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SECRETARY OF THE AIR FORCE**



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**Civil Engineering**

**CIVIL ENGINEER OPERATIONS**

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This instruction implements Air Force Policy Directive (AFPD) 32-10, *Installations and Facilities*, AFPD 32-70, *Environmental Considerations in Air Force Programs and Activities*, and Department of Defense Instruction (DODI) 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*. It also implements Title 29, Code of Federal Regulations (CFR), Part 1910.134, *Respiratory Protection*; Title 29 CFR, Part 1910.1001, *Asbestos*; Title 29 CFR, Part 1926.1101, *Asbestos*; Title 40, CFR, Part 763, Subpart E, *Asbestos-Containing Material in Schools*; Title 15, United State Code (USC), Chapter 53, *Toxic Substance Control Act (TSCA)*; Title 40, CFR, Part 61, subpart M, *National Emission Standard for Asbestos*; and Air Force Occupational Health and Safety Standard 48-137, *Respiratory Protection Program*. This Instruction applies to all civilian employees and uniformed members of the Regular Air Force and Air Force Reserve. Chapters 3, 5, 11, 12, 13, 14, and 15 apply to civilian and uniformed members of the Air National Guard. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but

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### **SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. The waiver authority for many requirements in this AFI has been reduced to reflect the need for installation-level ownership, management of risk, and commitment to executing Civil Engineer Operations in accordance with asset management principles. Information has been added to clarify the Air Force (AF) definitions and expectations of Real Property Asset Management. Additional guidance has been provided on managing the Preventive Maintenance (PM) program, the facility manager program, the U-Fix-It program, snow and ice control, asbestos management, and corrosion control. Requirements for procedures to maintain set points for maximum heating and minimum cooling temperatures have been included. Additionally, the following forms have been rescinded: AF Form 637, *BCE Job Order Log*, AF Form 919, *BCE In-Service Work Plan Work Sheet*, AF Form 1255, *Quality Control Evaluation*, AF Form 1445, *Materials and Equipment List*, AF Form 1841, *Maintenance Action Sheet*, and AF Form 1879, *BCE Job Order Record*.

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## Chapter 1

### ROLES AND RESPONSIBILITIES

#### **1.1. The Assistant Secretary of the Air Force Installations, Environment and Energy (SAF/IE). SAF/IE:**

- 1.1.1. Establishes and issues civil engineer operations policies that translate the ideas, goals or principles contained in the Air Force mission, vision and strategic plans.
- 1.1.2. Has overall responsibility for built infrastructure, facility operational energy, safety and occupational health, and ensure the sustainability and operational readiness of the Department of the Air Force including but not limited to resource advocacy.
- 1.1.3. Is accountable for congressional or interdepartmental engagement with respect to operations and maintenance of built infrastructure. May delegate responsibility to the Air Force Deputy Chief of Staff for Logistics, Engineering and Force Protection, Directorate of Civil Engineers (AF/A4C) for built infrastructure, facility energy, and occupational safety.
- 1.1.4. Provides guidance, direction, and oversight for all matters pertaining to the formulation, review, and execution of plans, policies, programs, and budgets to ensure the sustainment and protection from mission degradation related to built infrastructure.
- 1.1.5. Serves as the Department of the AF's Designated Agency Safety and Health Official and be responsible for all such duties within the scope of Title 29 of the Code of Federal Regulations.

#### **1.2. Deputy Assistant Secretary of the Air Force for Environment, Safety and Infrastructure (SAF/IEE). SAF/IEE is the delegated authority for all matters relating to the management of facilities and infrastructure on behalf of the Secretary of the Air Force as codified in HQ USAF Mission Directive 1-18. SAF/IEE reports to and serves as an agent of the Secretary of the Air Force to provide policy, strategic direction, priorities, guidance, and oversight on the management and execution of programs within this area of responsibility.**

#### **1.3. Air Force Deputy Chief of Staff for Logistics, Engineering and Force Protection, Directorate of Civil Engineers (AF/A4C). AF/A4C shall:**

- 1.3.1. Oversee the Civil Engineer (CE) Operations Management Program to ensure compliance with applicable U.S. Codes, Federal Regulations, higher directives, and authorities and develop Management Internal Control Toolset (MICT) self-assessment communicators.
- 1.3.2. Develop, maintain, clarify, and publish strategy, doctrine, and Air Force Instructions (AFI) for the operations and asset management programs.
- 1.3.3. Be accountable for congressional or interdepartmental engagement with respect to operations and maintenance of built infrastructure as delegated by SAF/IE.
- 1.3.4. Approve and provide guidance to the Air Force Installation and Mission Support Center regarding HQ USAF-directed Special Enterprise Execution Directives (SEEDs) and other special interest items.
- 1.3.5. Approve Air Force Installation and Mission Support Center's Air Force Real Property Asset Management Framework.

**1.4. The Air Force Installation and Mission Support Center (AFIMSC).** AFIMSC shall:

1.4.1. Participate and make recommendations through the CE Enterprise Governance process in the development of civil engineer operations strategy, policy and guidance.

1.4.2. Develop and publish the Air Force Civil Engineer Real Property Strategic Asset Management Plan with input from SAF/IE, AF/A4C, Air Force Institute of Technology, and any other critical stakeholders no later than 1 July 2021. Once published, provide a process for continual review and implementation. The plan shall incorporate requirements of Executive Order 13327, *Federal Real Property Asset Management*, and align with International Organization for Standardization (ISO) 55000 series standards. It will be in compliance with Chapter 4 of this publication and include processes, procedures, support systems, organizational roles and responsibilities, and best practices from GAO-19-57, *Federal Real Property Asset Management*.

1.4.3. Provide enterprise-level asset portfolio managers to oversee the management of Asset Management Plans (AMPs) listed in Chapter 4 as well as any additional activities as directed by HQ USAF.

1.4.4. Assign an enterprise-level asset portfolio manager to oversee the execution of any HQ USAF-directed SEEDs and special interest items.

1.4.5. Allocate resources supporting the operations and maintenance of built infrastructure in accordance with Air Force corporate structure decisions and Vice Chief of Staff of the Air Force-approved Air Force Common Output Level Standards (AF COLS). Distribute installation and mission support funds for unit requirements and for tenant units on non-Air Force installations with AFIMSC wing activity funding targets.

1.4.6. Provide resource advocacy to the Air Force corporate structure through the Agile Combat Support Core Function Lead and Installation Support Panel (AF/A4PR). Support program development and budgeting for the operations management program. Coordinate with AF/A4C prior to submission of Program Objective Memorandum (POM) requirements in accordance with CE enterprise governance.

1.4.7. Develop recurring updates to Major Command (MAJCOM) or Direct Reporting Unit (DRU) leadership on performance, report findings, high-risk areas, funds distribution and execution, and other applicable trends.

1.4.8. Provide timely, AFIMSC-appropriate information to support HQ USAF engagement and responses to the Office of the Secretary of Defense (OSD), Congress, and external organizations.

**1.5. The Air Force Civil Engineer Center (AFCEC).** AFCEC shall:

1.5.1. Provide technical oversight of programs covered under this AFI and collaborate with AF/A4C and AFIMSC for overall program compliance.

1.5.2. Provide technical and functional expertise to support policy development, standardization and improvement of business processes, collection and dissemination of best practices, and playbook development and maintenance.

1.5.3. Serve as designated subject matter experts for operations and maintenance of built infrastructure as well as establish standards and criteria for design, maintenance, repair and management of programs covered by this instruction.

1.5.4. Oversee processes and procedures for the collection and maintenance of built infrastructure condition data.

1.5.5. In coordination with the AF/A4C career field manager, oversee training and education of Air Force personnel related to the operations and maintenance of built infrastructure.

1.5.6. Approve corrosion control methods and equipment not specified in Air Force publications.

1.5.7. Provide oversight and environmental support ensuring effective facility asbestos management.

1.5.8. Develop and maintain a Preventive Maintenance Task List (PMTL) on a website that is accessible to all necessary users and reviewers.

1.5.9. Develop and maintain properly reviewed and coordinated service contract templates on a website that is accessible to all necessary users and reviewers.

**1.6. The Base Civil Engineer (BCE).** The BCE shall:

1.6.1. Develop a base asbestos management plan, maintain an inventory of all facilities with known asbestos-containing materials, and ensure real property records are properly annotated. **(T-1)**. The real property accountability officer must reconcile the asbestos management plan and the asbestos inventory with the real property records annually **(T-1)**. **Note:** Asbestos-containing material is any material containing more than one percent asbestos. Refer to Chapter 15 for additional information.

1.6.2. Develop and implement a comprehensive, asbestos operating plan. **(T-1)**. Refer to Chapter 15 for additional information.

1.6.3. Decide whether asbestos-related work will be accomplished with in-service resources or by contract. **(T-3)**.

1.6.4. Assign asset managers to each of the Asset Management Plans (AMPs) and sub-Asset Management Plans (sub-AMP) listed in Chapter 4. **(T-1)**. Additionally, each formal inspection program listed in Chapter 11 shall be assigned to an Asset Manager. **(T-1)**.

1.6.5. Ensure operations flight work complies with applicable laws, codes, and standards to include Unified Facility Criteria (UFC). **(T-0)**.

1.6.6. Ensure all Base Operations Support (BOS) contracts and Base Maintenance Contracts (BMC) follow all service delivery output requirements in this AFI and use Air Force-mandated IT systems. **(T-1)**. If not currently included in the contract language, the contract will be either modified or the requirements added during the next solicitation. **(T-1)**.

**1.7. The Operations Flight.** The operations flight's main objective is to effectively and efficiently operate, maintain, and repair Air Force real property and Real Property Installed Equipment (RPIE) through employment of asset management principles. The operations flight shall:



1.7.1. Employ asset management principles in their work efforts. **(T-0)**. Asset management is required by Executive Order 13327. To accomplish this, the operations flight shall:

1.7.1.1. Provide execution, management, and oversight of facility and infrastructure operations, maintenance and repair, materiel control, work planning, customer service, service contract management, and operations engineering. **(T-1)**.

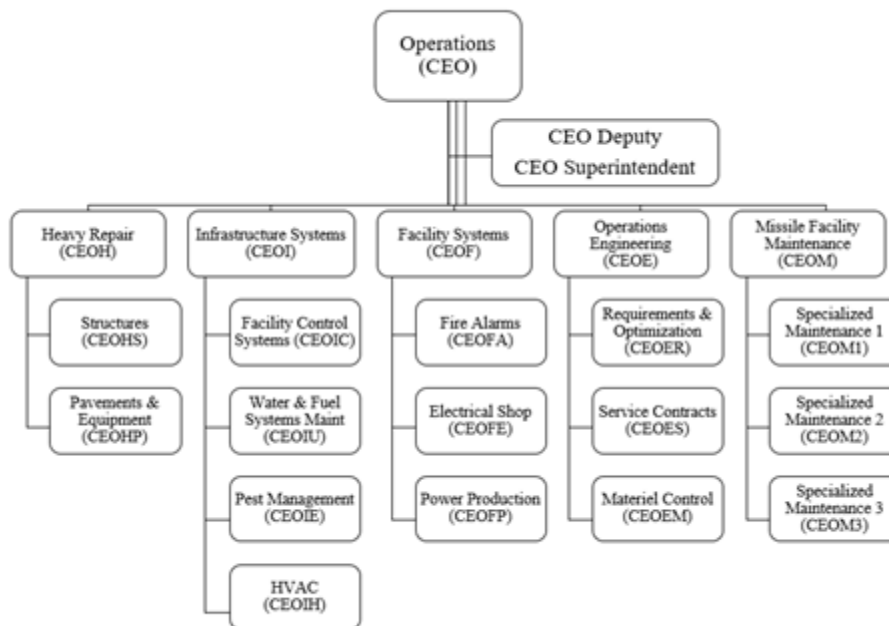
1.7.1.2. Maintain capability to respond to and mitigate any infrastructure-related emergency condition at all times. **(T-3)**.

