 **AP1.4.2. Standard 17. Emergency air distribution shutoff.** For all new and existing
5 inhabited buildings provide an emergency shutoff switch in the HVAC control system that can
6 immediately shut down air distribution throughout the building. The switch (or switches) must be located
7 to be easily accessible by building occupants. Providing such a capability will allow building occupants
8 to limit the distribution of airborne contaminants that may be introduced into the building.
9

10 **AP1.4.3. Standard 18. Utility distribution and installation.** Utility systems can suffer
11 significant damage when subjected to the shock of an explosion. Some of these utilities may be critical to
12 safely evacuating personnel from the building or their destruction could cause damage that is
13 disproportionate to other building damage resulting from an explosion. To minimize the possibility of the
14 above hazards apply the following measures:
15

16 **AP1.4.3.1. Utility routing.** For all new inhabited buildings route critical or fragile
17 utilities such that they are not on exterior walls or on walls shared with mailrooms. This requirement is
18 recommended, but not mandatory, for existing buildings.
19

20 **AP1.4.3.2. Redundant utilities.** Where redundant utilities are required in accordance
21 with other requirements or criteria, ensure that the redundant utilities are not collocated or do not run in
22 the same chases. This minimizes the possibility that both sets of utilities will be adversely affected by a
23 single event.
24

25 **AP1.4.4. Standard 19. Equipment bracing.** Mount all overhead utilities and other fixtures to
26 minimize the likelihood that they will fall and injure building occupants. Design all equipment
27 mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment
28 weight in the downward direction. This standard does not preclude the need to design equipment
29 mountings for forces required by other criteria such as seismic standards.
30

31 **AP1.4.5. Standard 20. Under building access.** To limit opportunities for aggressors placing
32 explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of
33 under building access is controlled.
34

35 **AP1.4.6. Standard 21. Mass notification.** All inhabited buildings must have a timely means to
36 notify occupants of threats and instruct them what to do in response to those threats.
37

38 **AP1.4.6.1. New buildings.** All new inhabited buildings must have a capability to
39 provide real-time information to building occupants or personnel in the immediate vicinity of the building
40 during emergency situations. The information relayed must be specific enough to discriminate
41 appropriate response actions. Any system, procedure, or combination thereof that provides this capability
42 will be acceptable under this standard.
43

44 **AP1.4.6.2. Existing buildings.** For existing buildings the above requirement is
45 mandatory for primary gathering buildings and billeting, but recommended for all inhabited buildings.
46

DRAFT**AP2. APPENDIX 2****RECOMMENDED ADDITIONAL ANTITERRORISM MEASURES
FOR NEW AND EXISTING BUILDINGS**

AP2.1. SITE PLANNING. The following additional measures, if implemented, will significantly enhance site security with little increase in cost and should be considered for all new and existing inhabited buildings.

AP2.1.1. Recommendation 1. Vehicle access points. The first line of defense in limiting opportunities for aggressors to get vehicles close to DoD buildings is at vehicle access points at the controlled perimeter, to parking areas, and at drive-up / drop-offs points. Keep the number of access points to the minimum necessary for operational or life safety purposes. That will limit the number of points at which access may have to be controlled with barriers and/or personnel in increased threat environments or if the threat increases in the future.

AP2.1.2. Recommendation 2. High speed vehicle approaches. The energy of a moving vehicle increases with the square of its velocity; therefore; minimizing a vehicle's speed allows vehicle barriers to be lighter and less expensive should vehicle barriers ever become necessary. To facilitate reductions in vehicle speeds in the future, ensure there are no unobstructed vehicle approaches perpendicular to perimeters at the required parking and roadway standoff distances.

AP2.1.3. Recommendation 3. Vantage points. Vantage points are natural or man-made positions from which potential aggressors can observe and target people or other assets in and around a building. Identify vantage points outside the control of personnel in the targeted building and either eliminate them or provide means to avoid exposure to them. Means to avoid exposure may include actions such as reorienting the building or shielding people or assets in and around the building using such measures as reflective glazing, walls, privacy fencing, or vegetation.

