

CHAPTER V  
DESIGN CRITERIA

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"When all else fails,, read the instructions."

CHAPTER V  
DESIGN CRITERIA

1.0. GENERAL INSTRUCTIONS

1.1. All projects shall conform to the criteria contained in the "Scope of Work" unless the A-E is given instructions in writing to the contrary. In cases where a COE review determines criteria has not been followed, the A-E will be required to conform his design to the criteria at his own time and expense, per the appropriate paragraphs of the A-E's contract.

2.0. DATES OF PUBLICATIONS

2.1. To eliminate the need to continually change the dates of the criteria references, dates are not included on the criteria index contained herein. The A-E will be issued the latest copy for all COE publications requested. Since the criteria often changes, the A-E shall discard criteria from any past COE projects and request up-to-date material. For all non-COE references, the A-E shall use those current at the time his contract his signed. If there is any question regarding this issue, it shall be resolved with the PM.

3.0. AVAILABILITY OF CRITERIA

3.1. Publications such as guide specs., TM's, AFM's, DM's, DOD manuals and Sacramento District prepared manuals such as, "COE Standard details for Utilities, Foundations and Railroads", are available on request from the COE PM. Other Government documents which are not available from the COE will be so noted in the criteria list. The A-E is responsible for obtaining these items from the appropriate Government agencies. All other references, such as American Concrete Institute's "Building Code Requirements for Reinforced Concrete", etc., shall be obtained by the A-E from other sources. See A-E Guide, Vol. 3 for source of such references.

4.0. CONFLICTS IN CRITERIA

4.1. In many instances, a subject has more than one criteria reference. These references may give conflicting information on a given point. In all cases, the Government publication will control over non-Government publications and Sacramento District references, unless otherwise stated. If there is any doubt regarding the controlling criteria, the A-E shall contact the COE PM.

5.0. REVISIONS TO CRITERIA

5.1. Periodically, revisions, or "SPK Supplements" will be issued by the Sacramento District to implement new criteria in the format shown in Figure 5. Each "SPK Supplement" will be dated and contain a "cover sheet" with instructions to designer on implementation. Normally, "routine" will be indicated for those changes that do not incur either re-design effort or schedule slippage; on rare occasions, "special" will be indicated for critical changes officially directed regardless of impact on stage of design. In addition, an "index supplement" will be issued with each "SPK supplement" to track previous and/or current changes to the same design criteria.

6.0. BASIC DESIGN CRITERIA PACKAGE. Upon notification from the COE PM, the District's Design Quality Assurance Section will transmit to the A-E a Basic Design Criteria Package. This package contains criteria that for the most part is generic to all designs. It includes such documents as the A-E Guide, Volumes 1, 2, and 3, Standard Details, the Seismic Design Manual (AFM 88-3, Chapter 13) and the Criteria and Standards for Air Force Construction (AFR 88-15) and several Engineer Technical Letters (ETL's). The A-E is requested not to re-request these documents unless absolutely necessary.

7.0. CRITERIA INDEX

7.1. The information that follows has been organized to facilitate the A-E's search for applicable criteria and the subsequent ordering of that criteria through the COE PM. The following pages contain:

a. DISCIPLINE/SUBJECT LISTING OF CRITERIA. To aid in your search for applicable criteria, this list has been developed with subjects presented in alphabetical order under each major discipline category. Please note that duplicative references to certain criteria may occur from discipline to discipline. Pay close attention to the remarks column. It will tell you if the document is not available from (N.A.F.) the COE.

b. NUMERICAL CRITERIA INDEX. This can be used as an "order form" simply by making a copy and circling the required documents. This list only contains those documents most frequently requested, therefore the A-E may find it necessary to add document numbers to this list. 7.2. All of the above shall be thoroughly examined by the A-E to make certain that all applicable criteria is utilized and adhered to. For guide specification lists the A-E is directed to Volume 3 of the A-E Guide.

"When all else fails,, read the instructions."

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DISCIPLINE/SUBJECT CRITERIA INDEX

CIVIL

SUBJECT	TITLE	CRITERIA REFERENCE NO.	REMARKS
ARMS RANGES	Arms Range, Small Arms	AFM 50-25	
AIRFIELDS			
Design, General	Airfield Design, General Provisions	TM 5-824-1/ AFM 88-6, Chap. 1	
Design, Flexible	Airfield Design, Flexible	TM 5-825.2/ AFM 88-6, Chap. 2	
Pavement Evaluation	Airfield Pavement Evaluation, Flexible	TM 5-827-2/ AFM 88-24, Chap. 2	
Pavement Evaluation	Airfield Pavement Evaluation, Rigid	TM 5-827-3/ AFM 88-24, Chap. 3	
Pavement Marking	Airfield Pavements, Marking	AFR 88-16	
BACKFILL	Backfill for Subsurface Structures	TM 5-818-4/ AFM 88-5, Chap. 5	
CONCRETE			
Standard Practice	Concrete, Standard Practices for Military Structures	TM 5-805-1/ AFM 88-3, Chap. 6	
Floor Slabs, heavy loads	Concrete Floor Slabs on Grade Subjected to Heavy Loads	TM 5-809-12/ AFM 88-3, Chap. 15	
DEWATERING, GROUNDWATER CONTROL	Dewatering and Groundwater Control for Deep Excavations	TM 5-818-5/ AFM 88-5, Chap. 6	
DRAINAGE			
Drainage, Grading	Drainage and Grading	AFR 88-15, Chap. 2, Sec. A & B	
Surface	Drainage, Surface, for Airfields and Heliports.	TM 5-820-1/ AFM 88-5, Chap. 1	
Subsurface	Drainage and Erosion Control Subsurface Drainage Facilities for Airfield Pavements	TM 5-820-2/ AFM 88-5, Chap. 2	
Structures	Drainage and Erosion Control Structures for Airfields and Heliports	TM 5-820-3/ AFM 88-5, Chap. 3	
Areas other than Airfields	Drainage, Areas other than Airfields	TM 5-820-4/ AFM 88-5, Chap. 4	
ENVIRONMENTAL			
	Environmental Impact	DA PAM 200-1/ AR 200-1	
	Environmental Quality	AR 200-1	
FACILITIES	Facility Requirements, Standard	AFM 86-2	

