

CECW-CE

Technical Letter  
No. 1110-3-511

31 May 2014

EXPIRES 31 MAY 2019  
Engineering and Design  
ARMY AIRFIELD/HELIPORT  
PLANNING AND DESIGN CHANGES

1. Purpose. This ETL provides U.S. Army changes to UFC 3-260-01, Airfield and Heliport Planning and Design.
2. Applicability. All Army organizations responsible for the planning and design of Army airfield/heliports/helipads.
3. Distribution Statement. Approved for public release: distribution is unlimited.
4. Intended Users.
  - a. U.S. Army Corps of Engineers
  - b. Designers of Army airfields
  - c. Other organizations responsible for airfield designs.
  - d. Organizations responsible for maintenance and operations of airfields/runways.
5. Reference. UFC 3-260-01, Airfield and Heliport Planning and Design, 17 November 2008.
6. Implementation. This ETL is effectively immediately.

Appendix A  
Army changes to UFC 3-260-01



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## APPENDIX A

### Changes and additions to UFC 3-260-01

A-1. Page 2, Para 1-4.1: Revise “The criteria in this manual are not intended to apply to facilities located or constructed under previous standards. This includes cases where runways may lack paved shoulders or other physical features because they were not previously required or authorized. Existing airfield facilities need not be modified nor upgraded to conform to the criteria in this manual if these facilities meet current mission requirements. If a change in mission necessitates reconstruction, an upgrade to current standards should be accomplished where practical. Once upgraded, facilities must be maintained at a level that will sustain compliance with current standards. USA and USAF personnel must identify the status of features and facilities on airfield maps as exempt (because they were constructed under a previous, less stringent standard), as a permissible deviation (authorized as a deviation to airfield criteria and sited appropriately), or as a violation, with or without approved waiver. Building restriction lines (BRL) encompass vertical facilities along the flight line that are exempt because they were constructed under previous standards. For other items or features, annotate the airfield map to identify the status of the facility or feature and the date of construction or waiver number. See Appendix B, Section 18, for the guidelines used to establish the BRL.” To read “The criteria in this manual are not intended to apply to facilities located or constructed under previous standards. This includes cases where runways may lack paved shoulders or other physical features because they were not previously required or authorized. Existing airfield facilities need not be modified nor upgraded to conform to the criteria in this manual if these facilities meet current mission requirements. If a change in mission necessitates reconstruction, an upgrade to current standards must be accomplished where practical. The criteria in this UFC apply to Army aviation facilities located in the US, its territories, trusts and possessions. Where an Army aviation facility is a tenant on a civil airport see Paragraph 1-4.5. Where an Army aviation installation complex is host to a civilian aviation operation, the criteria in this UFC applies. Apply this criteria to the extent practicable at overseas locations where the Army has vested rights. While the criteria in this UFC is not intended for use in theater of operations situations, it may be used as a guideline when prolonged use is anticipated and no other standard has been designated. Once upgraded, facilities must be maintained at a level that will sustain compliance with current standards. USA and USAF personnel must identify the status of features and facilities on airfield maps as exempt (because they were constructed under a previous, less stringent standard), as a permissible deviation (authorized as a deviation to airfield criteria and sited appropriately), or as a violation, with or without approved waiver. Building restriction lines (BRL) encompass vertical facilities along the flight line that are exempt because they were constructed under previous standards. For other items or features, annotate the airfield map to identify the status of the facility or feature and the date of construction or waiver number. See Appendix B, Section 18, for the guidelines used to establish the BRL.

A-2. Page 3, Para 1-4.5: Revise paragraph to “Military Activities on Civil Owned Airfields. Army, Army National Guard (ARNG), Army Reserve, Air Force, Air Force Reserve Command (AFRC), and ANG installations on municipal airports or FAA-controlled airfields must apply FAA criteria to facilities such as runways and taxiways that are jointly used by civilian and military aircraft. Facilities that are for military use only, such as aircraft parking aprons, must apply Air Force/Army/DOD criteria.”

31 May 14

A-3. Page 5, Para 1-10, next to the sentence: Delete “For Army, ANG, and Army Reserves, process the form in accordance with Chapter 8 of AR 95-2.”

A-4. Pages 6 & 7, Table 1-1, Associated Design Manuals: After Airfield Lighting, Army, revise “TM 5-811-5, Army Aviation Lighting” to “UFC 3-535-01, Visual Air Navigation Facilities”. After Pavement Marking, Army revise “TM 5-823-4, Marking of Army Airfield-Heliport Facilities (UFC 3-260-04)” to “ECB 2012-28 and UFC 3-260-05A, Marking Of Army Airfield Heliport Operational And Maintenance Facilities”. On Page 7, after Theater of Operations, Air Force/Army, revise “USAF ETL 04-7, C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria” to “USAF ETL 09-6, C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria”. After Area Lighting, Army, revise “TM 5-811-5, Army Aviation Lighting” to “UFC 3-535-01, Visual Air Navigation”.

A-5. Page 8, Para 2-1.4: Revise “Each USAF installation....” to “Each USA/USAF installation...”.

A-6. Page 10, Para 2-1.7: Delete “Space allowances, presented in Appendix B, Section 2, should be used when planning Army aviation facilities.” Replace with “Space allowances for Army aviation facilities will be per DAPAM 415-28”.

A-7. Page 14, Para 2-4.3, second & third line: Change “...the US Army Air Traffic Control Activity (USAATCA),...” to “the US Army Air Traffic Services Command (ATSCOM),...” and “Corps of Engineers Transportation Systems Center (COE TSMCX),...” to “U.S. Army Corps of Engineers Transportation Systems Center (USACE TSC)...”

A-8. Page 18, Para 2-7.3, second bullet: Revise “Rotary-wing runways in excess of 240 m (800 ft) long” to “Rotary-wing runways in excess of 490 m (1600 ft) long”

A-9. Page 19, Para 2-7.6.1, second sentence: Delete “Technical guidance for flight control between airfields may be obtained from USAASA.”

A-10. Page 23, para 2-10.6.1, Air Traffic Control Facilities: Change “...by USAATCA and the US Army Air Traffic Control Activity (ATZQ-ATC-A) for the Army,...” to “by the US Army Air Traffic Services Command (ATSCOM) for the Army...”

A-11. Page 27, Para 3-3.4, second sentence: Revise “Design criteria are found in Air Force Engineering Technical Letter (ETL) 04-7.” to “Design criteria are found in Air Force Engineering Technical Letter (ETL) 09-6.”

A-12. Page 28, Table 3-2, Item 1: In the remarks column, replace the last sentence with “For Army Class B Runways, the runway length will be determined by the ACOMS/ASCCS/DRUs in conjunction with HQDA, G4 by identifying the most critical aircraft in support of USTRANS COM global transportation requirements.