AP2.1.4. Recommendation 4. Drive-up / drop off. Locate these points away from large glazed areas of the building to minimize the potential for hazardous flying glass fragments in the event of an explosion. For example, the lane may be located at an outside corner of the building or otherwise away from the main entrance. The drive-up/drop-off point should be coordinated with the building geometry to minimize the possibility that explosive blast forces could be increased due to being trapped or otherwise concentrated. For further discussion of this issue refer to the DoD Security Engineering Manual.

AP2.1.5. Recommendation 5. Building location. Activities with large visitor populations provide opportunities for potential aggressors to get near buildings with minimal controls and therefore limit opportunities for early detection. Maximize separation distance between inhabited buildings and areas with large non-DoD visitor populations.

AP2.1.6. Recommendation 6. Railroad location. Avoid sites for inhabited buildings that are close to railroads. Where railroads are in the vicinity of existing buildings, standoff distances between the railroad and any inhabited buildings should be provided based on the standoff distances and explosive weight associated with controlled perimeters in Table AP1.1. Where those standoff distances are not available and since moving existing railroads may be difficult and prohibitively expensive, ensure that there are procedures in place to prohibit trains from stopping in the vicinity of inhabited structures.

DRAFT

1 **AP2.1.7. Recommendation 7. Entry control points for family housing.** For new family
2 housing areas, provide space for an entry control point at the perimeter of the housing area so that a
3 controlled perimeter can be established there if the need arises in the future.
4

5 **AP2.2. ARCHITECTURAL DESIGN.** The following additional measures, if implemented, will
6 significantly enhance building occupants' safety and security with little increase in cost and should be
7 considered for all new and existing inhabited buildings.
8

9 **AP2.2.1. Recommendation 8. Internal circulation.** Design circulation within buildings to
10 provide visual detection and monitoring of unauthorized personnel approaching controlled areas or
11 occupied spaces.
12

13 **AP2.2.2. Recommendation 9. Visitor control.** Controlling visitor access points maximizes the
14 possibility of detecting potential threatening activities. Keep visitor control points in buildings away from
15 sensitive or critical areas, areas where high risk or mission critical personnel are located, or other areas
16 with large population densities of DoD personnel.
17

18 **AP2.2.3. Recommendation 10. Asset location.** To minimize exposure to direct blast effects
19 and potential impacts from hazardous glass fragments and other potential debris, locate critical assets and
20 mission critical or high risk personnel away from the building exterior.
21

22 **AP2.2.4. Recommendation 11. Room layout.** In rooms adjacent to the exterior of the building
23 position personnel and critical equipment to minimize exposure to direct blast effects and potential
24 impacts from hazardous glass fragments and other potential debris.
25

26 **AP2.2.5. Recommendation 12. External hallways.** Because doors can become hazardous
27 debris during explosive blast events, because doors designed to resist blast effects are expensive, and
28 because external hallways have large numbers of doors leading into inhabited areas, avoid exterior
29 hallway configurations for inhabited structures.
30

31 **AP2.2.6. Recommendation 13. Windows.** To minimize the potential for glazing hazards,
32 minimize the size and number of windows for new construction.
33

34 **AP2.2.7. Recommendation 14. Minimize secondary debris.** Eliminate unrevetted concrete
35 barriers and site furnishings in the vicinity of inhabited structures that are accessible to vehicle traffic.
36 Revet exposed concrete surfaces with 1 meter (3 feet) of soil to prevent fragmentation hazards in the
37 event of an explosion.

DRAFT**AP3. APPENDIX 3****DoD Construction Standards for Expeditionary and Temporary Structures**

AP3.1. STANDARDS. All the standards that are unique to expeditionary and temporary structures pertain to site planning. Operational, logistic, and security requirements must be integrated in the overall configuration of structures, equipment, landscaping, parking, roads, and other features. The most cost-effective solution to mitigating explosive effects on expeditionary and temporary structures is to keep explosives as far away as possible. This is especially critical for these types of structures because hardening may or may not be possible. Costs and requirements for expeditionary and temporary structure hardening are addressed in the DoD Security Engineering Manual.