FENCE	Fence and Details Ty. FE-5, FE-6, FE-7	CEGS-02444 Dwg. # 40-16-08	
FIRE PROTECTION	Fire, Protection for Facilities	MIL-Handbook-1008	
FOUNDATIONS			
Procedures	Foundation Design, Procedures For	TM 5-818-1	
Expansive Soils	Foundations in Expansive Soils	TM 5-818-7	
GROUTING	Grouting Methods and Equipment	TM 5-818-6/ AFM 88-32	
HAZARDOUS WASTE			
Disposal/Treatment	Harzardous Waste Land Disposal/ Land Treatment Facilities	TM 5-814-7	
INSTALLATION DESIGN	Installation Design	TM 5-803-5/ AFM 88-43	
LANDSCAPING			
Ground Cover	Landscaping, Establishment of Herbaceous Ground Cover	TM 5-830-2/ AFM 88-17, Chap. 2	
Planting	Installation Design	TM 5-803-5/ AFM 88-43	
Dust Control	Landscaping, Dust Control	TM 5-830-3/ AFM 88-17, Chap. 3	
Planting Trees,	Landscaping, Planting and Maintenance	TM 5-830-4/ AFM 88-17, Chap. 4	Some bases have lists of trees shrubs, etc. suitable for their climate. Contact the PM for the appropriate list.
PARKING			
Non organizational vehicle	Installation Design	TM 5-803-5/ AFM 88-43	
Handicapped	Uniform Federal Accessibility Standards (UFAS)	UFAS	
PAVEMENT DESIGN			
Frost	Pavement Design - Seasonal Frost Conditions	TM 5-818-2/ AFM 88-6, Chap. 4	
PAVEMENT EVALUATION			
Frost	Pavement Evaluation, Frost Conditions	TM 5-818-3/ AFM 88-24, Chap. 4	

PAVEMENTS

General Provisions	General Provisions and Geometric Design for Roads, Streets, Walks, and Open storage areas	TM 5-822-2/ AFM 88-7, Chap. 5
Soil Stabilization	Pavements, Soil Stabilization, for Road/Streets	TM 5-822-4/ AFM 88-7, Chap. 4
Flexible Pavements	Flexible Pavements for Roads, Streets, Walks, and Open Storage Areas	TM 5-822-5/ AFM 88-7, Chap. 3
Rigid Pavements	Rigid Pavements for Roads, Streets, Walks, and Open Storage Areas	TM 5-822-6/ AFM 88-7, Chap. 1
Concrete	Standard Practice for Concrete Pavements	TM 5-822-7/ AFM 88-6, Chap. 8
Bituminous	Standard Practice for Bituminous Pavements	TM 5-822-8/ AFM 88-6, Chap. 9
Flexible, Airfields	Flexible Pavement Design for Airfields	TM 5-825-2/ AFM 88-6, Chap. 2
Rigid, Airfields	Rigid Pavement for Airfields	TM 5-825-3/ AFM 88-6, Chap. 3

PEST CONTROL

Pest Control Facilities	MIL - HDBK - 1028/8
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PLANNING

Airfields	Airfield Design, General Provisions	TM 5-824-1/ AFM 88-6, Chap. 1
Master	Principles and Procedures, Planning Guide	TM 5-803-1
Airfield and Heliport	Planning, Airfields and Heliport	TM 5-803-10/ AFR 88-33
	Airfield and Heliport Planning Criteria	TM 5-803-7/ AFR 86-14
Sports	Planning and Design of Outdoor Sports Facilities	TM 5-803-10/ AFR 88-33
Children's Play	Children's Play Areas and Equipment	TM 5-803-11/ AFM 88-30
	Recreation Facilities	
Master, Air Base	Master Air Base Planning	AFM 86-6
Airfield	Airfield and Airspace Planning	AFM 86-8

RAILROADS

Railroad Design and Construction at Army and Air Force Installations	TM 5-850-2/ AFM 88-7, Ch. 2
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SAFETY

Safety and Health Requirements	EM 385-1-1
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SEWAGE

	Criteria and Standards for Air Force Construction	AFR 88-15, Chap. 2, Sec. C
Gravity	Sanitary and Industrial Wastewater Collection - Gravity Sewers and Appurtenances	TM 5-814-1/ AFM 88-11, Vol 1; AFR 88-15, Sec. E&F
Force Mains	Sanitary and Industrial Wastewater Collection - Pumping Stations and Force Mains	TM 5-814-2/ AFM 88-11, Vol. 2; AFR 88-15. Chap. 15, Sec. E&F

Treatment	Domestic Wastewater Treatment	TM 5-814-3/ AFM 88-11, Chap. 3, AFR 88-15, Chap. 15, Sec. G	
SIGNAGE			
	Department of the Air Force sign standards Manual on Uniform Traffic Control Devices for Streets & Highways	AFP 88-40	N.A.F. COE
SOLID WASTES			
General Considerations	Criteria and Standards for Air Force Construction	AFR 88-15, Ch. 15, Sec. G	
Incineration	Sanitary Engineering, Incinerators	TM 5-814-4/AFM 88-11, Chap. 4	
Sanitary Landfill	Sanitary Landfill	TM 5-814-5/ASCE Man. No. 39	
STANDARD DETAILS			
	Standard Details for Utilities, Foundations, Paving, and Railroads	COE, Sacramento District	
SURVEYING & MAPPING			
	Sacramento District Design Manual for Surveying & Mapping	DM 4-805-10	
SYMBOLS			
Legends for Drawings	Standard Details for Utilities, Foundations, Paving and Railroads	COE, Sacramento District	
TIE DOWN ANCHOR AND GROUNDING ROD			
	For Aircraft Aprons	CEGS-02611	
TRAFFIC			
Design	Traffic Engineering for Better Signs and Markings	MTMC Pam 55-14	N.A.F. COE
Design	Traffic Engineering for Better Roads	MTMC Pam 55-10	N.A.F. COE
Design	Mastering Traffic Engineering	MTMC Pam 55-16 Vol. III	N.A.F. COE
US RESERVE FORCES			
Facilities Criteria	Design Guide for US Army Reserve Reserve Facilities	DG 1110-3-107	Army & Air Force
Utility, Services and siting	Criteria and Standards for Air Force Construction	AFR 88-15, Chap. 2, Sec. D	
WATER			
General	Water Supply, General Considerations	TM 5-813-1/ AFM 88-10, Chap. 1	
Pollution			