1.7.1.3. Use Air Force-mandated Information Technology (IT) systems to manage work, collect labor hours, document annual operating costs (labor, material, contracted services, etc.), input and manage whole building and asset warranties, validate inventories, and record condition assessments in Sustainment Management Systems (SMS) in accordance with 10 USC Section 2721, *Property Records: Maintenance on Quantitative and Monetary Basis*. **(T-0)**.

1.7.1.4. Provide consistent data quality. **(T-2)**. Ensure data entry standards, formats, and naming conventions follow guidance published by AFIMSC and AFCEC in order to facilitate MAJCOM and higher headquarter reporting, data filtering, and analysis. **(T-2)**.

1.7.2. Be organized in accordance with Figure 1.1. and include the following elements: Heavy Repair, Infrastructure Systems, Facility Systems, and Operations Engineering. **(T-1)**. The operations flight shall not deviate from this construct unless approved by HQ USAF in accordance with AFI 38-101, *Air Force Organization*. Civil Engineer Groups will use the appropriate organizational equivalent to flight used in this AFI. **(T-1)**. **Note:** Missile Facility Maintenance Element is an approved variance for Air Force Global Strike Command units.

**Figure 1.1. Operations Flight Structure.**



1.7.3. Utilize Playbooks for guidance on how to satisfy the requirements mandated by this AFI. Playbooks document standardized Civil Engineer (CE) business processes, operating procedures, and resources needed for managing the operations flight. AFCEC POCs update playbooks to reflect lessons learned, new policies, and best practices. The CE playbook library is located on the CE Portal provided in Attachment 1, *Links*.

1.7.4. Staff the operations engineering element to include a civil, mechanical, and electrical engineer. **(T-2)**. Additionally, the element will include technicians from CEOHS, CEOHP, CEOIU, CEOIH, and CEOF. **(T-3)**.

1.7.5. Base Operations Support (BOS) contracts and Base Maintenance Contracts (BMC) shall utilize SMS to support initial recurring inventory collections and condition determinations for, but not limited to, vertical and linear infrastructure. **(T-1)**. If not currently included in the contract language, the contract will be either modified or the requirements added during the next solicitation. **(T-1)**.

## Chapter 2

### STANDARDIZED WORK PRIORITIZATION

**2.1. Overview.** The operations flight must prioritize, execute, and track work in accordance with this AFI. **(T-2)**. The Work Management Playbook contains additional information on work prioritization.

**2.2. Work Priorities.** The general work priorities and types are summarized in Table 2.1. A link to the Work Management Playbook along with definitions is in Attachment 1, *Links*.

**Table 2.1. Work Priorities and Types.**

Work Priority	Work Type
1	Emergency Work
2A	Preventive Maintenance (PM) and Physical Plant Operations
2B	Contingency Projects
3A (High)	Scheduled <u>Sustainment</u> Work (Corrective Maintenance (CM))
3B (Medium)	Scheduled <u>Sustainment</u> Work (CM)
3C (Low)	Scheduled <u>Sustainment</u> Work (CM)
4A	Scheduled <u>Enhancement</u> Work
4B	All other <u>Enhancement</u> Work

2.2.1. Emergency work is unscheduled work requiring immediate response to sustain or ensure continued mission operations, prevent significant additional damage to facilities and infrastructure or protect the safety and security of the installation, mission, or personnel. Only those actions necessary to mitigate the emergency are accomplished on the initial work task. Stated differently, emergency work is the least amount of immediate repair to damaged infrastructure necessary for the infrastructure to support the mission. The operations flight will ensure additional work needed to restore complete functionality is identified and scheduled as a lower priority consistent with requirements of similar scope and nature. **(T-3)**. The operations flight will capture all emergency work activities in the Air Force mandated IT system for maintenance management. **(T-1)**.

2.2.2. PM is the care and service of equipment and facilities in satisfactory operating condition by systematic inspection, detection, and correction of incipient failures before they occur or develop major defects. The operations flight must prioritize PM ahead of all other forms of scheduled work. **(T-1)**. The operations flight will ensure the PM program is reviewed annually to ensure that assets identified as requiring PM are scheduled and the PM program workload is balanced. **(T-3)**.

2.2.3. The Work Request Working Group (WRWG) will review all work tasks above the Requirements and Optimization section (CEOER) approval authority level and/or managed as a facility project or candidates for an opportunity. **(T-3)**. Facility projects are defined as complex work requiring multi-organizational scheduling and execution or work with projected cost and labor estimates that warrant additional management control. Facility projects could

encompass contingency projects, sustainment, or enhancement depending on the complexity, cost, and labor required.

2.2.4. The Work Request Review Board (WRRB) should ensure the decision to approve and execute a facility project is made in the shortest possible timeframe within available resources. Stakeholders will be notified of the outcome of their facility project. For additional guidance on backlog management, reference the operations engineering playbooks.

2.2.5. The WRRB will ensure CEO completes formal planning to determine projected cost, materiel requirements, and labor. **(T-3)**. The operations flight commander should ensure that WRRB-approved work is scheduled and executed based on the availability of resources and mission impacts.

2.2.6. Fire safety deficiencies identified during the fire prevention inspection process shall be submitted by the facility manager via a work task. **(T-2)**. Deficiencies identified during recurring maintenance and repair shall be submitted by the technician discovering the deficiency. **(T-3)**. All work tasks are initially considered for correction through the in-house work program. If the operations flight approves the work for in-house execution, the CE shops will accomplish the work and capture it in the appropriate Air Force-mandated Information Technology (IT) systems.

2.2.6.1. Reference AFI 32-2001, *Fire and Emergency Services Program*, for details of the fire safety deficiency process. Reference UFC 3-601-02, *Operations and Maintenance: Inspection, Testing, and Maintenance of Fire Protection Systems*, for details of the fire system operations and maintenance.

2.2.6.2. Approved work tasks or opportunities represent the installation's resource commitment to correct fire safety deficiencies and will be considered the corrective action plan required by AFI 32-2001.

2.2.6.3. Facility projects or opportunities containing fire safety deficiency corrective actions combined with other maintenance and repair tasks will be coded as a fire safety deficiency correction effort only if more than 50 percent of the combined effort's cost is directly related to the fire safety deficiency correction work.

2.2.6.4. When a new opportunity is required to correct an identified fire safety deficiency, the information will be transferred from the operations flight to the engineering flight. Documentation entered into the operations database must be reentered into the project management database (to include the fire safety deficiency fields) if the two databases are not connected. **(T-2)**.

2.2.7. The Base Civil Engineer (BCE) must document, in writing, any delegated funding approval levels, for work accomplished in the operations flight. **(T-2)**. The BCE must ensure approval levels are based on work classification and dollar value. **(T-2)**.

**2.3. Contract by Requestor.** All operations, maintenance, repair, and construction of Air Force Real Property must be funded appropriately. If the WRRB authorizes users to contract work in a facility, the funding must be migrated into the proper funding code as dictated by the local comptroller organization. Maintenance and repair of all real property is the responsibility of the BCE unless covered by host-tenant relationships outlined in AFI 32-9005, *Real Property*

*Accountability and Reporting.* Contract by requestor work shall comply with all Civil Engineer planning and programming instructions and must be:

- 2.3.1. Approved by the WRRB prior to execution and tracked in accordance with this instruction. **(T-3)**.
- 2.3.2. Inspected by the appropriate CE personnel before final acceptance. **(T-3)**.
- 2.3.3. Closed out in accordance with paragraph 2.6 of this instruction. **(T-3)**.

**2.4. Work Coordination.** The operations flight must document coordination with safety, fire, bioenvironmental, and environmental functions as well as other applicable agencies such as airfield management for airfield work, prior to work execution. **(T-3)**. In the absence of the approved IT system, document on the AF Form 332, *Base Civil Engineer Work Request*. **(T-3)**. CEN coordination will include mandatory functional coordinating agencies above, as well as any other functional communities CEN deems necessary. **(T-3)**.

**2.5. Scope Changes.** The operations flight must monitor ongoing work within the flight and revalidate work plans, records, and approval documentation when a significant change in cost, scope or labor requirements occurs. **(T-3)**. Examples of significant changes can include:

- 2.5.1. Costs estimated to exceed the authority of the individual who approved the work.
- 2.5.2. Scope changed to deviate from repair versus replace decisions.
- 2.5.3. Scope increased to include work on real property not identified in the originally approved service request.
- 2.5.4. Facility projects and work tasks requiring WRRB approval must be re-evaluated when scope exceeds 25% of originally approved cost. **(T-1)**. Refer to the Work Management Playbook for additional information on work task approval.

**2.6. Work Closeout.** The operations flight must ensure closeout is accomplished in a complete and accurate manner in accordance with this AFI. **(T-2)**. Additional information can be found in the applicable playbooks.

**2.7. Playbooks.** Playbooks are tools that document standardized CE business processes, operating procedures, and resources needed for each of the business processes. They are updated to reflect lessons learned, new policies, and best practices. Operations flights should utilize playbooks to receive guidance on how to meet the requirements dictated in this AFI. A link to the playbooks can be found in Attachment 1.

## Chapter 3

### STANDARDIZED PREVENTIVE MAINTENANCE (PM)

**3.1. Overview.** The operations flight must develop a sustainable PM program that ties to the installation's lifecycle management and infrastructure as well as informing SMS processes. **(T-1)**. CEOE must ensure PM tasks are balanced, scheduled, monitored, and measured in concert with CEOH, CEOF, and CEOI. **(T-3)**. For additional guidance on the PM program, reference the PM Playbook.

3.1.1. The operations flight must conduct a review of the PM program annually to **(T-3)**:

3.1.1.1. Determine if all assets requiring PM based on life-cycle management and return on investment are included in the PM schedule.

3.1.1.2. Make adjustments for assets no longer part of the real property (RP) or real property installed equipment (RPIE) inventory or that require a revised level of PM.

3.1.1.3. Balance PM schedules for optimization of PM execution based on resource availability.

3.1.1.4. Determine the effectiveness and completion rates of scheduled PM activities.

**3.2. Preventive Maintenance Task List (PMTL).** The operations flight must ensure PM is accomplished in accordance with the Air Force Preventive Maintenance Task List (AFPMTL) that is vetted, approved, and published by AFCEC Operations Directorate (AFCEC/CO). **(T-2)**. Bases may add local supplemental steps to the PMTL, but must not reduce or ignore steps. The current PMTL library is located at AFCEC's PM SharePoint site (see Attachment 1, *Links*).

3.2.1. Operations flights that have or acquire assets not found in the AFPMTL must request development of a new task, specific to that asset, by the PM program manager at AFCEC/CO. **(T-1)**.

3.2.2. Where this guidance conflicts with higher level guidance, the higher level guidance controls. Prescribing more restrictive requirements does not, in and of itself, cause a conflict with higher level guidance.

**3.3. Scheduling.** The operations flight must execute 95% of scheduled PM. **(T-3)**. PM is scheduled in accordance with associated PM frequencies (e.g. daily, monthly, quarterly, annually, etc.). Bases are authorized to deviate from PM frequencies (e.g. elect to complete quarterly PM instead of monthly PM) when frequencies are shown not to produce optimal return on investment. See para 3.2.2 regarding conflicts.