AP3.1.1. Standard 1. Minimum Standoff Distances. The minimum standoff distances apply to all new and existing DoD expeditionary and temporary structures covered by these standards except as otherwise stated below. The minimum standoff distances are presented in Table AP3.1. Except as otherwise required in these standards, where the standoff distances in Table AP3.1 can be provided, conventional expeditionary and temporary structures may be used without a specific analysis of blast effects. Where those distances are not available, the structure must be analyzed and hardened as necessary (in those cases which permit structure hardening) to mitigate the effects of the explosives indicated in Table AP1.1 at the achievable standoff distance to the appropriate level of protection. The appropriate levels of protection for each structure category are shown in Table AP3.1 and are described in Table C2.3 and in the DoD Security Engineering Manual. The two structure types in Table AP3.1. respond in fundamentally different ways to explosive effects. Standoff distances in Table AP3.1 reflect those differences.

AP3.1.1.1. Controlled perimeter. The standoff distance will be measured from the closest point on the structure exterior to the controlled perimeter.

AP3.1.1.1.1. Fabric covered/metal frame construction and wood frame/rigid wall structures. Provide the standoff distance from Table AP3.1 for the applicable structure category.

AP3.1.1.1.2. Container structures. For these structures, apply the guidance in Appendix AP1.

AP3.1.1.2. Parking and roadways. Standoff distances for parking and roadways are based on the assumption that there is a controlled perimeter at which larger vehicle bombs will be detected and kept from entering the controlled perimeter. Where there is a controlled perimeter, the standoff distances and explosive weight associated with parking and roadways in Table AP3.1 apply unless otherwise stated below. If there is no controlled perimeter, it must be assumed that the larger explosive weights upon which the controlled perimeter standoff distances are based (explosive weight I from Table AP3.1.) can access parking and roadways near buildings. Therefore, where there is no controlled perimeter, standoff distances from parking and roadways will be in accordance with the distances and the explosive weight associated with controlled perimeters in Table AP3.1.

AP3.1.1.2.1. All Fabric covered/metal frame construction and wood frame/rigid wall structures. The standoff distance will be measured from the closest point on the structure exterior to the closest edge of parking areas and roadways. The minimum standoff for all structures regardless of hardening or analysis will be 10 meters (33 feet).

AP3.1.1.2.2. Existing Fabric covered/metal frame construction and wood frame/rigid wall structures. Moving existing parking areas and roadways may be difficult to achieve and structural retrofits to existing structures may be prohibitively expensive or technically impossible; therefore, the following operational options are provided for existing inhabited structures where the standoff distances in Table AP3.1 are impractical to achieve.

AP3.1.1.2.2.1. Parking areas. Establish entry control to portions of parking areas to ensure unauthorized vehicles are not allowed closer than the required standoff distance. For primary

DRAFT

1 gathering structures and billeting if entry control is provided to prevent unauthorized parking within the required
2 standoff distance, controlled parking may be permitted as close as 10 meters (33 feet) without hardening or analysis.

3 **AP3.1.1.2.2. Roadways.** Eliminate parking within the required standoff
4 distances along roads adjacent to existing structures covered by these standards.

5
6 **AP3.1.1.2.3. Container structures.** For these structures, apply the guidance in
7 Appendix AP1.

8
9 **AP3.1.1.3. Trash containers.** The standoff distance will be measured from the closest point on
10 the structure to the nearest point of the trash container or trash container enclosure. As a mitigating measure where
11 the standoff distance is not available, hardening of trash enclosures to mitigate the direct blast effects of the
12 explosive and the secondary fragment effects on the structure is acceptable if the applicable level of protection can
13 be proven by analysis.

14
15 **AP3.1.1.3.1. Fabric covered/metal frame construction and wood frame/rigid wall**
16 **construction.** Provide the standoff distance from Table AP3.1 for the applicable structure category.

17
18 **AP3.1.1.3.2. Container structures.** For these structures, apply the guidance in
19 Appendix AP1.

