

# MALMSTROM AFB



## DESIGN STANDARDS

1 Jan 00

**APPENDIX 3**  
**BASE DESIGN STANDARDS**  
**13 Dec 99**

1. ARCHITECTURAL AND STRUCTURAL:

a. General:

(1) The designers shall comply with all applicable codes in their selection of interior/exterior materials and finishes. Interior and exterior material selection shall also be based on aesthetics, functions/use, and maintainability. Provide complete color boards with recommended manufacturers' names, product numbers, color numbers and actual material samples. Design shall comply with the Base General Plan, Engineering Technical Letters (ETL's), Construction Technical Letters (CTL's), and design documents referenced herein. Unless otherwise noted, these design standards do not apply to Military Family Housing (MFH) projects. MFH projects designs shall be in compliance with all Air Force regulations including the Air Force Family Housing Design Guide, Base Housing Community Plan, Design Guide for Energy Efficient Revitalization and New Construction for Military Family Housing, and Base directives.

(2) Energy conservation will be achieved through the use of high "R" roof Insulation (R-38) and wall insulation (R-19), low "E" insulating glass windows in thermal break sash, insulated personnel doors with positive weather-stripping seal. Provide high efficiency mechanical/ventilation systems, rapid heat recovery systems and energy monitoring and control systems to be installed and connected to existing base system. Specify power ventilation systems in cold attic spaces, where equipment is installed, to reduce summer heat load. Roof overhangs must be utilized. Comply with all mandated energy conservation executive orders and DOD directives.

(3) Architect shall develop a minimum of two (2) architectural concepts with elevations for the facility. Enhanced computer renderings using digital photographs will be acceptable. Submittal schemes shall be subject to the review and approval of the user and base civil engineer.

(4) First floor in dorms including public restrooms, except mechanical rooms, shall be accessible to the physically handicapped, both adults and children.

(5) All project drawings will be Auto Cadd release 14 generated, word processing will be Microsoft Word 6.0 (**conversion from other software is not acceptable**); and spreadsheets will be Excel 5.0. If fonts or software other than standard Release 14 are used, the designer will provide a copy of the software with the bid documents. All specification sections, including mechanical and electrical, will be in the same font and style. Each final product drawing shall be functionally complete to include all layers, fonts, and menus. The designer is required to utilize AIA CAD layering guidelines. All project documents shall be submitted in electronic form (CD) ,

(6) Base Pass: All contractor personnel are required to have a base pass, which is obtained as directed by the Contracting Officer and as required by the base security police.

(7) Base Road Damage: For all projects having heavy truck equipment traffic include the following in the design:

(1) A designated haul/access route on the plans.

(2) Designated fenced staging area and fenced construction area.

(3) Staging and site areas shall be restored to original condition at the end of the construction contract.

(4) Specify load limits as follows shall apply to all contractor-operated equipment on Base:

April 1 to June 1	--	350 #/inch width of tire
All other times	--	400 #/inch width of tireb. Architectural:

b. Architectural:

(1) Signage: Interior and exterior signs will be provided in each new building project or renovation and be in accordance with Air Force Pamphlet 88-40, U.S. Air Force Sign Standards, AFP 32-1097, and Headquarters AFSPC guidance.

(2) Color: Base exterior paint, masonry, and metal siding colors shall be Antique Linen, federal standard color #23578, for main building, and Dark Brown, federal standard color #37056, for trim and standing seam metal roofs. Although the main building must be antique linen, the building base, window sills, lintels, horizontal banding, metal roof and other accents must be dark brown. All material colors used on exterior must be approved by the base civil engineer. Exterior paint materials shall be long life coatings consisting of baked-on factory finish where available, powder coatings, and/or 2 component modified polyurethane coatings as approved by the BCE. The above standards must be matched to retain uniformity across the base. Compliance with the Base Architectural Compatibility Design Guide is a mandatory requirement.

(3) Painted CMU is not acceptable as an interior wall finish, except in utility areas, as approved by the BCE. Finishes shall comply with the Base Architectural Compatibility Guide, and Facilities Excellence Guide, AFSPCH32-1004.

(4) Insulated windows and store fronts are to have ~~medium~~<sup>DARK</sup> bronze anodized aluminum frames and be of high commercial quality with thermal break, low "E" glazing, and screens for operating sash.

(5) New roof systems on existing and new buildings in the Base cantonment area shall be a standing seam metal system with baked on 20-year finish, Insulated with metal subdeck. Use Corps of Engineers guide specification CEGS 07416

(Oct 98) as revised by Malmstrom AFB (reference add-in pages, **Appendix 1**) and Air Force guidance as criteria for metal roof systems. New roof systems on existing and new buildings in other Base areas and where specifically approved, shall be fully adhered, single ply, fire rated EPDM, 60 mil thickness using ETL 90-8 Guide Specification as revised by Malmstrom AFB for EPDM Roofs. Reference **Appendix 2**. Design/warranty system shall be based on 90-mph wind uplift resistance. Insulation for both roof systems shall be polyisocyanurate rigid board applied in multiple layers. Specify minimum 5-year Contractor labor and material warranty and 20-year manufacturer's finish and labor, material, weathertightness warranty.

(6) Locksets shall be keyed to the Base's "Best/Falcon" lock System with a grand master, master key system. All Base facility locks shall be seven-pin equal to base standard lock system (Best/Falcon or equal). Specify type "A" keyway for the base facilities and type "M" keyway for MAF'S. Keying schedule shall be a submittal item in the construction contract. Specify contractor to provide bitting list. Contractor shall supply three (3) keys for each room lock set and ten (10) keys for each exterior entrance door. All exterior doors shall be keyed alike except for the mechanical room door, which shall be keyed to the base master key system.. Provide electronic card lock system (Tesa or approved equal) for all interior and exterior locking doors in dormitories except mechanical rooms, telephone rooms, and electrical panel rooms. Reference **Appendix 3**.

(7) Specify split face concrete masonry units be manufactured using 100% white cement to obtain specified standard base color (antique linen or dark brown).

(8) Ground mounted equipment such as transformers, A/C condensers, and dumpsters shall be located on concrete pads, away from public access, and fully screened from public view using approved materials to match exterior building finish and colors.

(9) Provide continuous bar style snow stops, with bases secured to the standing seam with nonpenetrating fasteners, on all eaves of metal roof system.

(10) Provide snow/ice melt heating cable system with GFI protected thermostatic controls in all gutters and downspouts on building. Connect downspouts to storm drain system. If storm drain connection is not possible, provide approved concrete splash blocks at downspout discharge. Layout of splash blocks shall provide positive drainage away from foundations for ten feet minimum.

(11) Seal all exterior split-faced CMU block surfaces using minimum two (2) coats of an approved siloxene or silicon waterproofing.

(12) Exterior personnel doors shall be designed with appropriate swing and with heavy duty hardware, stops, etc., to prevent damage from prevailing wind conditions.

c. Structural:

(1) Foundation: All new foundation systems will be designed based on geotechnical investigations of the site and shall be of reinforced concrete. Evaluation will include geotechnical testing to determine existing soils and foundation parameters. Since all areas of the base are susceptible to problems caused by expansive clays, consideration of this fact must be taken into account for all foundation, pavement and utility systems design. Foundations will extend below frost depth, typically six (6) feet below grade. Drilled pier and grade beam system has performed very well on the base and is the Base preferred system.

(2) Typical soil profile is montmorillonitic clays with moderate-to-severe shrink-and-swell potential with surface layer of wind blown sand occurring in isolated areas of the base. Sands range from 0 to approximately 10 feet thick. Bedrock is Kootenai Shale and occurs from about 40 feet to over 100 feet below surface. All areas of the base are susceptible to problems caused by expansive clays.

(3) Perched water varies throughout the base, from 2-3 feet to 10 feet or more below the surface.

(4) Sand Lenses: Sand lenses within the clay layers may contain perched water requiring water removal from footing/foundation work. Include provisions in the project documents for site dewatering and foundation drain systems tied to existing storm drainage system where available. If storm drain system is not available use sump pump. Provide for foundation system waterproofing in the project documents

(5) pH: Soil pH average 7.9 on the base.

(6) Resistivity: Soil resistivity averages 2,000 ohms/cubic centimeters.

## 2. CIVIL

a. General: Reference **Appendix 4** for Base Standard Construction Details.

(1) Pavements shall be designed for light vehicle traffic. Pavements trafficked by refuse or delivery trucks shall be designed for heavy vehicle traffic. Construct new parking lot and paved access road to standard design, with separation from the front of the building. Parking lots will allow for removal of snow and ice. Provide combination concrete curb and gutter around entire perimeter of parking lots and driveways.

(2) Rainfall design shall be based on a ten (10) year design storm.

(3) Contractor's activities are to be restricted to the area determined on plans as "construction limits."

(4) A project construction sign, conforming to current ETL guidance and Base Sign Drawing in **Appendix 4**, is required.

(5) Specify organic topsoil using COE guide specification approved by the base civil engineer specifically for Malmstrom AFB. Specify sod for all lawn areas. Hydroseeding and broadcast seeding methods are not acceptable for lawn areas but are acceptable for native grasses. Specify contractor shall maintain all existing seeded areas within the project construction limits through the entire construction period and shall maintain new sodded/seeded growth through two full cuttings.

(7) Storm water pollution prevention during construction must include Best Management Practice (BMP) methods and be in compliance with the Montana Department of Environmental Quality Sediment and Erosion Control Manual. These need to be addressed by the A-E during design.

b. Plumbing: Water line tap shall be performed while line is under pressure or contractor shall provide approved by-pass line to maintain line use. For building water supply, connect to existing base distribution system to meet functional design requirements.

(1) Potable water for base facilities is purchased from the adjoining city system. Water distribution system on base is government owned.

(2) Piping materials shall be as follows:

(a) Water Main and Service Lines: PVC , C900, Class 150 for lines 2 inch diameter and larger and soft copper (Type K) for lines less than 2 inches in diameter.

(b) Internal Plumbing: Rigid copper (Type L).

(3) Water Distribution System Plans: The piping pressure class is 150 psi for water distribution. Cast iron fittings shall be class 250. Valves shall isolate lines at the intersection of all branch and main lines. Services shall have a curb stop box and a corporation stop. Mains shall be considered as that part of the water system supplying fire hydrants. Mains are to be valved so that no more than 2 hydrants will be out of service due to a single break in the water distribution system. All interior water supply lines shall be copper in commercial and in residential facilities.

(a) Mains: Water distribution mains shall be looped and be of adequate size to satisfy both domestic and fire flow requirements. No mains shall be less than 6 inches in diameter. Dead ends up to 300 feet long are permitted if terminated by fire hydrants or flushing hydrants

(b) Flow Requirements: Total domestic requirements will be determined for average daily, peak daily and fire flow requirements. System design shall provide a minimum residual pressure of 20 psi at each fire hydrant. All plugs, caps, tees, bends, and hydrants on water mains and hydrant laterals shall be provided with reaction backing or movement prevented by attaching metal tie rods or clamps. Metal tie rods are not to be used on plastic pipe. Fire hydrant flow requirements must meet MIL Handbook 1008C, Chapter 5.

(c) Trenches: Water, sewer, storm drains, and gas mains and service connections to individual units shall not be installed in the same trench. In accordance with NFPA 24, water mains and branches shall have a minimum of 72 inches of earth cover.

(d) Fire Hydrants: Fire hydrants shall be UL listed, dry barrel type, either Kennedy (Guardian) or Centurian (Mueller). Install fire hydrants in accordance with MIL Handbook 1008C, Chapter 5, Paragraph 5.7.3.1. Fire hydrant spacing shall not be greater than 500 feet apart by paved road, with no dwelling unit more than 300 feet apart. Preference is to install hydrants at intersections whenever possible. Hydrant laterals shall be 6-inch minimum size, shall not exceed 50 feet in length, and shall have an underground shut-off valve with an adjustable valve box in each lateral within 10 feet of the hydrant. Hydrants shall have their pumper outlet (4-1/2") facing the street. Hydrants shall be located a minimum of 3 feet and not more than 7 feet from pavement, and shall not be located in sidewalks or where obstructed by parked vehicles, shrubbery, etc. Flow test and mark each hydrant in accordance with base standards, fire flow color code sheet (reference paragraph 6.b. and appendix 9).

(e) Curb and Corporation Stops: Provide each building with a separate curb stop in the grassed area between the back of the curb and the beginning edge of the sidewalk. Curb box shall be cast iron, Minneapolis pattern, and must be approved by the contracting officer. Corporation stops shall be double strapped with bronze saddles. Curb shall be bronze with Minneapolis top and copper flare connections.

(f) Cathodic Protection: Provide cathodic protection for all material subject to corrosion used in the utility distribution system. All fire hydrants and all ferrous metal underground utility components, including piping, valves, connections, sleeves, etc., shall be protected by a cathodic protection system.

(g) Streets, Driveways, Sidewalks, Bike Paths and Fences: The street system must provide convenient and safe access and circulation (including collections, deliveries, snow removal, and fire protection), within the housing area and should discourage through traffic. Street design shall conform to local and state criteria and the Air Force Family Housing Guide and manual on Uniform Traffic Control Devices for Streets and Highways published by the US Department of Transportation - Federal Highway Administration. All existing streets on the site do not meet the required

standards and must be upgraded as part of the construction if a similar roadway layout is used. Pavement design will be in accordance with current Air Force design manuals.

(1) Curbs and Gutters: Streets shall be provided with standard integral barrier concrete curbs and gutters. Minimum curb radii at intersections shall be 20 feet. Curbs shall be depressed at entrances to driveways; all gradients shall provide positive drainage (no ponding). Curbs and gutters shall be as shown in the Base construction standard details, **Appendix 4**.

(2) Sidewalks: Sidewalks should be a minimum of 5 feet wide. House walks and street walks shall be of non-reinforced concrete with a minimum nominal thickness of 4 inches and shall be poured over a minimum 4 inch compacted granular base course.

(3) Street Signs: Street name and traffic control signs shall be provided at all street intersections and shall conform to requirements of the Military Traffic Management Command (MTMC), PAM 55-14, AFP 88-40 and the manual of Uniform Traffic Control Devices for Streets and Highways. Street names will be provided by the contracting officer.

(4) Utility: All plastic or PVC piping systems shall include warning tape and #12 TW tracer wire installed per standard drawing for the specific utility.

### 3. MECHANICAL:

a. General: A licensed professional engineer shall design the site utilities.

(1) Design shall also conform to the Base Unique Mechanical Design Requirements listed in **Appendix 5** and current ETLs and CTL's.

(2) Energy Monitoring and Control System: The base has an Energy Management and Control System (EMCS). Mechanical system installation shall be compatible with this system and shall provide both monitoring and control of the utility systems. Provide complete connection to existing base system and interface to computer system in Building 471. This requires a fiber optic line to the nearest building with a working system FID. Specify direct digital controls be sole source from Staefa Control Systems.

(3) Provide meters for electricity, water, BTU for high temperature hot water meter output, and natural gas. Meters output signals shall be tied into EMCS.

(4) Operations and maintenance manuals (4 sets) shall be furnished for all mechanical and electrical equipment. Specify a lockable metal wall cabinet be provided in the mechanical room for storage of one (1) set of O & M manuals.

b. Safety Regulations: The contractor shall comply with all state and federal



c. OSHA, NIOSH, and EPA regulations.

d. Design Loads: All loads (i.e., seismic, wind, snow, etc). Design loads shall be based on occupancy Category 1, Table 1, ANSI A58.1-1982. Wind and snow loads shall also be in accordance with ANSI A58.1-1982. Wind loads shall be based on a design wind speed of 85 mph, exposure C. Roof snow load shall be based on a ground snow load of 30 PSF. The minimum roof live load is 30 PSF. Seismic design shall be in accordance with AFMAN 32 1149, for specified seismic zone. Structural design including wind and seismic must also meet the requirements of the current UBC and Air Force Directives (reference HQ AFSPC letter, Appendix 6) in place at the time of award of the project. Light poles and light-supporting structures shall be designed to withstand wind of 100 mph in accordance with IL-HKBK-1190. Reference drawings, Appendix 7. Specify force protection design requirements be incorporated on designated facilities IAW Interim Department of Defense Construction Standards. Reference Appendix 8.

e. Frost Depth: Frost depth for this area is 6 feet. Refer to Corps of Engineers' geotechnical report for superseding information.

f. Energy Budget Figure: The A-E shall determine and adhere to the energy budget figure IAW ETL 87-4 provide in design analysis.

g. Cathodic Protection: Provide for complete cathodic protection of underground metallic piping and structures, IAW ETL 91-6 and as follows:

(1) Apply cathodic protection on all buried or submerged ferrous piping, tanks, and related facilities. Under no circumstances will coated facilities be installed without cathodic protection. This requirement includes ferrous metals such as cast iron.

(2) All buried and submerged cast iron pipe joints will be bonded with number 4 A.W.G. insulated wire. Thermite wire connections must be coated.

(3) All cathodic protection designs must be based upon specific field tests made at the construction site. Tests should include soil resistivity and water conductivity. Resistivity surveys to be provided to base civil engineer with review packages.

(4) The cathodic protection design must be based on providing a protection potential to meet the requirements of NACE Standard RP-01-69 (revised). These specifications must not be a performance type, which requires the contractor to provide the design for approval, via submittal. The A-E will not be required to use a NACE accredited specialist.

h. Seismic protection will be required for all mechanical equipment in accordance with AFM 88-3, Chapter 13.

i. Water Requirements: Provide hot water to lavatories and janitor closets and to support areas requiring hot water. Water heaters shall be natural gas types. Investigate the use of instantaneous hot water heating devices for domestic water systems. Provide life cycle cost data in the design analysis to substantiate cost savings. Hot water temperature at lavatories shall not exceed 120 degrees F. Specify shutoff valves for hot and cold water at each fixture.

j. Existing Energy Source: The source of heat shall be high temperature hot water from the central heat plant for commercial/industrial areas and natural gas for housing and designated remote base facilities

k. Air Conditioning: Specify air conditioning be provided in all offices, administrative areas, and dormitory living areas in both new and renovated facilities.

l. Gas Service: Specify material be polyethylene plastic with plastic valves. Gas service, valves, and meters shall be installed in compliance with current national codes and gas standards.

m. Water Coolers: Provide refrigerated water coolers in corridors adjacent to toilet facilities.

#### 4. ELECTRICAL:

##### High Voltage Primary

12470/7200V 3ph 4 wire Y

##### Standardized feeder wire:

#2 Cu 15KV BICC Cables Unishield, 133% EPR  
High Voltage underground in Concrete Ductbank

##### Transformers:

3 phase Pad mounted  
Dead Front Construction  
12470 VAC Delta Connected Primary  
95 KV BIL minimum  
2 each 2-1/2 % taps above nominal and 2 each 2-1/2% taps below nominal  
maximum 65 degree C rise  
Oil drain, filler and level plugs w/ automatic pressure relief device  
Barriered high and low voltage compartments  
Over Voltage MOV Lightning arrestors  
Drywell CLE fuses at 150%  
High Voltage Loadbreak elbow bushings with bushing wells  
Loop Feed Feature

Copper Windings

4 hole blade secondary bushings

Pad-lockable door operating handle with pentahead security bolt.

Exterior color shall be Federal Spec #23578, antique linen, baked-on enamel.

Stencil KVA on exterior of transformer in 3" high, contrasting color.

Install a ground ring around transformer pad with 4 cu ground rods connected with 3/0 AWG cu wire.

Provide with external kilowatt-hour demand meter with necessary CT's and wiring connections

Transformers shall be screened in with same architectural treatment as building.

### **SECONDARY SERVICE**

600 volt copper cable in Schedule 40 PVC conduit in sand bed.

### **Meters**

Self contained w/ direct reading registers

Transformer rated

Factory assembled and tested to exclude dust

General Electric VM-64, Form 9S, 3-Stator, 120v, 4 wire, 3 phase, 13 jaw, Class 10, with type M-90 secondary reading, factory programmed, electronic demand register and 4 dial kilowatt-hour mechanical display or approved equal.

### **PANELBOARDS**

Dead front safety type branch panelboards

Anti-burn solderless pressure type lug connectors approved for copper conductors

Copper bus bars

Full size neutral bar

Heavy duty bolt on, quick make, quick break circuit breakers with toggle handles that indicates when tripped.

Engraved phenolic label on the exterior door

Circuit-directory located inside door

Rated for the Available Short Circuit Current and the Demand Current present

### **Conductors**

All copper, run in conduit.

Minimum size: #12

### **Lighting**

Use High efficiency electronic ballasted fluorescent fixtures where applicable.

Lighting levels shall be in accordance with IES standards.

Provide lights by all exterior doors.

At least one emergency light per room. For recessed fluorescent fixtures provide back-up emergency ballast.

### **Parking Lot Lighting**

Square, 35' non tapered, dark bronze anodized aluminum pole on circular concrete base. Reference **Appendix 7**.

Type 5, Cutoff Distribution

400 W HPS, 240 VAC Ballast

fusing at base of pole

Poles and brackets shall be rated to withstand winds up to 100 mph, with vibration dampers to control harmonics from 20 mph sustained winds.

Light and pole shall be grounded to a ground rod at the pole.

### **Engine Heater Plug-ins**

Provide 120V AC receptacles for engine heater plug-ins in parking lot. Each duplex receptacle shall be capable of supplying 1400 Watts. Receptacles shall be GFCI type.

### **Cathodic Protection**

Provide cathodic protection for all underground metallic structures. Provide necessary magnesium anodes, DC rectifier, and connections to metallic structures being protected.

### **FIRE ALARM**

Zoned, noncoded, addressable, microprocessor-based fire detection and alarm system

Single action pull stations

Analog addressable photoelectric smoke detectors for room detectors

Analog addressable ionization smoke detector for duct, with relay fan shutdown rated to interrupt fan motor-control circuit.