## Chapter 4

### ASSET MANAGEMENT

**4.1. Overview.** Asset Management translates Air Force objectives into asset-related decisions by understanding assets' physical attributes, condition, usage, and performance as well as the realized and potential value to the mission. When applied correctly, asset management balances risk, current and future Air Force objectives, resource limitations, and lifecycle management. Real property asset management should:

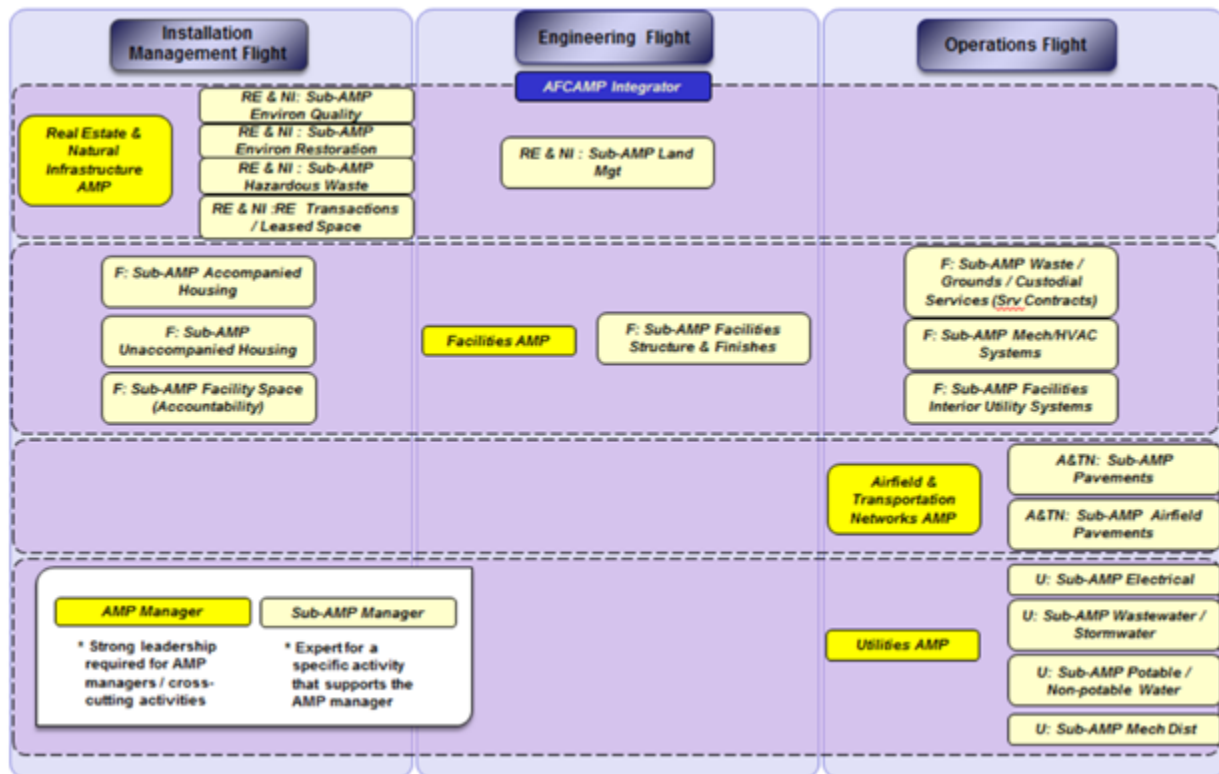
- 4.1.1. Provide an understanding of how each asset contributes to mission accomplishment.
- 4.1.2. Manage and invest in assets to optimize mission accomplishment.
- 4.1.3. Focus on cost effective infrastructure management across the entire life cycle of assets.
- 4.1.4. Develop and grow a culture of effective, risk-based, mission-focused decision making through training, professional development, education, and leadership support at all levels.

**4.2. Data Collection.** Standard asset data collection and analysis supports effective asset management. The operations flight must analyze asset data to optimize, align, and de-conflict current and future resource allocation against RP and RPIE in coordination with the installation management (CEI) and engineering (CEN) flights. **(T-2).**

4.2.1. The operations flight must collect, input, maintain, and update data utilizing AF-mandated IT systems in accordance with the memo from the Under Secretary of Defense for Acquisition, Technology, and Logistics, *Standardizing Facility Condition Assessments*, issued 10 Sep 2013. **(T-0).** Data must be maintained for:

- 4.2.1.1. Operations Work Management. **(T-0).**
- 4.2.1.2. Sustainment Management System (SMS) (e.g. BUILDER™, PAVER™, eMH, future designated sustainment management products, etc.). **(T-0).** For additional guidance on the SMS, reference the SMS Playbook. **Note:** eMH is the authorized sustainment management suite for all military family housing and unaccompanied housing assets. **(T-0).**
- 4.2.1.3. AF COLS categories for which the operations flight is responsible. **(T-1).**

**Figure 4.1. Installation AMP and sub-AMP Alignment.**



**4.3. Asset Management Plans and Sub-Asset Management Plans.** An Asset Management Plan (AMP) specifies activities, resources, and timescales required for an individual asset or grouping of assets to achieve the organization’s asset management objectives. A sub-AMP is a subset of an AMP with assets grouped by type, kind, or common characteristics. There will typically be minor asset overlap in multiple AMPs or sub-AMPs. Communication and coordination between affected AMP and sub-AMP managers is essential. The operations flight shall establish and be responsible for three AMPs and nine sub-AMPs, as shown in **Figure 4.1. (T-2)**. AMP and Sub-AMP Managers shall be assigned to the following plans **(T-2)**:

**4.3.1. Transportation Network and Airfield Pavement AMP.** The Transportation Network and Airfield Pavement (TNAP) AMP encompasses the provision and management of airfield pavements and transportation infrastructure networks to enable the safe and efficient movement of people, equipment, aircraft, and materiel across the installation and airfield. The airfield manager plays a key role in working with CE, specifically the TNAP AMP and Sub-AMP Managers, for scheduling airfield maintenance and repair as well as identifying potential corrective maintenance and replacement project requirements. The Airfield Manager is responsible for inspecting the airfield on a daily basis and is well suited to coordinate required maintenance.

**4.3.1.1. Pavements Sub-AMP.** The Pavements Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all Air Force-owned roads, bridges, parking lots, curbs and gutters, traffic signals, signage, marking, sidewalks, walkways, rail systems, final denial barriers (FDB), FDB control systems, FDB supporting safety systems, and docks including traffic management and planning. **(T-3)**. The Pavements Sub-AMP manager works with the facilities AMP manager regarding loading docks that are part of



buildings. If the dock is a separate structure, the pavements AMP manager has primacy. If the dock is part of a building, the facility AMP manager has primacy. The pavements Sub-AMP manager will jointly assist with the development of the Future Years Defense Program +3 (FYDP+3) infrastructure pavements as well as traffic and traffic controls plans. **(T-3)**.

4.3.1.2. **Airfield Pavements Sub-AMP.** The Airfield Pavements Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all Air Force-owned airfield pavements including runways, taxiways, aprons, and other airfield pavements. **(T-3)**. This includes signage, pavement markings, and aircraft arresting systems (AAS). The Airfield Pavements Sub-AMP manager will jointly develop the FYDP+3 for airfield pavements. **(T-3)**.

4.3.2. **Utilities AMP.** The Utilities AMP manager is responsible for an asset lifecycle management portfolio containing all the provision and management of water supply, wastewater, storm water, electrical, mechanical, and fuels services.

4.3.2.1. **Electrical Sub-AMP.** The Electrical Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all AF-owned electrical power production and electrical systems within the base boundary up to points of demarcation or five feet, or up to and including the secondary tap of distribution transformers. This includes overhead and underground distribution lines (electrical manholes, ducts, transformers, switches, junctions, etc.), substations, switching stations, generation plants, backup generators, utility poles, area lighting (roads, parking lots, security, apron, and recreational), and grounding, bonding and cathodic protection systems for utilities. An exception to the five-foot line rule is where electrical service entrances exceed 600 volts. Responsibilities also include arc flash, relay coordination, and electrical system modeling programs. The Electrical Sub-AMP manager provides facility industrial control systems inputs to the Facilities AMP manager. Generator fuel supplies to meet emergency electrical requirements are Sub-AMP manager responsibilities only in the sense of ensuring enough tankage, not day-to-day operational fueling. The Electrical Sub-AMP manager will develop the FYDP+3 infrastructure plans. **(T-3)**. Airfield and roadway lighting, lightning protection systems, and aircraft arresting systems are also covered in the Transportation Network and Airfield Pavement AMP, so it is necessary to work closely with Airfield and Transportation Airfield Pavements Sub-AMP manager for requirements.

4.3.2.2. **Wastewater and Storm Water Sub-AMP.** The Wastewater and Storm Water Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all Air Force-owned industrial and domestic wastewater systems up to the five-foot line of serviced facilities and to the edge of paved surfaces for storm water, including lift stations, collection lines, manholes, wastewater treatment plants, oil-water separators, other wastewater pre-treatment units, storm water pipes, swales, detention and retention areas, and outfalls. The Wastewater and Storm Water Sub-AMP manager also works closely with the Land Sub-AMP manager to provide watershed-level storm water planning. The Wastewater and Storm Water Sub-AMP manager has primacy for all related manmade structures and the Land Sub-AMP manager consults regarding the effects those structures (or the lack thereof) have on the watershed. Coordination between affected Sub-AMP managers is essential. The dividing line is the five-foot line for facilities under the Facilities AMP manager and paved surfaces for Transportation Network and Airfield

Pavement Sub-AMP managers. The Wastewater and Storm Water Sub-AMP manager will develop the FYDP+3 infrastructure wastewater and storm drainage plans. **(T-3)**.

**4.3.2.3. Potable and Non-Potable Water Sub-AMP.** The Potable and Non-Potable Water Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all Air Force-owned potable water, non-potable water, and Fire Emergency Services (FES) systems up to the five-foot line of serviced facilities. This includes wells, distribution lines, potable water treatment plants, pumps, valves, hydrants, and storage. The Water Sub-AMP manager will develop the FYDP+3 infrastructure water plan. **(T-3)**.

**4.3.2.4. Mechanical Distribution Sub-AMP.** The Mechanical Distribution Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all facilities that are for the sole purpose of providing transmission, monitoring, and maintenance support to the distribution system. This includes all Air Force-owned and privatized non-electric energy transmission systems (natural gas, hot water, steam) within the base boundary up to the five foot line of structures. The Mechanical Distribution sub-AMP manager is also responsible for all facility-specific heating, ventilation, and air conditioning (HVAC) systems and facility mechanical rooms. The Mechanical Distribution sub-AMP manager is responsible for FYDP+3 infrastructure plans to include natural gas and HVAC plans.

**4.3.3. Facilities AMP (Executed by the engineering flight).** The Facilities AMP manager is responsible for an asset lifecycle management portfolio containing all planning, design, construction, operation, maintenance, repair, sustainment, restoration, modernization (SRM), and demolition of facility assets. This includes housing (e.g. unaccompanied housing, accompanied housing) as well as facility space accountability, space planning and high-altitude electromagnetic pulse (HEMP) shielding. There are several Sub-AMPs that support the Facilities AMP; additionally, there are also Facilities Sub-AMPs (e.g., Unaccompanied Housing Sub-AMP) that are more service related and are aligned to provide support for all facilities. Any facility asset support not specifically assigned to a separate Sub-AMP is the responsibility of the Facilities AMP.