A-13. Page 35, Para 3-8.2.1: Revise “Army. For Army Class A runways, the runway length will be determined in accordance with Table 3-3. Army Class B runways are used by Air Force aircraft; therefore, the Air Force MAJCOM will determine those runway lengths.” to read “Army. For Army Class A runways, the runway length will be determined in accordance with Table 3-3. Army Class B runways are used to support USTRANSCOM global transportation requirements; therefore, runway length will be determined by the ACOMS/ASCCS/DRUs in conjunction with HQDA, G4 by identifying the most critical aircraft in support of USTRANSCOM requirements.”

A-14. Page 37, Note 7: After first sentence add “Ground surfaces may penetrate the primary surface provided they meet the lateral clearance grading requirements (2% minimum to 10% maximum).”

A-15. Page 60, para 3-11.2, seventh line: After “MAJCOM” insert “or USAASA, as applicable...”

A-16. Page 71, para 3-15.2: Revise “Determining Obstructions. For airfields located in the US and trust territories, an obstruction to air navigation is determined in accordance with the standards contained in 14 Code of Federal Regulations (CFR) Part 77. Paragraph 77.23, “Standards for Determining Obstruction,” from Part 77, has been included in Appendix B, Section 5, of this manual.” to read “Determining Obstructions. For airfields located in the US and trust territories, an obstruction to air navigation is determined in accordance with this UFC and the standards contained in 14 Code of Federal Regulations (CFR) Part 77. Paragraph 77.23, “Standards for Determining Obstruction,” from Part 77, has been included in Appendix B, Section 5, of this manual.”

A-17. Page 81, Figure 4-2: In the Plan and Longitudinal Profile layouts under “Runway Length + 121.92m [400’]” delete “BUT NOT LESS THAN 609.6m [2,000]”.

A-18. Page 83 & 85: Insert new “Para 4-4.4 Elevated Helipad. This is a facility that has an elevation above ground level either mounted on pilings or roof tops. This is an exception to policy and requires approval of the Facilities Design Team (FTD).” Renumber existing paragraphs and subparagraphs 4-4.4 to 4-4.6 accordingly.

A-19. Page 83, Para 4-4.4.2: Revise “Above Ground Helipads. The construction of helipads on buildings or on any type of elevated structure above ground is not authorized for the Air Force and Army. For these Services, helipads will be constructed as a slab on grade. For Navy and...” to read “4-4.5.2 Above Ground Helipads. The construction of helipads on buildings or on any type of elevated structure above ground is not authorized for the Air Force. For the Air Force, helipads will be constructed as a slab on grade. For Navy and...”

A-20. Page 84, Table 4-2, Item 1: Add:

	<p>16.8 m x 16.8 m (55 ft x 55 ft)</p> <p>22.9 m x 22.9 m (75 ft x 75 ft)</p>	<p>Elevated Army Helipads</p> <p>UH-60 or smaller helicopters</p> <p>CH-47 and larger helicopters</p>
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A-21. Page 84, Table 4-2, Item 4: Add:

	<p>59.4 m x 59.4 m (195 ft x 195 ft)</p> <p>83.2 m x 83.2 m (275 ft x 275 ft)</p>	<p>Elevated Army Helipads</p> <p>UH-60 or smaller helicopters</p> <p>CH-47 and larger helicopters</p>
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A-22. Page 84, Table 4-2, Item 5, Remarks: Revise “91.44m 91.44m (300 ft 300 ft)” to “91.44m X 91.44m (300 ft X 300 ft)” and add “For elevated helipads, no obstacles may penetrate the elevation of the primary surface.”

A-23. Page 84, Table 4-2, Item 6: Revise “Length of clear zone\*\*” to read “Length of clear zone\*\*/protection zone”.

A-24. Page 84, Table 4-2, Item 7: Revise “Width of clear zone\*\*” to read “Width of clear zone\*\*/protection zone”.

A-25. Page 84, Table 4-2, Item 7: Add:

	59.4m (195 ft) at start of Protection Zone expanding to 98.9m (295 ft) at end of Protection Zone	Elevated Army Helipads  UH-60 or smaller helicopters
	83.2m (275 ft) at start of Protection Zone expanding to 114.3m (375 ft) at end of Protection Zone	CH-47 and larger helicopters

A-26. Page 85, Table 4-2, Item 9, Remarks: Change: "Hoverpoints, VFR, and standard IFR" to "Elevated helipads, Hoverpoints, VFR and standard IFR helipads".

A-27. Page 85, Table 4-2, Item 10: Add:

	98.9 m (295 ft)	Elevated Army Helipads UH-60 or smaller helicopters
	114.3 m (375 ft)	CH-47 or larger helicopters

A-28. Page 86, Para 4.7: Add the following as Paragraph 4.7 and renumber the remaining paragraphs (originally Para 4-7 thru 4-13) accordingly:

