

CHAPTER 1

GENERAL

1-1. Purpose. Information and criteria in this manual will guide engineering design personnel in determining the adequacy of lightning and static electricity protection systems for all types of facilities. Policy and procedure of design development and tests are also included. Referenced criteria, codes, and standards are intended to include provisions for normal type facilities, which when integrated with criteria included herein, establish complete provisions for these protection systems. The standards and methods of system protection discussed are intended as the most practical and economical means of accomplishing protection of real property and avoidance of casualties to personnel. These criteria will not provide suitable protection for construction contractors' personnel.

1-2. Scope

a. General. The scope of this manual will include adequacy of engineering design for facilities of Army, Air Force and other agencies in conformance with paragraph 1-3.

b. Limitations. Limitations within continental United States will be subject only to specific provisions of project design directives, deviations included herein or authorized by HQDA (DAEN-ECE-E) WASH DC 20314-1000, for Army projects, and HQUSAF/LEEE WASH DC 20332, for Air Force Projects.

c. Other protection systems. These criteria are not intended to support or implement separate criteria such as furnished for electromagnetic protection or electromagnetic shielding requirements.

1-3. Application. Except as included for facilities of the Army Materiel Development and Readiness Command, criteria contained in this manual will apply to new construction of permanent, fixed type facilities conforming to AR 415-15 within the continental United States. Where conflicts arise with criteria or design guidance of different Army or Air Force agencies, or with Federal organizations other than Army or Air Force, the most stringent guidance will govern. Criteria or design guidance will apply to overseas facilities in conformance with AR 415-36.

1-4. General

a. Separate section of a specification. Inasmuch as provisions for lightning protection involve a special type (steeple jack) trade, contract requirements for lightning and static electricity protection will be included as a separate section in project specifications.

b. Environmental considerations. Design consideration will be given to overall appearance so as to maintain an attractive facility in harmony with area surroundings.

c. System components. Components will conform to applicable NFPA codes, except as otherwise stated or indicated.

d. Penetration of building exterior surfaces. Where roofing, walls, floor and waterproofing membranes are penetrated by components of these systems, adequate waterproofing and caulking of such penetrations will be provided. However such penetrations will be avoided whenever possible.

1-5. Applicable codes and standards. Codes and standards referenced in this manual and listed in Appendix A are to be considered as an integral part of this manual,

1-6. Design development

a. Lightning protection system. When contract drawings comprise more than one sheet showing composite roof and architectural elevation, a separate sheet will be provided showing locations of air terminals, routing of roof conductors, down conductors, and grounding system pattern.

b. Static electricity protection system. Where static electricity protection for two or more rooms or areas is indicated on an architectural floor plan and cannot be shown on an appropriate electrical plan, a separate floor plan sheet showing the complete static electricity protection system pattern will be included in the project design.

1-7. Approved type systems

a. Lightning protection. Selection of the type of protective system will be as prescribed in this manual, NFPA No. 78, and MIL-HDBR-419.

b. Static electricity protection. Selection of system type will be prescribed in NFPA No. 77, MIL-HDBR 419, and MIL-STD-188-124.

1-8. Materials. Materials will conform to applicable NFPA codes, unless otherwise stated. Normally, copper materials will be specified for use below finished grade. Stainless steel grounding devices should be used when there is a potential of galvanic corrosion of nearby steelpipes. UL listed compression-type connectors may be used where such connectors are equivalent to the welded type. Special consideration will be given to selection of materials to compen-

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sate for the following conditions as encountered at project locations:

- (1) Corrosive soils and atmosphere.
- (2) Atmospheric and ground contact corrosion.
- (3) Electrolytic couples that will accelerate corrosion in the presence of moisture or ground contact

corrosion. This must be prevented by use of same type metals, or by providing junctions of dissimilar metals in air that will permanently exclude moisture.

- (4) Equal mechanical strength or fusing capability where conductors of different metals are joined.