**4.3.3.1. Mechanical and Heating, Ventilation, and Air Conditioning (HVAC) Systems Sub-AMP.** The Mechanical and HVAC Systems Sub-AMP manager is responsible for an asset lifecycle management portfolio containing all systems consistent with UNIFORMAT II mechanical systems and conveying systems including cooling, heating, ventilating, and elevators. The Mechanical and HVAC Sub-AMP manager will develop the overall operation, maintenance, repair, compliance, sustainment, and recapitalization of facility-related mechanical and HVAC assets and associated FYDP+3 requirements identification. **(T-3)**.

**4.3.3.2. Facilities Interior Utility Systems Sub-AMP.** The Facilities Interior Utility Systems Sub-AMP manager is responsible for the asset lifecycle management portfolio containing all systems consistent with UNIFORMAT II plumbing systems, electrical systems, and fire emergency services. This includes interior water, wastewater, fire suppression, lighting, alarms, and interior electrical. The Facilities Interior Utility Systems Sub-AMP manager will develop the overall operation, maintenance, repair, compliance, sustainment, and recapitalization of facility-related assets and associated FYDP+3 requirements identification plans. **(T-3)**. The Facilities Interior Utility Systems Sub-AMP

manager works closely with technical staff most familiar with the systems. Base Civil Engineers (BCEs) may choose to further assign Sub-AMP managers to work specific portions of this Sub-AMP.

**4.3.4. Other Sub-AMPS.** In addition to the above mandatory sub-AMPS, installations may find it helpful to incorporate additional sub-AMPS into their asset management practices. Units should consider additional sub-AMPS if a particular type of asset is prevalent on the installation. A few sub-AMPS that may prove beneficial include Energy Assurance, Bridges, Ports and Wharfs, Railways, Fuels, Fire Protection, etc,

**4.4. AMP Manager Inclusion in Project Prioritization.** AMP and Sub-AMP managers shall coordinate on, and be involved with development of, the installation's Integrated Priority List (IPL) and participate in the Facilities Board. **(T-2).**

## Chapter 5

### CAPITALIZING FACILITY IMPROVEMENTS

**5.1. Capital Improvement.** A capital improvement is defined in Volume 4 of DoD 7000.14-R, *Department of Defense Financial Management Regulation*, and UFC 1-300-08 as “an improvement to real property that increases the real property asset’s square footage, size, capacity, efficiency, or useful life.”

5.1.1. Replacing a facility or facility component of the same size or capacity that has failed or is no longer performing the function for which it was designated is not a capital improvement and will not be recorded in the real property inventory.

5.1.2. Capitalization costs include total project costs (both funded and unfunded).

**5.2. Capitalization Process.** Any capital improvements (e.g. extending useful life, increasing efficiency, capacity, or size, changing functionality, etc.) to a facility or any other improvements must be capitalized by the installation real property office in accordance with AFI 32-9005. **(T-1)**. Refer to UFC 1-300-08, *Criteria for Transfer and Acceptance of DoD Real Property*, and consult with the installation Real Property Officer for additional facility capitalization guidance.

5.2.1. The project manager shall report all capital improvements via the AF-mandated IT system, complete a DD Form 1354, *Transfer and Acceptance of DoD Real Property*, and forward the DD Form 1354 to the real property office. **(T-1)**.

5.2.2. See AFI 32-9005 and UFC 1-300-08 for further details.

## Chapter 6

### ORGANIZATIONAL EQUIPMENT

**6.1. Overview.** Organizational Equipment includes assets which do not meet the criteria to be capitalized on real property records. Real property determinations are governed in AFI 32-9005.

6.1.1. The accountability, operation, purchase and maintenance (to include emergency repairs) of organizational equipment is typically the owning unit's responsibility and is not considered RP or RPIE.

6.1.2. For specific information regarding what is considered RP and RPIE, reference AFI 32-9005.

**6.2. Unit Responsibility.** Recurring maintenance, repair, replacement or service requirements must be addressed through organic or contractual support and managed by the owning unit unless responsibility for the item is accepted, in writing, by the BCE. **(T-1)**.

6.2.1. If responsibility is accepted by the BCE, CE support for organizational equipment must be documented with a memorandum of understanding with the owning organization, on a fully reimbursable basis, and is subject to labor-hour availability of CE personnel performing work prioritized in Table 2.1. **(T-1)**.

6.2.2. Emergency work (work priority 1 per Table 2.1) may be performed on organizational equipment when approved by the BCE or operations flight commander. If this work is completed, the owning unit will reimburse materiel and labor costs to the maximum extent permitted by Vol 11A of DoD 7000.14-R. **(T-0)**. Performing approved emergency work does not make the item RP, RPIE or a civil engineer asset and does not ensure future work by the civil engineer.

6.2.3. The utilities that supply organizational equipment (e.g., water, gas or electric) are typically real property and should be maintained by Civil Engineers. Civil Engineers are responsible only for the utility up to the appropriate point of demarcation, such as a panel, branch circuit or meter as long as the installation meets building codes.

6.2.4. Units must consult with the civil engineer unit before purchasing any equipment that may have an impact on base infrastructure (e.g. large size, weight, large power draw, etc.). **(T-2)**

## Chapter 7

### FACILITY MANAGER PROGRAM

**7.1. Facility Manager Program.** All units assigned real property facilities, or portions of facilities, including on joint bases, will have a primary and alternate facility manager assigned in writing by the unit commander. **(T-3).** Facility manager responsibilities may be further delegated.

7.1.1. Facility managers ensure basic facility upkeep is conducted, though they do not have to personally complete all tasks. **(T-3).** Basic facility maintenance includes, but is not limited to, tasks such as picking up trash outside the facility, changing light bulbs lower than 10 feet above the floor, and keeping mechanical rooms clear of debris and combustible material.

7.1.2. Facility managers are officially designated by, and act on behalf of, the unit commander. Disseminating information or facilitating service request management duties may be augmented by contracted personnel but cannot replace a government facility manager unless covered in an approved outsourcing decision. **(T-3).** For Air Force controlled facilities on a joint base, the supporting command department of public works or facilities establishes the facility manager requirement and can deviate from the requirements listed above in accordance with supporting command policy.

7.1.3. The operations flight executes and manages the base Facility Manager Program. **(T-3).** This includes documentation of facility manager assignment, training, and communications. The operations flight and facility manager must ensure all facility manager records, training documents, and guidance are kept current. **(T-3).** The operations flight shall develop and maintain a *Facility Manager Handbook*. The BCE is the waiver authority for this requirement and waivers must be documented in writing.

7.1.4. No facility manager, or any other facility occupant, will make or facilitate alterations to real property without coordination and approval documentation from the BCE. **(T-2).** Facility managers who submit facility project requests (defined in paragraph 2.2.3) must include unit commander's coordination via a signed one line memo or e-mail correspondence in the mandated AF-mandated IT system or AF Form 332. **(T-3).**

7.1.5. Facility managers will conduct a semi-annual review of all submitted service requests. Facility managers will consolidate and coordinate with their unit commanders to provide their unit's priority listing in accordance with Table 2.1. **(T-3).** The operations flight should provide information to aid in unit commander prioritization. The aid should provide context, limits, or boundaries for unit commanders to consider during their prioritization to limit backlog build up (see Chapter 2).

7.1.6. The operations flight must ensure that contractors provide a comparable facility manager when provided government furnished facilities. **(T-3).** **Example:** A base maintenance contractor provided workshop or storage facility. The owning unit commander, or civilian equivalent, must provide written designation of a contractor facility manager to the CE Squadron. **(T-3).**

7.1.7. The operations flight should create and maintain a repository of facility manager program information, related materials, and any other facility manager information prescribed locally and advertise the location of this information to facility managers.

7.1.8. Private or non-DoD organizations on Air Force installations are expected to follow local support agreements or procedures when submitting service requests on facilities they are managing.

7.1.9. Facility managers will submit service requests using the AF-mandated enterprise IT system or the AF Form 332 if the enterprise IT system is unavailable. **(T-2)**. Work requests will be categorized for prioritization based on Table 2.1 and must be reviewed by the WRWG and processed by the WRRB as applicable. **(T-3)**.

7.1.10. For regularly scheduled walkthroughs with engineer personnel, facility managers will prepare an AF Form 1219, *Multi-Craft Job Order Register*, noting deficiencies prior to the facility inspection. **(T-3)**.

**7.2. Facility Abuse.** Facility abuse is considered damage caused by willful or negligent acts, improper use and care, or unauthorized alteration to RP or RPIE. The BCE will direct an investigation for all loss, damage, destruction or theft of government-owned RP in accordance with DoD 7000.14-R, Volume 12 Chapter 7. **(T-0)**.

7.2.1. When facility abuse causes damage to facilities, Priority 1 repairs will be completed to mitigate any potential emergencies in accordance with para 2.2.1. of this instruction. All remaining work will not be conducted until an investigation has been completed or the property is released by the Accountable Officer (AO). **(T-3)**.

7.2.2. When responsibility cannot be determined, the using organizations will fund repair or replacement costs associated with RP and RPIE abuse and/or accidental damage. **(T-3)**.

7.2.3. Incorporate abuse guidance into local *Facility Manager Handbook* and training and coordinate with the local legal and finance offices when suspected facility abuse has occurred. **(T-3)**.

**7.3. Work Management Sharepoint.** Reference the Work Management SharePoint site for additional information on the facility manager program (see Attachment 1, *Links*).

## Chapter 8

### SERVICE CONTRACTS

**8.1. Service Contracts.** The operations flight must ensure that Integrated Solid Waste Management, Custodial Services, Grounds Maintenance, and maintenance contracts, repair, and inspection services of Vertical Transportation Equipment are executed using the standard Air Force Performance Work Statement templates. **(T-3).** **Note:** A link to templates can be found in the Links section of [Attachment 1](#).

8.1.1. The operations flight must work with the local manpower office to ensure its service contract program minimizes contracts awarded for work that earns positions within the flight according to the Manpower Standard. **(T-1).**

8.1.2. Refer to AFI 38-201, *Management of Manpower Requirements and Authorizations*, and the local personnel office for additional information.



## Chapter 9

### MATERIAL CONTROL

**9.1. Overview.** Information on the Material Control Section can be found within The Materiel Control Playbook and SharePoint site (Attachment 1, Links) contains additional information on materiel control.

9.1.1. Enterprise Specification List. The operations flight must ensure that repetitively used or stocked inventory items not currently loaded in the Enterprise Specification List are not duplicated and use draft specifications at the base level. **(T-3)**. Do not forward list to AFCEC/COO for review/approval.

9.1.2. Contractor Operated Civil Engineer Supply Stores (COCESS). Bases utilizing COCESS will utilize the statement of work template developed and approved by AFICA and AFCEC/COO. **(T-2)**.

## Chapter 10

### U-FIX-IT PROGRAM

**10.1. Overview.** The U-Fix-It Program employs a “do-it-yourself” concept for tasks that the facility manager can accomplish and do not require any special tools, materials, or training.

10.1.1. The operations flight will define its local U-Fix-It Program in detail within their local facility manager guidance. **(T-3)**. For more information reference the playbook located on the CE Portal. Link provided in Attachment 1, *Links*.

10.1.2. The BCE must establish local guidance incorporating applicable laws, regulations, and directive publications when items classified as hazardous material (HAZMAT) are made available for U-Fix-It use (e.g. paints, pesticides, etc.). **(T-3)**.