#### 4-7 ELEVATED HELIPADS

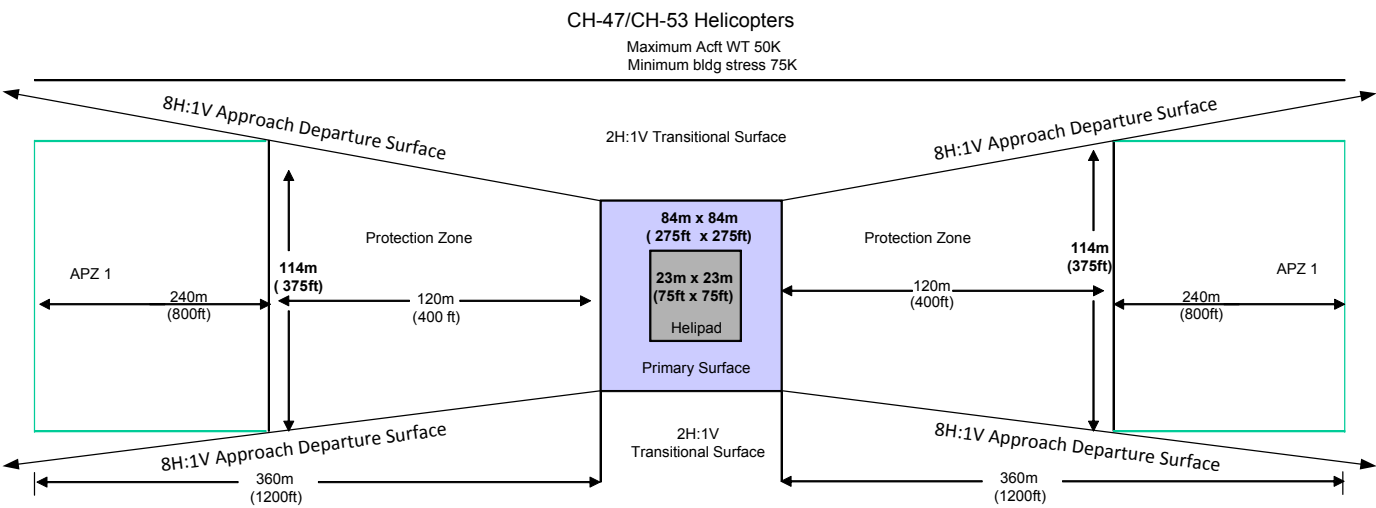
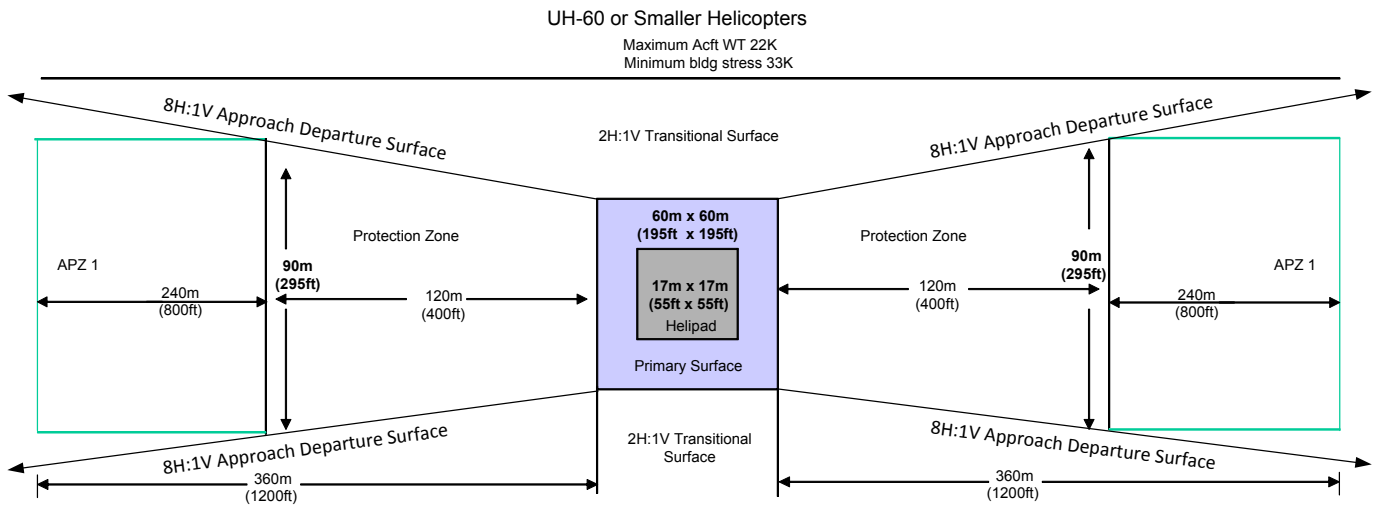
4-7.1 **General.** Elevating helipads 6 feet (1.8 m) or more above the level of the roof will generally minimize the turbulent effect of air flowing over the roof edge. While elevating the platform helps reduce or eliminate the air turbulence effects, a safety net may be required. Helipads should be constructed of metal or concrete. Surfaces should have a broomed pavement or other roughened finish that provides a skid-resistant surface for helicopters and non-slippery footing for people. The primary surface should be contained on the structure.

4-7.2 **Rooftop and Other Elevated Helipads.** Elevated helipads and any supporting helipad structure should be capable of supporting the dynamic loads of the design helicopter (stressed to 1.5 times the weight of the design helicopter).

4-7.3 **Dimensions.** Table 4-2 presents dimensional criteria for the layout and design of elevated helipads.

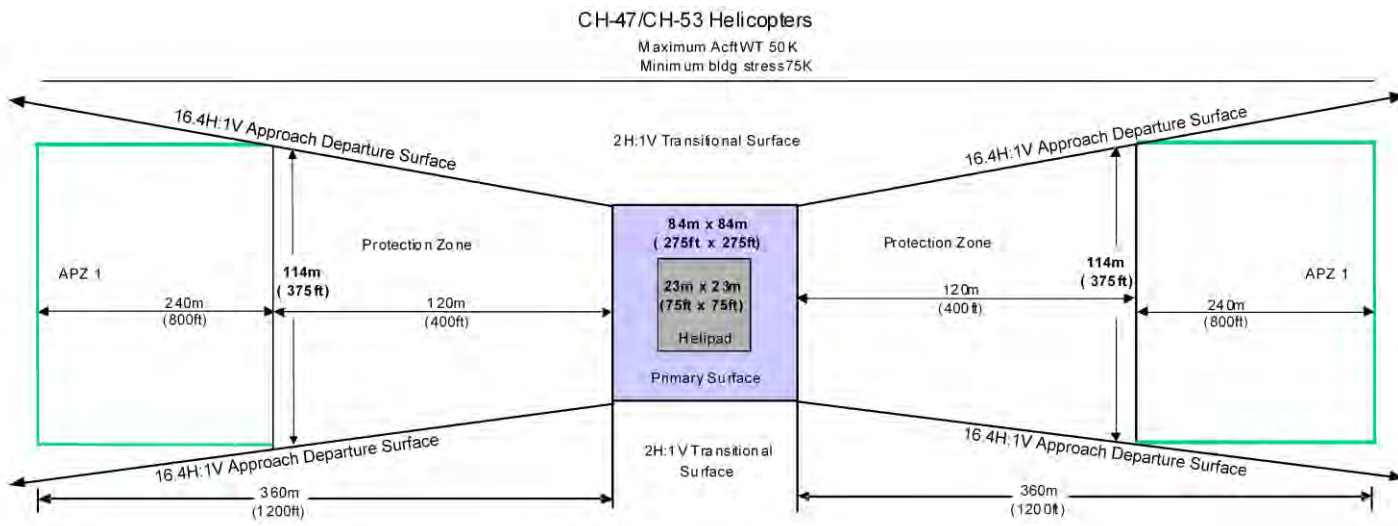
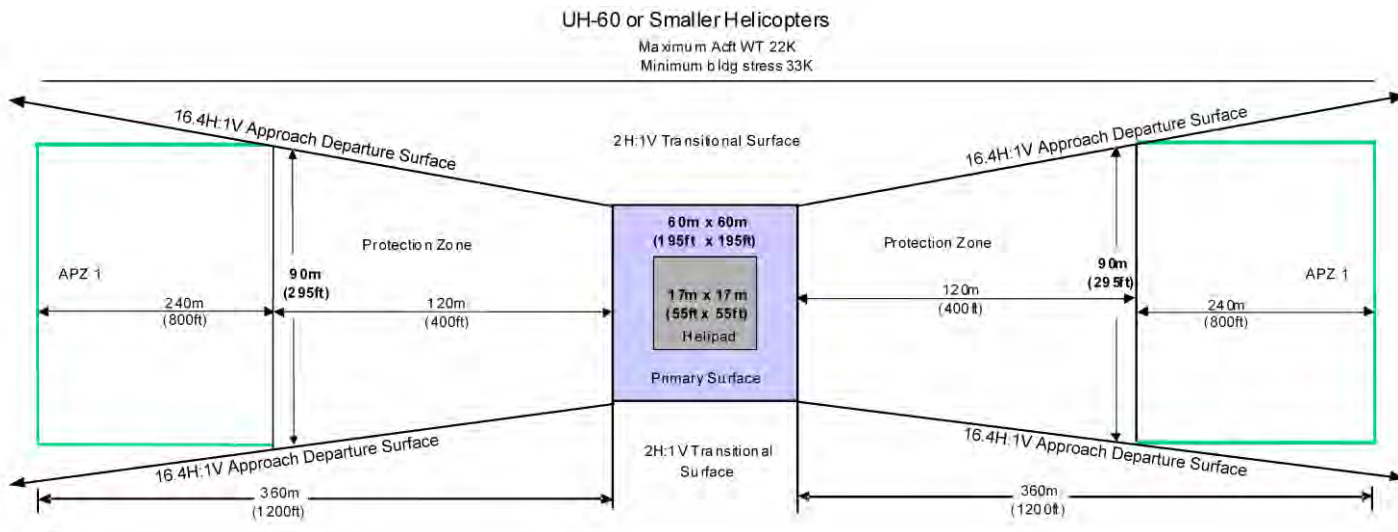
4-7.4 **Layout.** Add the following layout diagrams to Chapter 4 for Elevated Helipads:

### Elevated Helipad Layout Criteria





## Elevated Hospital Helipad Layout Criteria



4-7.5 **Safety Net.** When the helipad is on a platform elevated more than 30 inches (76 cm) above its surroundings, a safety net, not less than 5 feet (1.5 m) wide, should be provided. A railing or fence should not be used since it would be a safety hazard during helicopter operations. The safety net should have a load carrying capability of 25 lb/ft<sup>2</sup> (122 kg/m<sup>2</sup>). The net should not project above the level of the helipad. Both the inside and outside edges of the safety net should be fastened to a solid structure.

4-7.6 **Access to Elevated Helipads.** OSHA requires two separate access points for an elevated structure such as a elevated helipad. Hospital heliports should provide access to and from the helipad via a ramp in order to provide for quick and easy transportation of a patient on

31 May 14

a gurney. Ramps should be built in accordance with state and local requirements. The width of the ramp, and any turns in the ramp, should be wide enough to accommodate a gurney with a person walking on each side. Straight segments of the ramp should be not less than 6 feet (1.8 m) wide. Additional width may be required in the turns. The ramp surface should provide a slip-resistant surface. The slope of the ramp should be no steeper than 12:1 (12 unit horizontal in 1 units vertical). Inside the primary surface any handrails should not extend above the elevation of the helipad. Where a handrail complying with Appendix A of 49 CFR 37, Section 4.8, is not provided, other means should be provided to protect personnel from fall hazards.

**4-7.7 Fixed Objects within a Primary Surface.** No fixed object shall be permitted within a primary surface or protection zone, except for frangibly mounted objects that, due to their function, must be located there.

**4-7.8 Obstructions.** Elevator penthouses, cooling towers, exhaust vents, fresh-air vents, and other raised features can impact helipad operations. Helicopter exhausts can impact building air quality if the helipad is too close to fresh-air vents. These issues shall be resolved during facility design. In addition, control mechanisms should be established to ensure that obstruction hazards are not installed after the helipad is operational. Those objects whose functions require them to be located within these areas should be less than a height of 8 inches (20 cm), be frangible, and must not penetrate the approach/departure surfaces or transitional surfaces.

**4-7.9 Protection Zone.** The protection zone takes the place of a clear zone for elevated helipads. It is an imaginary planar surface that starts at the elevation of the helipad and extends out 400'. The area underlying the protection zone has to be owned or controlled by the installation. All incompatible objects or facilities should be removed from this area. Incompatible facilities include, occupied structures, main entrances, other areas where people congregate, and facilities that might create smoke or steam that would obscure visibility.”.

A-29. Page 87, Figure 4-4, Note: Add second note “ For Army Hospital Helipads: a. The slope of the approach-departure clearance surface shall be 16.4:1 when a CHAPI is used. b. The length of the approach-departure clearance surface shall be 749.82m(2460') when a CHAPI is used. c. The width of sloped portion of approach- departure surface at end of sloped portion shall be 278.90m (915') when a CHAPI is used.”

A-30. Page 88, Figure 4-5, Notes: Add “3. For Army Hospital Helipads: a. The slope of the approach-departure clearance surface shall be 16.4:1 when a CHAPI is used. b. The length of the approach-departure clearance surface shall be 749.82m(2460') when a CHAPI is used. c. The width of sloped portion of approach-departure surface at end of sloped portion shall be 256.18m (870') when a CHAPI is used.”

A-31. Page 89, Figure 4-6, Note 4: Change “Transitional Surface Slope Ratio is 7H:1V for Army and 4H:1V for all others.” to “Transitional Surface Slope Ratio is 4H:1V”

A-32. Page 90, Figure 4-7: Add “Note: For Army Hospital Helipads: a. The slope of the approach-departure clearance surface shall be 16.4:1 when a CHAPI is used. b. The length of the approach-departure clearance surface shall be 749.82m(2460’) when a CHAPI is used. c. The width of sloped portion of approach- departure surface at end of sloped portion shall be 278.90m (915’) when a CHAPI is used.”

A-33. Page 91, Figure 4-8, Add “Note: For Army Hospital Helipads: a. The slope of the approach-departure clearance surface shall be 16.4:1 when a CHAPI is used. b. The length of the approach-departure clearance surface shall be 749.82m(2460’) when a CHAPI is used. c. The width of sloped portion of approach- departure surface at end of sloped portion shall be 256.18m (870’) when a CHAPI is used.”

A-34. Page 96, Figure 4-11: Change “See Note 5” on upper left side of plan view to “See Note 6” in the figure.

A-35. Page 96, Note 5, first sentence: Change “...PLUS 68.60m [225’] FOR AIR FORCE, NAVY, AND MARINE CORPS VFR LANDING LANES.” to “...PLUS 45.72m [150’] FOR ARMY AND AIR FORCE VFR LANDING LANES AND 60.96m [200’] FOR NAVY AND MARINE CORPS VFR LANDING LANES.”