20
21 **AP3.1.2. Standard 2. Structure separation.** Structure separation requirements are established to
22 minimize the possibility that an attack on one structure causes injuries or fatalities in adjacent structures. The
23 separation distance is predicated on the potential use of indirect fire weapons.

24
25 **AP3.1.2.1. Billeting and primary gathering structures.**

26
27 **AP3.1.2.1.1. Fabric covered/metal frame construction and wood frame/rigid wall**
28 **construction.** For all new billeting and primary gathering structures ensure that adjacent structures are separated by
29 at least the distances in Table AP3.1. Where it is necessary to encroach on those structure separations, analyze the
30 structure and provide hardened structure components as necessary to mitigate the effects of the explosive indicated
31 in Table AP3.1 to the appropriate level of protection as shown in Table AP3.1 and described in Table C1.3 and in
32 the DoD Security Engineering Manual.

33
34 **AP3.1.2.1.2. Container structures.** For these structures, apply the guidance in
35 Appendix AP1.

36
37 **AP3.1.2.2. Other inhabited buildings.** There are no minimum separation distances required for
38 antiterrorism for inhabited buildings.

39
40 **AP3.1.3. Standard 3. Unobstructed space.** Keep areas within 10 meters (33 feet) of all expeditionary
41 and temporary structures free of items other than those that are part of the infrastructure.

DRAFT

1

Table AP3.1 Minimum Standoff Distances and Structure Separations
For Expeditionary and Temporary Structures

Location	Structure Category	Standoff Distance or Separation Requirements			
		Applicable Level of Protection	Fabric Covered/Metal Frame Construction ⁽¹⁾	Wood Frame/Rigid Wall Construction ⁽¹⁾	Applicable Explosive Weight (TNT) ⁽⁴⁾
Controlled Perimeter or Parking and Roadways without a Controlled Perimeter	Billeting	Low	31 m (102 ft.)	71 m (233 ft.)	
	Primary Gathering Structure	Low	31 m (102 ft.)	71 m (233 ft.)	
	Inhabited Structure	Very Low	24 m (79 ft.)	47 m (154 ft.)	
Parking and Roadways within a Controlled Perimeter	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	
	Inhabited Structure	Very Low	11 m (33 ft.)	23 m (75 ft.)	
Trash containers	Billeting	Low	14 m (46 ft.)	32 m (105 ft.)	
	Primary Gathering Structure	Low	14 m (46 ft.)	32 m (105 ft.)	
	Inhabited Structure	Very Low	11 m (33 ft.)	23 m (75 ft.)	
Structure Separation ⁽²⁾	Separation between Structure Groups	Low	18 m (59 ft.)	18 m (59 ft.)	
	Separation between Structure Rows	Low	9 m (30 ft.)	9 m (30 ft.)	
	Separation between Structures in a Row	Very Low	3.5 m (12 ft.)	3.5 m (12 ft.)	

1. See Definitions for a complete description of these structure types.
2. Applies to Billeting and Primary Gathering Structures only. There are no minimum separation distances for inhabited structures.
3. Explosive for building separation includes fragmentation effect.
4. When this column is moved from the table, the table is no longer For Official Use Only