Distribution	Water Supply, Water Distribution Systems	TM 5-813-5/ AFM 88-10, Chap. 5	
Sources	Water Supply, Water Sources	TM 5-813-2/ AFM 88-10, Chap. 2	
Storage	Water Supply, Water Storage	TM 5-813-4/ AFM 88-10, Chap. 4	
Supply	Criteria and Standards for Air Force Construction	AFR 88-15, Chap. 15, Sec. C	Air Force only. Provides guidance in materials selection for
<b>Water</b>			
Supply for Fire Protection	Water Supply for Fire Protection	TM 5-813-6/ AFM 88-10, Chap. 6	Supply Treatment and Distribution facilities Prescribes Water Supply requirements for fire protection at Army and Air Force Installations
Special Projects	Water Supply for Special Projects	TM 5-813-7/ AFM 88-10, Chap. 7	For anti-aircraft tactical sites, including family housing, Air Control and Warning Stations and
<b>Reserve</b>			
Treatment	Water Treatment Plant Design Water Supply, Water Treatment	ASCE Manual TM 5-813-3/ AFM 88-10, Vol. 3	Centers N.A.F. COE
<b>WELLS</b>			
	Groundwater Standard for Deep Wells Manual of Water Well Construction Practices Water Well Standards	AWWA Manual No. M21 AWWA Standard A100 EPA Manual 570/9-75 -001 State of California Bulletin 74	N.A.F. COE N.A.F. COE N.A.F. COE N.A.F. COE

ARCHITECTURAL

SUBJECT	TITLE	CRITERIA REFERENCE NO.	REMARKS
GENERAL	Criteria and Standards for Air Force Construction	AFR 88-15	
	Design Criteria/Architectural and Engineering Instructions	AEI w/chge 1	Use also on AF jobs where AFR 88-15 is silent. Supplement to AEI
	Construction Criteria for Army Facilities	TM 5-800-1	
	Master Planning for Army Installations	AR 210-20	
	Military Construction Army Program Development	AR 415-15	
CAULKING AND SEALANTS	Caulking and Sealants	TM 5-805-6	
	Caulking and Sealants	CEGS-07920	
CHILD CARE	Joint Services Construction Criteria Document for Military Child Development Centers		
	Child Development Services	AR 608-10	
	Design Guide - Child Care Centers	DG 1110-3-140	
	Children's Play Areas and Equipment	TM 5-803-11	
CHEMICAL FALLOUT	Protection Against Chemical and Biological Agents and Radiological Fallout	TM 5-855-2	
CLEAN ROOMS	Criteria for Air Force Clean Facility Design and Construction	AFM 88-4, Chap. 5	
COLORS	Federal Standard Colors	Fed. Std. 595a	Order from General Services Administration, Washington D.C. 20406
COLOR SELECTION	Check with individual Installation for exterior colors		
COMMISSARIES	Decor Guide for Commissary Store Facilities	D-58 Cerl Technical Report	
COMMUNITY CENTERS	Site Planning - Community Centers	TM 5-803-6	

CONSTRUCTION TYPES	Criteria and Standards for Air Force Construction	AFR 88-15	
	Uniform Building Code	UBC	as modified by Mil-HDBK-1008
CONSOLIDATED FACILITIES	Space Planning Guide for TDA Consolidated Facilities	TM 5-841-2	
CONTINUING EDUCATION FACILITIES	Design Guide - Army Continuing Education System Centers	DG 1110-3-112	
COURIER STATIONS	Courier Station Design	TM 5-844-1	
DESIGN AND CONSTRUCTION MANAGEMENT	Design and Construction Management	AFR 89-1	
DINING FACILITIES	Decor Guide for Enlisted Personnel Dining Facilities	D-38 CERL Technical Data Series	
DOORS	Criteria and Standards for Air Force Construction	AFR 88-15	
	NFPA 80, 101		
	Steel Door Institute	SDI 100	N.A.F. COE
EXPLOSIVES STANDARDS	Explosives Safety Standards	AFR 127-100	
FIELD OFFICES	Design Guide - CID Field Offices	DG 1110-3-144	
FIRE AND SMOKE PARTITIONS	Criteria and Standards for Air Force Construction	AFR 88-15	
	Fire Protection for Facilities Engineering, Design and Construction	MIL-HDBK-1008	
	National Fire Protection Association	NFPA 101	N.A.F. COE
	Underwriters Laboratories (UL) Fire Resistance Directory		N.A.F. COE
FIRE AREA LIMITATION	UBC		UBC N.A.F. COE
FIRE PROTECTION	Criteria and Standards for Air Force Construction	AFR 88-15, Chap. 15-H	
	Fire Protection for Facilities Engineering, Design and Construction	MIL-HDBK-1008	