A-36. Page 96, Note 5, second sentence: Change ‘FOR ARMY LANDING LANES, AND AIR FORCE, NAVY AND MARINE CORPS IFR LANDING LANES, THE PRIMARY SURFACE LENGTH IS THE LANDING LANE LENGTH PLUS 121.92m [400’] OR 510.54m [1,675’], WHICHEVER IS GREATER.’ to “FOR ARMY, AIR FORCE, NAVY AND MARINE CORPS IFR LANDING LANES, THE PRIMARY SURFACE LENGTH IS THE LANDING LANE LENGTH PLUS 121.92M [400’].”

A-37. Page 98, Table 4-5, Itm 3, Remarks, top line: Change “...plus paved shoulders” to “...plus shoulders”.

A-38. Page 101, Table 4-7: Replace Table 4-7 with the revised table which includes a column for elevated helipads and entries for Army hospital helipads:

**Table 4-7. Rotary-Wing Imaginary Surface for VFR Approaches**

Rotary-Wing Imaginary Surface for VFR Approaches							
Item		Legend in Figures	Helicopter Runway and Landing Lane	Helipad		Elevated Helipad	Remarks
No.	Description			Air Force and Army VFR Standard	Air Force and Army VFR Limited Use; Navy and Marine Corps Standard Helipad and Hoverpoints <sup>1,2</sup>		
1	Primary surface width	A	91.44 m (300 ft)	91.44 m (300 ft)	45.72 m (150 ft)	<b>59.4 m (195ft) for UH60 and smaller helicopters</b> <b>83.8 m (275 ft) for CH47 and larger helicopters</b>	Centered on the ground point of intercept (GPI)
2	Primary surface length	A	Runway or landing lane length plus 22.86 m (75 ft) at each end	91.44 m (300 ft) centered on facility	45.72 m (150 ft) centered on facility	<b>59.4 m (195 ft) for UH60 and smaller helicopters</b> <b>83.8 m (275 ft) for CH47 and larger helicopters</b>	Runway or landing lane length plus 30.48 m (100 ft) at each end for Navy and Marine Corps facilities
3	Primary surface elevation	A	The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline or at the established elevation of the landing surface.			<b>The elevation of any point on the primary surface is the same as the established elevation of the landing surface</b>	
4	Clear zone surface	B	See Table 4-6	See Table 4-2	See Table 4-2	<b>See Table 4-2</b>	
5	Start of approach-departure surface	C	22.86 m (75 ft) from end of runway or landing lane	45.72 m (150 ft) from GPI	22.86 m (75 ft) from GPI	<b>29.7 m (97.5 ft) from GPI for UH60 and smaller helicopters</b>	

						<b>41.9 m (137.5 ft) from GPI for CH47 and larger helicopters</b>	
6	Length of sloped portion of approach-departure surface	C	365.76 m (1,200 ft)	365.76 m (1,200 ft)*	365.76 m (1,200 ft)*	<b>365.76 m (1,200 ft)*</b>	Measured horizontally. <b>*(For Army Hospital Helipads – The length shall be 749.82m (2460') when a CHAPI is used)</b>
7	Slope of approach-departure surface	C	8:1	8:1**	8:1**	<b>8:1**</b>	Slope ratio is horizontal to vertical. 8:1 is 8 m (ft) horizontal to 1 m (ft) vertical.  <b>** (For Army Hospital Helipads – The slope shall be 16.4:1 when a CHAPI is used)</b>
8	Width of sloped portion of approach-departure surface at start of sloped portion	C	91.44 m (300 ft)	91.44 m (300 ft)	45.72 m (150 ft)	<b>59.4 m (195 ft) for UH60 and smaller helicopters</b>  <b>83.3 m (275 ft) for CH47 and larger helicopters</b>	Centered on the extended center-line, and is the same width as the primary surface
9	Width of sloped portion of approach-departure surface at end of sloped portion	C	182.88 m (600 ft)	182.88 m (600 ft)  <b>[278.90m (915')]***</b>	152.4 m (500 ft)***  <b>[256.18m (870')]***</b>	<b>152.4 m (500 ft)</b>  <b>[224.03m (735')]***</b>	Centered on the extended center-line  <b>*** (For Army Hospital Helipads when a CHAPI is used)</b>

31 May 14

10	Elevation of approach-departure surface at start of sloped portion	C	0 m (0 ft)	0 m (0 ft)	0 m (0 ft)	<b>0 m (0 ft)</b>	Above the established elevation of the landing surface.
11	Elevation of approach-departure surface at end of sloped portion	C	45.72 m (150 ft)	45.72 m (150 ft)	45.72 m (150 ft)	<b>45.7 m (150 ft)</b>	Above the established elevation of the landing surface.
12	Length of approach-departure zone	D	365.76 m (1,200 ft)	365.76 m (1,200 ft)*	365.76 m (1,200 ft)*	<b>365.76 m (1,200 ft)*</b>	Measured horizontally from the end of the primary surface and is the same length as the approach-departure clearance surface length <b>*(For Army Hospital Helipads – The length shall be 749.82m (2460') when a CHAPI is used)</b>
13	Start of approach-departure zone	D	22.86 m (75 ft) from end of runway	45.72 m (150 ft) from center of helipad	22.86 m (75 ft) from center of helipad	<b>29.7 m (97.5 ft) from center of helipad for UH60 and smaller helicopters</b>  <b>41.9 m (137.5 ft) from center of helipad for CH47 and larger helicopters</b>	Starts at the end of the primary surface
14	Transitional surface slope	H	2H:1V  See remark 1	2H:1V  See remark 1	2H:1V  See remark 2	<b>2H:1V</b>  <b>See remark 2</b>	(1) The transitional surface starts at the lateral edges of the primary surface and the approach-departure clearance surface. It continues outward and upward at the prescribed slope to

							<p>an elevation of 45.72 m (150 ft) above the established airfield elevation.</p> <p>(2) The transitional surface starts at the lateral edges of the primary surface and the approach-departure clearance surface. It continues outward and upward at the prescribed slope to an elevation of 26.67 m (87.5 ft) above the established airfield elevation. It then rises vertically to an elevation of 45.7 m (150 ft) above the established airfield elevation.</p> <p>See figures 4-5 and 4-10 for the shape of transitional surfaces.</p>
15	Horizontal surface	G	Not required	Not required	Not required	Not required	

**NOTES:**

1. The Navy and Marine Corps do not have criteria for same direction ingress/egress.
2. The Army does not have VFR rotary-wing runways.
3. Metric units apply to new airfield construction and, where practical, modification to existing airfields and heliports, as discussed in paragraph 1-4.4.

A-39 Page 104, Table 4-8, Item 2, Helicopter Runway & Landing Lanes column: Delete "or 510.54 m (1,675 ft) at the end.

A-40. Page 106, Table 4-8, Item 12, Transitional surface slope: In the first two rows change "7:1" (*four places*) to "4:1".