Class A wiring of initiating and notification circuits

NICET Level II Certification of Installers

Automatically route alarm, supervisory, and trouble signals to the base fire station via radio signal with a Monaco BT2-3 transmitter.

Alphanumeric Display provides descriptions and addresses of initiating devices, trouble signals, supervisory signals, monitoring actions, system and component status.

Flow switch and Sprinkler valve tamper switch monitoring.

Backup batteries with expected 10 yr life. Amp-hour capacity equivalent to 24 hours in normal mode plus 15 minutes of operation in alarm mode.

Alarm Wire: solid copper conductor minimum 16 AWG, plenum rated, red insulation, in metal raceway.

### **EMCS (Energy Management and Control System) Fiber Optic Cable**

Chromatic Technologies or approved equal

2 glass fibers, one orange coated, one blue coated

100 micrometer core diameter

140 micrometer cladding diameter

250 micrometer primary buffer tube outside diameter, one fiber per buffer tube  
900 micrometer secondary tight buffer tube  
kevlar central strength member  
rated minus 40 deg F. to 122 deg F.  
Maximum attenuation: 4 dB/km at 850 nanometers  
Minimum Bandwidth: 100 MHz/km  
Numerical Aperture: .29  
Maximum Installation Load: 1200N (270 lbs)  
Maximum operational Load: 500N (110 lbs)  
Minimum bending radius:  
    During installation: 14 cm  
    During operation: 7 cm  
Splices are not allowed.  
Fiber Optic Connectors (at the modem): Stainless steel Type II FSMA 906 with outside cladding diameter of 140 micrometers

## 5. WATER SUPPLY/WASTE WATER:

a. Water Supply: Water for the base is supplied by the city and is distributed throughout the base by the base-owned water distribution system. This facility shall connect to the nearest adequately sized water main. The new line shall be sized to meet fire protection and occupant usage. The system shall comply with the design requirements in MIL-HDBK 190 and applicable regulations and manuals.

Back-Flow Prevention Devices: As required by AFM 85-1 and IAW 87-5.

b. Wastewater Treatment: Sewage treatment for the base is supplied by the city. The facility shall connect to the nearest adequately sized sewer line.  
Projected Wastewater Discharge: The A-E shall determine the quantity of wastewater created and discharged by the facility. The new sewer lines will be designed to handle these requirements.

### c. Storm Drainage System:

(1) Existing Site Drainage: The A-E shall identify existing site drainage and provide collection system data to determine flow requirements. Verify adequacy of system. Upgrade and extend on-site drain system to existing base system to meet design requirements of the new facility.

(2) Design Precipitation: Follow AFM 88-5, Chapters 1-4, and applicable chapters in AFM 88-6, AFM 88-7, and AFM 86-8. Use local data for storm durations and intensities.

(3) Required Storm Detention Facilities: Investigate the need for storm water detention and provide as necessary. Specify contractor to obtain all required State and Federal permits prior to starting construction.

(4) Roof Leader Collection System: Provide rain water collection system for entire roof area and connect downspouts directly to new storm drainage system. Install heating cables with GFI protected thermostatic controls in gutters and downspouts.

(5) Foundation Drains: Investigate the need for a foundation drain system and provide if design conditions dictate. Foundation drains need to be connected to storm drain system.

(6) Grading and Drainage: Provide storm drainage in accordance with AFM 88-5, Chapter 4, Drainage for Areas Other Than Airfields. Storm drainage shall be done using 10-year storm frequency. Rainfall intensity shall be based on US Department of Commerce Weather Bureau data.

(a) Surface Storm Drainage: Provide drainage away from all buildings on all sides with a minimum slope of 8 inches in 10 feet, for a minimum of 30 feet.

(b) Minimum Size: Storm drains and main culverts shall have a minimum diameter of 15 inches. Lines from a field inlet or curb and gutter inlet to a manhole, minimum size is 12 inches.

(c) Aggressive Materials: Storm drainage material shall be PVC or RCP.

d. Sanitary Sewage System: Sanitary sewage system shall be designed and constructed in accordance with local codes and regulations and with AFM 88-11, Volume 1, Sanitary & Industrial Waste Water Collection, Gravity Sewers and Appurtenances. All sewage piping shall be PVC in accordance with ASTM-D-3034, type PSM, with a maximum SDR of 35, size 15 inches or less in diameter, with flexible elastomeric gasket joint in accordance with ASTM-D-3212.

(1) Sewer Laterals: Sewer lateral lines (connections from building sewer lines to main) shall be 4 inch minimum. Each unit shall have a separate sewer lateral line. Cleanouts shall be provided according to applicable codes. The minimum size of the collection line (sewer main) shall be 8 inches.

e. Lawn Sprinkler System: All landscaped areas shall be irrigated by an underground sprinkler system with automatic controls and connected to Base's Irrigation Management Control System (IMCS) main computer located in building 470. Systems to be water saving and state-of-the-art. System requires gravity drain for freeze protection. Provide drip irrigation system for landscaping. Add air hose connection to irrigation piping for winter maintenance/system evacuation.

f. Yard Hydrants: Provide freeze-proof yard hydrants on each side of the building, for grounds maintenance.

## 6. FIRE PROTECTION:

a. General: The A-E shall design the project in strict accordance with the requirements of MIL-HDBK 1190 and MIL HDBK 1008 (current edition), NFPA, Life Safety Code 101 (current edition), 1997 ed, Uniform Building Code Requirements 1997 ed, and supplemental base standards in Tab H-14. (Until the 2000 version of the Life Safety Code is published this year code will be used.)

b. Water supply for fire protection will be the base distribution system. Storage is adequate. Hydrant flow data to be provided by the base. Reference **Appendix 9** for fire hydrant colors. Hydrants shall be installed in accordance with MIL-HDBK 1008, Section 7 and testing shall be in accordance with NFPA 24, and local requirements. Written certification of flushing and flow test of the hydrants and sprinkler systems will be provided to the base plumbing and the base fire prevention office (341 CES/CEFT).

c. Facility construction will be in accordance with AFR 88-38. Facility fire extinguishers shall be provided for each construction project upon completion and be of size and rated as required by base requirements of 4A 60BC-10 lb. Type rated and fit extinguisher cabinets, size 8"x8"x28", full flat face glass in door, no locking hardware, extinguisher to sit on bottom of cabinet (no hanging brackets) and be of semi-recess or recess-type cabinet.

d. Most facilities require a fire alarm detection system. Requirements for these systems will be determined by the base fire prevention office as soon as the type of construction and occupancy type are determined. If a fire alarm detection system is required, addressable fire alarm panel and addressable detection devices shall be used. Alarm circuits shall be "Class A." Fire alarm pull stations will be installed at each exit to include mechanical rooms with minimum of two-pull stations per floor. Notification devices shall be audio-visual, horn/strobe type with adjustable dba taps and match the interior décor design of the facility. Otherwise, they shall be red in color. All fire alarm pull stations will be red with white lettering. The dba level of notification devices shall be not less than 100 dba. All fire alarm devices and panels shall meet Underwriters Laboratory (UL) requirements as listed in the UL Fire Protection Equipment Directory, Underwriters Laboratories dated 1998. All fire alarm, detection, and tamper switches shall be connected to the addressable fire alarm panel. The base fire prevention office will determine the number of zones required or approve zoning requirements before installation. All fire alarm system installation of any kind, NFPA Code 72, 1996 ed, shall be used. The fire alarm contractor must ensure fire alarm components are compatible and cross-listed by Underwriters Laboratories for use with each other.

e. Installation of fire alarm detection systems, fire protection suppression systems, and any of the components, the technician installing the equipment must be licensed in the state of Montana and hold the proper endorsement for such installation. The licensed and endorsements are as follows: SAF = Fire Alarms, SEF = Extinguishing Systems, and SAFS = Special Agent Fire Suppression Systems.

(1) A licensed journeyman electrician can install fire alarm systems and its components if the above endorsements are stamped on their license and factory trained or NICET II certified and factory trained in the installation of the fire alarm devices being installed. The installer must be NICET II certified and licensed with the state of Montana licensing program to inspect, test, and certify the operational condition of the system and make the connections to the system. All licenses, endorsements and NICET certifications must be presented to the contracting officers, the fire prevention office, and the company name and personnel names installing the system before work is to begin.

(2) All fire alarms, fire suppression, and special agent systems must be installed IAW the appropriate NFPA Code 13, 13A, 17, 17A, 24, 25, 72, 101 and any other reference mentioned in contract specification, recommendations, and construction drawings. Current licenses, endorsements, and NICET certifications must be on file with the Department of Commerce, Professional and Occupational Licensing Bureau, 11 North Jackson, P.O. Box 200513, Helena MT 59620-0513.

(3) All fire alarm and detection systems, fire suppression systems, special hazard fire detection and suppression systems will come with a five-year warranty and emergency recall service (respond within 45 minutes) for repair and service when notified.

f. The entire facility shall have an automatic sprinkler fire suppression system. Sprinkler heads in corridors shall be flush mounted and inconspicuous. Each dormitory/apartment facility shall also have a Dry Class I standpipe installed on each floor in the enclosed stairway with the 2 ½ inch (fire department stand thread) hose connection pointing up toward the direction of the next upper floor. Fire department connections for sprinkler and standpipe shall be mounted in the same location together on the facility and not separated at different location on the facility. Each connection shall be properly identified and marked IAW the proper NFPA Code.

g. The Malmstrom AFB Fire Prevention Office (341 CES/CEFT) must review and approve all fire alarm detection and sprinkler system designs proposed by the contractor before it is installed. A certified fire protection engineer must certify all fire sprinkler designs before review and approval by the fire prevention office.

h. Fire Department Response Time: Required within 9 minutes.

i. Alarm Systems: Provide a new Monaco D500, BT 2-3 or BT 2-4 automatic reporting system for reporting to fire department (Bldg 349). Transceiver shall transmit at 138.925 MHz with frequency modulation and minimum output of 4 watts or greater. Greater is recommended. System shall be design in accordance with MIL HDBK 1008 and NFPA 72 current edition. The audio/visual alarms shall be horn/strobe type for every facility and in each dormitory/apartment a horn/strobe shall be installed in each sleeping room as close as possible to the shower room as possible to ensure proper occupant notification.



j. Provide new fire alarms system from Monaco, Simplex, or Secutron, addressable type with LCD screen fire alarm system Class A type with Class A smoke detectors and other devices. Addressable fire alarm panel to be located at the front entryway of the facility assessable to fire alarm maintenance personnel and fire department personnel only. Fire alarm keys shall not be given to the facility manager; only to fire department and fire alarm maintenance personnel only. Other locations must be coordinated through the MAFB Fire Prevention Office. Fire alarm panels will not be installed or placed in mechanical rooms.

k. All new fire alarm panels shall be addressable types indicating location of pull stations, duct detectors, fire sprinkler systems, smoke/heat detectors, shall be connected to the facility fire alarm control panel. Dormitory smoke detectors are connected to the facility fire alarm system to indicate facility alarm activation when activated and if tampered with transmitting a fire alarm code to the fire department. ~~Smoke detectors are not required in dormitory corridors if facility is entirely sprinklered.~~ Smoke detectors are required in each dormitory/apartment sleeping room and connected to fire alarm panel as required herein.

*CORRIDORS, COMMON AREAS  
HEAT DETECTORS REQ'D IN CORRIDORS & MECH/ELECT ROOMS.*

l. ~~Heat detectors shall not be used in facilities that are completely sprinklered. The sprinkler head serves as the heat detector.~~ However, if used, fixed temperature electronic resetable type are to be used, not rate of rise. All smoke detectors installed in living quarters-type facilities shall be Class A addressable and connected to the facility addressable fire alarm panel to indicate activation or tampering (dorm/apartment facilities only) and will activate the facility fire alarm system.

m. Special Fire Suppression System Requirements:

(1) Means of Egress: Comply with NFPA Life Safety Code 101, 1997 edition and change to the 2000 edition when published.

(2) Fire Area Limitations: Comply with MIL-HDBK 1008B and Life Safety Code 101, 1997 ed and change to the 2000 edition when published.

(3) Firewalls, Partitions, and Draft Curtains: Comply with MIL HDBK 1008B, Life Safety Code 101, 1997 ed (change to the 2000 edition when published) and Uniform Building Code, 1997 ed.

(4) Emergency Lighting: Comply with Life Safety Code 101, 1997 ed and change to the 2000 edition when published.

(5) Finish Materials: Use of Class "C" interior finishes is not allowed. Public assembly facilities shall use all Class "A" interior finish materials. All other areas may use Class B interior finishes providing it meets the requirements of MIL HDBK 1008B and Life Safety Code 101, 1997 ed and change to the 2000 edition when published.

(6) Post-Indicator Sprinkler and Outside Screws & Yoke Valves: Outside screw and yoke valves shall be used on sprinkler system and be provided tamper switches tied to the fire alarm system.

(7) Provide lightning protection for designated buildings in accordance with NFPA 780, ETL 90-6 and AFI 32-1065.

## 7. MAINTAINABILITY:

a. Operating and maintenance manuals are to be prepared in accordance with ETL 89-2. Provide schematic diagrams (framed) for all systems.

b. Cathodic protection using the base impressed current system and sacrificial anodes shall be provided for all buried metallic structures and piping.

c. Particular attention shall be given to access for maintenance for mechanical and electrical equipment such as heating, ventilating, and air conditioning (HVAC) equipment, and access thereto.

d. HVAC control diagrams shall conform to ETL 83-1.

e. Specify lockable metal cabinet in each building mechanical room sized to store and secure one complete set of operating and maintenance manuals.

f. Specify contractor to provide an itemized list of all construction items/system warranties complete with warranty expiration dates for each item. Warranty data is to be included in the operating and maintenance manuals. List in submittal schedule.

g. Provide a "Systems Checklist" describing all tests and certifications required in the design for use during pre-final and final inspections.

## 8. COMMUNICATIONS/COMPUTER SYSTEMS:

a. Description of Base Telephone System: The base has a touch-tone system. Contact the base communications squadron for connection points to existing base system and for a copy of the current communication cable site plan.

b. A separate telephone room and separate electrical panel room shall be provided within the facility. There will be no electrical panels in the Telco room. Provide two 110v four-plex electrical receptacles to be located in the telephone room. Provide a 4'x8'x3/4" shellacked fire resistive plywood backboard to be installed in the telephone room.

c. Facilities shall be pre-wired to provide eight cable pairs to each duplex telephone receptacle from the telephone panel. Provide conduit from receptacles up to ceiling space. Conduit (3/4") from the telephone panel up to the ceiling shall also be provided. Plenum rated cable shall be used where required by NFPA standards. Provide level 5 LAN cable in designated location in each building.

d. Two 4-inch conduits shall be installed from building exterior into each telephone room to the existing pedestal or communications manhole as required.

e. EMCS: An underground fiber optic line must be run to the mechanical room of the nearest building that contains a working system FID. Contractor must verify signals at existing system FID.

(1) Fiber optics cable core diameter must be 100 micrometers. The cable outside diameter must be 140 micrometers. Each fiber shall be continuous with no factory or field splices.

(2) Ensure EMCS components including fiber optics connectors, EMCS temperature sensors and room sensors are compatible with base system.

#### 9. SPECIAL CONSTRUCTION CONSIDERATIONS:

a. Winter: The winter construction season starts in late October and generally extends through April. During this period, freezing temperatures and snow should be expected. Industry standards and specific guidelines shall be specified for the use of all temperature/weather sensitive materials (i.e., concrete, paint, etc).

b. Labor: Availability of skilled labor is not a problem for this area. Large product quantities and uncommon materials for projects may require local suppliers to put forth additional effort in obtaining materials to meet demand requirements.

c. Construction Permit: Contractor shall obtain an approved AF Form 103, Base Civil Engineering Work Clearance Request, from base civil engineering prior to starting construction work. Excavation must be coordinated so representatives from the communications squadron or telephone company will know 24 hours in advance that excavation is scheduled and approved.

d. Hand Digging: Digging within 3 feet of existing communication and electrical cables and existing natural gas lines is to be performed by hand digging until the cable or line is exposed along its length. When existing utilities are reburied, install a marker along the length that was uncovered at 12 inches below finished grade. The marker tape shall be a 5 mil, plastic tape no less than 3 inches wide, brightly colored, with lettering to identify what the buried utility is below it. A metalocator strip shall be a part of the marker tape. For abandoned utility lines, remove the old piping, standpipes, and valve boxes back to the main. Depths for buried utility lines shall be 30 inches for communications, 36 inches for electrical, and 42 inches for natural gas.

(1) Access to Communications Manhole or Handhole: No communications manhole or handhole shall be entered without first obtaining a fiber optic cable briefing. Upon request from the contractor, construction management will arrange for a briefing from the base communications officer.

(2) All repairs due to cable cuts on scope exchange cables shall be the responsibility of the contractor. Repair actions must be accomplished by the current scope exchange contractor and paid for and coordinated under this contract. Work to restore lost service must begin within 1 hour after the cut and must continue unceasingly until the job is completed, tested, and accepted.

e. Utility Outages: All utilities programmed to be interrupted during construction shall be coordinated with base civil engineering at least 10 days in advance of the outage and at a time convenient for the government. The "utility outage notice" will be completed by the contractor and submitted to the base construction management office for approval. No interruptions shall be made until an outage notice is approved and returned to the contractor. Utilities will include all overhead and underground utilities and road closures or partial closures.

f. Repair of Road Cuts: Asphaltic surface shall be completely in place within 10 days after the road is cut. During the time between backfilling and paving, a base course-driving surface shall be installed and maintained by the contractor.

g. 1354 Checklist: (Reference **Appendix 10** and CTL 88-2) The contractor will complete the property inventory checklist and submit it to base civil engineering construction management office 10 days prior to final inspection. The checklists will be delivered to the contractor at the pre-construction conference.

h. Safety Regulations: The contractor shall comply with all OSHA, NIOSH, and EPA regulations.

i. Base Pass: All contractor personnel are required to have a base pass, which is obtained as directed by the contracting officer.

j. Foundation Requirement: Severe soil movement associated with expansive clay requires special attention during structural design. Drilled pier and grade beam systems have performed very well on the base and should be used whenever possible.

l. Grounds Maintenance: The contractor shall be required to maintain all lawn and native grass areas within the confines of fenced construction and staging areas. Maintenance shall include mowing and trimming, to maintain 2'3" grass height, watering and fertilizer to maintain healthy growth and weed control for the entire construction period. Specify damaged lawn areas shall be replaced with sod. Damaged native

m. Government Furnished Equipment: It will be a design responsibility with base civil engineering's assistance to obtain a listing of government-furnished equipment from the using agency for which installation mountings, mechanical and electrical or other provisions shall be required.

## 10. COMPREHENSIVE INTERIOR DESIGN:

Each designated project shall receive a complete Comprehensive Interior Design (CID) and Structural Interior Design (SID). Reference **Appendix 11** guidance.

### a. General Requirements:

(1) The interior design shall provide a physically attractive environment in which the occupants can work and effectively communicate with co-workers. The design shall promote a sense of belonging and provide a feeling of comfort and convenience. Finishes and basic color schemes shall be selected to delineate the various areas. Carpet shall be used to tie various areas together and as a basis for all color schemes. Carpet shall be Class A fire resistive material with a smoke development rating of 400 or less and a flame spread of 0 to 25.

(2) Provide a complete list of CID furnishings and cost to the user at 35% design completion stage for purpose of establishing a funding requirement in the stock fund system.

b. Design Considerations: Color should be used to add interest and vitality to the facility. Accent color can do much to brighten up and add interest to an otherwise uninteresting area or surface. Accent colors can be introduced in the office and administrative areas by the use of a different color paint on one wall or by using vinyl wallcovering on one wall. Graphics can also be used to add interest and color in all common use areas, corridors, breakrooms, or lounges. The architect is responsible for developing all color and material selections that are a part of construction. The CID service shall include:

(1) Selection of furnishings authorized by a table of allowance and approved by the using agency/organization.

(2) Preparation of a furniture layout plan and furniture illustration sheet.

(3) Preparation of an itemized list of all furnishings, quantities required, source data, and cost.

(4) Preparation of color boards, colors and finishes schedule, and proposed graphics system. All interior finishes must be selected for low maintenance qualities and high resistance to damage.

c. Furniture: All furniture including chairs, tables, and vertical wall units should be selected to be scaled in proportion to the room size and available space.

d. Graphics and Signage: Signage includes building identification signs, room identification signs and numbers, direction signs, door name and card holders, and informational signs. Identification shall include but not be limited to offices, dorm rooms, conference rooms, toilet rooms, and facilities, lounge, stair, janitor, storage, and vending machine room. The interior design should consider the use of graphics, pictures and other decorative items to enhance the interior design.

e. Submittals: The A-E shall provide complete color boards for each area at the 95% design stage. The submittal shall include product samples, product color and finish schedule, manufacturer's part numbers and color numbers for each area, and proposed graphics and sketches showing suggested furniture, and equipment layouts in each area.

f. Landscape Design: The A-E shall also provide comprehensive landscape design services. The design objective is to provide an exterior environment which will integrate design (architectural and landscape) of the adjacent facilities located near the site. The solution shall be consistent with chosen plant materials and new contours and berms.

11. Comply with mandated recycled building products listing. Reference **Appendix 12**.

12. Provide 35% presentation drawings and wing briefing as outlined in **Appendix 13** for selected major projects or as required in the A-E statement of work.

13. Include attached 01000 General Requirements section in specifications. Reference **Appendix 14**.

14. Include attached 01001 (**Appendix 15**) for Base projects or 01001 (**Appendix 16**) for WSA projects, Security Requirements section, as required, in specifications for Contractor base entry requirements.

15. Specify comply with architectural rendering requirements for Milcon Projects as required in **Appendix 17**.

END

**STANDING SEAM METAL ROOF (SSMR) MANUFACTURER  
PRE-AWARD CERTIFICATION SUBMITTAL**

**Submittal #1**

The following statement is required from the SSMR manufacturer. The SSMR manufacturer is defined as the metal roof panel manufacturer, who also manufactures the other system components such as metal or other flashings, fascia panels, fasteners, and support structures.