FIRE SEPARATION OF BUILDINGS	Criteria and Standards for Air Force Construction	AFR 88-15, Chap. 1	
	Fire Protection for Facilities Engineering, Design and Construction	MIL-HDBK-1008	
FLASHING, SHEET METAL	Architectural Sheet Metal Manual by Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)	SMACNA	N.A.F. COE
HANDICAPPED CRITERIA	Uniform Federal Accessibility Standards	UFAS	
HARDWARE, BUILDERS'	Builders Hardware Manufacturers Assoc.	BHMA	BHMA material N.A.F. COE
	Hardware, Builders'	CEGS-08700	Listed in A-E Guide Vol. 3 -Specs.
HEALTH FACILITIES	Design and Construction of Air Force Health Facilities	AFR 88-50	
	Army Health Facility Design	TM 5-838-2	
	Construction and Material Schedule for Military Medical and Dental Facilities	MIL-STD-1691a	
INSULATION	Criteria and Standards for Air Force Construction	AFR 88-15	
INTERIOR FINISHES	Criteria and Standards for Air Force Construction	AFR 88-15	
INTERIOR DESIGN	Statement-of-work for Comprehensive Interior Design Requirements	AFP 88-41	
	Comprehensive Interior Design Requirements	DTL 1110-4-20	
LIFE SAFETY	National Fire Protection Association	NFPA 101	
LAUNDRY PLANTS	Laundries and Dry-Cleaning Plants	TM 5-842-2	
MAINTENANCE FACILITIES	Space Planning guide for TOE Maintenance Facilities	TM 5-841-1	
MASONRY WALLS, 'U' VALUES	Masonry Wall "U" Values	DM 4-805-1	

MASTER PLANNING	Master Planning - Principles and Procedures	TM 5-803-1	
	The Overlay - Composite Method of Master Plan Preparation	TB ENG-353	
	Preparation of Master Plans by Negative Engraving and Type Overlay Techniques Including Samples of Master Planning Components	TB ENG-353-1	
MATERIALS OF CONSTRUCTION	Criteria and Standards for Air Force Construction	AFR 88-15	
MOBILE HOMES	Convertible Mobile Home Communities	TM 5-845-2	
	Procurement Manual for Mobile Home Community		One-Step "turnkey" contract
MUNITIONS PRODUCTION	Safety Regulation to Munitions Production Base Support Construction Program Projects	R 385-100	
MUSIC CENTERS	Design Guide - Music and Drama Centers	DG 1110-3-120	
NOISE	Noise and vibration Control for Mech. Equipment	TM 5-805-4/ AFM 88-37	
	Planning in the Noise Environment	TM 5-803-2	
NUCLEAR EFFECT	Designing Facilities to Resist Nuclear Weapons Effects	TM 5-858-1	
OCCUPANCY CLASSIFICATION	NFPA	NFPA 101	
	Fire Protection for Facilities Engineering, Design and Construction	MIL-HDBK-1008	
OCCUPATIONAL SAFETY AND HEALTH	Safety and Health Requirements Manual	EM 385-1-1	
	OSHA		
	General Industry Standards		
OFFICERS CLUB	Design Guide - Commissioned and Non-Commissioned Officers Club	DG 1110-3-134	
PAINT	Paints and Protective Coatings	TM 5-618	
PETROLEUM FACILITIES	Petroleum Fuel Facilities	NAVFAC DM-22	
	Petroleum Fuel Facilities	DM 4-805-9	

PHYSICAL FITNESS CENTER	Design Guide - Physical Fitness Centers	DG 1110-3-128	
PHYSICAL SECURITY	Security, Air Physical Security Program	AFR 207-1	
	Physical Security of Arms Ammunition and Explosives	AR 190-11	
	Physical Security of Sensitive Conventional Arms Ammunition and Explosives	DOD 5100,76-M	
PORTS	Engineering and Design of Military Ports	TM 5-805-9	
POWER PLANTS	Power Plant Acoustics	TM 5-800-3	
PROTECTIVE DESIGN	Fundamentals of Protective Design	TM 5-855-1	
RAISED FLOORS	Raised Floor Systems	TM 5-805-13	
RANGE COMPLEXES	Design Information for Multi-purpose Range Complex (Light Infantry)	HNDM 1110-1-8	
RECREATION FACILITIES	Planning Design of Outdoor Sports Facilities	TM 5-803-10	
	Design of Recreation Areas and Facilities - Access and Circulation	EM 1110-2-410	
	Design Guide - Recreation Centers	DG 1110-3-132	
	Outdoor Recreation Facilities	TM 5-803-12	
RESERVE FACILITIES	Design Guide - U.S. Army Reserve Facilities	DG 1110-3-107	
ROOFING DESIGN	Criteria and Standards for Air Force Construction	AFR 88-15	
	Built-up Roofing	SPK 7-A	Listed in A-E Guide Vol. 3-Specs.
	Roof Deck Systems	TM 5-805-3	
	Roofing Design	TM 5-805-14	
	Metal Roofing and Siding	TM 5-809-8/ AFM 88-3, Chap. 8	
SAFETY	Safety and Health Requirements	EM 385-1-1	

SECURITY	Physical Security	NAVFAC DM 13.1	
	Designing for Security	TM 5-853-1	
SERVICE SCHOOLS	Space and Planning Criteria for US Army Service Schools	TM 5-843-1	
	Design Guide - US Army Service Schools	DG 1110-3-106	
SIGN STANDARDS	Sign Standards	AFP 88-40	
STORAGE DEPOTS	Storage Depots	TM 5-840-2	
SWIMMING POOLS	Occupational and Environmental Health Swimming Pools and Bathing Facilities	TB MED-575	
TEMPEST SHIELDING	Tempest/EMP Shielding	DM 4-805-4	
UNACCOMPANIED ENLISTED PERSONNEL HOUSING	Enlisted Dormitory Design Guide		specify Air Force
WIND	Design Criteria for Facilities in Areas Subject to Typhoons and Hurricanes	TM 5-809-11	
X-RAYS	X-Ray Shielding	TM 5-805-12	
	Diagnostic X-Ray, etc. Protection	TB MED-62	
VAULTS	Vaults, Arms Storage and Secure Storage Areas	DM 4-805-2	