31 May 14

A-41. Page 107, Para 4-13 Obstructions and Airfield Airspace Criteria, second line: Change "...rotary-wing runway, helipad, landing lane, or..." to "...rotary-wing runway, helipad, elevated helipad, landing lane, or..."

A-42. Page 134-138, Table 6-1: Revise Table 6-1 as shown:

**Table 6-1. Fixed-Wing Aprons**

Fixed-Wing Aprons				
Item		Class A Runway	Class B Runway	Remarks
No.	Description	Requirement		
1	Size and configuration	<p>Variable</p> <p>For Army and Air Force requirements, see the criteria listed below and AFH 32-1084.</p> <p>For Navy and Marine Corps requirements, see Navy NAVFAC P-80.</p>		As a general rule there are no standard sizes for aprons. They are individually designed to support specific aircraft uses. The dimensions are determined by the number and type of aircraft involved, the function of the apron, the maneuvering characteristics of the aircraft, the jet blast of the aircraft, and the degree of unit integrity to be maintained. Other determinants are the physical characteristics of the site, the relationship of the apron area to other airfield facilities, and the objective of the comprehensive plan.
2	Parking space width ("W")	Design aircraft wingspan		Army and Air Force airfields. For CV-22 parking dimensions, see Figure 6-38.
3	Parking space length ("L")	Design aircraft length		Army and Air Force airfields. For CV-22 parking dimensions, see Figure 6-38.
4	Wingtip clearance of parked aircraft ("P")	3.1 m (10 ft)		Army and Air Force airfields, aircraft with wingspans up to 33.5 m (110 ft) For CV-22 wingtip clearances, see Figure 6-38.
		6.1 m (20 ft)		Army and Air Force airfields, aircraft with wingspans of 33.5 m (110 ft) or more except as noted below  See note 1 for <b>USAF</b> .



		7.7 m (25 ft)	Army and Air Force airfields, transient aprons, C-5 and C-17 aircraft (also see paragraph 6-5.8)  See note 1 for USAF.
		15.3 m (50 ft)	Army and Air Force airfields, KC-10 and KC-135 aircraft to accommodate fuel load changes  See note 1 for USAF.
5	Wingtip clearance of aircraft on interior or secondary peripheral taxilanes ("I")	6.1 m (20 ft)	Army and Air Force airfields, aircraft with wingspans up to 33.5 m (110 ft), except transient aprons. For CV-22 wingtip clearances, see Figure 6-38.  See note 1 for USAF.
		7.7 m (25 ft)	Army and Air Force airfields, transient aprons  See note 1 for USAF.  For CV-22 wingtip clearances, see Figure 6-38.
		9.2 m (30 ft)	Army and Air Force airfields, aircraft with wingspans of 33.5 m (110 ft) or more, except transient aprons  See note 1 for USAF
6	Wingtip clearance of aircraft on through or primary peripheral taxilanes ("T")	9.2 m (30 ft)	Army and Air Force airfields, aircraft with wingspans up to 33.5 m (110 ft). For CV-22 wingtip clearances, see Figure 6-38.  See note 1 for USAF.
		Min 15.3 m (50 ft)	Army and Air Force airfields, aircraft with wingspans of 33.5 m (110 ft) or more  See note 1 for USAF.

31 May 14

7	Distance from peripheral taxiway centerline to the apron boundary marking ("C")	7.7 m (25 ft)		Army and Air Force airfields  Designed for aircraft with wingspan up to 33.5 m (110 ft). For CV-22 wingtip clearances, see Figure 6-38.
		11.5 m (37.5 ft)		Army and Air Force airfields  Designed for aircraft with wingspan of 33.5 m (110 ft) and greater
8	Clear distance around aircraft during fueling (see paragraph 6-5.7.)	7.7 m (25 ft)		Around aircraft fuel vent outlets (see T.O. 00-25-172).
		15.3 m (50 ft)		From a pressurized fuel carrying servicing component (see T.O. 00-25-172).
		See Remarks		Consider refueling operations when locating taxiways.
9	Grades in the direction of drainage	Min 0.5 percent  Max 1.5 percent		Avoid surface drainage patterns with numerous or abrupt grade changes that can produce excessive flexing of aircraft and structural damage. Lateral and transverse slopes must be combined to derive maximum slope in the direction of drainage. (i.e., the square root of the transverse slope squared plus longitudinal slope squared is equal to the slope in the direction of drainage.) For the Air Force, no grade changes are allowed for individual parking positions within the aircraft block dimensions (not including clearance distances) of the design aircraft. Exceptions are allowed for fuel hydrant pits.
10	Width of shoulders (total width including paved and unpaved)	7.5 m (25 ft)	15 m (50 ft)	Army and Air Force airfields

11	Paved width of shoulders	7.5 m (25 ft)	7.5 m (25 ft)	Army and Air Force airfields not otherwise specified. For apron shoulders where fire hydrants must be installed, see <b>Note 5 and</b> Appendix B, Section 13, for the minimum set back from the taxilane centerline.
		N/A	15 m (50 ft)	Army and Air Force airfields that accommodate B-52, C-5, E-4, and 747 aircraft. For apron shoulders where fire hydrants must be installed, see <b>Note 5 and</b> Appendix B, Section 13, for the minimum set back from the taxilane centerline.
12	Longitudinal grade of shoulders	Variable		Conform to longitudinal grade of the abutting primary pavement.
13	Transverse grade of paved shoulder	Min 2.0 percent Max 4.0 percent		Army airfields and Air Force airfields not otherwise specified
		N/A	Min 1.5 percent Max 2.0 percent	Air Force airfields that accommodate B-52 aircraft
14	Transverse grade of unpaved shoulders	N/A	(a) 40 mm (1.5 in) drop-off at edge of paved shoulder, +/- 13 mm (0.5 in).  (b) 2.0 percent min, 4.0 percent max.	Unpaved shoulders shall be graded to provide positive surface drainage away from paved surfaces.

15	Clearance from apron boundary marking to fixed or mobile obstacles	<b>Variable</b>		<p>Compute this distance by multiplying 0.5 x the wingspan of the most demanding aircraft that will use the apron and add the appropriate wingtip clearance required by item 5 or 6. Then subtract the distance from the taxilane centerline to the apron boundary marking (item 7) to find the required clear distance.</p> <p>This distance is to be clear of all fixed and mobile obstacles except as specifically noted in Appendix B, Section 13, even if there is no peripheral taxilane along the edge of apron. This clear distance is required for safety purposes.</p> <p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. Light poles are not allowed within this distance without waiver.</li> <li>2. Implement operational controls to ensure that aircraft larger than the design aircraft do not use the apron without wing-walkers. Publish this information in the airfield operating instruction.</li> <li>3. For USAF, submit a revised summary of airfield restrictions to allow update to the AMC Airfield Suitability and Restrictions Report. Mail the revision to:                  HQ AMC/A3AS                  402 Scott Drive Unit 3A1                  Scott AFB IL 62225-5302</li> </ol>
16	Grades in cleared area beyond shoulders to fixed or mobile obstacles	<p>(a) 40 mm (1.5 in) drop-off at edge of paved shoulder, +/- 13 mm (0.5 in).</p> <p>(b) Min 2 percent Max 10 percent</p>	<p>Min 2 percent Max 10.0 percent</p>	<p>40 mm (1.5-in) drop-off (+/- 13 mm (0.5 in)) at edge of pavement when the entire shoulder is paved.</p> <p>When a slope reversal is required within this area, a flat bottom ditch that is graded to drain adequately shall be provided.</p>

A-43. Page 141, Figure 6-5: Add a 20m (60') taxi-lane to the edge of apron on the right side of the plan view, as shown on as Figure 6-6.

