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SECRETARY OF THE AIR FORCE**

AIR FORCE INSTRUCTION 32-1051

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Civil Engineering

ROOF SYSTEMS MANAGEMENT



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 32-10, *Installations and Facilities*, and provides guidance for establishing and maintaining a roof management program. It also specifies use of the *Manual for Inspection and Maintenance* of various roofing systems, which is published by The National Roofing Contractors Association. This publication applies to all Air Force, Air Force Reserve Command (AFRC), and Air National Guard (ANG) units and personnel. This publication may be supplemented at any level, but all direct Supplements must be routed to the Office of Primary Responsibility (OPR) of this publication for coordination prior to certification approval. The authorities to waive wing/unit level requirement in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Refer recommended changes and questions about this publication to the 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. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include the addition of Tier wavier authority requirements, updated office symbols, and updated references.

1. Program Objective. 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.

2. Responsibilities.

2.1. Air Force Director of Civil Engineers (AF/A4C):

2.1.1. Establishes policies for roofing systems.

2.2. Air Force Civil Engineer Center (AFCEC):

2.2.1. Establishes standards and criteria for design, maintenance, repair, and management of roofing systems IAW mandatory requirements of UFC 3-110-3, *Roofing* and UFC 3-110-4, *Roofing Maintenance and Repair*. **(T-0)**

2.2.2. Reviews emerging technologies and evaluates for applicability to the Air Force.

2.2.3. Evaluates roofing training conducted internally by the Air Force.

2.2.4. Assists major commands (MAJCOMs) and bases in troubleshooting roofing-related issues.

2.3. MAJCOMs:

2.3.1. Manage roofing programs within the command.

2.3.2. Appoint a roof engineer to monitor command roofing programs.

2.4. Base Civil Engineer Squadron:

2.4.1. Manage the base roofing program as required by Executive Order 13327, Federal Real Property Asset Management (EO 13327) in accordance with asset management principles and as a component of the facilities Activity Management Plan (AMP). **(T-0)**

2.4.2. Design and maintain roofs IAW mandatory requirements of UFC 3-110-3 *Roofing* and, UFC 3-110-4, *Roofing Maintenance and Repair*. **(T-0)**

3. Roof System Database. The purpose of the database is to help in effectively managing roof system assets. BUILDER™ Sustainment Management System (SMS), a Government Off-the-Shelf (GOTS) tool, is the primary Air Force SMS system. BUILDER™ must be utilized, updated, and maintained by the installation. **(T-0)** It tracks information on the type and age of roof and assigns a condition to the roof based on a fixed set of criteria. With this information, it can provide a remaining service life prediction, and reveal when to execute corrective maintenance or repair actions. Other Commercial Off-the-Shelf (COTS) and GOTS 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.

4. Condition Assessment. Accomplish condition assessments in accordance with criteria in BUILDER™ SMS. If a roof section is not inventoried in SMS, upload data as part of the annual maintenance inspections. **(T-1)**

5. Maintenance Inspections. To promote the efficient and economical use of Air Force real property assets as required by EO 13327, inspect all roofs at least once annually in accordance with the inspection guidelines outlined in the BUILDER™ Condition Assessment Manual. **(T-1)**

JUDITH A. FEDDER, Lieutenant General, USAF
DCS/Logistics, Installations & Mission Support

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

Department of Defense:

AFI 33-360, *Publications and Forms Management*

AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*

AFI 32-1023, *Design and Construction Standards and Execution of Facility Construction Projects*

AFMAN 33-363, *Management of Records*

UFC 3-110-03, *Roofing*

UFC 3-110-04, *Roofing Maintenance and Repair*

UFGS 07 22 00, *Roof and Deck Insulation*

UFGS 07 31 13, *Asphalt Shingles*

UFGS 07 31 26, *Slate Roofing*

UFGS 07 32 13, *Roof Tiles*

UFGS 07 32 14, *Clay Tile Roofing Replacement or Repair*

UFGS 07 41 13, *Metal Roof Panels*

UFGS 07 41 63, *Fabricated Roof Panel Assemblies*

UFGS 07 42 13, *Metal Wall Panels*

UFGS 07 51 13, *Built-Up Asphalt Roofing*

UFGS 07 52 00, *Modified Bituminous Membrane Roofing*

UFGS 07 53 23, *Ethylene-Propylene-Diene-Monomer Roofing*

UFGS 07 54 19, *Polyvinyl Chloride Roofing*

UFGS 07 55 00, *Protected Membrane Roofing (PMR)*

UFGS 07 57 13, *Sprayed Polyurethane Foam (SPF) Roofing*

UFGS 07 60 00, *Flashing and Sheet Metal*

UFGS 07 61 01, *Copper Roof System*

UFGS 07 61 14.00 20, *Steel Standing Seam Roofing*

UFGS 07 61 15.00 20, *Aluminum Standing Seam Roofing*

Note: Above publications can be found at <http://www.wbdg.org/index.php>

Suggested Training Sources:

The Civil Engineer School at the Air Force Institute of Technology, "Roofing Design and Management (ENG 440)"

366th Training Squadron/Detachment 6, NCBC, Gulfport, MS

Various Courses offered by National Roofing Contractors Association located on-line at <http://www.nrca.net/roofing/Course-index-288>

Various Courses offered through Department to Engineering Professional Development at University of Wisconsin found at <http://www.epd.engr.wisc.edu>

Suggested Reading Materials:

RIEI Roofing Maintenance Manual

Repair Manual for Low-slope Membrane Roof Systems

SPRI/NRCA Manual of Roof Inspection, Maintenance, and Emergency Repair for Existing Single-ply Roofing Systems

Manual for Inspection and Maintenance of Built-Up and Modified Bitumen Roof Systems: A Guide for Building Owners

NRCA Roofing Manual: Membrane Roof Systems

NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing

NRCA Roofing Manual: Steep-slope Roof Systems

NRCA Roofing Manual: Metal Panel and SPF Roof Systems

All are available at: The National Roofing Contractors Association, O'Hare International Center 10255, Higgins Road, Suite 600 Rosemont IL 60018-5607, 1-800-323-9545

Industry Professional Roofing Periodicals:

RSI - Roofing Siding Insulation, 600 Superior Avenue E, Suite 1100, Cleveland OH 44114 (216) 706-3700

Western Roofing, Insulation, and Siding, 546 Court Street Reno NV 89501-9834 (702) 333-1080

Metal Architecture and Metal Construction News, Both are available at Modern Trade Communications 7450 N. Skokie Blvd. Skokie IL 60077 (708) 674-2200

Books

Manual of Built-Up Roof Systems (Second Edition), 1982, by C.W. Griffin, Jr., P.E., for The American Institute of Architects, McGraw-Hill, 330 West 42nd St, New York NY 10036

The Science and Technology of Traditional and Modern Roofing Systems, by H.O. Laaly, 2 volumes, Laaly Scientific Publishing, 1992, 9037 Mount Mar Drive, Los Angeles CA 90035

Prescribed Forms

None.

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

AF Form 1768, *Staff Summary Sheet*

DD Form 67, Form Processing Action Request***Abbreviations and Acronyms*****AFCEC**—Air Force Civil Engineer Center**AFI**—Air Force Instruction**AFRC**—Air Force Reserve Command**AFRIMS**—Air Force Records Information Management System**AMP**—Activity Management Plan**ANG**—Air National Guard**COTS**—commercial off-the-shelf**GOTS**—government off-the-shelf**MAJCOM**—major command**NRCA**—National Roofing Contractors Association**OPR**—Office of Primary Responsibility**RDS**—Records Disposition Schedule**SMS**—Sustainment Management System