STRUCTURAL

SUBJECT	TITLE	CRITERIA REFERENCE	NO.	REMARKS
GENERAL DESIGN STRUCTURE	Seismic Design for Buildings		TM 5-809-10/ AFM 88-3, Chap. 13	
	Seismic Design Guidelines for Essential Buildings		TM 5-809-10-1/ AFM 88-3, Chap. 13, Sec A	
	Seismic Upgrading Existing Building		TM 5-809-10-2/ AFM 88-3, Chap. 13.2	Draft Edition Only
	Structures to Resist the Effects of Accidental Explosion		TM 5-1300/AFM 88-3,	Available on loan basis
	Fundamental of Protective Design		TM 5-855-1	Non-nuclear
	Protection Against Chemical and Biological Agents and Radiological Fallout		TM 5-855-2	
	Explosive Safety Standards		AFR 127-100	
	Vaults, Arms storage and secure storage areas		DM 4-805-2	
	Load Assumptions for Buildings		TM 5-809-1/ AFM 88-3, Chap. 1	Live, lateral, wind and snow loads. Frost penetration determination
	Structural Design - Thin-Shell Construction		TM 5-809-9/ AFM 88-3, Chap. 12	
	Structural Design - Structures other than Buildings		TM 5-809-6	
	Working Stresses for Structural Design		EM 110-1-2101	
	Physical Security		NAVFAC DM 13.1	
	FOUNDATION AND SOIL	Procedures for Foundation Design of Buildings and Other Structures (Except Hydraulic Structures)		TM 5-818-1/ AFM 88-3, Chap. 7
	Standard Details for Utilities, Foundations, Paving and Railroads		C.O.E. Sacramento District	See Plates F1 through F12.
	Foundation in Expansive Soils		TM 5-818-7	

CONCRETE	Concrete Structural Design for Buildings	TM 5-809-2/ AFM 88-3, Chap. 2	Also see TM 5-809-10
	Building Code Requirements for Reinforced Concrete	ACI 318	N.A.F. COE Also see TM 5-809-10
	ACI Detailing Manual	SP-66	N.A.F. COE Also, see COE Standard Details. Sacramento District
	Concrete Floor Slabs on Grade Subjected to Heavy Loads	TM 5-809-12/ AFM 88-3, Chap. 15	
	Design Manual for Composite Decks, from Deck, and Roof Decks	Steel Deck Institute	N.A.F. COE
	Standard Practice for Concrete Military Structures	TM 5-805-1/ AFM 88-3, Chap. 6	
	Design Handbook, Precast and Prestressed Concrete	Prestressed Concrete Institute	N.A.F. COE
	Retaining Walls	EM 1110-2-2502	Also see ACI 318
	Grouting Methods and Equipment	TM 5-818-6/ AFM 88-32	
	MASONRY	Masonry Structural Design for Buildings	TM 5-809-3/ AFM 88-3, Chap . 3
Reinforced Masonry Engineering Handbook		Masonry Institute of America	N.A.F. COE
STEEL	Manual of Steel Construction	AISC	N.A.F. COE Also, see TM 5-809-10
	Steel and Aluminum, Structural Design for Buildings	TM 5-809-4/ AFM 88-3, Chap. 4	Also see SDI Design Manual for Steel Deck.
	Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders	Steel Joist Institute	N.A.F. COE
	Welding: Design, Procedures and Inspection	TM 5-805-7/ AFM 88-4, Chap. 7	
	Structural Welding Code - Steel	AWS D1.1	N.A.F. COE
	Structural Welding Code - Reinforcing Steel	AWS D1.4	N.A.F. COE
	Code-Formed Steel Design Manual	AISI	N.A.F. COE Also, see TM 5-809-10

WOOD	Wood Structural Design for Buildings	TM 5-809-5/ AFM 88-3, Chap. 5	
MISCELLANEOUS	Raised Floor System	TM 5-805-13/ AFM 88-4, Chap. 9	
	Metal Building Systems Manual	MBMA	N.A.F. COE
	Metal Roofing and Siding	TM 5-809-8/ AFM 88-3, Chap. 8	

MECHANICAL

SUBJECT	TITLE	CRITERIA REFERENCE	NO.	REMARKS
FIRE PROTECTION	Policy and General Standards Mechanical Fire Protection		AFM 88-15, Chaps. 1 & 15, Sec. H	
	Military Handbook. Fire Protection for Facilities Engineering, Design, and Construction		MIL-HDBK-1008	
	Mechanical Standard Details		COE, Sacramento District	
HEATING, VENTILATING &  15	Mechanical; Air Conditioning, Mechanical Ventilation		AFR 88-15, Chap. 15, I & J	
	Air Conditioning, Evaporative Cooling, Dehumidification, Mec. Ventilation and Refrigeration.		AEI w/chge 1	
	High Temperature Water Heating Systems		TM 5-810-2/ AFR 88-28	
	Mechanical Design; Heating, Ventilating, and Air Conditioning		TM 5-810-1	
	Heating Criteria and Mechanical Equipment		AEI w/chge 1	
	Engineering Weather Data		TM 5-785/ AFM 88-29/P-89	
	ASHRAE Guides			As Directed by AFR 88- & AEI
Publication	Mechanical Standard Details		COE, Sacramento District	
	American Conference of Government Industrial Hygienist Manual			Special Ventilation applications such as Exhaust Hoods, Paint Spray Booths, Toxic Vapors, etc.
	Mechanical Refrigeration and Ventilation in Cold Storage Facilities		TM 5-810-3/ AFM 88-8, Chap. 2	N.A.F. COE
PLUMBING	Plumbing. Domestic Wastes. Industrial Wastes		AFR 88-15, Chap. 15, Sec. D, E, & F	
	Criteria for Plumbing Equipment		AEI w/chge 1	