A-44. Page 146, Table 6-2, Item 13: Revise as follows:

**Table 6-2. Rotary-Wing Aprons for Army Airfields**

13	Clearance from the edge of the apron to fixed and mobile obstacles (clear area)	23 m (75 ft)	Measured from rear and side of apron. When there is a peripheral taxilane/hoverlane the distance from the edge of apron is 9 m (30 ft). Distance to other aircraft operational pavements may require a greater clearance except as noted in Appendix B, Section 13.
		30m (100 ft)	For aprons regularly servicing H-53 helicopters  <b>When aircraft are towed on and off washracks the rotor clearance can be reduced to 25'.</b>

A-45. Page 146, para 6-8: Change second sentence from “The intent of a warm-up pad is to provide a parking location,…” to “The intent of a warm-up pad is to provide a holding location…” and the references to “PARKED” and “PARKING” on Figure 6-12 on page 151 and Figure 6-15 on page 154, respectively, need to be changed to “HOLDING”.

A-46. Page 165, Para 6-11: After the first sentence add “A CCP is not required by the Army, but if one is provided, or used, then requirements of Paragraph 6-11 and the applicable subparagraphs apply.”

A-47. Page 169, Para 6-12.6.1: Change “...apron lighting…” to “...apron flood lighting…”.

A-48. Page 198. Chapter 7: AF ETL 09-6 C-130 and C-17 Landing Zone (LZ) Dimensional, Marking, and Lighting Criteria supersedes Chapter 7 and must be used in lieu of this chapter.

A-49. Page 229, Chapter 8, Table 8-1: Change CH-47 Length dimensions from “33.5m” and “110ft” to “36.5m” and “120 ft” and C-12 Length dimensions from “19.5m” and “64ft” to “24.5m” and “80 ft”.

A-50. Page 229, Chapter 8, Table 8-1: Add a third note under Table 8-1 stating “\*\*\* Aircraft Space Modules on the ends of a row inside a hangar facility need to provide 3m (10 ft) of clearance to walls and/or structural elements.”

A-51. Page 231: Insert “ACOM – Army Command” after AC – alternating current.

ETL 1110-3-511

31 May 14

A-52. Page 231: Insert “ARNG – Army National Guard” after ANG – Air National Guard.

A-53. Page 232: Insert “ASCC – Army Service Command Component” after AR – Army Regulation.

A-54. Page 233: Insert “DRU – Direct Reporting Unit” after DPTM.

A-55. Page 235: Change “MAJCOM – major command (Army/Air Force)” to “MAJCOM – major command (Air Force)”

A-56 Page 242, Correctable Obstruction: After “MAJCOM” add “or USAASA as applicable.”

A-57. Page 247, Permissible Deviation: Change “Permissible Deviation (Air Force only)” to “Permissible Deviation (Air Force and Army only)”.

A-58. Appendix B, Page 265, Para B1-1.1.1.2: Revise “Submit requests through the installation to the major command (MAJCOM).” to “Submit requests through the installation to the ACOM/ASCC/DRU/HQARNG as appropriate.”

A-59. Appendix B, Page 265, Para B1-1.1.2: Revise “The MAJCOM will:” to “The ACOM/ASCC/DRU/HQARNG will:”

A-60. Appendix B, Page 265, Para B1-1.1.2.3: Change “...all viable requests...” to “...all command supported requests...” and change “...MAJCOMs...” to “...ACOM/ASCC/DRU/HQARNG as applicable...”.

A-61. Appendix B, Page 266, Para B1-1.1.2.3.4: Change “Director, USACE Transportation Systems Center, ATTN: TSMCX, 215 N 17<sup>th</sup> St, Omaha, NE 68102-3869” to “Director, USACE Transportation Systems Center, 1616 Capitol Ave., Omaha, NE 68102-4901”.

A-62. Appendix B, Page 266: After Para B1-1.2.3 add “B1-1.2.4. Temporary waiver requests shall include the action planned to correct the violation, risk assessment, project/work order number, and estimated completion date.”

A-63. Appendix B, Page 274-303, SECTION 2 Army Land Use and Facility Space – Allowances: Delete Section 2 in its entirety. Section 2 is being replaced by the Army Standards and Category Codes in DAPAM 415-28.

A-64. Appendix B, Page 304-314, SECTION 3: DOD Air Installations Compatible Use Zones Suggested Land Use Compatibility in Accident Potential Zones is superseded by the Dept. of Defense Instruction (DODI) 4165.57 dated May 2, 2011.

A-65. Appendix B, Page 347, Figure B11-3: In the Plan View change the Mooring Device note

from “See Figure A12.1” to “See Figure B11-1”.

A-66. Appendix B, Page 356, Figure B11-9: Change “Finished Apron” to “Finished Floor”.

A-67. Appendix B, Page 370, SECTION 13: Revise title to “SECTION 13 DEVIATIONS FROM CRITERIA FOR ARMY AND AIR FORCE AIRFIELD SUPPORT FACILITIES”.

A-68. Appendix B, Page 370, Section 13, para B13-1.1: Revise first sentence to “This section provides information for selected airfield support systems and facilities that are authorized to deviate from criteria presented in this UFC with a specific waiver from the MAJCOM (USAF) or USAASA (USA)/ACOM/ASCC/DRU as applicable.”

A-69. Appendix B, Page 370, Section 13, para B13-1.2: Delete all references to “Army” from this paragraph.