THIS is to advise that \_\_\_\_\_ (roofing contractor/subcontractor) is an approved applicator of our roofing system and is capable of obtaining our 20-year labor and materials warranty. We will execute the Air Force 20-year warranty certification upon the successful completion of all work in accordance with the project plans and specifications or as modified to comply with our roofing system requirements, whichever is most stringent.

WE have reviewed the System Summary Sheet for Project No. \_\_\_\_\_ at \_\_\_\_\_ (location). We certify that the roofing systems listed below and described in the attached product literature are suitable for use with the roof system construction specified for this project as it relates to normal wear and exposure to the weather.

WE certify that the specified components are compatible with the roofing panels and would qualify for our 20-year materials and labor warranty. We accept responsibility for defects or failure of, or improper application of, and components used as a base over which the roofing is applied.

WE understand that proposed changes relating to the roofing system will be submitted for our review and acceptance. A signed copy approving the concept of the change will be returned to the Contracting Officer.

Building Number(s)	Roofing System Designation	Support Structure
--------------------	----------------------------	-------------------


A technical representative can be made available to attend the pre-construction conference to discuss proper installation procedures for our SSMR system. The same representative will also be available to make at least one in-progress inspection and one final acceptance inspection of the installation.

Roofing Manufacturer

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

Authorized Representative:  
STANDING SEAM METAL ROOFING (SSMR)

Signature: \_\_\_\_\_  
Printed or Typed Name: \_\_\_\_\_  
Signed this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_.



**SYSTEM SUMMARY SHEET**  
**Submittal #2**

This is to notify you that we shall apply for your full 20-year labor and materials warranty for the following project:

Solicitation No. \_\_\_\_\_ Name of Building: \_\_\_\_\_

Address of Building: \_\_\_\_\_

Type and Use of Building: \_\_\_\_\_

New Building                       Recover                       Tear Off

No. of Squares \_\_\_\_\_ Mfg Spec # \_\_\_\_\_ Feet of Flashing \_\_\_\_\_ Mfg Spec # \_\_\_\_\_

Description of Project: \_\_\_\_\_

Roof Slope \_\_\_\_\_ Does roof have adequate drainage?  Yes  No

Deck:                       Steel    Gauge \_\_\_\_\_    Joist Spacing \_\_\_\_\_    Width of Rib \_\_\_\_\_  
                               Wood    Type \_\_\_\_\_    Thickness \_\_\_\_\_    Joist Spacing \_\_\_\_\_  
                               Lightweight Concrete    Type \_\_\_\_\_    Min. Thickness \_\_\_\_\_  
                               Concrete Type \_\_\_\_\_     Structural Wood Fiber Trade Name \_\_\_\_\_  
                               Gypsum Type \_\_\_\_\_     Other (Specify) \_\_\_\_\_

Vapor Retarder:  No     Yes     Old     New    Type \_\_\_\_\_

New Insulation:             Fiberboard                       Perlite  
                                   Isocyanurate                     Other \_\_\_\_\_  
  
                                   EPS                                       Urethane  
                                   Cellular Glass                     Fiberglass

Attachment:                 Mechanical Fastener  
                                   Type \_\_\_\_\_

Insulation Mfg \_\_\_\_\_ No. of Layers \_\_\_\_\_ Thickness \_\_\_\_\_

Recover Info:    Number of Existing Roofs? \_\_\_\_\_    Existing Surface? \_\_\_\_\_  
                          Loose Gravel to be removed? Y/N    Wet Insulation? Y/N  
                          Waterlogged areas to be removed?  Yes     No  
                          Roof vents to be used?     Yes     No    Spacing \_\_\_\_\_

This job will be completed in accordance with the contract specifications or the latest issue of the SSMR manufacturer's "commerical roofing specifications" manual, whichever is most stringent, and we will use only approved products.

We plan to start this job on \_\_\_\_\_. We plan to complete this job on \_\_\_\_\_.

Name of Roofing Contractor/Subcontractor \_\_\_\_\_

Phone No. \_\_\_\_\_ Address \_\_\_\_\_

Signature of Company Official \_\_\_\_\_ Title \_\_\_\_\_

We acknowledge your notirication that the U.S. Government 20-Year SSMR Warranty will be required on the roof described above and will sign and issue this warranty/guarantee to the Government upon your successful completion of this project. There will be a charge to you of \$\_\_\_\_\_.

Manufacturer \_\_\_\_\_

Authorized Representative \_\_\_\_\_ Date \_\_\_\_\_

**APPOINTMENT OF QUALITY CONTROLLER**  
**Submittal #3**

\_\_\_\_\_ (name) is appointed as quality controller on Project No. \_\_\_\_\_ with the authority to regulate the quality of the work so that it conforms to the contract. The quality controller is authorized to order discontinuance of any operation causing nonconforming work.

The quality controller is experienced in the supervision and inspection of SSMR construction similar to that required in this contract. The quality controller understands all requirements of these specifications.

Name of Firm \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Authorized Representative's Signature \_\_\_\_\_

Printed or Typed Name \_\_\_\_\_

Date \_\_\_\_\_

I acknowledge receipt of this letter.

Quality Controller's Signature \_\_\_\_\_

Printed or Typed Name \_\_\_\_\_

Date \_\_\_\_\_

**Add following paragraphs to warranty clause**

BURDEN OF PROOF

The manufacturers shall have the burden of proving the existence of a condition which established an exclusion from coverage, or which would render the warranty ineffective or null and void.

OTHER WARRANTIES

SIGNATURE The warranty contained herein shall be in addition to and not in lieu of any warranty otherwise applicable to the work or materials used in the contract.

Manufacturer Firm Name \_\_\_\_\_

Address \_\_\_\_\_

Authorized Representative's Signature \_\_\_\_\_

Date \_\_\_\_\_

Authorized Representative's Name \_\_\_\_\_

Title \_\_\_\_\_

Manufacturer's Warranty/Serial  
Number of Building Number \_\_\_\_\_

Located at \_\_\_\_\_

Warranty/Guaranty Expiration Date \_\_\_\_\_

**AS-BUILT ROOF SYSTEM SUMMARY**  
**Submittal #6**

As-Built Roof System Summary:

After completion of construction, accurately fill in the information required on this sheet. If more than one system applies to the same building, complete one sheet for each system. Submit in quadruplicate before final acceptance.

Bldg No. \_\_\_\_\_ Project \_\_\_\_\_ AFB

Total Project Area in Square Feet \_\_\_\_\_

Building Area Where This System is Installed \_\_\_\_\_

Deck Type \_\_\_\_\_ Deck Slope \_\_\_\_\_

Underlayment Components (type and number) \_\_\_\_\_

Underlayment Attachment Method \_\_\_\_\_

Support Structure:

Type \_\_\_\_\_

Manufacturer \_\_\_\_\_

Primary: Thickness \_\_\_\_\_ Attachment \_\_\_\_\_

Secondary: Thickness \_\_\_\_\_ Attachment \_\_\_\_\_

Metal Roof Panel:

Manufacturer \_\_\_\_\_

System Designation \_\_\_\_\_

Type of Metal \_\_\_\_\_

Type of Finish \_\_\_\_\_

Type of Seam \_\_\_\_\_

Type of Fastening \_\_\_\_\_

Was this a new system installed over existing roof? \_\_\_\_\_

Roof Completion Date \_\_\_\_\_

Roofing Contractor \_\_\_\_\_  
(NAME)

\_\_\_\_\_  
(ADDRESS)

Day \_\_\_\_\_ 24 Hour \_\_\_\_\_  
(TELEPHONE)

**DO NOT  
MAKE REPAIRS  
OR ALTERATIONS  
to this Roof!**

**WITHOUT APPROVAL  
FROM THE  
BASE CIVIL ENGINEER**

**THIS ROOF IS UNDER WARRANTY UNTIL (1) BY**

**MANUFACTURER (2)**

**ADDRESS**

**CITY, STATE, ZIP CODE**

**PHONE: AREA CODE/NUMBER**

**SIGNS -TO BE POSTED AS SPECIFIED**

**INSERT WARRANTY EXPIRATION DATE 15 YEARS FROM FINAL ACCEPTANCE.  
INSERT THE MANUFACTURER'S NAME, ADDRESS, AND PHONE NUMBER**



DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07550 - EPDM MEMBRANE ROOFING SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide "insulated, flexible, membrane sheet roofing system assemblies", including accessories, where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.
1. Furnish the administration, facilities, materials, labor, equipment, and quality control (QC) necessary to integrate the work into the total building system so that leakage into the roofing system or building does not occur. The roofing system is an assembly of components including the underlayment and insulation as applicable, roofing membrane, elastomeric and metal flashings, and all related parts necessary to complete the assembly. The roofing system manufacturer is the elastomeric membrane manufacturer, who may or may not manufacture and market the other components of the roofing system. The manufacturer or his licensed/approved installer shall complete the work and provide a material and labor warranty for a fifteen-year period from date of final acceptance of the building. The 15-year Government warranty (Attachment #4) shall be signed by the EPDM system manufacturer and provided to the Contracting Officer prior to final acceptance.
  2. QC procedures, tolerances, testing, and requirements are specified in these contract documents. Nonconforming work will be rejected as a violation to these specifications.
  3. The work to be performed under this specification section shall include, but is not limited to, the following principle features:
    - a. Furnish all qualified supervision, experienced labor, materials, tools, and equipment required or necessary to complete in an acceptable manner the specified Flexible Sheet Roofing System in accordance with this specification. The FSRS shall be applied in strict accordance with the latest written "Contractor Application Instruction" as supplied by the manufacturer.

- b. Furnish all materials, labor, and equipment for surface preparation and corrective work in connection with repair of existing roof deck surfaces to receive new roofing, insulation, flashing systems, and roof drains.
- c. Furnish materials and labor for replacement of cap or counterflashing, vents, ducts, curbs, or other penetrations through the deck as well as miscellaneous flashings and equipment items.

## 1.2 QUALITY ASSURANCE (QA)

- A. As specified herein, provide the QA evidence needed to establish confidence that QC is being performed adequately.
- B. Except as modified and supplemented herein, follow the published requirements for methods of installation and written recommendations of the elastomeric membrane manufacturer and other materials manufacturers.
- C. The specified QA requirements are minimums. The Contractor shall provide additional QC if, in the opinion of the Contracting Officer, the QC is not effective enough to provide conforming work. This additional QC does not constitute a change to the contract.
- D. The QC is subject to audit by a Government inspector and the Contractor shall provide all information necessary for the audit.
  - 1. The Government is not obligated to inspect a contractor's work nor to protect a contractor from the consequences of malperformance of his work force. Government inspection is a general examination of the contractor's conduct and work, and is solely for the purposes of the Government. Government inspectors do not have the authority to accept any work, whether it be conforming or not. Government inspection is not to be construed as conclusive. Information that may be offered to the contractor does not change the contract.
  - 2. Government agents including inspectors, engineers, and QA evaluators are not authorized to change the contract. This lack of authority extends to all situations in which the actions of those agents could be construed as constituting a change.
- E. Provide Quality Control (QC) defined as follows:
  - 1. Quality Control is the regulatory process by which the contractor measures actual quality performance, compares it with standards, and acts on the differences. The

- QC function is the entire collection of activities through which fitness for use is achieved.
2. Contractor inspection is a careful and critical investigation of all work to verify that it conforms to the contract, and to detect variances and act to correct them in time to prevent reworking and delay. On discovery of variance, the contractor will immediately institute corrective action and insure all future work conforms to the requirements of the contract.
  3. Hire or appoint a representative to act as Quality Controller. The Quality Controller is to have at least five years experience in the installation of elastomeric roofing systems.
  4. Before the start of roofing work, the Contracting Officer will schedule a preconstruction conference at the air base to review the contract. The Quality Controller and foreman or superintendent must attend the conference. Technical representatives from both the elastomeric membrane and insulation manufacturers shall also attend the preconstruction conference. These representatives shall be knowledgeable in the installation peculiarities and compatibilities of their products. Contractor and technical representative will present oral and documented installation procedures to be used. This conference may include a visit to the work site.
  5. Basic QC requirements appear in part four of these specifications. As a minimum, the Quality Controller shall perform each of the actions listed on a daily basis. Failure to perform these actions constitutes failure to perform and entitles the Government to terminate the contractor for default.

### 1.3 SUBMITTALS

- A. Hi-lite all descriptive literature to accomplish identification of specific components/items which are proposed to be furnished. Government will not react to descriptive material/literature which has not been hi-lited, except to reject the Submittal.
- B. Submittals 1 through 6 are included at the end of this specification. Additional submittal forms shall be obtained from the Contracting Officer if required. Submit requests for all changes (including resolution for variances) in writing. Do not proceed with any change without written authorization of the Contracting Officer. Approvals of submittals which do not conform to the contract shall not be construed as a change unless such nonconformance is a change specifically so indicated on the submittal and approved by the Contracting Officer.

1. Submittal #1. The EPDM System Manufacturer's Certification (Submittal #1). Submittal #1 is a qualification for award of this contract. It must be submitted as part of the bid and be accepted by the Contracting Officer.
2. Submittal #2. System Summary Sheet. It must be signed by both the perspective contractor and elastomeric membrane manufacturer, and submitted as part of the bid. This document is tailored to present project requirements to the system manufacturer who can then ascertain the technical aspects of the project and the acceptability of the design to their 15-year warranty system.
3. Submittal #3. Designation of Roofing Quality Control Controller. The most effective means to evaluate quality installation is by thorough, continuous visual examination at the time of installation, conducted by a person who is knowledgeable in roofing technology and good workmanship practices. The contractor shall designate a person to be in charge of roofing quality control. The quality controller shall have at least 5 years experience in the supervision and inspection of single-ply roofing and shall not be a principal or officer of the roofing contractor's company. The Air Force inspector will audit the quality control process on a daily basis. The contractor must furnish Submittal 3 as required herein, modified as necessary, to identify the person in charge of roofing quality control. This submittal must be approved by the Contracting Officer before the Notice To Proceed (NTP) is issued.
4. Submittal #4. The Air Force EPDM Roofing System 15-Year Labor and Material Warranty. The manufacturer shall provide an executed copy of the 15-Year Warranty (Submittal #4) upon satisfactory completion of the roofing system. The warranty is to be provided to the Contracting Officer prior to final acceptance of the project.
5. Submittal #5. Sample Identification. Use attachment #5 for submittal.
6. Submittal #6. As-Built Roof Summary. The contractor shall submit this summary upon completion of this project.
7. Materials Approval. Within 10 days after Notice to Proceed, the contractor shall submit to the Contracting Officer, certifications from the insulation and fastener manufacturers/suppliers that the materials to be used conform to specified standards as applicable to produce the elastomeric manufacturer's 15-year warranted system.
  - a. Within ten (10) days after issuance of Notice to Proceed and before start of work, submit:
    - 1) Evidence the approved materials have been ordered.
    - 2) Four copies of:

- a) Latest edition of elastomeric membrane manufacturer's published general requirements, technical literature, repair instructions, and material safety data sheets for each system to be used in this contract.
  - b) Latest editions of all other materials manufacturer's product and installation literature.
- b. Membrane Lots and Samples:
- 1) Factory certified test certificates from each lot of elastomeric membrane installed shall be furnished along with two (2) pieces, 12 inches square on receipt at job site. For this purpose, a lot shall be considered one shift (6 or 8 hours) of production from internal mixer and/or calendaring operation. Internal mixer production charts will be retained for two (2) years for each lot produced and shall be made available for inspection in the event of membrane failure. Internal laboratory test records for compound specific gravity, tensile strength, elongation, and rheology shall be retained for each internal mixer batch in each lot for a two (2) year period and shall be made available for inspection in the event of membrane failure.
  - 2) Contractor shall furnish at his expense on request of the Contracting Officer test results of a minimum of one lot up to 2 lots performed by a recognized testing laboratory such as Smithers Scientific Services, Akron Rubber Development Laboratory, or other such approved entity. Test results will show elastomer type, tensile strength, Die "C" tear, elongation, and specific gravity.
- c. Before final acceptance, submit:
- 1) A plan view drawing of each roof showing location and dates of installation of each lot of membrane, identified by manufacturer's lot number;
  - 2) As-Built Roof Summary (Submittal #6);
  - 3) 15-Year Warranty Certification (Submittal #4).

#### 1.4 ACCEPTANCE OF COMPLETED WORK

- A. Acceptance of completed work will be based on its conformance to the contract. Nonconforming work will be rejected; the Government is not obligated to accept nonconforming work at a reduced price. Contractor shall start replacement or correction

of rejected work within 10 calendar days after receipt of the rejection notice. Otherwise, the Government may have this work done by others and charge the cost to the contractor.

- B. A signed final acceptance certificate by the Contracting Officer issued to the contractor is the only final acceptance under the Inspection and Acceptance Clause of this contract.

## PART 2 - PRODUCTS

### 2.1 ABBREVIATIONS

- A. APA (American Plywood Association)
- B. ASTM (American Society for Testing and Materials)
- C. AWPB (American Wood Preservers Bureau)
- D. FM (Factory Mutual Engineering Corporation)
- E. FS (Federal Specification or Federal Standard)
- F. NELMA (Northeastern Lumber Manufacturer's Association)
- G. SPIB (Southern Pine Inspection Bureau)
- H. WWPA (Western Wood Products Association)

### 2.2 ROOF SYSTEM COMPONENTS

- A. Fire-rated, Elastomeric EPDM membrane, shall conform to the general requirements of ASTM D-4637-87, 0.060 inches in thickness, 10 foot maximum width, that meets or exceeds the following physical properties:

Physical Property	Test Method	Minimum Test Result
Color		Black
Specific Gravity	ASTM D-297-90	1.12
Tensile Strength	ASTM D-412-92	1300 psi
Elongation at Break	ASTM D-412-92	300%
Tear Resistance		

(Die C)	ASTM D-624-91	175 lb/in.
Sheet Composition	ASTM D-297-90	
% Polymer that is EPDM		100
% Sheet that is polymer		30

Provide and install the roofing system manufacturer's rubber roof top walk pads where indicated on the drawings to protect the roofing membrane from foot traffic on the roofs. Pads shall be fully adhered to EPDM roofing with rubber adhesive, or with the manufacturer's approved bending tape or 100 percent of the walkway pad area.

1. Size: .30 inch thick by 30 inch by 30 inch.

## 2.3 GYPSUM BOARD BASE

- A. Provide 1/2 inch gypsum board sheathing that meets ASTM 36, Type X.

## 2.4 FSRs OVER EXISTING AND NEW DECKS – Reference Drawings

- A. Underlayment: Existing deck areas shall require contractor to provide single layer of 1/2 inch gypsum board directly over existing aggregate surfaced build-up roof system. Note contractor to sweep and vacuum all roof areas prior to installation of 1/2 inch gypsum barrier board.
- B. Underlayment Attachment: Mechanical fasteners.
- C. Insulation for new 1/4 inch per foot slope deck areas: As designated for two layers (minimum) of polyisocyanurate board insulation.
- D. Tapered insulation for new cricket areas.
- E. Insulation Attachment:
  1. First layer insulation system: Approved mechanical fasteners as required to secure insulation board.
  2. Second layer or additional layers of tapered insulation: Full approved mechanical fasteners as required by FM, FSR manufacturer and insulation manufacturer.
- F. Cricket Insulation: Tapered polyisocyanurate insulation board. Thickness as required to obtain proper slope.

- G. Cricket Insulation Attachment: Mechanical fasteners as required by Fm FSR manufacturer and insulation manufacturer.
- H. FSR Membrane: Similar to Carlisle Syntec Systems, Design "A" Adhered System, fire rated, or approved equal.

## 2.5 CEMENTS AND PRIMERS

- A. Cements and primers used for splicing patching, and flashing shall be compatible to the polymers furnished, furnished by the same manufacturer as the membrane elastomer, and meet the manufacturer's published specifications for same.

## 2.6 FLASHINGS

- A. Metal Flashings: Metal flashings shall be at least 24 GA. Galvanized steel, compatible with elastomeric membrane manufacturer's published flashing details and shall be factory baked-on, 20 year warranted, Kynar 500 finish in Fed. Standard Color #37056.
- B. Elastomeric Flashing: Elastomeric flashing can be furnished in vulcanized or uncured condition, depending on membrane manufacturer's recommendation. When cured, both types shall meet or exceed the following test values:

<u>Property</u>	<u>Test Method</u>	<u>Test Value</u>
Tensile Strength	ASTM D-412-92	1200 psi
Elongation @ break	ASTM D-412-92	400%
Brittleness Temperature	ASTM D-746-79	- 40oC
Tear Resistance Die C	ASTM D-624-91	140 lb/in.
Resistance to Ozone	ASTM D-1149-88	No Cracks

## 2.7 SEALANTS

- A. Lap sealant shall be a one part elastomeric caulking/adhesive sealant furnished by elastomeric membrane manufacturer according to his latest published catalog. Shelf life shall be marked clearly on containers: "Do not use after \_\_\_\_\_;" and use will not be permitted of expired material. Store and apply according to manufacturer's installation instructions. Silicone type sealants are not to be used in this roof construction.



- B. Sealant for difficult to flash penetrations or objects shall be an elastomeric, pourable material furnished by membrane manufacturer according to his latest published catalog. Shelf life shall be marked clearly on containers: "Do not use after \_\_\_\_\_;" and use will not be permitted of expired material. Store and apply according to manufacturer's installations instructions.
- C. Water cut-off sealant is to be used for end of day stopping point and shall be an elastomeric sealant to adhere and seal space at edge of membrane and substrate. It will be furnished by elastomeric membrane manufacturer and meet his latest published catalog requirements. Store and apply according to manufacturer's installation instructions.
- D. Other sealers, tack coats, and tapes used shall be compatible to the elastomeric membrane and shall be as furnished and recommended by membrane manufacture. General purpose sealants and caulking shall be urethane based products similar to Sonneborn NP-1 or approved equal. Use shall be according to manufacturer's recommendations and within the shelf life period designated on the containers. Asphalt or coal tar derivative products are not to be used in this construction. Silicone based sealants and latex based sealants shall not be used for exterior applications.