## Chapter 11

### FORMAL INSPECTION PROGRAMS

**11.1. Bridge Inspections and Reporting.** The Transportation Network and Airfield Pavement AMP Manager shall ensure bridges on Air Force installations are inventoried and inspected according to UFC 3-310-08, *Non-Expeditionary Bridge Inspection, Maintenance, and Repair*. **(T-1)**. The Transportation Network and Airfield Pavement AMP manager shall provide an update to AFCEC/CO annually. **(T-1)**. This meets the requirements of the Federal Highway Administration National Bridge Inventory. **(T-0)**.

**11.2. Dam Inspections and Reporting.**

11.2.1. AFCEC shall establish a rolling, 5-year dam safety inspection program for all Air Force dams classified as a significant hazard included in the National Inventory of Dams database. This inspection program shall meet all formal dam inspection requirements as defined in 33 USC Section 467, *Dam Inspection Program*, and FEMA 93, *Federal Guidelines for Dam Safety*.

11.2.2. AFCEC/CO shall appoint an Air Force Dam Safety Officer to oversee the Air Force Dam Safety Management Program. In this role, the Air Force Dam Safety Officer shall coordinate formal inspections, provide technical reviews of studies and reports, assist installations with identifying a prioritized list of dam safety work projects, and coordinate National Inventory of Dams database updates with USACE and FEMA.

11.2.3. Base Civil Engineers on all installations with dam responsibility shall perform the operations and maintenance of those dams as well as informal and intermediate inspections as defined in FEMA 93. **(T-1)**. AFCEC will only be responsible for coordinating the formal 5-year inspection for reportable dams.

11.2.4. BCEs shall provide the necessary support and coordination required to allow the AFCEC designated inspectors to complete Formal Dam Safety Inspections. **(T-2)**. Each installation will use inspection findings to develop a comprehensive 5-year dam safety plan that captures, schedules, and documents dam safety and maintenance activities, as well as, budgeting and prioritization required to correct deficiencies across multiple fiscal years. **(T-2)**. This plan shall be sent to AFCEC/CO within 3 months of receiving the final report. **(T-3)**.

11.2.5. BCEs on all installations with dams shall appoint an Installation Dam Safety Officer (IDSO) to oversee Intermediate and Informal Inspections of visible appurtenant features and develop a 5-year dam safety plan. **(T-2)**. Intermediate and Informal inspections shall be performed by personnel who are most familiar with the dam facility and any operations and maintenance requirements, in accordance with FEMA 93. **(T-0)**. The IDSO will annually review and update the condition assessments, and report annual updates as well as unusual conditions immediately to the Air Force Dam Safety Officer. **(T-1)**.

**11.3. Vehicle Final Denial Barrier (FDB) Maintenance, Inspections, and Reporting.**

11.3.1. The operations flight is responsible for maintenance, inspection, and testing to verify that the Vehicle FDB, FDB control systems, and supporting safety systems are in good working order and functioning properly. **(T-1)**. The operations flight shall complete manufacturer-recommended inspections, testing, and maintenance of the barrier at prescribed intervals along

with PMTL prescribed tasks and intervals. **(T-1)**. The inspection, testing and maintenance shall also include the controls and supporting safety systems. **(T-1)**. The operations flight must ensure records of the maintenance, inspections, and testing are documented in writing. **(T-2)**.

11.3.2. AFIMSC Installation Engineering branch (AFIMSC/IZB) shall assign an Enterprise AMP manager to manage the final denial barrier program. The Enterprise AMP manager shall develop a report on the operational status of the inventory, maintenance trends, and unit compliance. Submit the report to AF/A4C as directed. **(T-1)**.

11.3.3. AFCEC shall maintain a final denial barrier database for units to report quarterly requirements.

11.3.4. The operations flight must report quarterly status of FDBs as directed by AFIMSC. **(T-1)**. At a minimum, the following fields require quarterly reporting: gate name, MAJCOM, base or installation, barrier type, barrier brand and model, number of barriers, inspection date, operational status, number of barrier failures in the calendar year, and average days the barrier was inoperable. **(T-1)**.

11.3.5. Operations flights shall also report barrier accidents, mishaps, or inadvertent activations. Reports shall be made within 48 hours on the SharePoint site and via email notice to MAJCOM A4Cs and AFIMSC Det/CC. **(T-1)**.

11.3.6. The AFCEC reports and maintenance database is located at <https://portal.afcec.hedc.af.mil/CO/AVB/SitePages/Home.aspx>.

11.3.7. The Air Force Civil Engineering Commodity Council has established a mandatory use Multiple Award Task Order Contract (MATOC) to consolidate FDB PM, inspection, and repair on CONUS Air Force installations where the Air Force is the lead agency. Use of this contract is optional for Air National Guard (ANG) and Air Force Reserve. The Air Force Installation Contracting Agency (AFICA 771 ESS) administers this MATOC contract. The individual installation contract task orders are initiated and administered by each local contracting office.

11.3.7.1. Active duty CONUS installations performing organic maintenance and inspection must immediately convert to the MATOC contract. **(T-1)**. For those already performing this responsibility by contract, prepare to migrate to the MATOC contract once the existing barrier maintenance contracts expire. **(T-1)**.

11.3.7.2. Use of the AFICA Vehicle Barrier Maintenance and Repair MATOC is mandatory on all active-duty CONUS Air Force installations unless one or more of the standing exemption criteria outlined below are met or capacity and capabilities do not exist on the AFICA Vehicle Barrier Maintenance and Repair MATOC to fulfill the requirement. The waiver authority for this requirement is detailed in the AFICA Vehicle Barrier Maintenance and Repair MATOC ordering guide. No waiver is necessary when:

11.3.7.2.1. Requirements contracts exist in accordance with FAR 16.503 that are in the current ordering period.

11.3.7.2.2. The FDB is located on a joint base where the Air Force is not the host service (procurement performed by host service).

11.3.7.2.3. Contracts are based on emergency acquisitions allowed by FAR Part 18. **Example:** tornadoes, floods, and other force majeure.

11.3.7.2.4. FDB maintenance and repair is included in, and under the warranty of, an independent construction contract.

11.3.8. OCONUS, Alaskan and Hawaiian installations should develop their own individual or regional barrier maintenance contracts providing the same level of maintenance and inspection found in the Air Force MATOC contract.

11.3.9. AFCEC shall develop and execute an implementation plan for FDB category management standardizing type, make, and models across the Air Force. **(T-1)**.

## Chapter 12

### HEATING, VENTILATION, AND AIR CONDITIONING CONTROL SYSTEMS

**12.1. Overview.** The Air Force is required to take action to save energy per Executive Order 13834, *Efficient Federal Operations*. The most cost effective method to operate and maintain HVAC systems is to maintain appropriate temperatures when facilities are occupied and allow for a wider temperature range during unoccupied periods.

**12.2. Set Point Standards.** Installations shall establish local policies ensuring HVAC control systems are set at points equal to, or more restrictive than design requirements found in UFC 3-410-01, *Heating, Ventilating, and Air Conditioning Systems*, Section 3-4. HVAC systems will be adjusted based on occupancy rates in all facilities, or portions of facilities without a 24-hour mission. **(T-2)**. Installations will not exceed these set points unless specified in a facility-specific UFC or a waiver is issued for each individual facility. **(T-3)**.

**12.3. Temporary Adjustments.** The BCE is authorized to allow temporary deviations from the set points for spaces with broken systems, exterior envelope issues, temporary changes in occupancy, and large temperature variations (as determined by the BCE). This authority shall be delegated no lower than the operations flight Commander or equivalent. **(T-3)**. Spaces with these issues should have a plan to correct the issue prior to granting the deviation.

**12.4. Facility Related Control Systems.** Installations shall establish control systems that maintain temperatures in accordance with UFC 3-410-01 design criteria. **(T-1)**. HVAC controls shall be connected to an Energy Management Control System or Utility Management Control System in accordance with UFC 4-010-06, *Cybersecurity of Facility-Related Control Systems* and AFGM 2018-32-01, *Civil Engineer Control Systems Cybersecurity*. When Energy Management Control System connection is not feasible, local programmable thermostats must be installed. **(T-2)**.

**12.5. Civil Engineer Maintenance Inspection and Repair Team (CEMIRT).** CEMIRT will provide a quarterly data call for field support articulating CEMIRT capabilities and instructions to request support. At installations request, CEMIRT will provide troubleshooting and recommendations to improve complex systems. CEMIRT will provide a formal report and out-brief to BCEs upon conclusion of installation visits. **(T-3)**. Installations will develop formal processes to ensure CEMIRT recommendations are evaluated, implemented, and tracked to completion. **(T-3)**.

## Chapter 13

### SNOW AND ICE CONTROL PROGRAM

**13.1. Snow and Ice Control Plan (S&ICP).** Installations with over 150 millimeters (6 inches) of average annual snowfall will maintain an S&ICP and form a Snow and Ice Control Committee (S&ICC). **(T-3).** It is recommended that the S&ICP be briefed to the installation commander and applicable group commanders two times per year; once in the fall for winter preparation and once in the spring for assessment and lessons learned. For installations receiving less than 150 millimeters (6 inches) of average annual snowfall, the installation commander directs the development of plans and committees, as required, to meet their specific needs.

**13.2. Snow Control Priorities.** It is difficult to simultaneously control snow and ice on all paved surfaces. The S&ICC should establish tiered priority levels to execute snow and ice control operations in order of relative mission importance. Wing leadership should publicize these priorities to avoid misunderstanding and dissatisfaction between base organizations and populace.

13.2.1. The operations group commander, typically through airfield management, will establish snow control priorities for flying operations and minimum runway condition readings (RCR) for departing and arriving aircraft annually. **(T-2).**

13.2.2. The maintenance group commander will ensure that parking plans have been developed with the airfield manager for use during implementation of the S&ICP. **(T-3).** Additionally, the maintenance group will relocate all removable items not in use (tools, fire bottles, aerospace ground equipment, etc.) from parking ramps to a designated area during S&ICP implementation. **(T-3).**

13.2.3. The BCE will establish annual snow control priorities for roadways, parking areas, and all other paved areas in coordination with installation leadership. **(T-3).**

### **13.3. Snow and Ice Control Products and Procedures.**

13.3.1. Snow clearing personnel will employ principles outlined in the current version of the Federal Aviation Administration Advisory Circular (FAA AC) 150/5200-30, *Airport Winter Safety and Operations* and FAA AC 150/5220-20, *Airport Snow and Ice Control Equipment*. **(T-0).**

13.3.2. Installations should minimize the use of ice control products to protect aircraft and weapons systems, airfield infrastructure, and the environment. The S&ICC will ensure only airfield anti-icing and deicing products vetted and approved by AFCEC subject matter experts are used on Air Force controlled airfields. **(T-2).** All products shall be evaluated for their effects on airfield pavement, how they affect aircraft systems, braking, weapons systems, aircraft coatings, and impacts on the natural environment to ensure no adverse effects. **(T-0).**

13.3.2.1. Products must meet the performance requirements of the Society of Automotive Engineer (SAE) Aerospace Material Specifications (AMS) most current editions of SAE AMS 1431E, *Compound, Solid Runway and Taxiway Deicing/Anti-icing*, and SAE AMS 1435D, *Liquid Runway Deicing/Anti-Icing Product*. **(T-1).**

13.3.2.2. AFCEC has evaluated the effects of potassium acetate, potassium formate, sodium acetate, and sodium formate and determined these products to be suitable for use around all airframes and weapon systems. Compatibility studies show that none of the

products listed are completely risk free of airframe corrosion; however, no product possesses an increased risk more than another. Consult AFCEC/COO for additional questions on airfield anti-icing/deicing products.