A-70. Appendix B, Page 371, para B13-1.8: Revise paragraph to read “Air Traffic Control Tower (ATCT). The ATCT cab must be correctly oriented so that the area to be controlled is visible from the cab. Air traffic controllers must have proper depth perception of the area under surveillance and there can be no electronic interference with equipment in the cab or with navigational equipment on the ground. A site survey must be conducted to determine the best siting. For these and other operational and technical aspects and considerations for selecting a site, consult Air Force Flight Standards Agency (AFFSA), Requirements and Sustainment Directorate, HQ AFFSA/A3/8, 7919 Mid-America Blvd, Ste 300, Oklahoma City, OK 73135, or for Army Facilities, contact the United States Army Air Traffic Services Command (ATSCOM), Fixed Base Systems Division (AFAT-ATS-CB), Building 50301 Nevin Street, Cairns Army Airfield, Ft. Rucker, AL 36362-5265, in the early stages of planning. Specific architectural, structural, mechanical, and electrical systems design requirements may be found in the *Air Traffic Control Tower and Radar Approach Control Facility Design Guide* published by the Air Force Civil Engineer Center (HQ AFCEC/DCD). Also, see paragraph B13-2.20.3.7 and Section 17 of this appendix.

A-71. Appendix B, Page 371, para B13-2.1, fifth line: Change “...or a waiver from the MAJCOM is required.” to “...or a waiver from the MAJCOM or USAASA, as applicable, is required.”

A-72. Appendix B, Page 371. Para B13-2.1.1, ninth line: Revise sentence to “To accommodate these needs, the clear zone size was expanded and the allowable uses were published within the Air Installation Compatible Use Zone (AICUZ) Program guidance, DODI 4165.57 and for USAF currently in AFI 32-7063.”

A-73. Appendix B, Page 372, para B13-2.2: Starting with the second sentence revise text to “This applies for any above ground construction within 76 meters (250 feet) of the fixed runway centerline and an extension of that dimension for 914 meters (3,000 feet) beyond the ends of the runway thresholds and within 60 meters (200 feet) or 48 meters (150 feet) of taxiway centerlines for USAF and Army respectively, but is limited to structures owned or controlled by DOD. For VFR helicopter runways/helipads (except limited use facilities) frangibility requirements apply within 30 meters (100 feet) of centerline/center of helipad and an

ETL 1110-3-511

31 May 14

extension of that dimension beyond the ends of the runway threshold/ approach/departure surface for 120 meters (400 feet). Frangibility implies that an object will collapse or fall over after being struck by a moving aircraft thereby minimizing damage to the aircraft to the maximum extent practicable. The constructed object must..."

A-74. Appendix B, Page 376: Add Para "B13-2.8.1. For Army, at least one reflector must be located within the AN/FPN67/AN/TPN-31 PAR azimuth angle coverage area in order to provide a horizontal reference point. It can be sited within 250 feet of the runway centerline with an approved waiver."

A-75. Appendix B, Page 376, Para 13-2.9.1.3: Add "Army siting requirements are contained in FAA Order 6750.16."

A-76. Appendix B, Page 381, Para B13-2.20.1.3, third line: Revise to read "When a personnel shelter is required, it is considered a part of the arm/disarm complex and must be sited to provide minimum wingtip/rotor clearance for the adjacent pavement type (taxiway or taxilane) and according to explosives quantity-distance criteria as discussed in Section 9 of this appendix and AFMAN 91-201/DA Pam 385-64 for Air Force and Army respectively. Also see paragraph B13-2.20.2.8."

A-77. Appendix B, Page 383, Para B13-2.20.2.4, last sentence: Revise to "For information on explosives safety standards, see AFMAN 91-201/DA Pam 385-64 for Air Force and Army respectively."

A-78. Appendix B, Section 13, Page 384, Para B13-2.20.2.8, last sentence: Revise to "Explosive quantity distance criteria in AFMAN 91-201/DA Pam 385-64 applies for Air Force and Army respectively."

A-79. Appendix B, Section 14, Page 390, Para B14-6.1.2: Change "Taxiways and Taxilanes." to "Taxiways and Aprons."

A-80. Appendix B, Section 17, Page 418, Para B17-1: After the sentence "For these considerations and other operational and technical aspects for selecting a site, consult Air Force Flight Standards Agency, Engineering and Systems Integration Branch (HQ AFFSA/A3/8, 7919 Mid-America Blvd, Ste 300 Oklahoma City, OK, in the early stages of planning." add "For Army Facilities, the United States Air Traffic Services Command (ATSCOM), Fixed Base Systems Division, Building 50301 Nevin Street, Cairns Army Airfield, Ft Rucker, AL, 36362-5265 is the siting authority that should be contacted."

A-81. Appendix B, Section 17, Page 418, Para B17-1, revise the 2<sup>nd</sup> to last sentence from ... Air Force Center for Engineering and the Environment (HQ AFCEE/DCD)" to "Air Force Civil Engineer Center (HQ AFCEC/DCD)."

A-82. Appendix B, Section 17, Page 418, Para B17-2.3: Revise to "Quantity Distance Criteria . Siting of the ATCT must meet explosives separation distance criteria in AFMAN 91-201 and DOD 6055.9-STD."



A-83. Appendix B, Section 17, Page 418, Para B17-2.4: After "...AFI 11-230" add "and FAAH 8260.3B)."

A-84. Appendix B, Section 17, Page 419, Para B17-2.7: Revise paragraph to read "Compliance With Airfield Standards. Siting should conform to airfield and airspace criteria in Chapter 3. Deviations should only be considered when they are absolutely necessary. Any siting deviations that would normally require a waiver must be subjected to a TERPS analysis performed by the appropriate MAJCOM TERPS office and AFFSA TERPS. US Army facilities would be analyzed by the Department of the Army Representatives (DAR) for FAA and USAASA Instrument Procedures Branch. If the analysis reveals that the control tower will not adversely affect instrument procedures, the ATCT siting may be considered a permissible deviation for USAF facilities with coordination from AFFSA/A3/8 and the MAJCOM/A3 and /A7, for US Army facilities with coordination from USAASA HQs."

A-85. Appendix B, Section 17, Page 425, Para B17-4, eight line: After "...and base civil engineering offices." insert "For US Army facilities, a representative from ATSCOM, Fixed Base Systems Division along with assistance from and concurrence of installation communications (plans and programs), airfield operations flight (control tower and airfield management), and base civil engineering/DPW offices will determine siting recommendations."

A-86. Appendix B, Section 17, Page 426, Para B17-4.3: Change "...proposed tower location and final elevation and determine..." to "...proposed tower location and final structural elevation (not antenna height), and determine..."

A-87. Appendix B, Section 17, Page 426, Para B17-4.3, NOTE: Revise to "NOTE: Towers will not be sited within the primary surface (less than 304.8 meters [1,000 feet] for USAF) and (less than 152.4m [500 feet] for US Army) from a runway centerline except at locations required to operate under International Civil Aviation Organization (ICAO) standards. At these locations, the tower must be located at least 228.6 meters (750 feet) from the runway centerline.

A-88. Appendix B, Section 17, Page 426, Para B17-5: Change "SITE RECOMMENDATIONS. On completing..." to "SITE RECOMMENDATIONS (Non-applicable for US Army). On completing..."