## 2.8 FASTENERS

- A. Fasteners shall be screws as recommended by the elastomeric membrane manufacturer for the type of deck, type and thickness of insulation, and fastening requirements of the manufacturer's system, UL, local building code, or insurance requirements, whichever is most stringent. Fastener spacings shall meet FM approval Guide for I-90 windstorm rating in addition to the roofing manufacturer's enhanced wind speed requirements for minimum 80 MPH as required on Warranty Form, page 07550. when used with the selected insulation. Fasteners shall be galvanized steel or other noncorroding material employing plastic washers of a size recommended by the EPDM manufacturer. Washers, batten strips, and metal flashings or clips will be protected from contact with dissimilar metals in fasteners or companion accessories to preclude electrolytic corrosion. Length of penetration into substrate deck, wall, or nailer shall be sufficient to prevent backing out by vibration, shrinkage, or swelling action.

## 2.9 WOOD PRODUCTS

- A. Lumber Species: Choose from the following: douglas fir, northern white pine, ponderosa pine, southern pine, jack pine, and red pine.

B. Grades: Choose among WWPA, NELMA, or SPIB grading rule for the specified grades for lumber provided. Plywood panels shall meet the requirements of the latest edition of U.S. Product Standard PS1.

1. Enclosed and incorporated into the roof system (i.e., nailers, sleepers, blocking, and decking):

a. Lumber:

1) Thickness less than 2" and all widths:

a) WWPA and NELMA: Board Class, No. 2 common grade or:

b) SPIB: No. 1 Boards.

C. Preservative Treatment:

1. Wood enclosed and incorporated into the roof system: AWPB specification LP-22 standard for lumber, timber, and plywood pressure treated with water borne preservatives for ground contact use, (July 1975) except, do not use acid copper chromate (ACC) preservative.

D. Moisture: The moisture content for lumber and plywood is to be 12%, plus or minus 2% at delivery, in storage, at installation, and be maintained within those tolerances until painted or enclosed and incorporated into the roof system. Wood found exceeding that moisture level shall be conspicuously marked and removed from the job site. Before preservative treatment, wood products shall have been kiln dried to 12% moisture content. After pressure treatment, wood shall be kiln dried to the 12% moisture content again, and protected during shipment and storage.

E. Marking:

1. Each piece of lumber must bear a grade stamp or grade mark showing the association under whose rules it was graded, the grade, the species, and either "S-DRY", "KD", or "MC-15".
2. Each piece of plywood must bear the APA grade trademark.
3. Each piece of preservative - treated lumber and plywood must bear the AWPB Quality Mark.

## 2.10 FIRE SAFETY

- A. The complete roof covering assembly shall have UL 790 Class A or B classification, be listed as fire-classified in the UL Building Materials Directory, or listed as Class I roof deck construction in the FM approval Guide.

## 2.11 WINDSTORM RESISTANCE

- A. The complete roof covering assembly shall be capable of withstanding an uplift pressure of 90 pounds per square foot in addition to manufacturer's requirements for enhanced wind speed coverage of minimum 80 MPH when tested in accordance with the uplift pressure test described in the FM Loss Prevention Data Sheet 1-28.

## 2.12 INSULATION BOARD

- A. Provide roof insulation board as follows: 2 - 3 inch layers faced polyisocyanurate foam core insulation board meeting Federal Specification #HH-I-1972/2, or as approved, having a six month conditioned thermal resistance "R" value as indicated on the Drawings when conditioned according to PIMA Bulletin No. 101 using ASTM Test Method C518-91 at 75 degrees F mean temperature. Insulation is to be provided for above R-value in two (2) layers, staggering joints a minimum of 12" during installation.

## 2.13 PRECAST CONCRETE SPLASHBLOCK

- A. Factory manufactured product. Furnish size as detailed on Drawings. Requires submittal for approval. Provide splash block at each downspout location.

## PART 3 - EXECUTION

### 3.1 ROOFING QUALITY CONTROL

- A. Quality Controller shall review each day each significant feature and segment of the work.
- B. All material shall be delivered to the site in protected trucks with packaging intact and readable labels. Use materials having labels that:
  - 1. Identify the material and source.

2. Indicate conformance with the reference standard applicable to the material.
  3. Indicate expiration of shelf life.
  4. Indicate storage requirements, (if any).
  5. Identify lot and/or batch numbers of elastomeric materials.
- C. Collect samples, 2 pieces, 12" x 12" each, of each lot of elastomeric roofing membrane. Plainly mark and dispatch as required for laboratory testing as directed by the Contracting Officer. Cost for sampling and testing shall be borne by the contractor.
- D. Store and handle all materials as follows:
1. Do not expose materials to moisture in any form before, during, or after delivery to site.
  2. Store material in a completely enclosed building or trailer. If necessary to store outdoors during the workday, stack materials on platforms or pallets at least 4 inches above ground and cover with waterproof canvas. Allow air circulation under canvas so condensation does not occur; do not extend to ground. Remove nonweathertight plastic manufacturer supplied packaging from insulation prior to storage; tear off labels and tuck in insulation stack for identification purposes. Return all unused materials to the storage buildings or trailers at the end of the workday.
  3. Conspicuously mark unprotected or damaged materials and remove from the site.
  4. Follow manufacturer's instructions on sealers, caulking, tapes, cements, and potting compounds with regard to temperature of storage and provide heated or cooled storage as required.
- E. Program work so that each area of the roofing system installation is completed the same day it is begun. Included are the roof membrane and all flashings within or attached to the membrane. Remove all installed material from areas where the system was begun to be installed but not completed on the same day, and do not reuse.
1. Install temporary water cutoffs and tie-ins at the end of each workday. Remove temporary cutoffs and tie-ins so that all vertical faces of insulation are exposed at the beginning of the next day's work.
  2. Do not cut the staggered insulation pieces that are already installed. Fill in the staggered sections to a straight edge line with unattached cut pieces of insulation, but do not include the temporary filler places in the permanent roof system.
- F. Except for expedient temporary work, do not proceed with roofing work during inclement weather. Remove all temporary work and insure dry surfaces and components before installing permanent components and materials.

### 3.2 OPERATIONAL PROCEDURES

- A. Confine equipment, storage of materials and debris, and the operations and movements of workmen within limits as indicated or as directed by the Contracting Officer. Do not load or permit any part of a structure to be loaded with a weight that will endanger its safety or cause damage.
- B. Protect the building, all contents, and the surrounding area from damage and building occupants or passers-by from injury during the work. Do this so it will not affect the normal conduct of operations in and around the building. The contractor must determine the nature of those operations and provide proper protection. Contractor to repair all damage at his cost caused by lack of such protection to the Contracting Officer's satisfaction. If repairs are not made, or if the Contracting Officer determines that repairs are beyond the contractor's ability, the Government will have the work done by others and charge the cost to the contractor. Contractor shall give timely notice to inform the building occupants of scheduled roofing operations.
- C. Remove all debris daily from the roof. Use enclosed chute, crane and bucket, or construction hoist to minimize and contain dust, dirt, and noise.
- D. When wheeled or other traffic over the partially or fully completed roofing is unavoidable, use adequate plank or plywood protection for the roofing.
- E. Provide at least one (1) portable ammonium phosphate or other dry type fire extinguisher at the work site in case of electrical or solvent fires.

### 3.3 PREPARATION FOR ROOFING

- A. Removals shall include all existing built-up roof components including gravel, membrane, insulation, vapor barriers, and bitumen coating on roof deck and must result in a clean, dry substrate, except for residual stains, providing a surface suitable to apply new materials. A substrate surface is suitable when application of new materials results in a uniform, positive, and maximum contact between such materials and the substrate. Remove all collections of debris in decking ribs or crevices.
- B. Contractor will check roof scuppers and downspouts for free flow before and after completion of work. Keep debris out of roof scuppers and downspouts during construction and return to operable condition at completion of work.

- C. If conditions are uncovered or created that would be detrimental to the application of specified work, immediately notify the Contracting Officer for determination of treatment.
- D. Existing roof system materials including vapor barrier, inner ply felts, flashing sheet, cements, and mineral cap sheet contains asbestos containing materials. Removal, haul, and disposal shall comply with Federal, State, and local environmental regulations, permits and local land fill special handling requirements and all associated costs shall be the Contractor's responsibility.
- E. Repair and patch all existing holes in metal deck using minimum 22 gauge galvanized metal bent to conform to existing deck shape and securely rivet to metal deck.
- F. Remove all existing roof-top mechanical equipment, support curbs, pipes, ducts, and access hatches to allow for installation of new treated wood curbs, curb extensions, duct extensions, and FSRS components. Reinstall all equipment. Provide all mechanical equipment items necessary to comply with N.E.C. and make units fully operational.
- G. Lift or remove and reinstall metal and metal accessories, pipes, ducts, etc., indicated to remain, to aid the installation of new materials.

### 3.4 UNDERLAYMENT INSTALLATION

- A. Follow elastomeric membrane manufacturer's recommendation for underlayment and deck sealing in his current published technical manual or installation guide. Should a condition occur not covered in published literature, a written, signed letter from the manufacturer must be furnished for approval before proceeding with the work.

### 3.5 INSULATION INSTALLATION

- A. General Requirements:
  - 1. Secure cant and tapered edge strips in place with adhesive or fastener specified by membrane manufacturer. Cut and neatly fit all joints and miters.
  - 2. Insulation board, cant strips, and tapered edge strips that can be readily lifted or displaced by hand are not adequately secured. Reinstall adequately all lifted and displaced items that are not damaged. Replace damaged items with new materials.

3. Follow additional applicable requirements of the insulation and membrane manufacturers.

B. Over Steel Deck:

1. First (bottom) layer:
  - a. Place insulation with long side of boards parallel with deck flutes so that side joints between boards do not occur over the deck ribs.
  - b. Stagger and joints by maximum dimensions. Bring boards into moderate, uniform edge contact.
  - c. Secure insulation boards in first layer with a sufficient quantity of mechanical fasteners to prevent displacement of the boards during insulation installation.
2. Second or Additional Layers: Secure all insulation layers including tapered insulation and crickets with mechanical fasteners in accordance with FM or I-90 wind uplift resistance in addition to the membrane manufacturer's enhanced wind speed requirements for minimum 80 MPH wind speed, and insulation manufacturer's requirements. Stagger end joints by maximum dimensions, bring boards into moderate, uniform contact at sides and ends. Stagger all joints between layers by maximum dimensions in both directions. Filler pieces shall have at least two fasteners. Follow installation instructions of membrane manufacturer for subsequent layers of insulation or recovery board.

3.6 MEMBRANE INSTALLATION

- A. Apply membrane according to elastomeric membrane manufacturer's published instructions and the following requirements.
- B. Fully Adhered Application: Apply adhesive evenly and continuously to substrate and underside of sheets at rates recommended by elastomeric sheet manufacturer's printed application instructions. Allow adhesive to dry to consistency prescribed by manufacturer before adhering sheets to the substrate. Roll each sheet into adhesive to avoid wrinkles; broom or roll to remove air pockets and 'fishmouths' and to ensure full, continuous bonding of sheet to substrate. Clean both mating surfaces at splice area, apply adhesive, lap adjoining sheets a minimum of 4", and seal seams by centering a 6-inch wide uncured flashing along all field splices.

- C. Walkways as specified in Section 07550-5, paragraph 2.2.A around mechanical roof top equipment and access ways are to be placed as shown on the drawings. Installation shall be in accordance with the manufacturer's detailed requirements and, in addition, shall be bonded to the FSR membrane with tape and/or adhesive on 100% of the pad area.

### 3.7 FLASHING AND FLASHING ACCESSORIES

- A. Flashing, including perimeter flashing, flashing around roof penetrations, and prefabricated pipe seals, shall be 0.60 inch minimum thick uncured neoprene or uncured elastomeric sheet, as recommended by the elastomeric sheet manufacturer's printed data. Thoroughly clean all surfaces to be flashed. Completely bond all flashings to the substrate, and the flashing plies to each other without looseness or voids. Apply adhesive to flashing and substrate and ply interfaces to achieve a full and uniformly bonded system. Provide stainless steel draw bands around top of all elastomeric pipe flashings.
1. All membrane field seams to be strip-in with a minimum of 6" wide uncured EPDM flashing materials.
  2. Fabricate and install metal as shown on drawings. Conform to standards of the components and materials manufacturers, Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), 8224 Old Courthouse Road, Tysons Corner, Vienna, Virginia 32180, and Copper Development Association, 1011 High Ridge Road, Stamford, CT 06905, as they apply to this project.
  3. Reposition and reinstall all metal accessories indicated or designated to remain.
    - a. Replace missing or irreparable metal with the type, gauge, thickness, weight, and size of metal to match other existing sections or the removed section.
    - b. Clean and repair the metal as necessary and required.
    - c. The contractor is responsible to perform all the work required to make any displaced mechanical units operational. Included are repair, testing, and balancing to conform to the original level of performance as determined by the Contracting Officer.
  4. Isolate dissimilar metals in contact by painting with a dielectric coating or by using an uncured nonconducting elastomeric sheet gasket.
  5. Sheet Metal with Flanges:
    - a. Set metal flanges over composition flashings and on roofing membrane in a full bed of sealing cement furnished by the elastomeric membrane manufacturer.



- b. Nail flanges to wood nailers, when present under membrane or flashing, such as at roof fascias or gravel stops. Nail in two parallel rows 1-1/2 inches apart with one row 1/2 inch from the flange outer edge and staggered 3 inches on center with nails in the other row. Nails and/or screws shall be galvanized annular ring shank or zinc coated screw type fastener.
6. Roof drains and Scuppers: Follow applicable published requirements of the EPDM manufacturer or NRCA published details and procedures.

### 3.8 METAL INSTALLATION

- A. Furnish and install metal as shown on the Drawings and as specified in Section 07550 and 07620.

### 3.9 WOOD INSTALLATION

- A. Provide wood members as indicated, necessary, and required for a complete, workmanlike system.
- B. Provide fasteners at not more than 18 inches on center, and also within 6 inches of each end, to secure nailers to the building construction adequately, to resist pullout force of 200 lb per lineal foot of nailer.
- C. Where nailers are stacked, secure the top nailer to the lower with spikes or nails of proper length, spaced 18 inches on center, staggered, and also within 6 inches of all nailer ends .
- D. Brush apply one coat of concentrated solution of the preservative used in treatment onto all cut surfaces of preservative treated lumber.

### 3.10 SEALANT INSTALLATION

- A. Follow sealant manufacturer's installation requirements, cleaning substrates so no contaminants will prevent bonding, priming as required, and installing back up material as required .

### 3.11 WARRANTY SIGN

- A. Provide 10 inch X 12 inch minimum size painted signs (see attachment #7) made of aluminum with a dark color background and letters of contrasting color. Use paint compatible with the aluminum. Sign shall read as indicated. Permanently post signs at all access points leading to the roofs and prominent points on the roofs. Provide at least one sign mounted on roof as directed by Contracting Officer's Representative.

### 3.12 INSTRUCTIONS TO GOVERNMENT PERSONNEL

- A. Provide written and verbal instructions to designated Base Civil Engineering maintenance personnel. Instructions shall be provided by a competent representative of the roofing membrane manufacturer and shall include a minimum of 4 hours on inspection and maintenance of membranes. Repair of defects and/or damage to the membrane are to be repaired by the EPDM manufacturer's authorized and approved installer to preclude voiding the warranty.

## PART 4 - QUALITY CONTROL PROCEDURES

### 4.1 INTRODUCTION

- A. The Quality Controller has the responsibility to assure the Government obtains products and services as required by the contract.
- B. To accomplish that, he must continuously observe work in progress, including testing and measuring, and report findings on a daily record form (AF Form 1063, Quality Control Record, shall be used for this purpose).

### 4.2 QUALITY CONTROLLER

- A. Before actual work begins, the Quality Controller must:
  1. Read the specifications and study the drawings.
  2. Understand the required tests and measurements.
  3. Understand AF Form 1063, Quality Control Record, and reporting procedures.
  4. Visit the roof and become familiar with its layout.
  5. Attend the preconstruction conference.

#### 4.3 EQUIPMENT

- A. Supply the following equipment for tests and measurements required to be performed under this contract:
1. Measuring tape, 50 or 100 ft, ft and inches, nonconducting.
  2. Moisture meter for determining moisture content of wood (such as nailers or curbing) at time of installation.

#### 4.4 ALLOWABLE TOLERANCES

- A. The following tolerances establish the range of acceptable variances. Assure that work outside this range is removed; act to prevent reoccurrence.
1. Dimensions: (plus or minus)
    - a. 1/16 inch for any single dimension less than 1 inch.
    - b. 1/8 inch for any single lineal dimension 2 inches or more or aggregate of measurements to 10 feet, even.
    - c. 1/4 inch for any aggregate of measurements exceeding 10 feet.
  2. Insulation joint gap, minimum = 0, maximum = 3/16"
  3. Lumber
    - a. Straightness, no bows exceeding 0.1%, i.e., 1/8" in 10 ft, 1/16" in 5 ft.
    - b. No twisted or split lumber allowed.
    - c. Moisture content not to exceed 14% when installed.

#### 4.5 QUALITY CONTROL RECORD

- A. Complete AF Form 1063, daily, as follows:
1. Top section:
    - a. Insert date and record number.
    - b. Insert weather description and temperature.
    - c. Indicate crew start/stop times.
    - d. Indicate your start/stop times.
    - e. Indicate total roof area.

- f. Indicate roof area completed previous to date.
2. Products section. This section is divided into major categories. Each category may include several materials:
  - a. Examine each material within the category and check the proper box.
  - b. Check the "Not Applicable" box for materials not included in today's work.
  - c. Assure that all materials in a category comply with the contract to result in a check in the "Complies" box. To determine compliance, compare the material with the project specifications and drawings, and also with the approved manufacturer's literature submitted. Since materials other than those covered by the components listed may be used, enter their compliance in the "All Other Materials" category.
3. Execution section:
  - a. The work item numbers in this section of the record correspond to the work items in these basic QC requirements. The work items are specification items considered to be of major concern. These items are in the basic QC requirements for convenience and tabulation.
  - b. Performance of the "Actions" below the work item will result in an entry in the proper box on the QC record. Specification items not in the basic QC requirements must also be considered, and their acceptability grouped and documented in the "Other" box.
4. Variance section:
  - a. An entry in any "Varies" box under the "Products" or "Execution" sections requires an explanation of the variance in this section. The explanation should be limited to a description of the variance only; reasons for variances are not necessary.
  - b. Indicate action taken to resolve each variance to result in complying work. If a variance is not resolved on the same day it occurs, the number of that day's record must be entered in the space provided on records for all succeeding days, until the variance is resolved.
5. Closing section: Sign the record at the end of the workday and submit it to the Government inspector.

#### 4.6 WORK ITEMS

(corresponds to work item under Execution on AF Form 1063)

- A. **Work Item 1:** Do not expose materials to moisture in any form before, during, or after delivery to the site.
1. **Action:** Inspect materials upon delivery for intact manufacturer's shipping containers. Verify the vehicle delivering materials provided adequate cover for protection of materials. Inspect materials for evidence of contact with moisture before acceptance. Inspect job site storage; ascertain enclosed storage to protect materials from moisture from any source. Observe material handling from storage areas to roof. Delivery to job site requires the same attention as delivery to storage area. Mark conspicuously all materials exposed to any form of moisture and have them permanently removed from the project site.
- B. **Work Item 2:** Execute the work so that each area of the installation is completed ("dried in") on the same day it is begun. Included are all flashings and related parts to complete assembly.
1. **Action:** Determine the area of work planned and ascertain that enough materials are at hand to complete it. Inspect work at day's end, verify completion to tie in point.
- C. **Work Item 3:** Install temporary water cutoffs and tie ins at the end of each workday. Remove cutoffs and tie ins on resuming workday so that all vertical faces of insulation are exposed.
1. **Action:** Observe tie in to verify that insulation joints are staggered and no moisture has intruded. Complete all field seams, and secure and make watertight all membrane terminations before the end of each workday.
- D. **Work Item 4:** Except for expedient temporary work, do not proceed with roofing work during inclement weather.
1. **Action:** During bad weather, ascertain that work being done is only temporary and protects the facility and previously completed roofing system. Assure that all temporary work is removed before installation of permanent components when work is resumed.

- E. **Work Item 5**: Do not apply roofing system components if moisture in any form can be seen or felt on the substrate to which the components will be applied. Insulation and/or substrate shall be free from debris, sharp objects, films or other contaminants.
1. **Action**: Ascertain no moisture is on deck, vapor barrier, or insulation layers before applying subsequent materials. If there are objects present which present a physical danger to the membrane, they are to be swept off or smoothed out. Water shall be broomed or pumped off and the surface allowed to dry before laying insulation or membrane. Other contaminants which may be present and not addressed in the specification shall be prevented from coming into physical contact with the sheet.
- F. **Work Item 6**: Rolls of membrane are to be lifted using slings or by the ends. Chains, cables or similar small diameter materials are not to be used unless padded with two layers of membrane.
1. **Action**: Check lifting points for evidence of cuts or punctures on padding material or packaging. If damage is evident, very closely examine areas under damage for evidence of cuts or pinholes.
- G. **Work Item 7**: Provide method to move rolls without damaging membrane.
1. **Action**: Use carts or buggies. If it is necessary to move rolls without carts or buggies, the area over which the roll will be moved shall be cleared and inspected for the presence of objects which could puncture the membrane. After rolling rolls, inspect foremost outside layer for any evidence of punctures or damage.
- H. **Work Item 8**: Allow panels to relax in place for 30 minutes minimum prior to seaming.
1. **Action**: Wait 30 minutes. Panels seamed in place too soon shall be cut loose, allowed to relax, and then stripped back in place.
- I. **Work Item 9**: If traffic of any kind over the partially or fully completed roofing is unavoidable, provide and use adequate plank or plywood protection for the roofing.
1. **Action**: Inspect activities and methods used to transport materials over the completed or partially completed roofing system. Check adequacy of planks or plywood to protect system.
- J. **Work Item 10**: Do not load or permit any part of a structure to be loaded with a weight that will adversely affect its safety.