National Standard Plumbing Code		Latest Edition. Army & Air Force. N.A.F. COE
Plumbing	TM 5-810-5/ AFM 88-8, Chap. 4	
Federal Specification Plumbing Fixtures (Land Use) (General Specifications)	WW-P-541	Document N.A.F. COE
Non Industrial Gas Piping Systems	TM 5-810-6/ AFM 88-8, Chap. 5	
Gas Distribution	TM 5-848-1/ AFM 88-12, Chap. 4	
High Pressure Gas and Cryogenic System	TM 5-810-7/ AFM 88-10, Vol 3	
Compressed Air	TM 5-810-4/ AFM 88-8, Ch. 3	
Water Supply; Water Storage	TM 5-813-4	
Water Supply; Water Supply for Fire	TM 5-813-6	
Sanitary Engineering Incinerators	TM 5-814-4	
Mechanical Standard Details	COE, Sacramento District U-45 (AF) U-46 (Army)	Rainfall Intensity Tables
Mechanical Standard Details	COE, Sacramento District	
Ashrae Book of Fundamentals		N.A.F. COE Legend and Symbols
HEALTH AND MEDICAL FACILITIES	Criteria for Design and Construction of Air Force Health Facilities	AFM 88-50
will		Includes Hospitals and Dental Clinics, etc. Additional criteria be provided on a per project basis.
Army Health Facility Design	TM 5-838-2	See Remark Above
Mechanical Standard Details	COE, Sacramento District	
Plumbing, Hospital	CEGS-15410	Listed in A-E Guide, Vol 3 - Specifications

ENERGY CONSERVATION analysis	Policy and General Standards.  Mechanical	AFR 88-15, Chap. 1 & 15	Include economic  (LCCA-Life Cycle Cost Analysis), ECIP (Energy Conservation Investment Program), EBF (Energy Budget Figure) etc.
	Energy Conservation	AEI w/chge 1	Same as above
ENERGY BUDGET CALCS	Building Design Energy Budgets	TM 5-810-1 App, "F".	
a	Energy Monitoring and Control Systems	TM 5-815-2/  AFM 88-36	Additional guidance on  Project Case Basis
	Mechanical Design; Heating, Ventilating and Air Conditioning - Energy Conservation	TM 5-810-1	
PETROLEUM & FUEL FACILITIES	Air Force Petroleum Fuel Facilities	DM 4-805-9	Sacramento District Design Manual. Developed from NAVFAC DM-22. See ETL 84-3
for			AF.
	Handling Aircraft and Automotive Fuels	TM 5-848-2	
	Ground Storage of Coal	TM 5-848-3	
SOLAR ENERGY	Mechanical Design Heating, Ventilating and Air-Conditioning	TM 5-810-1, Appendix H	
	Solar Energy Systems	TM 5-804-2	
	Solar Applications	ETL 86-14	
OCCUPATIONAL SAFETY AND HEALTH	Life Safety Code Handbook	NFPA 101	Most Stringent Criteria Governs NFPA 101 & OSHA Standards N.A.F. COE
	OSHA, General Industry Standards		
	AFOSH Standards Safety and Health Requirements	AFOSH 127-66 EM 385-1-1	N.A.F. COE
MISCELLANEOUS ITEMS; MECHANICAL & OTHERS			
Seismic Protection	Seismic Design for Buildings	TM 5-809-10/ AFM 88-3, Chap. 13	
	Seismic Design Guidelines For Essential Buildings	TM-809-10-1/ AFM 88-3, Ch. 13, Sect. A	
	Seismic Protection for Mechanical, Electrical Equipment	CEGS-15200	Listed in A-E Guide, Vol 3 - Specifications

Pollution	Air Pollution Control for Boilers and Incinerator	TM 5-815-1/ AFR 19-6	
UEPH (Barracks)	AF - Unaccompanied Enlisted Personnel Housing (UEPH)	AFR 88-15, Chap. 15, Sec. H	
	Barracks & BQ's	AEI w/chge 1	
	Enlisted Dormitory Design Guide,		Specify Air Force or Army
	HVAC Duct Construction Standards	SMACNA	Document N.A.F. COE
Noise/Acoustics	Power Plant Acoustics	TM 5-805-9/ AFM 88-20	
	Noise and Vibration Control for Mechanical Equipment	TM 5-805-4/ AFM 88-37 DM - 3.10	
	Uniform Federal Accessibility	UFAS	
Reserve Facilities	UFAS Reserve Facilities	AFR 88-15	
Family Housing	Family Housing Facilities Criteria	AEI w/chge 1	
	Family Housing Design	AFM 88-25	
be Kitchens and Dishwashing	Mechanical Design; Heating, Ventilation and Air Conditioning	TM 5-810-1, Chap. 4, Para 4.2.b.	Specific criteria will provided on a Project Case Basis Air Force: Use TM in conjunction with AFR 88-15, para 15-103, sub-para 3.b.
Dining Facilities	A/C, Mech., Vent., EC, & Dehum.	AFR 88-15, Chap. 15, Section I	
CHILD CARE	Joint Services Construction Criteria Document for Military Child Development Centers.		Document N.A.F. COE
TACTICAL VEHICLES MAINTENANCE FACILITY	Architectural and Engineering Instructions Tactical Vehicle Maintenance		N.A.F. COE

## ELECTRICAL

SUBJECT	TITLE	CRITERIA REFERENCE	NO.	REMARKS
AIRFIELD LIGHTING	Airfield & Airspace Criteria		AFM 86-8	
	Visual Air Navigation Facilities		AFM 88-14	
	FAA Runway and Taxiway Lighting System Guides		AC 150/5340-24	N.A.F. COE
BONDING GROUNDING ETC. FOR ELECTROMAGNETIC COMPATIBILITY	Bonding Grounding & Electrical Requirements for Electromagnetic Compatibility		Sam Tech Manual 80.3	N.A.F. COE
	Bonding, Electrical and Lighting Protection for Aerospace Systems		MIL-B-5087B (ASG)	N.A.F. COE
	Electromagnetic Compatibility & Grounding Requirements for Space System Facilities		Military Standards 1542	N.A.F. COE
	Grounding Bonding & Shielding for Common Long Haul/Tactical Comm. Systems		Military Standards 188-124A	N.A.F. COE
	Method of Insertion-Loss Measurement EMC Handbook Vol. 3		MIL-STD-220A	N.A.F. COE
	Grounding, Bonding & Shielding Vol. 1 & 2		MIL-HDBK-419	
COMMUNICATION SYSTEMS	Elect. Comm. Systems Engr., Inside Plant		TM 11-486-4	N.A.F. COE
	Elect. Comm. Systems Engr., Outside Plant wire		TM 11-486-5	N.A.F. COE
	AFCC Technical Bulletin on Building Cable and Duct Systems		TB 86-07-EZ	Available from 1842nd EEG/EEICS, Scott AFB, 62225-6348
IL				
IL	AFCC Tech. Bulletin on Local Area Network User Requirement		TB 85-02-EC	Available from 1842nd EEG/EEICS, Scott AFB, 62225-6348
	Analysis-PCR, Part I			62225-6348
IL	AFCC Tech. Bulletin on Local Area Network Dual Cable Broadband		TB 85-04-EC	Available from 1842nd EEG/EEICS, Scott AFB, 62225-6348
	Coaxial CAble Distribution System			62225-6348