13.3.2.3. Glycol-based products and urea are not approved for use as airfield anti-icing and deicing products and shall not be used on any Air Force controlled airfields. **(T-2)**.

13.3.2.4. All products shall be used as recommended by the manufacturer. **(T-2)**.

13.3.3. Abrasives (sand) may be used but will only improve traction. All sands must be an FAA approved type meeting the current version of FAA Advisory Circular 150/5200-30. **(T-0)**.

13.3.4. The Base Civil Engineer shall notify the installation maintenance unit of all anti-icing and deicing products being used to ensure they are aware of additional actions required to wash and rinse aircraft systems which may come in contact with these products. **(T-1)**.

#### **13.4. Training.**

13.4.1. Installations with a S&ICP shall include a training plan in the document. **(T-3)**.

13.4.2. Installations with over 150 millimeters (6 inches) of average annual snowfall will annually send at least two snow and ice control operators to Basic Airport Winter Operations Specialist and the Air Force Winter Snow Control Management training courses at the International Aviation Snow Symposium each spring. **(T-3)**.

13.4.3. Each member of the snow and ice control team shall review the training course "Snow and Ice Control Techniques" at least once prior to the beginning of the snow season. **(T-3)**. The training is available on AFCEC's Virtual Learning Center accessed via the Advanced Distributed Learning Service (ADLS) gateway or <https://afcec.adls.af.mil>.

13.4.4. Each member of the snow and ice control team will receive hands-on operation training for all snow and ice control equipment. **(T-3)**. Perform practice runs with the equipment using typical operation scenarios substituting water for liquid deicers to reproduce realistic operations. **Note:** This requirement may be waived at the discretion of the Base Civil Engineer (no further delegation is authorized) and must be documented in writing.

13.4.5. Additional training shall be conducted at the discretion of the Base Civil Engineer (BCE). This training may include any combination of the following:

13.4.5.1. Details of the snow and ice control plan, emphasizing the order of priorities.

13.4.5.2. Effective and efficient anti-icing and deicing methods with minimal product use.

13.4.5.3. Product usage issues, personal safety, Pollution Prevention and Best Management Practices (P2/BMPs), environmental impact, and impact on aircraft, weapon systems, and airfield infrastructure.

13.4.5.4. Tabletop exercises using miniature equipment on airfield layouts to simulate operations and reduce training costs.

13.4.5.5. Operator maintenance responsibilities, including fuel, fluid, supply locations, repair techniques, and heavy equipment maintenance reporting procedures.



13.4.5.6. Communication procedures, right-of-way information, and the procedures to follow if the radio signal is lost between the operator, snow control, the air traffic control tower, and the airfield snow removal lead.

13.4.5.7. A daytime and nighttime airfield and base familiarization tour, highlighting locations where problems are likely identifying such obstructions as aircraft airfield lighting systems, aircraft arresting cables and recessed arresting systems, aircraft fuel hydrant and valve pits, fire hydrants, railroad crossings, utility holes, curb and gutter systems, and any other obstructions that may be covered and difficult to see during snow removal operations.

## Chapter 14

### CORROSION CONTROL PROGRAM

**14.1. Overview.** The primary goals of the corrosion control program are to develop and maintain reliable and long-lived structures, equipment, plants, and systems, conserve energy, reduce costs due to corrosion, scale, and microbiological fouling, and ensure compliance with Environmental Protection Agency, Department of Transportation, and Occupational Safety and Health Administration regulations. Basic guidelines, including testing methods and frequency, criteria, maintenance, recordkeeping requirements, and more can be found in UFC 3-570-06 *O&M: Cathodic Protection Systems*.

**14.2. Local Operating Instruction.** Units will publish a squadron (or equivalent) operating instruction for the corrosion control program to ensure compliance with all corrosion control requirements in this instruction and UFC 3-570-06. **(T-0).** A sample operating instruction can be found in UFC 3-570-06, Appendix A, Part 1. **Note:** Details of use and waiver authorities are found in UFC 3-570-06. This section also contains information on the use of the following forms:

14.2.1. AF Form 491, *Cathodic Protection Operating Log for Impressed Current Systems*.

14.2.2. AF Form 1686, *Cathodic Protection Operating Log for Sacrificial Anode System*.

14.2.3. AF Form 1687, *Leak/Failure Data Record Resource Advocacy/Corrosion Control Metric*.

14.2.4. AF Form 1688, *Annual Cathodic Protection Performance Survey*.

14.2.5. AF Form 1689, *Water Tank Calibration*.

**14.3. Scope.** The corrosion control program includes:

14.3.1. Cathodic protection to control electrochemical reactions (corrosion).

14.3.2. Protective coatings to reduce atmospheric corrosion or cathodic protection requirements.

14.3.3. Industrial water treatment to reduce corrosion, scale-forming deposits, and biological growths in heating and cooling systems.

14.3.4. Appropriate design and materials selection to help limit and mitigate corrosion of facilities and infrastructure.

**14.4. Training.** Units will ensure assigned cathodic protection personnel receive initial, annual, and refresher training or required certifications to properly manage the corrosion control program. **(T-1).** Key aspects of cathodic protection training include the ability to apply National Association of Corrosion Engineer® criteria to determine if the structure is protected and the ability to troubleshoot the system if inoperative at least at the National Association of Corrosion Engineers CP2 Technician level. Special training may be required on protective coatings, industrial waste treatment, or design and material selection for construction projects. For more information on available courses, see National Association of Corrosion Engineers International® ([www.nace.org](http://www.nace.org)), CorrConnect ([www.corrconnect.org](http://www.corrconnect.org)), Society of Protective Coatings ([www.sspc.org](http://www.sspc.org)) and UFC 3-570-06.

**14.5. Cathodic Protection Requirements.** Provide both cathodic protection and protective coatings as follows:

14.5.1. All metallic fuel storage tanks or tanks containing flammable, combustible, or regulated products in contact with the soil, including Underground Storage Tanks (UST), bottoms of Above-ground Storage Tanks (AST), and associated buried or submerged metallic piping. **(T-1)**.

14.5.2. Metallic USTs that are coated with a heavy cladding for corrosion protection may omit installation of cathodic protection if this cladding without cathodic protection is acceptable to the governing environmental regulating authority. Document the use of cladding in lieu of cathodic protection in the applicable underground storage tank record. **(T-1)**.

14.5.3. All metallic fuel piping or piping containing flammable, combustible, or regulated products in contact with the soil. Piping shall also be coated. **(T-1)**.

14.5.4. Interiors of water storage tanks and bottoms of water storage tanks in contact with the soil. Construction contracts that include coating of water storage and interior cathodic protection shall include provisions for the contractor to provide cathodic protection testing and maintenance for the duration of the construction project warranty period. **(T-1)**.

14.5.5. For other buried utilities, provide cathodic protection and protective coatings if the soil resistivity is below 10,000 ohm-centimeters. For soils at or above 10,000 ohm-centimeters, contact the AFIMSC Detachment or AFCEC SME for direction. **(T-1)**.

14.5.6. For ductile or cast iron water piping in soils greater than 10,000 ohm-centimeters, use of polyethylene encasement is permitted in lieu of cathodic protection with approval by AFCEC/COS. Polyethylene encasement shall be conducted in accordance with American Water Works Association® (AWWA) C105-10, *Polyethylene Encasement for Ductile-Iron Pipe Systems*. **(T-1)**.

14.5.7. To properly document cathodic protection performance, calibration, and operations, reference UFC 3-570-06. **(T-0)**.

#### **14.6. Industrial Water Treatment.**

14.6.1. Basic guidelines for industrial water treatment programs can be found in UFC 3-240-13FN, *Industrial Water Treatment Operation and Maintenance*. This UFC provides guidance for testing procedures and frequency, backflow prevention devices, and non-chemical industrial water treatment. Consult AFI 32-1067, *Water and Fuel Systems*, for additional information on proper use and handling of treatment chemicals and consult with the local base environment office prior to selecting and industrial water treatment chemicals.

14.6.2. Chemicals added to protect condensate lines from corrosion make the steam and condensate unfit for consumption or other uses normally reserved for potable water. Do not use treated steam in direct contact with food or for any direct steam humidification, such as in a gymnasium steam room or humidity control for electronic equipment. **(T-2)**.

14.6.3. Conduct acceptance testing of new heating and cooling systems to ensure the industrial water treatment system meets design and operation parameters. Construction contracts that include heating, ventilation, and air-conditioning systems shall include provisions for the contractor to provide water treatment testing and maintenance for the duration of the construction project warranty period. **(T-2)**.

14.6.4. Industrial water treatment records should reflect the minimum entries needed to effectively manage the control of the program and indicate the need for additional testing. At a minimum, units must:

14.6.4.1. Maintain one industrial water treatment operating log for each individually treated system (each boiler, each cooling tower bank, and each closed system). **(T-3)**.

14.6.4.2. Utilize AF Form 1457, *Water Treatment Operating Log for Cooling Tower Systems*, for all cooling towers. **(T-3)**.

14.6.4.3. Utilize AF IMT 1459, *Water Treatment Operating Log for Steam and Hot Water Boilers*, for all steam systems and hot water boilers. **(T-3)**

#### **14.7. Design and Material Selection.**

14.7.1. Design, construction, and application of cathodic protection, industrial water treatment, and protective coatings are functional requirements for almost all projects. Designs should achieve the minimum life cycle cost for the overall facility. Base personnel must be able to operate and maintain the final facility design, including the corrosion control systems, without extensive training or equipment investment, unless this is the best approach to achieve minimum life cycle cost.

14.7.2. Corrosion resistance is not the only criterion for material selection. When selecting a material, investigate all aspects of its physical properties in the application environment, during both normal operation and typical system failure.

14.7.3. Construct new pipelines to enable the use of in-line inspection tools such as video cameras, acoustic devices, and smart pigs.

## Chapter 15

### FACILITY ASBESTOS MANAGEMENT

**15.1. Background.** Asbestos is regulated by 15 USC §§ 2601-2697, 42 USC Chapter 85, *Clean Air Act* (CAA), and 29 U.S.C. §§ 651-678, *Occupational Safety and Health Act* (OSH). This instruction focuses on each base's development and implementation of asbestos management programs to reduce possible exposure to airborne asbestos fibers and satisfy regulatory requirements of 29 CFR Part 1910.1001, 29 CFR Part 1926.1101, 40 CFR Part 763, subpart E, 15 USC §§ 2641-2656, *Asbestos Hazard Emergency Response Act*, and 40 CFR Part 61, subpart M. Past and current records addressed in this instruction must be permanently maintained. **(T-0)**. For more details on referenced regulations and specific Air Force environmental and occupational health program requirements, contact AFCEC's Environmental Directorate (AFCEC/CZ), AFCEC/CFE for Europe, AFCEC/CFP for the Pacific, AFCEC/CIM for privatized housing, or the Air Force Legal Operations Agency, Environmental Law and Litigation Division's Environmental Law Field Support Center (AFLOA/JACE-FSC).