1. Action: Assure that runways (such as wood planks or plywood) are used to distribute the load of materials and equipment hauling over the deck so as not to cause deflection of the deck. Check for broken welds on bends in metal decking because of materials or equipment handling.
- K. **Work Item 11**: Removal of existing materials must result in clean, dry substrate, except for residual stains, providing a surface suitable to apply new materials.
1. Action: Inspect substrate for excessive roughness, cracks, holes, deleterious coatings, or deteriorated condition. Assure that decking or other substrate determined to be defective is repaired, replaced, or brought to the attention of the Contracting Officer. Assure that deck joints are sealed to prevent passage of moisture.
- L. **Work Item 12**: Ensure that insulation boards, cant strips, and tapered edge strips are adequately secured.
1. Action: Ensure that all layers of insulation is fully secured to the deck with mechanical fasteners in accordance with Factory Mutual I-90 and membrane manufacturer's requirements for enhanced wind speed of minimum 80 miles per hour. Measure the distance from the outer row of fasteners to the perimeter. Count and locate fasteners with respect to insulation boards. Test bond of insulation boards, cant strips, and tapered edge strips by trying to lift them after installation. Materials that are readily lifted without fracture are not securely fastened.
- M. **Work Item 13**: Apply elastomeric membrane according to manufacturer's current technical installation manual for the system to be installed.
1. Action: Refer to manufacturer's manual and ascertain the proper number, type, and length of fasteners are being used correctly, the correct laps are being used at all splices, that volatiles are allowed to dry off cements before jointing (if used), that sealing/fastening tapes are applied properly, and edge/lap seal is adequate and continuous.
- N. **Work Item 14**: Clean seam area using techniques required by manufacturer's specification.
1. Action: This is the most critical factor and should be monitored very carefully. Lap adhesion depends on proper cleaning of both mating surfaces. If incorrectly

cleaned, seams are to be taken apart and relapped for splicing. A 6" wide uncured flashing shall be centered over all field seams.

O. **Work Item 15:** Probe seams for defective adhesion.

1. **Action:** Check the outside edge of the seam using a pointed metal probe along the length of the lap area prior to strip-in of seam. The completed lap shall be visually free of any voids, fishmouths, wrinkles, or unattached areas, and shall lay flat.

P. **Work Item 16:** Pourable sealer must be set up firm and have a crown to drain.

1. **Action:** Use a low speed on an electric drill to assure complete mixing of resin and hardener.

Q. **Work Item 17:** Base flashings shall be installed with no bridging.

1. **Action:** Flashings having a bridge wider than 1/2" shall be cut and recovered or replaced.

R. **Attachments:**

1. Atch 1 Elastomeric Manufacturer Pre-Award Submittal #1
2. Atch 2 System Summary Sheet
3. Atch 3 Appointment of Quality Controller
4. Atch 4 EPDM 15-year Labor and Material Warranty (4 pages)
5. Atch 5 Sample Identification
6. Atch 6 As-built Roof System Summary
7. Atch 7 Sample Roof Sign



**ELASTOMERIC MANUFACTURER  
PRE-AWARD CERTIFICATION SUBMITTAL  
Submittal #1**

The following is to advise that \_\_\_\_\_ (roofing contractor/subcontractor) is an approved applicator of our roofing system and is capable of obtaining our 15-year labor and materials warranty. We will execute the Air Force 15-year warranty certification upon the successful completion of all work in accordance with the project plans and specifications or as modified to comply with our 15-year roofing system requirements, whichever is most stringent. Attached is a current letter of good standing for the Contractor.

We have reviewed the System Summary Sheet for Project # \_\_\_\_\_ at \_\_\_\_\_ (location). We certify that the roofing systems listed below and described in the attached product literature are suitable for use with the roof system construction specified for this project as it relates to normal wear and exposure to the weather.

We certify that the specified insulations are compatible with the membrane and would qualify for our 15-year materials and labor warranty. We accept responsibility for defects or failure of, or improper application of, roof insulation used as a base over which the roofing is applied, except the roof deck.

We understand that proposed changes relating to the roofing system will be submitted for our review and acceptance. A signed copy approving the concept of the change will be returned to the Contracting Officer.

Building Number	Roof System Designation (Membrane)
Insulation	
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

A technical representative can be made available to attend the pre-construction conference to discuss proper installation procedures for our EPDM system. A technical representative will also be available to make at least one in-progress inspection and one final acceptance inspection of the installation.

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

Roofing Manufacturer:

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

Authorized Representative:

Signature: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

Signed This \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_.

3 Atch

1. EPDM System Literature
2. Insulation Literature
3. Letter of good standing

Submittal #2

(To be completed and signed by an approved roofing contractor and elastomeric (EPDM) manufacturer prior to contract award.)

This is to notify you that we shall apply for your full 15-year labor and materials warranty for the following project:

Solicitation No. \_\_\_\_\_ Name of Building \_\_\_\_\_  
Address of Building: \_\_\_\_\_  
Type and Use of Building: \_\_\_\_\_

New Building       Recover       Tear Off

No. of Squares \_\_\_\_\_ Mfg Spec # \_\_\_\_\_ Feet of Flashing \_\_\_\_\_ Mfg Spec # \_\_\_\_\_

Description of Project: \_\_\_\_\_

Roof Slope: \_\_\_\_\_ Does the roof have adequate drainage?  Yes  No

Deck:  Steel Gauge \_\_\_\_\_ Joist Spacing \_\_\_\_\_ Width of Rib \_\_\_\_\_

Wood Type \_\_\_\_\_ Thickness \_\_\_\_\_ Joist Spacing \_\_\_\_\_

Lightweight Concrete Type \_\_\_\_\_ Min Thickness \_\_\_\_\_

Concrete Type \_\_\_\_\_  Structural Wood Fiber Trade Name \_\_\_\_\_

Gypsum Type \_\_\_\_\_  Other (specify) \_\_\_\_\_

Vapor Retarder:  No  Yes  Old  New Type \_\_\_\_\_

New Insulation:  Fiberboard  Perlite  Isocyanurate  Other \_\_\_\_\_

EPS  Urethane  Cellular Glass  Fiberglass  Phenolic

Attachment  Mechanical Fastener Type \_\_\_\_\_  Hot Asphalt

Insulation Manufacturer \_\_\_\_\_ No of Layers \_\_\_\_\_ Thickness \_\_\_\_\_

Recover Info: No of Existing Roofs \_\_\_\_\_ Existing Surface:  Smooth  Gravel  Cap Sheet

Loose Gravel to be removed?  Yes  No Wet Insulation?  Yes  No

Waterlogged areas to be removed?  Yes  No

Roof vents to be used?  Yes  No Spacing \_\_\_\_\_

This job will be completed in accordance with the contract specifications or the latest issue of the EPDM manufacturer "Commercial Roofing Specifications" manual, whichever is most stringent. and we will use only the undersigned manufacturer's products unless other products are approved by the manufacturer.

We plan to start this job on \_\_\_\_\_. We plan to complete the job on \_\_\_\_\_.

Name of Roofing Contractor/Subcontractor: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

Signature of Company Official \_\_\_\_\_  
Title \_\_\_\_\_ Print Name \_\_\_\_\_

We acknowledge your notification that U.S. Government 15-year EPDM warranty will be required on the roof described above and will sign and issue this warranty/guaranty to the Government upon your successful completion of this project. There will be a charge to you of \$.

Manufacturer \_\_\_\_\_  
Authorized Representatives \_\_\_\_\_ Date \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

**APPOINTMENT OF QUALITY CONTROLLER**  
**Submittal #3**

\_\_\_\_\_ (Name) is appointed as quality controller on Project # \_\_\_\_\_ with the authority to regulate the quality of the work so that it conforms to the contract. The quality controller is authorized to order discontinuance of any operation causing nonconforming work.

The quality controller is experienced (minimum of 10 years) in the supervision and inspection of EPDM construction similar to that required in this contract. The quality controller understands all requirements of these specifications and also understands that he is required to be at the job site full time when roofing work is being performed.

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Authorized Representative's Signature: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

Date: \_\_\_\_\_

I acknowledge receipt of this letter.

Quality Controller's Signature: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

Date: \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

**ETHYLENE PROPYLENE  
DIENE MONOMER (EPDM)  
15-YEAR LABOR AND MATERIAL WARRANTY  
Submittal #4**

WARRANTY COVERAGE:

This Ethylene Propylene Diene Monomer (EPDM) system is delivered to the United States Government subject to a full material and workmanship warranty for 15 years that guarantees that the manufacturer will pay all costs necessary to maintain the EPDM roofing membrane and flashing system in a watertight condition during the life of the warranty.

The specified roof system is equal to and comparable to our (manufacturer's name) 15-year system design and the insulations specified are compatible with our material. As the manufacturer of this system, we also accept responsibility for making repairs to the roofing system at no additional cost to the Government, to correct defective materials and workmanship down to the structural deck.

If the manufacturer fails to make required emergency and permanent repairs during the warranty period, as stated after notice by telephone from the Contracting Officer, the Government may have the work done by other authorized applicators and charge the cost to the manufacturer. The warranty provisions of this contract apply notwithstanding Government inspection and acceptance. A separate warranty is required for each building. Failure to perform the work, resulting in the Government having the work performed, will not void this warranty.

TERMS, CONDITIONS, LIMITATIONS:

Emergency repairs shall be made by the manufacturer or his licensed applicator within 48 hours of receipt of notice by telephone from the Contracting Officer and weather permitting, the manufacturer agrees to permanently repair the affected areas within 30 days by restoring them to a watertight condition, without cost to the Government. If it is determined that leaks were caused by either an exclusion from coverage or a specific condition listed below, the manufacturer will repair the defects and payment will be made by the Government based on invoices supplied by the manufacturer. The monetary liability to the manufacturer for replacement of a defective system is limited to the cost of the original installation of the total roof system.

EXCLUSIONS FROM COVERAGE:

1. Natural disasters, acts of nature (lightning, hurricanes, tornadoes, sustained winds exceeding 80 MPH as recorded at the nearest meteorological center, earthquakes, hail).

2. Acts of negligence or abuse and misuse by Government personnel, accidents, vandalism, civil disobedience, war, or damage caused by falling objects.
3. Damage by structural failure, settlement, movement, distortion, warpage, or displacement of structure.
4. Failure of material or flashing caused by movement of metal work not supplied by manufacturer issuing the warranty.
5. Leaks caused by repairs or alterations of roof system or installation of structures, fixtures or utilities on or through roof without prior written approval of manufacturer.
6. Storage of material on roof.
7. Moisture entering roof system through walls, coping, or any part of building structure except the roof, including from adjacent building.
8. Fire.
9. Faulty construction or design of building, including parapet wall, copings, chimneys, skylights, vents, or of structural roof deck.
10. Infiltration or condensation of moisture in or through underlying area; vapor condensation beneath the roof greater than the acceptable ambient moisture content for the given material as established by the appropriate American Society for Testing and Materials (ASTM) standard in effect at the time of installation.
11. Under no circumstances is the manufacturer responsible for damages to the building, its contents or structural roof deck.
12. Membrane deterioration due to chemical attack from: HVAC oil, lubricating oil, solvents or other petroleum products or contaminants.

SPECIFIC CONDITIONS THAT VOID THE WARRANTY

1. Failure by the owner to use, reasonable care in maintenance; failure to follow manufacturer's written maintenance instructions.
2. Failure of owner to make repairs to leaks not covered by manufacturer's warranty.



3. Repair work by any contractor other than EPDM manufacturer's licensed applicator or use of unapproved material.
4. Changes in building usage which may affect roof performance unless approved in writing by the manufacturer prior to such change.

#### DETERMINATION OF RESPONSIBILITY

A Government representative will call the manufacturer immediately when a leak is discovered. Receipt of notice by telephone or in writing from the Contracting Officer is evidence that the Contracting Officer has had the roof examined by a technically qualified representative of the Government and has determined, based on this examination, that none of the above exclusions or specific conditions apply and the manufacturer is obligated to make the repairs.

After completion of the 48-hour emergency repair, the manufacturer, to avoid application of the warranty, must notify the Contracting Officer in writing of the existence of an exclusion stated herein. Failure to provide such notice will preclude the manufacturer from later disputing the coverage of the warranty. The burden to establish the existence of an exclusion or specific condition affecting the warranty is on the manufacturer.

After the occurrence of an exclusion from coverage or a specific condition which renders the warranty ineffective, the warranty shall be allowed to continue as long as the Government returns the roofing system to its original condition and the manufacturer is allowed to make or oversee the repair. The manufacturer and his authorized installer will be paid for time and transportation to make or supervise the non-warranty repair.

#### BENEFICIARY

The warranty period starts on the date the roofing system (work) is accepted by the Government from the roofing manufacturer's technical representative and the roofing contractor.

It is understood by the manufacturer and his licensed/approved applicator (contractor) that the warranty provided herein shall be for the benefit of the United States Government.

#### BURDEN OF PROOF:

The manufacturers shall have the burden of proving the existence of a condition which established an exclusion from coverage, or which would render the warranty ineffective or null and void.

#### OTHER WARRANTIES:

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

The warranty contained herein shall be in addition to and not in lieu of any warranty otherwise applicable to the work or materials used in the contract.

SIGNATURE:

Manufacturer Firm Name \_\_\_\_\_  
Address \_\_\_\_\_  
Authorized Representative's Signature \_\_\_\_\_  
Date \_\_\_\_\_  
Authorized Representative's Name \_\_\_\_\_  
Title \_\_\_\_\_  
Manufacturer's Warranty/Serial \_\_\_\_\_  
Number for Building Number \_\_\_\_\_  
Located at \_\_\_\_\_  
Warranty/Guaranty Expiration Date \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

Submittal #5

Roofing Membrane Sample Identification Tags:

Include this attachment in the envelope with sample. Use indelible ink or typing.

Sample No. \_\_\_\_\_ Project No. \_\_\_\_\_

Air Base \_\_\_\_\_ Bldg. No. \_\_\_\_\_

Elastomeric Membrane Mfr. \_\_\_\_\_

Elastomeric Type \_\_\_\_\_

Elastomeric Thickness \_\_\_\_\_

Elastomeric Lot Number \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

**AS-BUILT ROOF SYSTEM SUMMARY**  
**Submittal #6**

After completion of construction, accurately fill in the information required on this sheet. If more than one system applies to the same building, complete one sheet for each system. Submit in quadruplicate before final acceptance.

Bldg No. \_\_\_\_\_ Project No. \_\_\_\_\_ AFB

Total Project Area in Square Feet \_\_\_\_\_

Building Area Where This System is Installed \_\_\_\_\_

Deck Type \_\_\_\_\_ Deck Slope \_\_\_\_\_

Underlayment Components (type and number) \_\_\_\_\_

Underlayment Attachment Method \_\_\_\_\_

Insulation:  
Type: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

First Layer: Thickness \_\_\_\_\_ Attachment: \_\_\_\_\_

Second Layer: Thickness \_\_\_\_\_ Attachment \_\_\_\_\_

Elastomeric Membrane:

Manufacturer \_\_\_\_\_

System Designation \_\_\_\_\_

Type of Elastomer \_\_\_\_\_

Type of Adhesive \_\_\_\_\_

Type of Lap Adhesive \_\_\_\_\_

Type of Lap Sealant \_\_\_\_\_

Was this a new system installed over existing roof? \_\_\_\_\_

Roof Completion Date \_\_\_\_\_

Roofing Contractor \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

(Name)

Address \_\_\_\_\_  
Telephone: Day \_\_\_\_\_ 24-Hour \_\_\_\_\_

ATTACHMENT 1  
REPAIR ROOFS - WSA  
VARIOUS BUILDINGS  
MALMSTROM AFB, MONTANA

F24604 XX RXXXX  
PROJ. NO. NZAS 98-1139

**DO NOT  
MAKE REPAIRS  
OR ALTERATIONS  
to this Roof!**

WITHOUT APPROVAL  
FROM THE  
BASE CIVIL ENGINEER

THIS ROOF IS UNDER WARRANTY UNTIL (1) BY

MANUFACTURER (2)

ADDRESS

CITY, STATE, ZIP CODE

PHONE: AREA CODE/NUMBER

**SIGNS - TO BE POSTED AS SPECIFIED**

INSERT WARRANTY EXPIRATION DATE 15 YEARS FROM FINAL ACCEPTANCE.  
INSERT THE MANUFACTURER'S NAME, ADDRESS, AND PHONE NUMBER.

END OF SECTION 07550

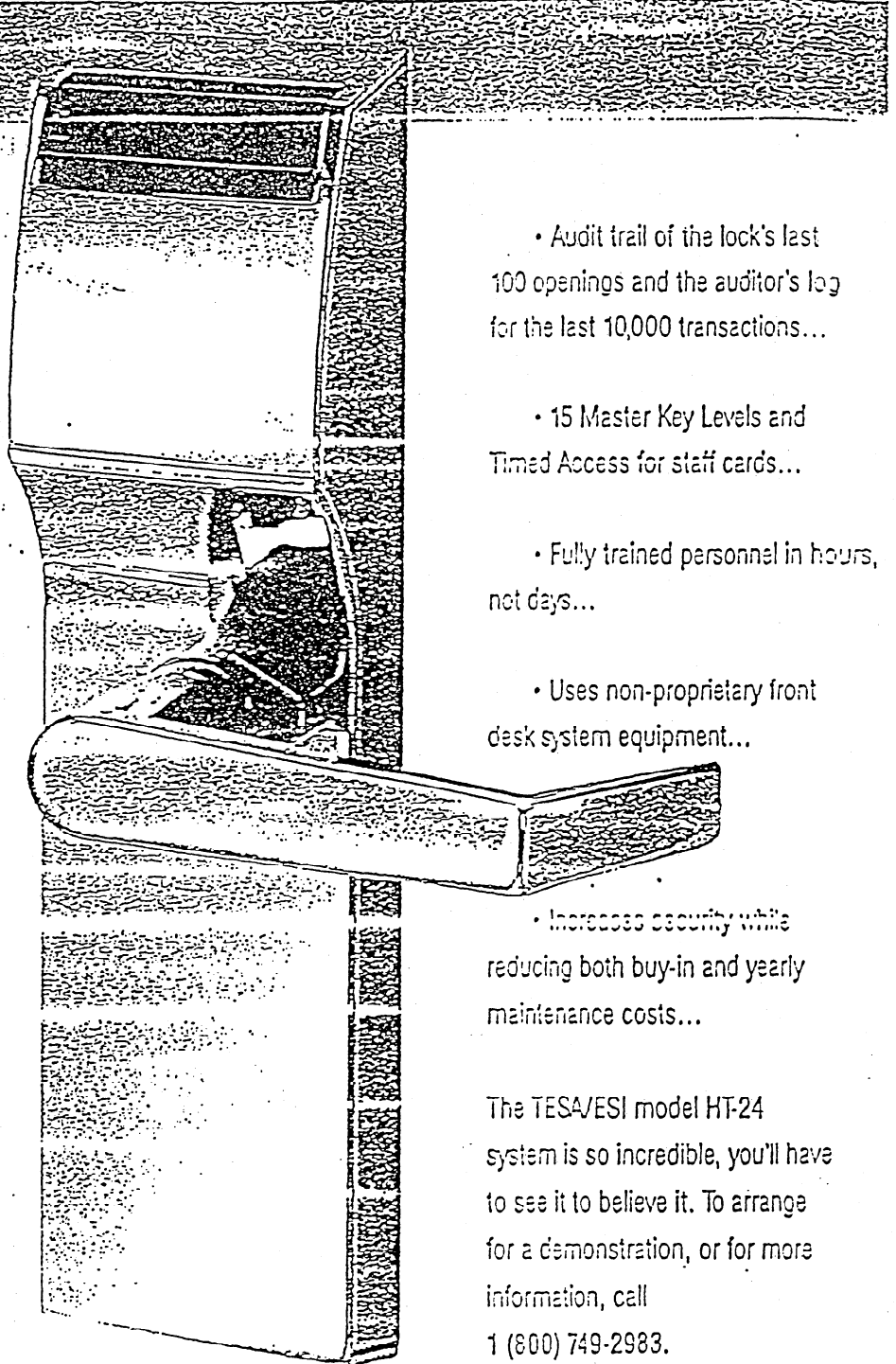
# Introducing the HT-24 from TESA/ESI...

The Electronic Hotel Locking System That's Even Better Than It Sounds

Introducing the revolution in electronic hotel access control... The model HT-24 from TESA/ESI. Proven in Europe and now ready to take North America by storm, the HT-24 offers an unprecedented combination of affordability and security in a system that is easier to use than anything else on the market.

*Here are just a few selected advantages of the HT-24:*

- The quick encoding procedure is as simple as...
  - 1 Selecting the check-in option from the pull-down menu
  - 2 Entering the room number
  - 3 Inserting the card into the encoder
- Programming office and meeting room function locks for back of house is even easier than that...



- Audit trail of the lock's last 100 openings and the auditor's log for the last 10,000 transactions...
- 15 Master Key Levels and Timed Access for staff cards...
- Fully trained personnel in hours, not days...
- Uses non-proprietary front desk system equipment...
- Increases security while reducing both buy-in and yearly maintenance costs...