11	AFCC Tech. Bulletin on Broadband Local Area Network, Preliminary Design	TB 85-07-EC	Available from 1842nd EEG/EEICS, Scott AFB,
	and Cost Estimating		62225-6348
	Telephone System-Prewire (SPK Prepared Guide Specification)	CEGS-16710 (Revise-Sep 1986)	Listed in A-E Guide Vol. 3 -
Specifications.			
CORROSION CONTROL	Cathodic Protection Design	AFM 88-45	
EMERGENCY/GENERATING SYSTEMS	Recommended Practice for Emergency & Standby Power Systems (Orange Book)	IEEE Standard 446	N.A.F. COE
	Motors and Generators	NEMA MG.1	N.A.F. COE
	Criteria & Standards for Air Force Construction	AFR 88-15, Chap. 16, Section B	
ENERGY MONITORING & CONTROL SYSTEMS (EMCS)	Energy Monitoring & Control Systems	TM 5-815-2/ AFM 88-36	
EXPLOSIVE SAFETY	Ordinance Safety Manual	DARCOM-R-385/100	N.A.F. COE
	Explosive Safety Standards	AFR 127-100	
	Ammunition & Explosive Standards	TM 9-1300-206	
EXTERIOR ELECTRICAL SYSTEMS	Electrical Power Supply & Distribution	TM 5-811-1/ AFM 88-9, Chap. 1	
	Criteria & Standards for Air Force Construction	AFR 88-15, Chap. 16, Section B	
FIRE ALARM SYSTEM & FIRE PROTECTION	Criteria & Standards for Air Force Construction	AFR 88-15, Chap. 16, Section A	
	Fire Protection for Facilities, Engineering, Design and Construction	MIL-HDBK-1008	
	Life Safety Code	NFPA 101	N.A.F. COE
GROUNDING	Recommended Practice for Grounding (Green Book)	IEEE Standard 142	N.A.F. COE
	Special Systems Grounding	DM 4-805-5	
	Guideline on Electrical Power for ADP Installation	FIPS Pub 94	N.A.F. COE

INTERIOR ELECTRICAL SYSTEMS	Interior Electrical System	TM 5-811-2/ AFM 88-9, Chap. 2	
	Criteria & Standards for Air Force Construction	AFR 88-15, Chap. 16, Section A	
	National Electrical Code	NFPA 70	N.A.F. COE
	OSHA Safety and Health Std., General Industry Standard	29 CFR Part 190	N.A.F. COE
	Recommended Practice for Elec. Power Dist. for Industrial Plants	IEEE Standard 141	N.A.F. COE
	Recommended Practice for Electrical Systems in Commercial Buildings	IEEE Standard 241	N.A.F. COE
	Recommended Practice for Protection & Co-ordination of Comm. & Ind. Power Systems	IEEE Standard 242	N.A.F. COE
	Recommended Practice for Power System Analysis (Brown Book)	IEEE Standard 399	N.A.F. COE
	Recommended Practice for Design of Reliable Power System (Gold Book)	IEEE Standard 493	N.A.F. COE
INTERIOR INTRUSION PROTECTION SYSTEM (J.SIIDS)	Installation, Operation & Checkout of J-SIIDS Intrusion Detection Systems	TM 5-6350-262-14/14 DM 4-805-6	
LIGHTING FIXTURES & LIGHTING	OCE Lighting Fixtures Standard	Standard DWG. No. 40-06-04	
	IES: Office (RP-1), Industrial (RP-7), Roadway (RP-8) & Sports (RP-6) Lighting Manuals	ANSI's	N.A.F. COE
	Illumination Calcs. by Zonal Cavity Method. IES Lighting Handbooks, Vol. I & II	1981 Vol. I & II	N.A.F. COE
LIGHTNING PROTECTION	Lightning & Static Electricity Protection	TM 5-811-3/ AFM 88-9, Chap. 3	
	Lightning Protection Code	NFPA-78	N.A.F. COE
MEDICAL FACILITIES	Army Health Facilities Design	TM 5-838-2	
	Medical/Dental Facilities	MIL-STD-1691A	
	Criteria for Design & Constr of Air Force Health Facilities	AFR 88-50	

	Standard for Health Care Facilities	NFPA-99	N.A.F. COE
	Recommended Practice for Electrical Systems in Health Care Facilities	IEEE Standard 603	N.A.F. COE
OVERHEAD ELECTRIC SUPPLY & COMMUNICATION	National Electrical Safety Code	ANSI C2	N.A.F. COE
	Rule for Overhead Elec Line Constr Gen. Ord. 95	G.O. 95	Use for Calif. Projects Only. N.A.F. COE
PHYSICALLY HANDICAPPED	Uniform Federal Accessibility Standards	UFAS	
RAISED FLOORS	Raised Floor System	TM 5-805-13/ AFM 88-4, Chap. 9	
SAFETY	Safety and Health Requirements	EM 385-1-1	
SECURITY	USAF Resources Protection Program	AFR 125-37	
	AF Physical Security Program	AFR 207-1	
	Construction for Secure Conference Rooms	AFP 88-26	
	Vaults, Arms, Storage & Secure Storage Areas	DM 4-805-2	
SEISMIC DESIGN	Seismic Design For Buildings	TM 5-809-10/ AFM 88-3, Chap. 13	Refer to Chapters on "Mechanical & Elements"
Electrical			
STATIC ELECTRICITY	Lightning & Static Electricity Protection	TM 5-811-3/ AFM 88-9, Chap. 3	
SYMBOLS	Graphic Symbols for Electricity & Electronics Diagrams	ANSI Y32.2	N.A.F. COE
	Graphic Symbols for Electrical & Wiring and Layout Diagrams	ANSI Y32.9	N.A.F. COE
TEMPEST (RED/BLACK CRITERIA)	Military Standardization Handbook Red/Black Engineer Installation Guidelines	MIL HDBK 232	Classified Material. A/E must have security clearance
	Tempest/EMP Shielding	DM 4-805-4	
TRAILER PARKS	Convertible Mobile Home Communities	TM 5-845-2	