**15.2. Asbestos Management and Operating Plans.** Civil Engineer units with maintenance responsibility involving asbestos shall have a written management plan and operating plan to carry out the objectives of facility asbestos management in accordance with the regulation listed in paragraph 15.1. **(T-1)**. These plans serve two purposes: to detail how tasks are done and to document the installation's commitment to protect the health of personnel. They may be combined into one document if each section clearly defines associated requirements. Current and past records created pursuant to this instruction must be permanently maintained. **(T-0)**. **Note:** Privatized housing maintains their own Asbestos Management Plan and records which are available for BCE and Real Property review.

**15.2.1. Asbestos Management Plan.** The objective of the asbestos management plan is to maintain a permanent record of the status and condition of all asbestos-containing materials (ACM) in an installation's facility inventory. The management plan shall include the documentation for all asbestos management efforts, and procedures for overseeing the entire facility asbestos management program, including procedures to ensure bases comply with applicable Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and state and local regulations. **(T-0)**.

**15.2.2. Asbestos Operating Plan.** The asbestos operating plan dictates how the base will carry out asbestos-related projects. The plan shall assign responsibilities, establish inspection and repair capabilities, and provide repair procedures and personnel protection instructions. **(T-1)**. The plan will refer to and incorporate information from applicable OSHA and EPA rules, AFD 32-70, and AFI 91-202, *The US Air Force Mishap Prevention Program*, with provisions for enforcement. **(T-0)**. The operating plan should include:

15.2.2.1. Organizational structure for carrying out asbestos-related work.

15.2.2.2. Project coordination and communication necessary for construction and renovation work involving facilities containing asbestos.

15.2.2.3. Personnel training programs.

15.2.2.4. Equipment and supply requirements.

15.2.2.5. Identification of worker manuals or other written procedures.

15.2.2.6. Yearly budget estimates.

15.2.2.7. Procedures for interim control measures and extraordinary precautions.

15.2.2.8. Procedures for asbestos certification and asbestos disposition statements on programming documents.

15.2.2.9. Requirements for a special response team and in-house inspection.

15.2.2.10. Requirements for contractor asbestos analysis and abatement.

**15.3. Applicable Regulations.** 29 CFR Part 1910.1001, 29 CFR Part 1926.1101, 40 CFR Part 763, subpart E, 15 USC Chapter 53, and 40 CFR Part 61, subpart M, prescribe requirements for identifying ACM, notifying building occupants of potential asbestos-related hazards, and acquiring specialized asbestos-related training. In addition, they provide specific guidance for asbestos identification, labeling, control, and abatement in schools, government, public, and commercial buildings. Planned asbestos abatement efforts must comply with these and other applicable federal, state, and local regulations prior to commencing work. **(T-0).**

#### **15.4. Asbestos Abatement.**

15.4.1. All damaged ACM, either friable or not intact, is presumed hazardous due to its potential to release asbestos fibers into the air. Damaged ACM must be repaired or removed to eliminate this potential hazard. **(T-0).** Bases will abate hazardous ACM through inventory management, isolation, containment, and removal. **(T-0).**

15.4.2. Any asbestos abatement operations shall be performed with adherence to good housekeeping procedures and adequate control measures to minimize the release of asbestos fibers to the environment. **(T-0).**

15.4.3. The unit must work directly with the Bioenvironmental Engineer (BE) to determine which actions are necessary to protect human health as well as to evaluate facilities containing ACM that cannot be dependably maintained, repaired, or isolated or is likely to become friable **(T-2).**

15.4.4. A facility asbestos survey shall be conducted prior to any renovation, alteration, repair or demolition project that could disturb building materials to ensure compliance with 40 CFR Part 61, Subpart M. **(T-0).**

#### **15.5. Asbestos Removal.**

15.5.1. Bases must remove ACM that cannot be dependably maintained, repaired, or isolated and that is likely to become friable or not remain intact. **(T-0).** "Must remove" mandates will be issued by the installation commander with advice from BE and the Base Civil Engineer (BCE), based on their direct evaluation of the material and the facility. **(T-0).** If asbestos is present at any detectable level (determined by bulk sampling in accordance with 40 CFR Part 763, paragraphs 763.85–87) and is disturbed during maintenance, repair, or removal actions, then the regulatory requirements of 29 CFR Part 1910.1001 and 29 CFR Part 1926.1101 apply. **(T-0).**

15.5.2. Where there is no mandate to remove asbestos, the BCE will consult with BE to determine the health risk to facility occupants and will evaluate the material's condition, use

of the facility, the feasibility or frequency of repair, and cost-effectiveness when deciding whether to remove or repair non-friable, intact ACM. **(T-1)**. The BCE, in consultation with the BE will determine what actions, if any, are required for ACM that cannot be dependably maintained, repaired, or isolated and is likely to become friable or not remain intact.

15.5.3. When safety and budgetary plans permit (e.g., if asbestos is non-friable and intact, encased, properly treated, or cost of asbestos removal is less than 10 percent of project cost), include complete removal of ACM when planning operations, maintenance, and military construction program facility projects. **(T-1)**.

15.5.4. Units should attempt to remove existing ACM at opportune times during minor construction or repairs (e.g., if wall sections are opened and ACM is exposed, or carpeting is replaced over vinyl asbestos flooring).

15.5.5. Refer to AFI 32-7042, *Waste Management*, and 40 CFR Part 61, Subpart M, for standards and requirements related to asbestos removal, renovation, and demolition including thresholds for pre-work notification, licensing, site preparation, removal and emission control procedures, and transportation and disposal requirements and limitations.

**15.6. Facility Asbestos Management.** To ensure ACM does not become airborne, the BCE will closely monitor all facilities. **(T-1)**.

15.6.1. Conduct asbestos surveys to identify all installed ACM. Pre-construction surveys will be performed by appropriately credentialed inspectors when a baseline survey has not been conducted and there is no information, or insufficient information, as to the existence of ACM within the planned limits of construction. **(T-2)**. In accordance with 29 CFR Part 1910.1001, all installed thermal system insulation and sprayed- or troweled-on surfacing materials shall be classified as presumed ACM in buildings constructed prior to 1980. **(T-0)**. Asphalt and vinyl flooring material installed prior 1980 must also be treated as asbestos-containing. **(T-0)**. To verify whether presumed ACM and flooring material contain asbestos, complete an asbestos survey in accordance with 40 CFR Part 763, subpart E (sampling methods are specified in paragraphs 763.85–87). **(T-0)**. Units may use commercially available non-regulatory survey method. Units may use ASTM E2356-18, *Standard Practice for Comprehensive Building Asbestos Surveys* as a commercially available non-regulatory survey method.

15.6.2. Units shall determine if visibly damaged thermal system insulation, existing spray- or trowel-applied surfacing or fireproofing, or miscellaneous ACM is in immediate danger of becoming friable or non-intact, and releasing airborne asbestos fibers. **(T-0)**. Ensure such material is quickly repaired by personnel trained in accordance with 40 CFR Part 763, subpart E, Appendix C. **(T-0)**.

15.6.3. Units shall regularly inspect identified ACM and Presumed ACM to verify that the material's condition has not changed. Approved methods are specified in 40 CFR Part 763, paragraphs 763.85–87. **(T-0)**. Incorporate recurring inspection of identified and presumed ACM into the installation PM program per Chapter 3 of this instruction.

## Chapter 16

### ROOFING MANAGEMENT PROGRAM

**16.1. Background.** The objective of a roof management program is to optimally manage roof systems over their life cycles to meet the required levels of service for Air Force real property. Roof management involves an asset management approach, taking into account performance measures, periodic inspections, routine maintenance and repair, and correct application of quality roofing products. **Note:** Privatized housing will maintain its own roof management program for the privatized real property.

#### **16.2. Design, Maintenance, and Management**

16.2.1. Units must design and maintain roofs in accordance with mandatory requirements of UFC 3-110-03, *Roofing*, and UFC 3-110-04, *Roofing Maintenance and Repair*. **(T-0)**.

16.2.2. BUILDER™ Sustainment Management System (SMS) is the enterprise approved Air Force SMS for roof system assets management and must be utilized, updated, and maintained by the installation. **(T-1)**. Other Commercial Off-the-Shelf tools are authorized, at the installation's expense, as a secondary database to support BUILDER™ for greater project-level details helpful to the base roof technicians and roof engineer.

16.2.3. Accomplish condition assessments in accordance with criteria in BUILDER™ SMS. If a roof section is not inventoried in the SMS, upload data as a part of the required PM inspection in accordance with DOD *Standardizing Facility Condition Assessments* memo. **(T-0)**.

16.2.4. Privatized housing maintains their own roof management program for the privatized real property and maintains their own records which are available for BCE and Real Property review.

WARREN D. BERRY, Lieutenant General, USAF  
DCS/Logistics, Engineering & Force Protection



## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

- Executive Order 13327, *Federal Real Property Asset Management*, 6 February 2004
- Executive Order 13834, *Efficient Federal Operations*, 17 May 2018
- 10 U.S.C. § 2721, *Property Records: Maintenance on Quantitative and Monetary Basis*, 1 Feb 2010
- 15 U.S.C. §§ 2601-2697, *Toxic Substance Control Act (TSCA)*, 22 June 2016
- 15 U.S.C. §§ 2641-2656 *Asbestos Hazard Emergency Response Act (AHERA)*, 7 January 2011
- 29 U.S.C. §§ 651-678, *Occupational Safety and Health Act (OSH)*, 29 December 1970
- 33 U.S.C. § 467, *Dam Inspection Program*, 10 June 2014
- 42 U.S.C. §§ 7401-7671q, *Clean Air Act (CAA)*, 31 December 1970
- 29 CFR Part 1910.134, *Respiratory Protection*, 22 November 2006
- 29 CFR Part 1910.1001, *Asbestos (Standard for General Industry)*, 30 June 1993
- 29 CFR Part 1926.1101, *Asbestos (Standard for the Construction Industry)*, 20 June 1986
- 40 CFR Part 61, Subpart M, *National Emission Standard for Hazardous Air Pollutants, Asbestos*, 5 April 1984
- 40 CFR Part 763, *Asbestos-Containing Material in Schools*, 30 October 1987
- DoD 7000.14-R, *Department of Defense Financial Management Regulation*, May 2019
- DoDI 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*, 31 August 2018
- UFC 1-300-08, *Criteria for Transfer and Acceptance of DoD Real Property*, 1 August 2011
- UFC 3-110-03, *Roofing*, 6 March 2019
- UFC 3-110-04, *Roofing Maintenance and Repair*, 11 January 2007
- UFC 3-240-13FN, *Industrial Water Treatment Operations and Maintenance*, 25 May 2005
- UFC 3-310-08, *Non-Expeditionary Bridge Inspection, Maintenance and Repair*, 17 July 2018
- UFC 3-410-01, *Heating, Ventilating, and Air Conditioning Systems*, 1 November 2017
- UFC 3-570-06, *O&M: Cathodic Protection Systems*, 31 January 2003
- UFC 3-601-02, *Operations and Maintenance: Inspection, Testing, and Maintenance of Fire Protection Systems*, 8 September 2010
- UFC 4-010-06, *Cybersecurity of Facility-Related Control Systems*, 18 January 2017
- HAF MD 1-18, *Assistant Secretary of the Air Force (Installations, Environmental, and Energy)*, 10 July 2014
- AFPD 32-10, *Installations and Facilities*, 4 March 2010

AFPD 32-70, *Environmental Considerations in Air Force Programs and Activities*, 30 July 2018

AFI 32-1067, *Water and Fuel Systems*, 4 February 2015

AFI 32-2001, *Fire and Emergency Service Program*, 28 September 2018

AFI 32-9005, *Real Property Accountability and Reporting*, 4 March 2015

AFI 32-7042, *Waste Management*, 7 November 2014

AFI 33-360, *Publications and Forms Management*, 1 December 2015

AFI 38-101, *Air Force Organization*, 31 January 2017

AFI 38-201, *Management of Manpower Requirements and Authorizations*, 20 January 2014

AFI 91-202, *The US Air Force Mishap Prevention Program*, 24 June 2015

AFMAN 33-363, *Management of Records*, 1 March 2008

AFGM 2018-32-01, *Civil Engineer Control Systems Cybersecurity*, 9 May 2018

FAA Advisory Circular 150/5200-30, *Airport Winter Safety and Operations*, 29 July 2016

FAA Advisory Circular 150/5220-20, *Airport Snow and Ice Control Equipment*, 14 April 2017

FAR Part 16.503, *Requirements Contracts*

FAR Part 18, *Emergency Acquisitions*

FEMA 93, *Federal Guidelines for Dam Safety*, April 2004

GAO 19-57, *Federal Real Property Asset Management*, November 2018

ASTM E2356-18, *Standard Practice for Comprehensive Building Asbestos Surveys*, 2018.