The TESA/ESI model HT-24 system is so incredible, you'll have to see it to believe it. To arrange for a demonstration, or for more information, call  
1 (800) 749-2983.



TESA/Entry Systems, Inc.  
2714 Apple Valley Road  
Atlanta, GA 30319  
(404) 237-4440

**APPENDIX 3**



ANSI Std. Mortise

# Architectural Hardware Specification for Hotel Locking System

# HT-24

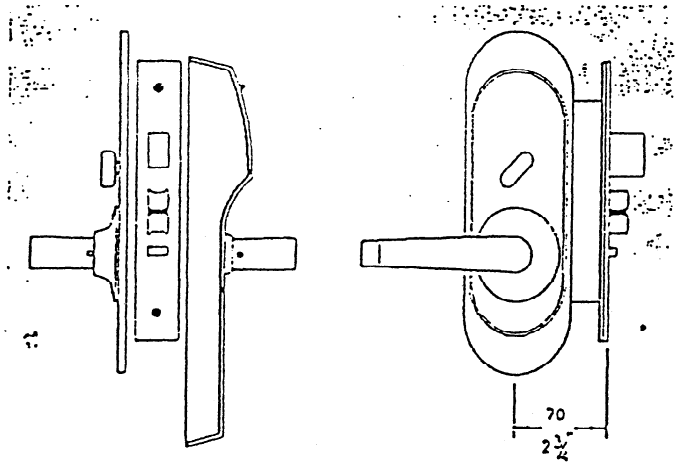
The Electronic Locking Security system shall be Model HT-24 as sold by TESA/Entry Systems, Inc.

The electronic components of the system shall meet Part 15 of the FCC Regulations. The mechanical lock mechanism shall meet ANSI Spec. A156.13-1987 Grade 1 Security Requirements and be UL listed for A, B, C, D, and E Class doors. The mechanical lock shall be readily adaptable to 1 3/8" thick doors and/or doors previously prepared for European style mortise locks. There shall be an optional high security key override cylinder available as well.

The electronic lock shall be automatically recoded upon insertion of a new guest key. The lock shall store its codes in resident, non-volatile memory. The security system shall have dual storage of the entire key system within the main computer and within the key encoder.

The hotel locking system shall provide 15 levels of user identified master key cards and timed access for staff employees. For the guest rooms, the system shall offer 250 code look-ahead, guest card expiration dates programmable for stays up to one year, and advance group room assignments that will not adversely affect the currently operating electronic key. For multiple check-in stations, the software shall operate with the Lantastic Network. The software shall be available with an optional interface program to allow operation of the system utilizing the property's PMS system.

The locking system shall be maintained by non-proprietary computer equipment and non-proprietary accessories such as power supply and standard ABA mag-stripe key cards.

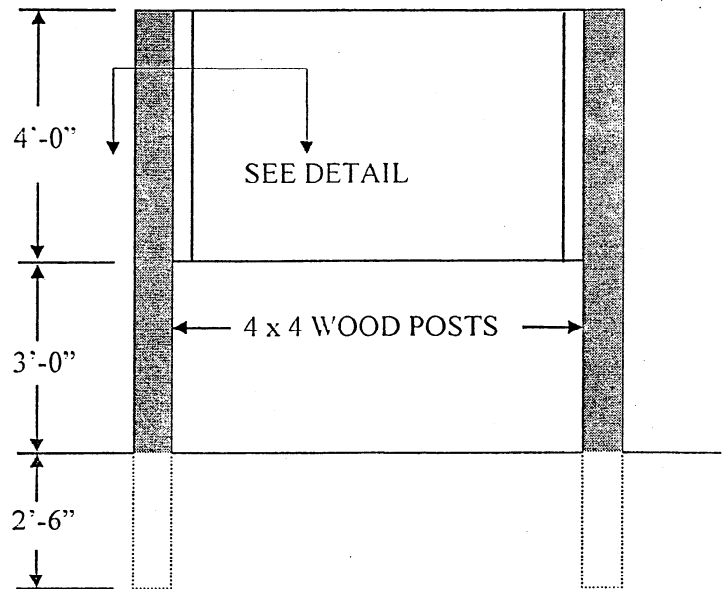
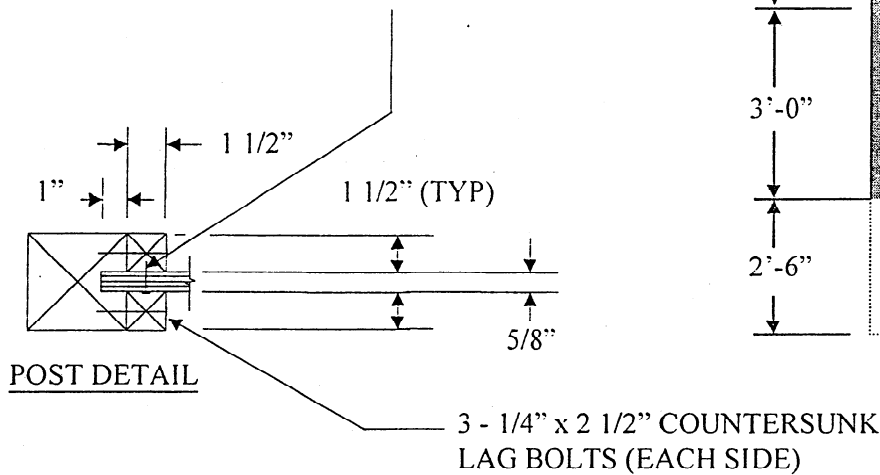


TESA/Entry Systems, Inc.  
 2714 Apple Valley Road  
 Atlanta, GA 30319  
 (404) 237-4440

# U.S. AIR FORCE PROJECT DESIGN

NOT TO SCALE

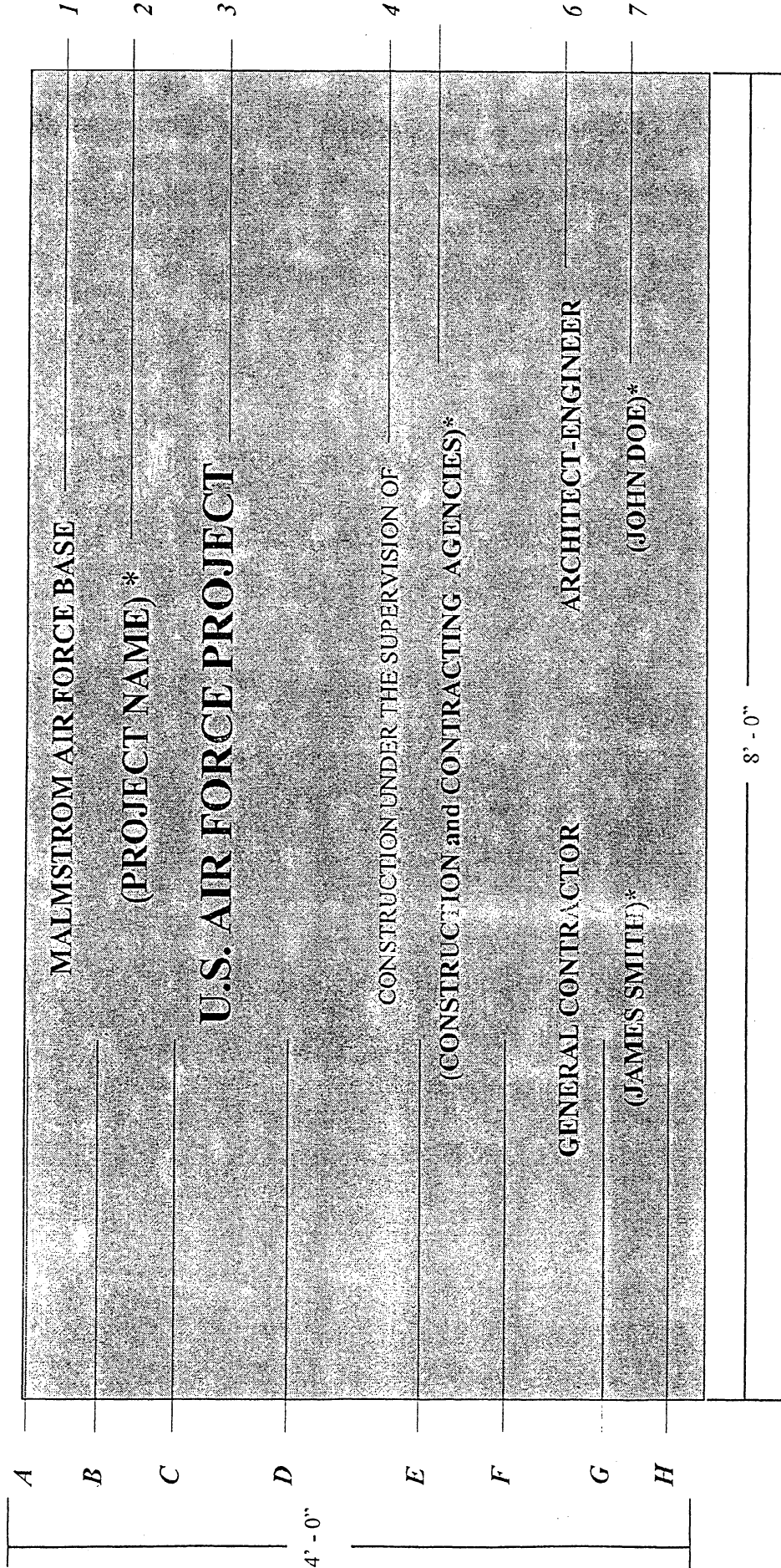
4 penny Galvanized  
common at 6" O.C.



## NOTES:

1. Signboard 4' x 8' x 5/8" grade A-C exterior type plywood with medium density overlay on both sides.
2. Paint both sides and edges with one prime coat and two coats of paint in accordance with FED. STD. 595a, color number 37056 exterior type enamel. Lettering shall be as shown on drawing and shall be antique linen 33578 gloss exterior type enamel.
3. Lettering shall be Helvetica medium.
4. Acceptable abbreviations may be used for contractors name.
5. No company logo shall be used.
6. Sign posts and 1 1/2" wood trim shall be stained dark brown.
7. Upon completion of work under this contract, the project sign shall be removed from the job site and shall remain the property of the contractor.

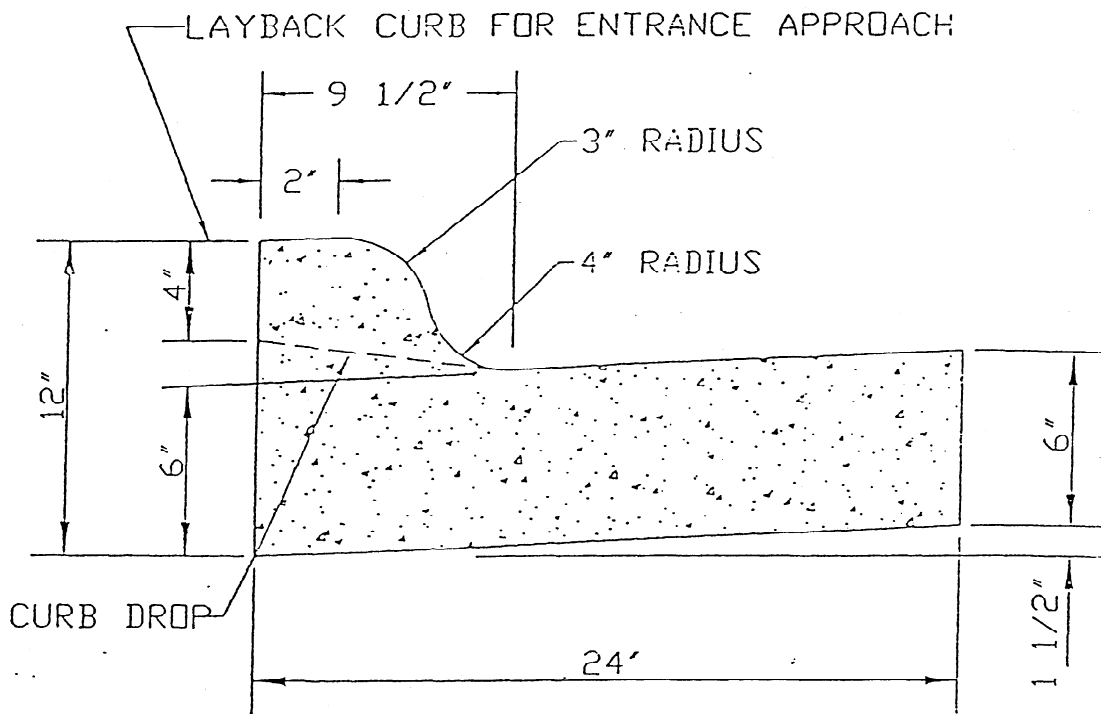
END OF SECTION 01000



**SAMPLE CONSTRUCTION SIGN FOR PROJECTS  
SCHEDULE**

SPACE	HT	LINE	DESCRIPTION	LETTER HT.	STROKE
A	2"	1	MALMSTROM AIR FORCE BASE	2 3/8"	1/4"
B	2 5/8"	2	* WILL VARY	2 3/4"	3/8"
C	5 3/4"	3	U.S. AIR FORCE PROJECT	4"	1/2"
D	8"	4	CONSTRUCTION UNDER THE SUPERVISION OF	1 1/12"	1/8"
E	2"	5	341 <sup>ST</sup> CONTRACTING & CIVIL ENGINEERING **	2 3/8"	1/4"
F	4"	6	GENERAL CONTRACTOR/ARCHITECT-ENGINEER	1 3/8"	3/16"
G	1"	7	* WILL VARY	1 3/8"	3/16"
H	2 7/8"		* WILL VARY		

\*\* Construction agent may vary on some projects - verify



CONCRETE CURB & GUTTER  
TYPE "1"

SCALE: 1 1/2"=1'-0"

NOTES:

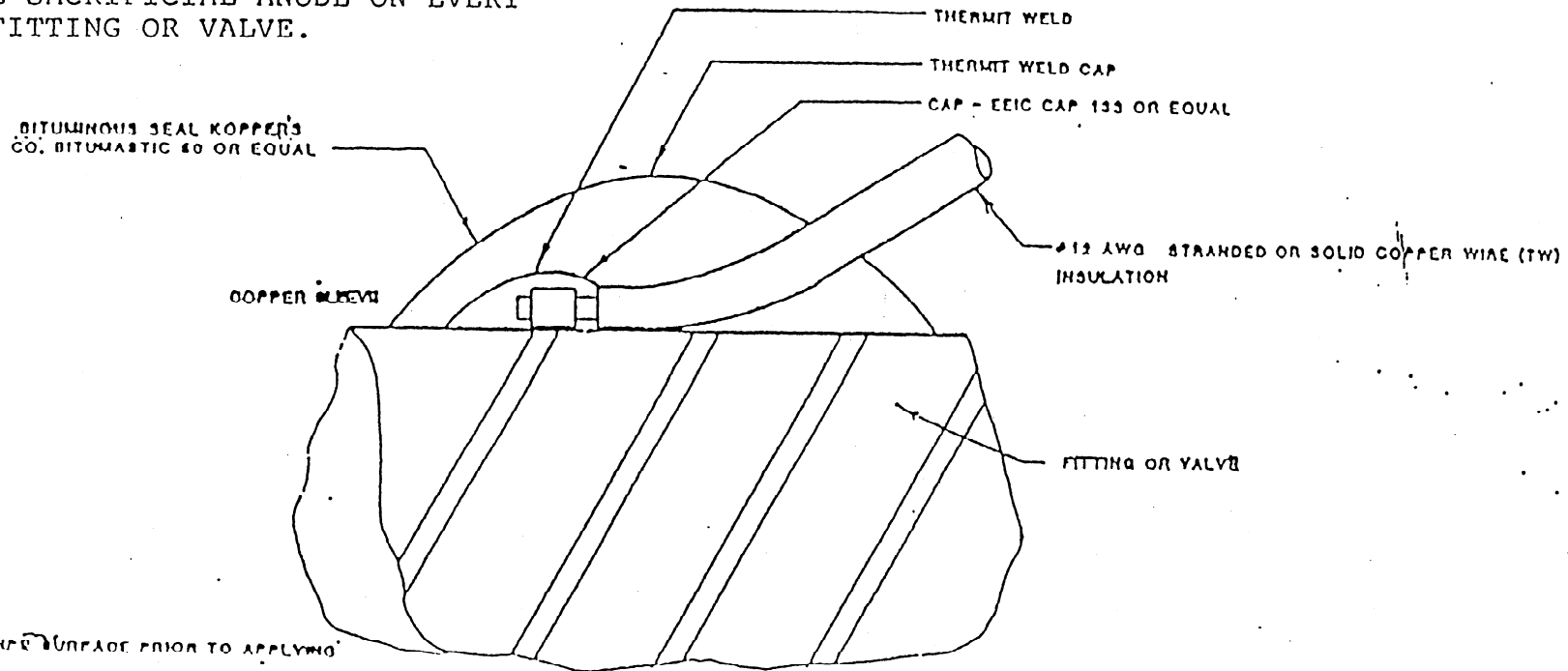
1. CONTRACTION JOINTS CUT AT 10 FOOT INTERVALS.
2. EXPANSION JOINTS AT 50 FOOT INTERVALS.
3. ROUND ALL SIDE EDGES AND JOINT EDGES WITH EDGING TOOL.
- 4.
5. THE TRANSITION LENGTH BETWEEN A NORMAL CURB SECTION AND A DROP CURB SECTION SHALL BE 3'-0".

Date: OCT. 13, 1992 | Revised:

CONSTRUCTION  
STANDARDS

COMBINED CONCRETE  
CURB & GUTTER  
NO. 02611-01

1. LOOP THE WIRE TO PROVIDE SLACK & LAY WIRE CLOSE TO STRUCTURE. USE CARE WHEN BACKFILLING SO AS NOT TO BREAK WIRE AT WELD OR ANODE.
2. BACKFILL WITH SOIL AND TAMP AROUND ANODE.
3. SATURATE ANODE WITH A MIN. 2 GALLONS FRESH WATER AFTER ANODE HAS BEEN BURIED WITH 6" BACKFILL ON TOP OF ANODE.
4. NEVER HANDLE ANODE BY LEAD WIRE. USE ONLY THE ANODE PACKAGE.
5. ANODE PACKAGES SHALL BE INSTALLED WITH LONG AXIS IN THE VERT. POSITION.
6. THERMIT WELD ANODE LEAD WIRE TO STRUCTURE AND COAT WITH BITUMASTIC 50 OR EQUAL.
7. PROTECT WITH THERMIT WELD CAP.
8. TEST STATIONS WILL NOT BE INSTALLED IN PAVEMENT OR STREET.
9. INSTALL SACRIFICIAL ANODE ON EVERY METAL FITTING OR VALVE.