UNDERGROUND ELEC SUPPLY  
& COMMUNICATIONS SYSTEMS

National Electrical Safety Code

ANSI C2

N.A.F. COE

Rules for Underground Electrical  
Line Construction

G.O. 128

For Calif Proj. only  
N.A.F. COE

USAF RESERVE FACILITIES

USAF Reserve Facilities

AFR 88-15

X-RAY & RF SHIELDING/EMP

Tempest/EMP Shielding

DM 4-805-4

Aerospace Medicine

AFM 161-38

NUMERICAL CRITERIA INDEX

The following is a partial list of frequently utilized criteria. When requesting project specified criteria from the COE Project Manager, the A-E designer shall furnish a similar numerical ordered list.

NUMBER	NUMBER	NUMBER	NUMBER
TM 5-618	TM 5-810-2	TM 5-818-7	TM 5-858-1
TM 5-785	(AFR 88-28	TM 5-820-1	TM 5-1300
TM 5-800-1	TM 5-810-3	(AFM 88-5, Ch 1)	TM 5-6350-262-14/14
TM 5-800-3	(AFM 88-8, Ch 2)	TM 5-820-2	TM 9-1300-206
TM 5-803-1	TM 5-810-4	(AFM 88-5, Ch 2)	TM 11-685
TM 5-802-1	(AFM 88-8, Ch 3)	TM 5-820-3	AFM 50-25
TM 5-803-2	TM 810-5	(AFM 88-5, Ch 3)	AFM 86-2
(AFM 19-10)	(AFR 88-8, Ch 4)	TM 5-820-4	AFM 86-6
TM 5-803-4	TM 5-810-6	(AFM 88-5, Ch 4)	AFM 86-8
TM 5-803-5	(AFM 88-8, Ch 5)	TM 5-822-2	AFM 88-4, Ch 5)
(AFM 88-43)	TM 5-810-7	(AFM 8807, Ch 5)	AFM 88-14
TM 5-803-6	(AFM 88-12, Ch 4)	TM 5-822-4	AFM 88-25
TM 5-803-7	TM 5-811-1	(AFM 8807, Ch 4)	AFM 88-45
(AFR 86-14)	(AFM 88-9, Ch 1)	TM 5-822-5	AFM 88-50
TM 5-803-10	TM 5-811-2	(AFM 8807, Ch 3)	AFP 88-40
(AFM 88-33)	(AFM 88-9, Ch 2)	TM 5-822-6	AFP 88-41
TM 5-803-11	TM 5-811-3	(AFM 8807, Ch 1)	AFR 88-15
(AFM 88-30)	(AFM 88-9, Ch 3)	TM 5-822-7	AFR 88-50
TM 5-803-12	TM 5-811-4	(AFM 88-6, Ch 8)	AFR 89-1
TM 5-804-2	(AFM 88-9, Ch 4)	TM 5-822-8	AFR 125-37
TM 5-805-1	TM 5-811-5	(AFM 88-6, Ch 9)	AFR 127-100
(AFM 88-3, Ch 6.)	TM 5-811-6	TM 5-822-9	AFR 207-1
TM 5-805-3	TM 5-811-7	TM 5-823-2	DG 1110-3-104
TM 5-805-4	TM 5-813-1	TM 5-823-3	DG 1110-3-106
(AFM 88-37)	(AFM 88-10, Ch 1)	TM 5-823-4	DG 1110-3-107
TM 5-805-6	TM 5-813-2	TM 5-824-1	DG 1110-3-112
(AFM 88-4, Ch 4)	(AFM 88-10, Ch 2)	(AFM 88-6, Ch 1)	DG 1110-3-119
TM 5-805-7	TM 5-813-3	TM 5-824-3	DG 1110-3-120
(AFM 88-4, Ch 7)	(AFM 88-10, Ch 3)	(AFM 88-6, Ch 3)	DG 1110-3-124
TM 5-805-9	TM 5-813-4	TM 5-824-4	DG 1110-3-126
TM 5-805-12	(AFM 88-10, Ch 4)	TM 5-825-2	DG 1110-3-128
TM 5-805-13	TM 5-813-5	(AFM 88-6, Ch 2)	DG 1110-3-132
(AFM 88-4, Ch)	(AFM 88-10, Ch 5)	TM 5-827-2	DG 1110-3-134
TM 5-805-14	TM 5-813-6	(AFM 88-24, Ch 2)	DG 1110-3-140
TM 5-807-7	(AFM 88-10, Ch 6)	TM 5-827-3	DG 1110-3-144
TM 5-807-10	TM 5-813-7	(AFM 88-24, Ch 3)	DG 1110-3-150
TM 5-809-1	(AFM 88-10, Ch 7)	TM 5-830-2	DM 4-805-1
(AFM 88-3, Ch 1)	TM 5-814-1	(AFM 88-17, Ch 2)	DM 4-805-1
TM 5-809-2	(AFM 88-11, Ch 1)	TM 5-830-3	DM 4-805-4
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TM 5-809-3	(AFM 88-11, Ch 2)	TM 5-830-4	DM 4-805-9
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(AFM 88-3, Ch 4)	TM 5-814-4	TM 5-840-2	EM 1110-2-410
TM 5-809-5	(AFM 88-11, Ch 4)	TM 5-841-1	EM 1110-2-501

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