

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1.1.1 Purpose

The purpose of this manual is to provide guidance to personnel engaged in or responsible for the inspection, maintenance, repair, or replacement of roofing at military installations.

1.1.2 Scope

This manual contains information applying to safety measures and inspection, maintenance, repairs, reroofing, and causes of failures of built-up roofing, asphalt-shingle roofing, roll roofing, asbestos-cement roofing, metal roofing, slate roofing, tile roofing, wood-shingle roofing, and flashing appurtenances. For convenience, each type of roofing is treated in a separate chapter, except for cross reference to avoid repetition. Information on sheet metal is presented to the extent that it pertains to roofing.

1.1.3 References

Other publications contain detailed information on maintenance of numerous component parts of roofing. References to them are made wherever applicable. Such publications and applicable specifications are listed in the appendixes A through E. References to Federal, Military or American Society for Testing and Materials (ASTM) specifications are to the current issues of these specifications as identified by their basic numbers.

1.1.4 Painting

Where painting is not covered in this manual, reference should be made to the tn-services manual entitled "Paints and Protective Coatings," (AFM 85-3, TM 5-618, NAVFAC MO-110).

1.1.5 Fire Classification of Roof Coverings for Military Construction

Roof coverings for military construction should have at least a "Class C" classification for external fire exposure as listed by the Underwriters' Laboratories, Inc., Factory Mutual Engineering Division, or other recognized testing laboratory. In addition, it is essential that roofing systems over steel and wood decks be in accordance with roof

deck constructions as listed by Underwriters' Laboratories, Inc. or Factory Mutual Engineering Division for spread of fire beneath the deck.

1.1.6 Manufacturers' Instructions

Information is presented in this publication in general terms, since it is impossible to cover in detail the many varied types of roofing materials and their component accessories produced by numerous manufacturers. Minute detail is omitted here because of readily available excellent instructions, diagrams, drawings, and photographs that most manufacturers provide with their roofing products.

1.1.7 Use of Accepted Materials

Materials to be incorporated in roofing work should comply with the latest issue of Federal, Military, or ASTM specifications, or with instructions issued by the military department concerned. Use of proprietary materials should be avoided and materials that do not comply with an appropriate Federal, Military, or ASTM specification should not be used. The manufacturer's printed label on material should show applicable specifications.

1.1.8 Structural Problems

Structural problems must be resolved by qualified engineers. Adequacy of existing structural systems to carry anticipated loads must be verified.

1.1.9 Method of Accomplishing Work

Roofing maintenance and repairs should be accomplished by qualified personnel only. Minor maintenance and repair work, the scope of which is difficult to determine, or emergency work required to provide immediate protection against interior water damage, or work that involves a threat to a secure area, is best accomplished by installation personnel. Major repair or complicated reroofing projects should be accomplished by contract methods. The installation engineer does not usually have the necessary staffing or equipment to attempt work of large scope. Further, attempting work of large scope generally results in the neglect of

essential routine maintenance. Every attempt should be made to schedule major repair and reroofing projects for accomplishment in dry weather during ambient temperatures of at least 40° F.

1.1.10 Access to Roofs

Traffic on roofs inevitably results in damage to the roofing. Traffic on roofs should therefore be kept to a minimum and access limited. Where traffic on roofs cannot be avoided, walkways must be provided.

1.1.10.1 Access Doors. All doors leading directly to roofs should be padlocked, with locks keyed alike. A sign should be stenciled on the inside of each door indicating that roofs are off-limits. Necessary equipment for forced exit in case of fire should be provided as required.

1.1.10.2 Access Ladders. A sign should be stenciled on the side of the building adjacent to each fixed ladder leading to roofs, stating that roofs are off-limits.

1.1.11 Equipment on Roofs

Equipment should not be placed on roofs except as absolutely necessary. Unauthorized equipment such as radio or television aerials should be removed.