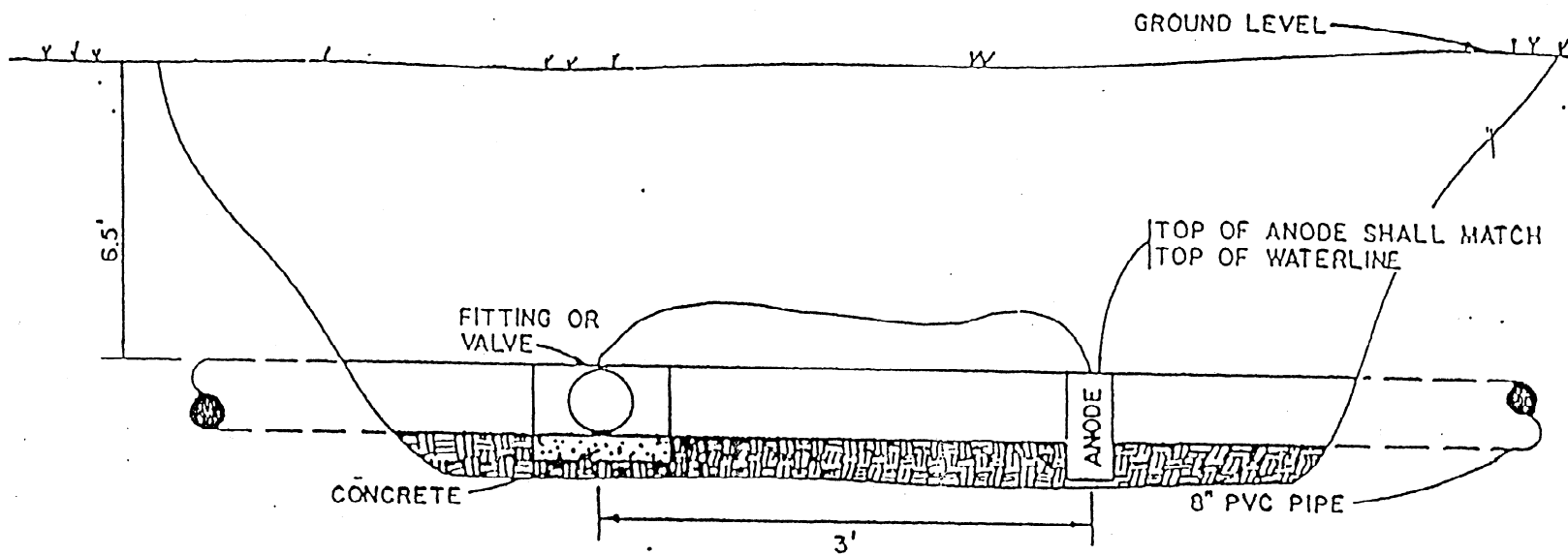


NOTE:  
PREPARE PIPE SURFACE PRIOR TO APPLYING

TYPICAL CABLE CONNECTION TO STRUCTURE

NTS

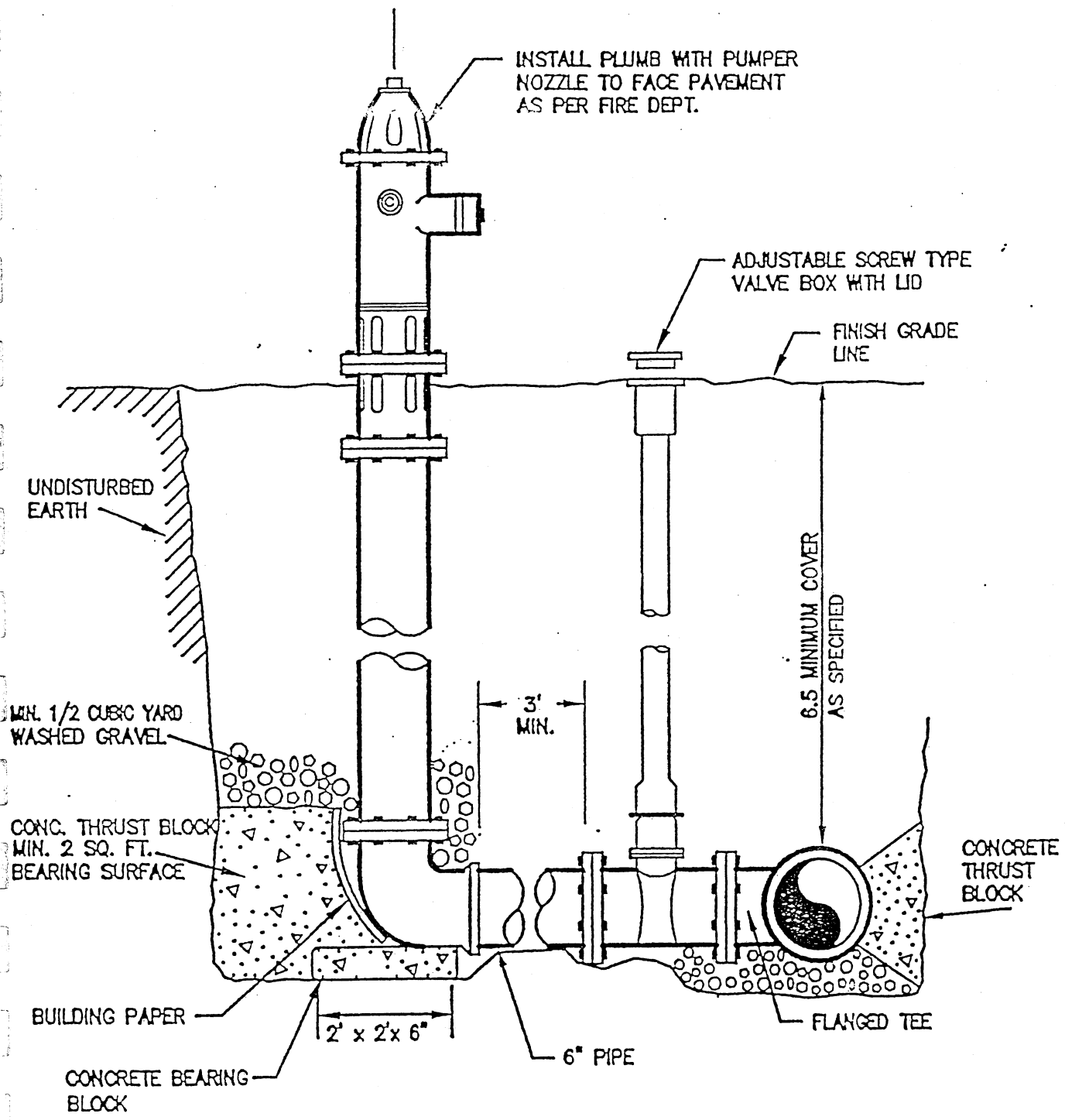
4  
14



③ SACRIFICIAL ANODE VERTICAL INSTALLATION

NTS

③  
14



INSTALL PLUMB WITH PUMPER  
NOZZLE TO FACE PAVEMENT  
AS PER FIRE DEPT.

ADJUSTABLE SCREW TYPE  
VALVE BOX WITH LID

FINISH GRADE  
LINE

UNDISTURBED  
EARTH

6.5 MINIMUM COVER  
AS SPECIFIED

MIN. 1/2 CUBIC YARD  
WASHED GRAVEL

3'  
MIN.

CONC. THRUST BLOCK  
MIN. 2 SQ. FT.  
BEARING SURFACE

CONCRETE  
THRUST  
BLOCK

BUILDING PAPER

2' x 2' x 6"

6" PIPE

FLANGED TEE

CONCRETE BEARING  
BLOCK

**NOTES:**

1. THRUST BLOCKING TO BE IN CONFORMANCE WITH STANDARD DRAWING 2713-1.
2. FOR BOLTED FITTINGS, BLOCKING SHALL NOT OBSTRUCT BOLTS.
3. HYDRANT WEEP HOLES TO REMAIN OBSTRUCTED.

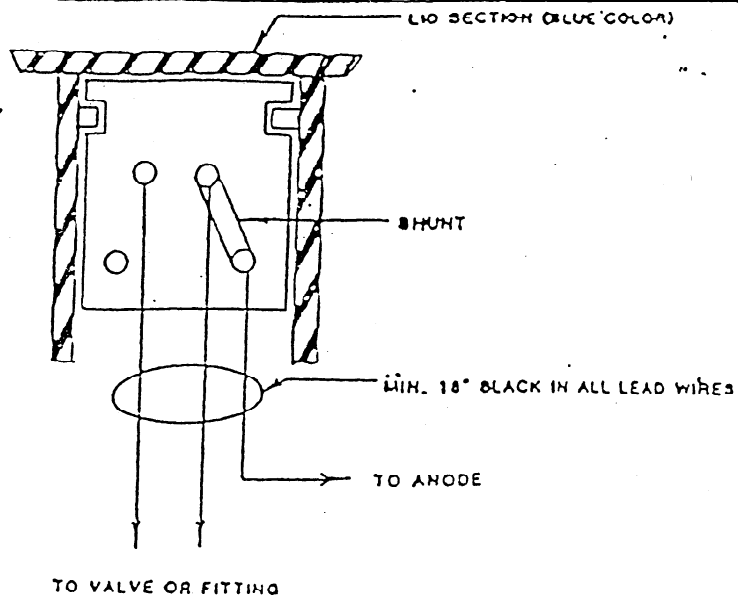
DATE:

STANDARD

FIRE HYDRANT

(WITH REMOTE AIRY VALVE)

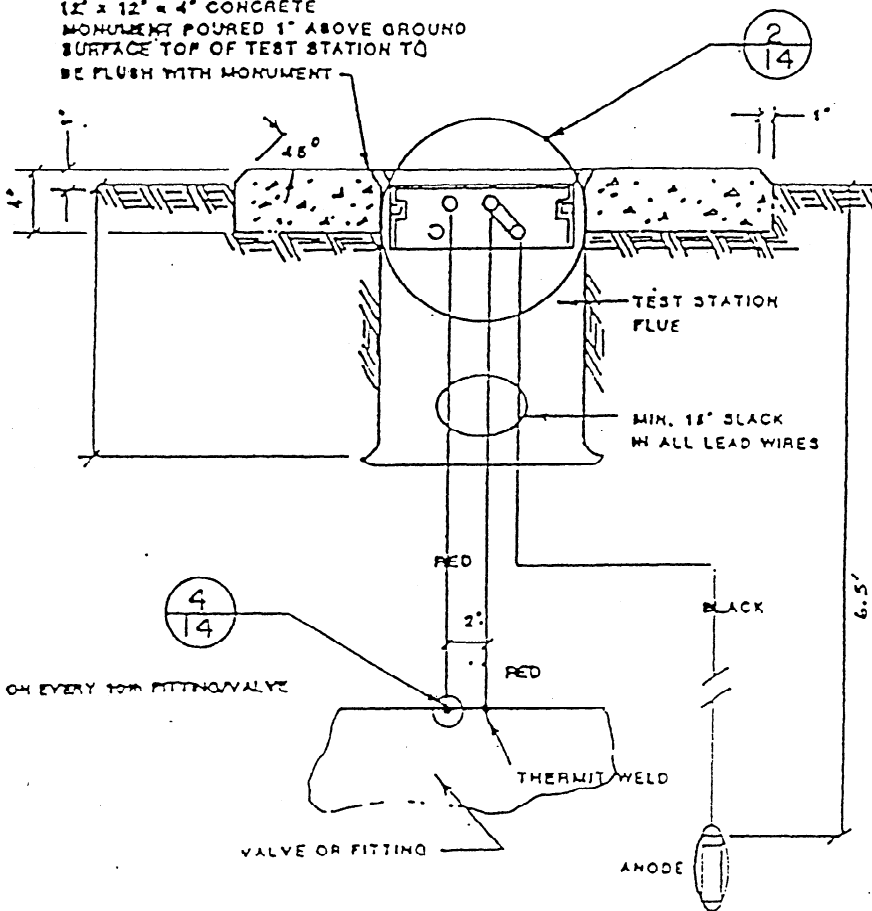
NOTE: See Std. Dwg 46, 1/3, for installation instructions.



TERMINAL IN TEST STATION  
NTS

2  
14

12' x 12' x 4" CONCRETE MONUMENT POURED 1" ABOVE GROUND SURFACE TOP OF TEST STATION TO BE FLUSH WITH MONUMENT



NOTE: INSTALL ON EVERY TOP FITTING VALVE

TEST STATION INSTALLATION  
NTS

1  
14



## Base Unique Mechanical Design Requirements List

Standard – Technical criteria specific to Malmstrom AFB and our climate for inclusion in our designs.

Results – Significant reduction in maintenance hours and projects that work well at Malmstrom AFB.

The items listed in red are specific requirements I have created and identified for all architects, engineers and contractors to adhere to. They provide a solid basis to technically regulate the mechanical work relevant to Malmstrom AFB.

- \* Design everything with maintenance ease and assess the priorities! Space requirements
- \* List salient features of all equipment specified, compatibility of products and materials
- \* References appropriate codes - most current edition

1. Heat Exchange Gasket Type - spiral flex
2. Design Heat Exchanger - Modulating valve located on return side of loop and check valve included.
3. Heating coil use Three-Way Modulating Valve located on the supply side of coil
4. HTHW Valve Packing - Marlo 333
5. HTHW Valve - Bellows type 2 inch or less (500 degrees F of 500-psi HW)
6. HTHW Valve- 2 inch larger gate, 500 degrees F 500 psi HW
7. Heating Pumps - 2 required
8. Chilled Water Pumps - 2 required in critical environment areas
9. Cooling Coil use three way modulating valve on supply side of the coil
10. Circulating Pumps to be located in the Mechanical Room
11. Pumps - Need isolation valves on inlet and outlet
12. Factory Rep Startup of all Major Mechanical Systems (written checklist to be provided in the required format)
13. Training for each System - by professional instructor and videotaped, minimum of 4 hours
14. Direct Digital Controls manufactured by STAEFA, sole source justified
15. Energy Management Control System manufactured by HSQ, sole source justified
16. EMCS - Thorough list of equipment required
17. Control Schematics - Laminated and mounted in mechanical room
18. Fiber Optic cable to be loose-tube gel-filled made by Siecor, sole source justified
19. Furnaces - High altitude rated, high efficiency

20. Furnaces - All exhaust vents sloped 1/4 inch per foot to prevent exhaust pipe freezing and carbon monoxide poisoning
21. Hot Water Heaters - High altitude, quick recovery, high efficiency
22. Boilers - High altitude, high efficiency
23. Utility Gas Lines - Use polyethylene valves
24. Utility Gas Lines - 36" depth, plastic marking tape and metal tracing wire line
25. Utility Gas Lines an anodeless riser assembly is required
26. Worker Qualifications - State qualifications for each trade to do work assigned
27. Copper Pipe Joints - All hidden joints to be SILFLOSS not soft solder; random joints may be inspected by destructive testing
28. Glycol Solution - Protect to -20 degrees F using propylene glycol.
29. Pipe - Flanges or unions after isolation valves and before coils, fin tubes, etc.
30. Pipe and Mechanical equipment shall be braced for earthquake protection
31. Plumbing - Do not put on outside wall because of freezing potential
32. Heating and Chilled Water - use propylene glycol system
33. Protect and Support all Piping Properly, especially the Refrigerant Piping
34. All Gauges Readable from the Floor Level
35. Access panels for all valves on unitary heating systems in buildings
36. Fan Coil - Access to change filters
37. Water Treatment - Use demineralized water, inhibitor and glycol match to existing chemicals for compatibility
38. Motors - Thermal protectors for overload with sealed bearings
39. Make Up Air Units - Not to inlet snow
40. Make Up Air Units to have closed combustion chambers
41. Roof Ventilators - Direct drive type
42. Flex Duct - Use high quality plastic type; radius not to exceed minimal diameter allowed by SMACNA
43. Check for CFCs in Project.
44. Check for Asbestos.
45. Large AHUs - Use face and bypass concept
46. Design heating equipment for an outside temperature of -21 degrees F
47. Use Low Ambient Temperature Cutoffs for Condensers
48. Self Contained through Wall AC Units - Liebert
49. Provide Utility Meters for gas, electricity, BTU'S from High Temperature Hot Water, and Water
50. Renovation - Engineers to verify utility connections, size, type, psi location, etc.
51. Coordinate Designs with other Design Discipline.
52. Mixed Air portion of the AHU requires Low Temperature Limits to prevent coil freezing.
53. Velocitrols for VAVs to be KREUTER CSC-3011
54. Chemical Feeders to be Bypass Pot Feeders
55. Catwalks around Suspended Equipment

56. Electrical Disconnects Labeled to Match Equipment
57. Breaker Schedule - Have EE verify to equipment
58. Phase Protection of Equipment - Use high quality type
59. Fire Suppression System must be designed by a registered Fire Protection Engineer
60. Fire Detection Transmission System must be made by Monaco, sole source justified.



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE SPACE COMMAND

19 OCT 1998

CC: \_\_\_\_\_  
CID: \_\_\_\_\_  
CC: CEC  
CEM  
CED

MEMORANDUM FOR 21 CES/CC 30 CES/CC 45 CES/CC 50 CES/CC  
90 CES/CC 341 CES/CC 721 CES/CC

FROM: HQ AFSPC/CEC  
150 Vandenberg Street, Suite 1105  
Peterson AFB CO 80914-4150

SUBJECT: Seismic Design Criteria for New Construction/All Geographic Locations

1. The attached AFCESA policy memorandum is forwarded for your immediate compliance. The new seismic design criteria contained in the 1997 Edition of the National Earthquake Hazard Reduction Program (NEHRP), *Provisions for New Buildings and Other Structures*, must be applied to all new design starts of Air Force projects in the FY00 construction programs. This applies for new buildings and for new additions to existing buildings, regardless of funding source. The new provisions adopt the United States Geological Survey (USGS) national maps for seismic hazards. Employing design agents with a working knowledge of the 1997 NEHRP Provisions will be a requirement to execute a successful design. These provisions are adopted by reference in a new tri-services design procedures document to be published soon. The Air Force designation will be AFMAN 32-1149 V1 (I), *Seismic Design for Buildings*. Additional details are contained in the attached Agency memo.

2. Existing buildings and alterations or renovations of existing buildings will continue to comply with HQ USAF/ILE memo, *Mitigating Existing Building Seismic Deficiencies*, 23 Apr 97. We forwarded this memo to all AFSPC BCEs on 2 May 97 for compliance.

3. If your staff requires additional information, please have them contact Mr Bill Welborn, PE, HQ AFSPC/CECO, at DSN 692-2717FAX 2750, or E-mail Internet Address [wwelborn@spacecom.af.mil](mailto:wwelborn@spacecom.af.mil).

TIMOTHY M. FINK, Lt Colonel, USAF  
Deputy Chief, Engineering Division

Attachment:  
HQ AFCESA/CES Memo, 9 Sep 98

cc:  
14 AF/LG w/o Atch  
20 AF/CV w/o Atch  
HQ AFCESA/CESC w/o Atch  
HQ AFSPC/CEP/CEF  
23 SOPS/CE  
750 MSS/CE



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

9 SEP 1998

MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ AFCESA/CES  
139 Barnes Drive, Suite 1  
Tyndall AFB FL 32403-5319

SUBJECT: Seismic Design Criteria for New Construction/All Geographic Locations

1. The 1997 Edition of the National Earthquake Hazard Reduction Program (NEHRP) *Provisions for New Buildings and Other Structures*, a national consensus standard, establishes new seismic design criteria. Effective immediately, apply this new criteria to all new design starts of Air Force projects in the FY00 construction programs. All design starts for new buildings and for new additions to existing buildings, regardless of funding source, must follow this criteria. This new criteria will not apply to designs beyond project definition approval stage as of this date. Only building code provisions that incorporate the 1997 NEHRP provisions will be considered as being equivalent design procedures. Existing buildings and alterations or renovations of existing buildings will continue to comply with HQ USAF/LE memo, Mitigating Existing Building Seismic Deficiencies, 23 Apr 97 (Atch 2).
2. The new NEHRP provisions adopt the United States Geological Survey (USGS) national maps for seismic hazards. These new maps assign seismic load coefficients for all geographic areas for the United States, Guam, Tutuila, Puerto Rico, Culebra, Vieques, St. Thomas, St. John, and St. Croix. The traditional seismic maps associated with the Uniform Building Code (UBC) seismic design provisions are no longer valid. Minimum values of building seismic response apply to all geographic locations. There are no areas where there is a zero seismic zone. Site specific development procedures are available for foreign locations where USGS maps do not apply.
3. In addition to new maps, there are significant changes to the design procedures for incorporating seismic resistance into building systems. The design of structures will now be based on balanced energy dissipation and the prevention of structural collapse for a *maximum considered earthquake* (MCE). The only buildings exempt from the new design procedures are one- and two-family detached dwellings located in low seismic areas. HQ AFCESA/CESC is currently preparing a list for distribution of those Air Force bases and geographic locations where the exemption criteria will apply. There are also special design provisions for water treatment facilities, power generating stations, and petroleum storage and distribution systems.
4. The new design procedures recognize the differences between the rocky soil of the western United States and the deep deposits of soft soils of the eastern United States. This is the first time seismic provisions will be incorporated into all structures, including those in the low seismic

Atch

zones. Wind loads will no longer be assumed to govern in low and zero seismic areas. Designs must now incorporate seismic and wind provisions and the appropriate details for each design. Because this is the first time dynamic loading is a requirement, many designers will be required to accomplish something for which they have little or no experience. Therefore, some confusion and artificially inflated design costs will be experienced. We encourage those Air Force civil engineers that employ design agents to encourage those professionals to seek education courses through professional affiliations. A working knowledge of the 1997 NEHRP provisions will be a requirement to execute a successful design.

5. We do not expect significant increases in building costs because of the new design procedures and the detailing requirements. Detailing requirements are a normal practice for the high seismic areas of the western United States. The largest impact is expected to be a learning curve for those engineers in the low seismic areas to adopt standard seismic details to local practice. Experience suggests larger structural members or different materials are not necessary for seismic compliance. The 1997 NEHRP provisions focus more on connections than larger loads on primary frame members.

6. The 1997 NEHRP Provisions are adopted by reference in a new tri-services design procedures document. When published, Army Corps of Engineer document TI-809-04 (AFMAN 32-1149 V1 (I)), *Seismic Design for Buildings*, will supersede Army TM 5-809-10 (AFM 88-3, Chapter 13, Sep 1992). A DRAFT of the new publication is currently at Army Corps District Offices and Navy design centers. HQ AFCESA/CESC also has a copy available for any private sector firms doing a new design start for an Air Force facility. The final manuscript will be published in October 1998, with publication on electronic media by December 1998. The DRAFT document may be used and is suitable for new design starts.

7. The point of contact at HQ AFCESA/CES is Mr. Jim Lafrenz, DSN 523-6332, or e-mail [lafrenzj@afcesa.af.mil](mailto:lafrenzj@afcesa.af.mil).



LANCE C. BRENDEL, Colonel, USAF  
Director of Technical Support

Attachments:

1. Distribution List
2. HQ USAF/ILE Memo, 23 Apr 97

DISTRIBUTION LIST

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SAN ANTONIO TX 78216-5518

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WASHINGTON DC 20314-1000

NAVFACENGCOM (MPC-13)  
WASHINGTON NAVY YARD  
1322 PATTERSON AVE SE SUITE 1000  
WASHINGTON DC 20374-5065



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON, DC

23 APR 1997

MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ USAF/ILE  
1260 Air Force Pentagon  
Washington, DC 20330-1260

SUBJECT: Mitigating Existing Building Seismic Deficiencies

This letter provides guidance to implement the 1994 requirements of Public Law 95-124 and Executive Order 12941, *Seismic Safety of Existing Federally Owned or Leased Buildings*.

All projects for Level 1 buildings (reference Attachment 2), not currently under construction, shall have seismic life safety sufficiency evaluations as prescribed by draft AFMAN 32-1095, *Structural Evaluation of Existing Buildings*, Sep 1994. All projects which involve existing buildings, including additions, for FY 98 and beyond, shall include a seismic evaluation if any of the following conditions exists (as taken from guidance formulated by the Interagency Council on Seismic Safety in Construction (ICSSC), and previously provided to your MAJCOM and base seismic safety coordinators):

- a. There is a change in the building's occupancy to a higher performance objective category (reference Attachment 3); or,
- b. There are any changes, including damage by fire, wind, or earthquake, to the building that cause the capacity of the structural system, or a component, to be reduced to 90 percent or less of its original stability or strength as determined by a structural engineering evaluation; or,
- c. A project extends the building's useful life and the cost of the proposed work will exceed 50 percent of the current replacement value.


Seismic deficiencies, structural or nonstructural, identified by the seismic evaluation shall be mitigated in the project which triggers the evaluation. Mitigation options include demolition, change in occupancy to one of a lower performance objective category, or rehabilitation. The level of rehabilitation shall be the same as the seismic requirements for new buildings (reference AFJMAN 32-1049, *Seismic Design for Buildings*). Cost guidance is available in Federal Emergency Management Agency (FEMA) publication 156, Dec 94, *Typical Costs for Seismic Rehabilitation of Existing Buildings*.