DRAFT

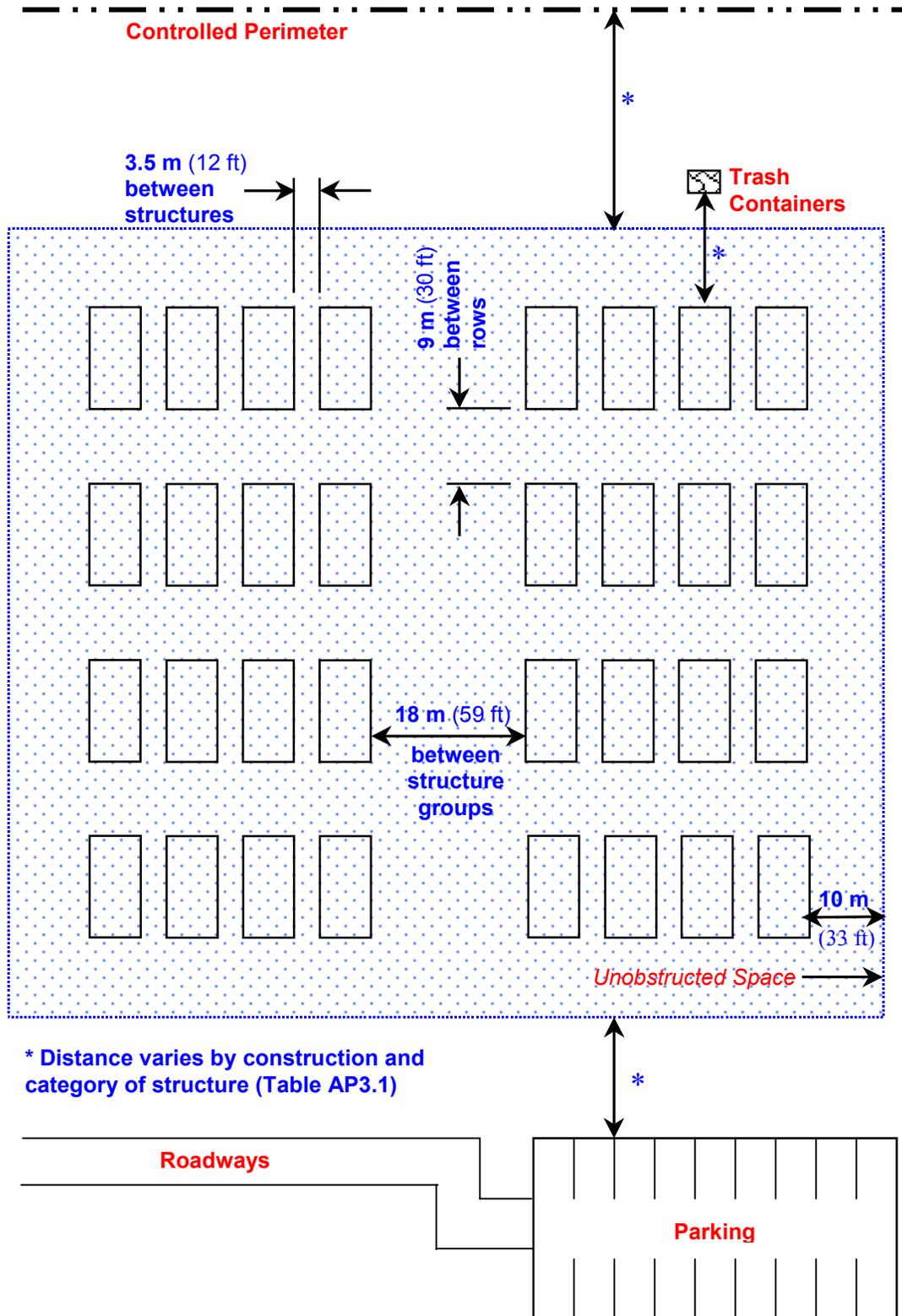


Figure AP3.1. Standoff Distances and Structure Separation for Expeditionary Structures

DRAFT

AP3.1.4. Additional standards. In addition to the specific standards detailed in this appendix, standards from Appendix AP1 shall apply to expeditionary and temporary structures as follows:

AP3.1.4.1. Fabric covered/metal frame construction and wood frame/rigid wall construction. The following standards from Appendix AP1 shall be applied to these structures:

AP3.1.4.1.1. Standard 4. Drive-up/drop off and access roads

AP3.1.4.1.2. Standard 10. Windows and glazed doors

AP3.1.4.1.3. Standard 11. Building entrance layout

AP3.1.4.1.4. Standard 19, Equipment bracing

AP3.1.4.1.5. Standard 18. Mass notification.

AP3.1.4.2. Container structures. For these structures, all standards in Appendix AP1 apply.

AP3.3. ANTITERRORISM RECOMMENDATIONS. All recommendations except for Recommendation 7 (Entry Control Points for Family Housing) from Appendix AP2 should be applied to expeditionary and temporary structures.

DRAFT