1.1.12 Use of Construction Guide Specifications

It is often feasible to utilize military or federal (FCGS) construction guide specifications for re-roofing work. However, it is essential in all such cases to carefully adapt the guide specification to suit the project under consideration. In particular, the work to be accomplished should be clearly delineated including that pertaining to retention or removal of existing materials, and portions of the guide specification should be modified or deleted as appropriate.

1.1.13 Roofing Colors

Roof surfaces of high reflectivity should be employed where it is desirable to reduce solar heat penetration and facilitate cooling. Where asphalt shingle or roll roofing is applied to military buildings, other than family housing, colors should be limited to white, off-white, gray, or green. Family housing is restricted to white or light gray. On aggregate-surfaced built-up roofing, crushed marble or other light colored aggregate is used to give a heat-reflective surface. For smooth-surfaced built-up roofing, aluminum pigmented asphalt coatings are employed to provide a reflective weathering surface.

Section II. ARMY RESPONSIBILITY

1.2.1 General

AR 420-10 pertains to facilities engineering, assigns responsibility, and delegates approval authority for real property facilities projects.

1.2.2 Criteria, Standards, and Procedures

AR 420-70 prescribes criteria, standards, and procedures in connection with facilities engineer responsibilities for buildings, structures, and training facilities.

Section III. NAVY RESPONSIBILITY

1.3.1 Naval Facilities Engineering Command

The overall responsibility for the maintenance of the Department of the Navy shore installations is assigned to the Commander, Naval Facilities Engineering Command (NAVFAC). His authority is delegated to the Commanders and Commanding Officers of NAVFAC's Engineering Field Divisions (EFDs) who provide overall technical guidance in operations and maintenance matters to these shore installations.

1.3.2 Commanding Officer

The Commanding Officer at each Department of the Navy shore installation is responsible for providing an adequate maintenance program.

Normally, these responsibilities are delegated to the Public Works Centers or Public Works Departments/Maintenance Departments, as appropriate.

1.3.3 Public Works Center/Public Works Department/ Maintenance Department

At each Naval and Marine Corps installation, the Commanding Officer of a Public Works Center, or the Public Works Officer/Maintenance Officer is responsible to the Commanding Officer for the provision of—

- (1) Inspections and surveys to determine and identify roofing conditions.
- (2) Recommendations for maintenance

standards and procedures that affect the life of the roofs.

(3) Establishing Dynamic Equipment Inspection/Service (preventive maintenance) Programs.

(4) Trained and qualified personnel to accomplish effective roof maintenance.

(5) Periodic supervisory personnel training, education, and certification in maintenance programs that utilize work improvement main-

tenance techniques.

(6) Inspections and instructions to assure that labor, materials and equipment are used properly and safely in accordance with pertinent regulations, and that operations are planned and supervised by qualified personnel.

(7) Coordination with civilian and other governmental agencies that have similar maintenance capabilities.

Section IV. AIR FORCE RESPONSIBILITY

1.4.1 Directives

The responsibility within the Air Force for the Operations and Maintenance of Real Property is defined in the following publications:

(1) AFR 85-5, "Operation and Maintenance of Real Property," delegates the responsibilities for the maintenance and protection of Real Property.

(2) AFR 85-6, "Real Property, Maintenance, Repair and Construction," controls the classification and level of approval authority for all work.

(3) AFM 85-1, "Resources and Work Force Management," sets the work processing control procedure for all work.

(4) AFM 88-15, "Air Force Design Manual — -Criteria and Standards of Air Force Construction," controls the selection of materials for all work.

1.4.2 Headquarters, USAF Level

Within HQ USAF, the Director of Civil Engineering is responsible for developing policy and procedures and for administering and supervising an effective operations and maintenance program for all real property under the control of the Air Force.

1.4.3 Major Command Level

The commander of each major command is responsible for establishing and accomplishing an effective O&M program at all installations under his command.

1.4.4 Base Commander Level

The base commander will plan, initiate, and supervise through his Base Civil Engineer the execution of the engineering responsibilities for the operations and maintenance of real property under his jurisdiction.