ISO 55000, *Asset Management – Overview, Principles and Terminology*, 15 March 2014

ISO 55001, *Asset Management – Management Systems – Requirements*, 15 January 2014

ISO 55002, *Asset Management – Management Systems – Guidelines for the Application of ISO 55001*, 15 March 2014

SAE AMS 1435D, *Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways*, 2 November 2018

SAE AMS 1431D, *Compound, Solid Runway and Taxiway Deicing/Anti-Icing*, 24 October 2018

### ***Prescribed Forms***

AF Form 103, *Base Civil Engineering Work Clearance Request*

AF Form 332, *Base Civil Engineer Service Request*

AF Form 491, *Cathodic Protection Operating Log for Impressed Current Systems*

AF Form 1081, *BCE Work Request*

AF Form 1219, *Multi-Craft Job Order Register*

AF Form 1457, *Water Treatment Operating Log for Cooling Tower Systems*

AF Form 1686, *Cathodic Protection Operating Log for Sacrificial Anode System*

AF Form 1687, *Leak/Failure Data Record Resource Advocacy/Corrosion Control Metric*

AF Form 1688, *Annual Cathodic Protection Performance Survey*

AF Form 1689, *Water Tank Calibration*

### ***Adopted Forms***

DD Form 1354, *Transfer and Acceptance of DoD Real Property*

AF Form 847, *Recommendation for Change of Publication*

AF Form 1459, *Water Treatment Operating Log for Steam and Hot Water Boilers*

### ***Links***

CE Dash: <https://cs2.eis.af.mil/sites/10159/scripts/homepage/home.aspx>

CE Portal: <https://cs2.eis.af.mil/sites/10041/Pages/default.aspx>

AFCEC Virtual Learning Center: <https://afcec.adls.af.mil>

AFCEC FDB Database: <https://portal.afcec.hedc.af.mil/CO/AVB/SitePages/Home.aspx>

Air Force Common Output Level Standards Reporting Tool:

<https://cs2.eis.af.mil/sites/12508/RT/Module/InstallationMetrics.aspx>

CE Playbooks: <https://cs2.eis.af.mil/sites/10041/CEPlaybooks/Pages/PlaybookViews.aspx>

CE Transformation: <https://cs2.eis.af.mil/sites/10041/Pages/CETransformation.aspx>

CorrConnect: <http://www.corrconnect.org/>

FAA Advisory Circulars: [http://www.faa.gov/airports/resources/advisory\\_circulars/](http://www.faa.gov/airports/resources/advisory_circulars/)

Materiel Control SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/MaterielControl/SitePages/Home.aspx>

National Association of Corrosion Engineers International®: <http://www.nace.org/>

Operations Flight SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/SitePages/Home.aspx>

Preventive Maintenance SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/PreventMaint/SitePages/Home.aspx>

Service Contracts SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/ServiceContracts/SitePages/Home.aspx>

Society of Protective Coatings: <https://www.sspc.org>

Snow & Ice Control SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/vehicle-snow-ice/layouts/15/start.aspx#/SitePages/Home.aspx>

Work Management SharePoint:

<https://cs2.eis.af.mil/sites/11252/24048/CO%20Support%20TRIRIGA%20Deploy/WorkManagement/SitePages/Home.aspx>

*Abbreviations and Acronyms*

**AF COLS**—Air Force Common Output Levels Standard

**AFCEC**—Air Force Civil Engineer Center

**AFCEC/CO**—Air Force Civil Engineer Center Operations Directorate

**AFCEC/CIM**—Air Force Civil Engineer Center Housing Division

**AFI**—Air Force Instruction

**AFIMSC**—Air Force Installation and Mission Support Center

**AFPD**—Air Force Policy Directive

**AMP**—Asset Management Plan

**BCE**—Base Civil Engineer

**CE**—Civil Engineer

**CEN**—Engineering Flight

**CEO**—Operations Flight

**CEOE**—Engineering Element

**CEOEM**—Materiel Control Section

**CEOER**—Requirements and Optimization Section

**CEOES**—Service Element Section

**CEOFA**—Fire Alarms Section

**CEOFE**—Electrical Shop Section

**CEOF**—Facility Systems Element

**CEOFP**—Power Production Section

**CEOH**—Heavy Repair Element

**CEOHP**—Pavements and Equipment Section

**CEOHS**—Structures Section

**CEOI**—Infrastructure Systems Element

**CEOIC**—Environmental Control Systems Section

**CEOIE**—Pest Management Section

**CEOIH**—Heating, Ventilation, and Air Conditioning Section

**CEOIU**—Water and Fuel Systems Maintenance Section

**CEOM**—Missile Facility Maintenance Element,

**CM**—Corrective Maintenance  
**FDB**—Final Denial Barrier  
**FEMA**—Federal Emergency Management Agency  
**HAZMAT**—hazardous materials  
**HVAC**—Heating, Ventilating, and Air Conditioning  
**IT**—Information Technology  
**MAJCOM**—major command  
**PM**—Preventive Maintenance  
**PMTL**—Preventive Maintenance Task List  
**ROI**—Return on Investment  
**RPIE**—Real Property Installed Equipment  
**RP**—Real Property  
**S&ICP**—Snow & Ice Control Plan  
**SMS**—Sustainment Management System  
**UFC**—Unified Facilities Criteria  
**WRRB**—Work Request Review Board  
**WRWG**—Work Request Working Group

### *Terms*

**Asset Management**—A way to translate the Air Force’s objectives into asset-related decisions and plans. Effective asset management requires understanding assets’ physical attributes, condition, usage, and performance as well as the realized and potential value to the mission. When applied correctly, asset management balances risk, current and future Air Force objectives, resource limitations, and lifecycle management.

**Asset Management Plan**—documented information that specifies the activities, resources, and timescales for an individual asset, or a grouping of assets, to achieve the organization’s asset management objectives. See ISO 55000, *Asset Management - Overview, Principles, and Terminology*.

**Built Infrastructure**—Installations, facilities and other fixed (i.e., permanent) and man-made assets essential to project, support, and sustain military forces and operations worldwide. These include buildings, airfields, roads/bridges, utility systems, stores of military equipment, and maintenance stations necessary for the support of military forces, whether they are stationed in bases, being deployed or engaged in operations (JP 3-27).

**Civil Engineer Maintenance Inspection and Repair Team**—CEMIRT provides Air Force-wide specialized maintenance, installation and repair support on electrical distribution and power generation systems; aircraft arresting systems; industrial control systems; and heating, ventilating and air conditioning systems during peacetime and emergency response operations.

**Cathodic Protection**—A technique to prevent the corrosion of a metal surface by making that surface the cathode of an electrochemical cell (UFC 3-570-01).

**Core Function Lead**—SecAF/CSAF-appointed senior leader responsible for specific Core Functions providing AF-level, long-term views. Core Function Leads integrate Total Force concepts, capabilities, modernization, and resourcing to ensure future assigned core capabilities across the range of military operations as directed by Air Force Strategy and Strategic Planning Guidance. Core Function Leads are responsible for the Core Function Support Plan and recommendations for the development of the POM for the assigned Core Functions. Core Function Leads have tasking authority regarding Core Functions issues to identify enabling capabilities and integration requirements/opportunities.

**Corrosion**—The deterioration of a material or its properties due to a reaction of that material with its chemical environment (10 U.S.C. § 2228).

**Emergency Repair**—The least amount of immediate repair to damaged facilities (or infrastructure) necessary for the facility (or infrastructure) to support the mission (Joint Publication 3-34).

**Emergency Work**—Unscheduled work that requires immediate response to sustain or ensure continued mission operations, prevent significant additional damage to facilities and infrastructure or protect the safety and security of the installation, mission, or personnel.

**Energy Management**—The process of developing, executing, and overseeing plans, programs, and initiatives to achieve energy and water goals and objectives across all functional areas (AFPR 90-17).

**Fire Safety Deficiency**—A condition which reduces fire safety below the acceptable level, including noncompliance with standards, but by itself cannot cause a fire to occur. A clear distinction between hazards and deficiencies may not always be possible; therefore, the judgment and experience of a qualified fire official must be relied upon. Fire safety deficiencies will not be assigned a RAC. See AFI 32-2001 and AFI 91-202 for additional information.

**Force Majeure**—Causes that could not be anticipated and/or are beyond the control of the unit.

**Joint Base**—A locality from which operations of two or more of the Military Departments are projected or supported and which is manned by significant elements of two or more Military Departments on in which significant elements of two or more Military Departments are located (Joint Publication 3-10).

**Life Cycle**—The total phases through which an item passes from the time it is initially developed until the time it is either consumed in use or disposed of as being excess to all known material requirements (JP 4-02).

**Playbook**—A non-directive publication, developed and maintained by AFCEC, that provides additional guidance and how-to information for a variety of civil engineer functions and sections. Playbooks can be found on the Air Force CE Portal: <https://cs2.eis.af.mil/sites/10041/CEPlaybooks/Pages/default.aspx>.

**Preventive Maintenance**—Care and service of equipment and facilities in satisfactory operating condition by systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects (JP 4-02).

**Real Property**—Lands, buildings, structures, utilities systems, improvements, and appurtenances thereto. Includes equipment attached to and made part of buildings and structures (such as heating systems) but not movable equipment (26 CFR Part 1.856-10).

**Real Property Infrastructure**—All buildings, structures, airfields, port facilities, surface and subterranean utility systems, heating and cooling systems, fuel tanks, pavements, and bridges.

**Storage Tank**—A stationary, aboveground or below ground device that contains an accumulation of regulated substances.

**Strategic Asset Management Plan**—Documented information that specifies how organizational objectives are to be converted into asset management objectives, the approach for developing asset management plans, and the role of the asset management system in supporting achievement of the asset management objectives. See ISO 55000, *Asset Management - Overview, Principles, and Terminology*.

**Work Request Review Board**—The WRRB is a meeting where approval and execution decisions are made based on inputs from the WRWG. Not all requirements reviewed by the WRWG will be reviewed by the WRRB but all WRRB decisions require WRWG input. The WRRB typically meets bi-weekly or monthly and is chaired by the operations flight commander, or equivalent.

**Work Request Working Group**—The WRWG is a group whose primary purpose is to evaluate and prepare CE work request requirements. The WRWG uses locally established processes to determine details and required actions for a work requirement. The WRWG can be a formal meeting or informal and is held on an as-needed basis. The WRWG is typically chaired by the chief of the requirements and optimization section.