✓ Dining Hall  
analysis was  
accomplished  
by A-E.



When a building is identified as a high risk structure under the standards set forth by the ICSSC, the Base Civil Engineer shall notify verbally and in writing all interested parties. As a minimum, the building occupants, safety, environmental, judge advocate, and the installation commander shall be notified. Notification will include the structural deficiency or condition posing a threat to personnel in the identified building.

If you have any questions, please direct them to our point of contact, Mr. Jim Lafrenz, HQ AFCESA/CESC, DSN 523-6332 or e-mail [lafrenzj@afcesa.af.mil](mailto:lafrenzj@afcesa.af.mil).



GARY M. ERICKSON, P.E.  
Acting Deputy Civil Engineer  
DCS/Installations & Logistics

Attachments:

1. Distribution List
2. Seismic Risk Priorities
3. Performance Objective Categories

DISTRIBUTION LIST

HQ AFMC/CE

HQ AFSPC/CE

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HQ USAFA/CE

HQ AIA/CE

AFIT/CE

ANGRC/CE

11 WG/CE

## DEFINITIONS OF PRIORITIES FOR SEISMIC RISK BUILDINGS FOR MITIGATION

**LEVEL 1:** This level includes buildings located in National Earthquake Hazard Reduction Program (NEHRP), map 2, seismic zones 6 and 7 (generally within California, Nevada, Alaska, southwest Montana, Hawaii and the territories of Puerto Rico and Guam) determined to be a life safety risk and either shelter high occupancies, or are necessary for the protection of life or property either during or after an event (performance category I and III buildings as defined in AFJMAN 32-1049 and ETL 93-3).

High occupancy buildings include, as a minimum, dormitories, lodging facilities, child care centers, MWR clubs, recreation centers, bowling alleys, BX and commissary buildings, chapels, and movie theaters.

Event recovery buildings include, as a minimum, fire stations, medical facilities, security police command centers and penal facilities. Hazardous materials storage buildings are included when damage could result in the release of materials with risk to life or personal safety.

One- and two-family residential detached housing is not included.

**LEVEL 2:** This level includes high occupancy, event recovery, and hazardous material storage buildings determined to be life safety risks and located in NEHRP map 2, seismic zone 5 (general areas are Washington, western Utah, western Wyoming, southeastern Idaho; Yuma County, Arizona; and the four-corner area near Memphis, Tennessee).

**LEVEL 3:** This level includes all other buildings (including one and two-family residential detached housing) located in NEHRP map 2, seismic zones 5, 6 and 7 not already included in level 1 or level 2 which the major command determines to be a life safety risk. This level includes buildings in other seismic zones that otherwise meet the criteria of level 1 and are determined to be a life safety risk by the major command.

99 Dorm  
EOD

## PERFORMANCE OBJECTIVE CATEGORIES

**IMMEDIATE OCCUPANCY:** Buildings remaining occupied and functional during an earthquake event and/or house a function necessary for post-disaster recovery. Examples include damage control centers, hospitals, fire stations, communications (including aircraft control towers), disaster preparedness offices (command and control), security police operations, weapons storage, petroleum storage, chemical storage, etc.

**HIGH RISK:** Buildings where primary occupancy is for assembly of large numbers of people, confinement of people (prisons), houses a service for a large number of other buildings, or shelters high-value equipment. Examples include theaters, dormitories, dining halls, aircraft hangars, central heat plants, water treatment plants, etc. Does not include family housing unless there are more than two families within one building.

**OTHER BUILDINGS:** All other buildings not included in the above categories and used for human occupancy.

**OTHER HAZARDS:** Buildings used for incidental occupancy for a period of less than two hours per day. This includes buildings used for storage or warehousing.

ATTACHMENT TO ARCHITECTURAL COMPATIBILITY GUIDE CHECKLIST  
ROADWAY/PARKING LOT LIGHTING  
MALMSTROM AFB, MT

General: All electrical components shall be UL approved and an integral component of the fixture.

All ballasts shall be the component type capable of providing lamp starting down -20 degrees F, with a power factor of 90% or better(High Power Factor). Ballasts shall be specified for a low watts loss of less than 10%.

The light distribution type shall be:

Collector/Major Roadway: Offset  
Non-Collector Roadway: Type 3  
Parking(Center-located)/Area Security: Type 5  
Parking(Edge-located): Type 3

There shall be a handhole at the bottom area of the pole for access to connections, ground connections, and fusing.

Pole finishes and color shall match the fixture and both shall be supplied by one manufacturer.

Fixture: Fixtures shall be as follows:

Collector/Major Roadway: Holophane Vector, or approved equal.  
Non-Collector Roadway: Kim Model EKG501, or approved equal.  
Parking(Center-located)/Area Security: Kim Model 5SQ, or approved equal.  
Parking(Edge-located): Kim Model EKG501, or approved equal.

The photometrics shall be such that foot-candle levels achieved will meet or exceed that achieved by the fixtures shown above, and be in accordance with AASHTO and the IES recommended maintained illuminance design levels with appropriate uniformity ratios of the roadway and area classifications indicated above.

Photometric tests shall be performed and results provided by an independent testing laboratory.

Where lighting is provided for any of the systems above, design and installation shall be on a "system" basis, not just on a fixture basis.

All lighting shall be high pressure sodium unless there is a specific requirement for metal halide-type(white) lighting.

Lamp wattage shall be 250 or 400 watt.

The voltage shall be 240 VAC, or 208 VAC, if tying to a 3 phase system.

Each fixture shall have its own photo control.

Each fixture shall be fused at the base of the pole.

Poles &  
Brackets:

Poles shall be aluminum, non-tapered, square, and rated to withstand winds up to 100 mph with the installed fixture, and shall have vibration dampners to control distortion from 20 mph sustained winds.

Poles shall be of the anchor-base type.

Poles and brackets shall be compatible with the fixtures provided.

Cover plates shall match the poles in color and finish and installed at the base of the pole to conceal the mounting bolts.

All poles, except poles for the Vector, Offset fixtures, shall be 30 ft. in height. Poles for the Vector shall be 39 ft. in height.

The wall thicknesses for all poles shall be a minimum of 1/4 inch thick.

Materials &  
Finishes:

Fixtures, poles, and brackets shall have a factory-applied anodized finish of semi-gloss dark bronze applied over a satin polish according to architectural Class I specifications.

Mounting:

Wall-mounting shall be accomplished by a modified arm containing an access hole to allow field splices with the arm.

Packaging:

Fixture, bracket, and pole shall be packed in corrugated cardboard for protection during shipment.

Poles shall be installed with the packing cardboard in place to protect the finish during installation.

Foundations:

Foundations for the poles shall be reinforced concrete and be 24 inches in diameter.

Foundations shall extend 6 feet below grade.

Near roadways, driveways, in parking lots, and near curb edges, the foundations shall extend 3 feet above grade.

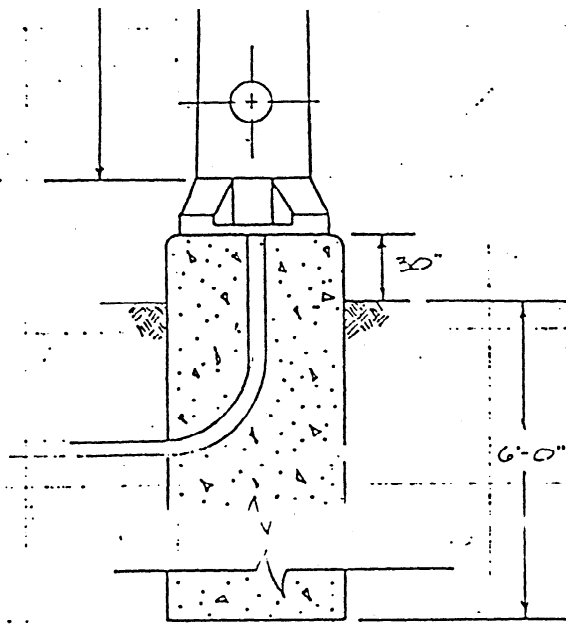
In grassed areas not near asphalted areas, the foundation shall extend one foot above grade.

At the intersection of the pole and the foundation, the area shall be grouted with a non-shrink grout after the pole is leveled and set.

From one foot below grade to the top of concrete above grade, sonaform tubing shall be used as the form in pouring the concrete. After the stripping of the form, sack the exterior to fill all voids.

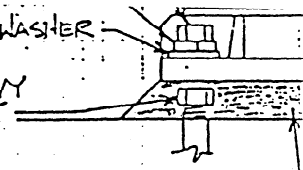
A 3/4"x 10' copper-clad steel ground rod shall be driven below grade adjacent to the pole foundation for grounding of the fixture and the pole. The grounding conductor shall be exothermically connected to the ground rod run through PVC pipe installed in the concrete foundation to the area of access handhole in the base of the pole.

A pole and foundation detail shall be included in the project drawings.



GALVANIZED FLAT WASHER

GALVANIZED HEAVY  
HEX LEVELING NUT

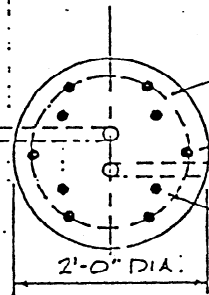


DET.  
N

ALERT LIGHT STRUCTURE

NTS

⊙

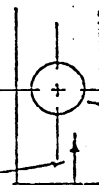


No. 3 HOOPS 18" O.C.

No. 4 VERTICAL BARS SPACED AT 60 DEGREES

CONDUIT, PVC 1 1/2"

ANCHOR BOLT SIZE, SPACING, AND PROJECTION PER MANUFACTURERS REQUIREMENTS



HAND HOLE  
TROWEL FINISH

ANCHOR BOLTS WITH LEVELING NUTS PER MFR. RECOMMENDATION

BOND GROUND CONDUCTOR TO  
SOLE GROUND PAD W/ SUITABLE  
CONNECTOR

CAST ALUMINUM ANCHORBASE  
(SEE DETAIL A)  
GROUT

45° CHAMFER

No. 6 COPPER WIRE

EXOTHERMIC WELD

3" TYP.

GROUND ROD

TYP. LIGHT POLE FOUNDATION

NTS



ATTACHMENT TO ARCHITECTURAL COMPATIBILITY GUIDE CHECKLIST  
ROADWAY/PARKING LOT LIGHTING  
MALMSTROM AFB, MT

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CECR *J*  
REV 8 Nov 97



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*Interim Department of Defense  
Antiterrorism/Force Protection  
Construction Standards*

*XXXXXXXX 1999*

*Deputy Under Secretary of Defense for  
Installations*

1

**FOR OFFICIAL USE ONLY**

**APPENDIX 8**

## FOREWORD

This document is issued under the authority of DoD Instruction Number 0-2000.16, "DoD Combating Terrorism Program Standards," May 10, 1999. DoD Instruction 0-2000.16 established DoD Standard 20, which requires the development of antiterrorism/force protection guidelines for new construction. This interim standard implements the requirement to provide guidance for the minimum construction requirements that should be incorporated into all inhabited new construction and major renovations funded under the Military Construction (MILCON) appropriation.

This document applies to the Office of the Secretary of Defense (OSD); the Military Departments (including their National guard and Reserve components); the Chairman, Joint Chiefs of Staff and Joint Staff; the Combatant Commands; and the Defense Agencies (hereafter referred to collectively as "DoD Components").

This document is effective immediately and is mandatory for use by all the DoD Components.

Send recommended changes to this document to:

Office of the Under Secretary of Defense for Installations  
Attn: \_\_\_\_\_  
3050 Defense Pentagon, Room XXXXX  
Washington, DC 20301-3050

The DoD Components may obtain copies of this document through

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## REFERENCES

- (a) DoD Directive 5200.8, Security of DoD Installations and Resources, April 25, 1991.
- (b) DoD Instruction 2000.16, DoD Combating Terrorism Program Standards with Change 1, May 10, 1999.
- (c) DoD FMR 7000.14R, DoD Financial Management Regulation, April 1998.
- (d) Technical Manual 5-853-1/Air Force Manual 32-1071, Volume 1, Security Engineering - Project Development (For Official Use Only), May 1994.
- (e) Technical Manual 5-853-2/Air Force Manual 32-1071, Volume 2, Security Engineering - Concept Design (For Official Use Only), May 1994.
- (f) Technical Manual 5-853-3/Air Force Manual 32-1071, Volume 3, Security Engineering - Final Design (For Official Use Only), May 1994.
- (g) Technical Manual 5-809-10/Navy Facilities Engineering Publication P-355/Air Force Manual 88-3 Chapter 13, Seismic Design for Buildings, October 20, 1992.
- (h) Military Handbook 1013/1A, Design Guidelines for Physical Security of Facilities, June 28, 1993.
- (i) User's Guide UG-2031-SHR, User's Guide on Protection Against Terrorist Vehicle Bombs, June 1998.
- (j) User's Guide UG-2030-SHR, User's Guide on Security Glazing Applications, June 1998.
- (k) U.S. Army Corps of Engineers Engineer Technical Letter 1110-3-498, Design of Collective Protection Shelters to Resist Chemical, Biological, and Radiological (CBR) Agents, February 24, 1999.
- (l) U.S. Central Command Operations Order (OPORD) 97-01A, Appendix 2 to Annex C, Construction Standards (Secret), April 15, 1999.
- (m) U.S. European Command Antiterrorism/Force Protection Operations Order 99-01, Appendix 1 to Annex D, Force Protection Design Standards (For Official Use Only), May 18, 1999.
- (n) U.S. Pacific Command Antiterrorism Operations Order 5050-99, Tab B to Appendix 1 to Annex M, Construction Standards, February 10, 1999.
- (o) U.S. Southern Command Regulation 380-16, Appendix G, Military Construction Considerations, September 9, 1998.

## DL1. DEFINITIONS

DL1.1. Terms used in this Manual are defined below:

DL1.1.1. Active Vehicle Barrier. A vehicle barrier which must be manually or automatically deployed in response to detection of a threat.

DL1.1.2. Aggressor. Any person seeking to compromise an asset. Aggressor categories include protesters, criminals, terrorists, and subversives.

DL1.1.3. Annealed Glass. The most common form of glass available. Depending on manufacturing techniques, it is also known as plate, float, or sheet glass.

DL1.1.4. Asset. A resource requiring protection. For this interim standard, the asset is limited to people.

DL1.1.5. Conventional Construction. Building construction including doors, windows, or manufacturers' components which is not designed to resist tools, weapons, or explosives but is designed to resist common environmental conditions.

DL1.1.6. DoD Personnel. Any U.S. military, DoD civilian, or family member.

DL1.1.7. Exclusive Standoff Zone. A controlled area surrounding a structure into which only service and delivery vehicles are allowed. The perimeter of this area is defined by perimeter barriers and is set at a standoff distance sufficient to reduce the blast effects of vehicle bomb detonations on the protected structure.

DL1.1.8. Facility. Any single building, project, or site.

DL1.1.9. Fragment Retention Film. A thin optically clear film applied to glass to minimize the spread of glass fragments when the glass is shattered. The film may also be treated with reflective coatings to provide obscuration.

DL1.1.10. Glazing. Glass, plastic, or composite sheets used in windows.



DL1.1.11. Inhabited Structure. Structures intended to be occupied by DoD personnel with a personnel density of greater than one person per 400 square feet. This density generally excludes industrial and storage facilities. This does not include guard type facilities, single and duplex detached family housing. It may include portions of structures in which not all areas have such population densities.

DL1.1.12. Laminated Glass. Two or more individual sheets of glass bonded together by a polyvinyl butyral (PVB) plastic interlayer.

DL1.1.13. Level of Protection. The degree to which an asset is protected against a tactic based on the asset's value. Levels of protection refer to the amount of damage a structure is allowed to sustain or the probability that an aggressor will be defeated by the protective system. Specific levels of protection are associated with each tactic.

DL1.1.14. Major Renovation. Modifications to buildings that cost in excess of 50 percent of the replacement cost of the building.

DL1.1.15. Minimum Standards. Protective measures to be applied to all inhabited structures or billeting or primary gathering structures regardless of the identified threat. These measures provide a degree of protection that will not preclude direct effects of blast, but will minimize collateral damage of buildings and people and will limit progressive collapse of structures. They add relatively little additional cost. and they may also facilitate future upgrades and deter acts of aggression.

DL1.1.16. Nonexclusive Standoff Zone. A controlled area used in conjunction with an exclusive standoff zone which provides less restrictive land use than an exclusive standoff zone. Cars (but not trucks) may be granted uncontrolled access to a nonexclusive standoff zone. The nonexclusive standoff zone perimeter is defined by barriers and set at a standoff distance sufficient to reduce the blast effects of a truck bomb detonation on the protected structure.

DL1.1.17. Passive Vehicle Barrier. Any perimeter barrier that serves the function of arresting or impeding vehicular movement and that is non-movable.

DL1.1.18. Perimeter Barrier. A fence, wall, passive vehicle barrier, landform, or line of vegetation applied along an exterior perimeter used to obscure vision, hinder personnel access, or hinder or prevent vehicle access.

DL1.1.19. Permanent Structure. All structures intended for use by DoD personnel for more than three years. They are normally, but not exclusively, structures designed with masonry exteriors.

DL1.1.20. Planning Team. The team responsible for criteria development on a project and for generating all of the necessary programming documents. The installation project planning team typically consists of a facilities planner, and representatives from security forces, force protection, intelligence, logistics, operations, and the facility user.

DL1.1.21. Primary Gathering Structures. A subset of inhabited structures in which 50 or more DoD personnel routinely gather (e.g., office buildings, and indoor recreation facilities).

DL1.1.22. Protective Measures. Elements of a protective system which protect an asset against a threat. Protective measures are divided into defensive and detection measures.

DL1.1.23. Protective System. An integration of all of the protective measures required to protect an asset against the range of threats applicable to the asset.

DL1.1.24. Standoff Distance. A distance maintained between a structure or inhabited portion of a structure and the potential location for an explosives detonation to reduce the explosives' blast effects on the structure. Standoff distances required vary with building component construction.

DL1.1.25. Tactics. The specific methods of achieving the aggressor's goals to injure personnel, destroy military assets, or steal military materiel or information.

DL1.1.26. Temporary Structures. Structures intended for use for a period of 3 years or less, and are not expeditionary. These structures are often capable of being relocated such as some pre-engineered buildings, trailers, and stress tension shelters.

DL1.1.27. Troop Billeting Structure. A subset of inhabited structures in which DoD personnel are billeted, not to include military single or duplex detached family housing.

DL1.1.28. Threat Severity Levels. Levels within each tactic which correspond to different sets of tools, weapons, and explosives. The severity of effects of the tools, weapons, and explosives increases with increasing threat severity levels.

## C1. CHAPTER 1

### CONSTRUCTION STANDARDS

#### C1.1. GENERAL.

C1.1.1. Recent terrorist attacks have demonstrated the vulnerability of U.S. military and civilian personnel and the facilities where they work and live. A heightened awareness of the terrorist threat has prompted the Department of Defense (DoD) to find methods to reduce injuries and death in the event of future attacks. To address that issue, DoD Instruction 2000.16 (reference a) established DoD Standard 20, which requires the development of antiterrorism/force protection guidelines for new construction. This interim standard partially implements that requirement.

C1.1.2. The purpose of this standard is to ensure that force protection standards are incorporated into the planning, programming, and budgeting for the design, and construction of Military Construction (MILCON) funded facilities. This interim standard will be updated with the completion of the first volume of the DoD Security Engineering Manual. This standard includes minimum construction requirements that will be incorporated into all inhabited new MILCON construction and major renovations regardless of the threat level. It also addresses measures that can be applied where higher threat levels apply. Inhabited structures are defined for the purposes of this standard as structures occupied by DoD personnel with a personnel density of greater than one person per 400 square feet. This density generally excludes industrial and storage facilities and also does not cover guard facilities or single and duplex detached family housing. The standard also provides additional guidance for troop billeting and primary gathering structures, a special case of inhabited structures.

C1.1.3. This interim construction standard addresses what could effectively be addressed in the short term and what the Chairman of the Joint Chiefs of Staff wanted to be covered as soon as possible. It applies to all DoD agencies and services with MILCON programming, design, or construction responsibilities. It applies to new MILCON construction and major renovations for inhabited structures both within and outside the continental United States funded under the MILCON appropriation for fiscal year 2002 and beyond. This interim standard is the minimum set for DoD. Each Commander-in-Chief (CINC) may set more stringent AT/FP construction standards to meet the specific threats in that CINC's area of responsibility.

#### C1.2. SCOPE.

C1.2.1. This standard provides guidance to:

C1.2.1.1. Specify the planning, engineering, design, and construction criteria for incorporating force protection requirements into MILCON projects.

C1.2.1.2. Provide a process and a tool for incorporating force protection costs into DD Form 1391 for MILCON projects.

C1.2.2. This standard establishes minimum construction standards for all DoD inhabited structures with additional requirements for troop billeting and primary gathering structures. C1.3. CONSTRUCTION STANDARDS.

C1.3.1. Minimum Standards. Minimum standards apply regardless of the identified threat. These standards offer protection for relatively little additional cost (approximately 0.5 percent of facility cost for one- and two-story buildings, except for administrative buildings and 1 percent for administrative buildings and buildings of three or more stories). The minimum standards include application of effective layout or prudent use of elements not specifically required to mitigate threats. They also may facilitate future upgrades and increased threat conditions (THREATCON) and may deter acts of aggression. Minimum standards are addressed in detail in Appendix 2. Those measures are to be considered minimum construction standards that will be incorporated into all new construction and major renovations for inhabited structures. Appendix 2 includes additional protective measures for troop billeting and primary gathering structures a critical subset of inhabited structures.

C1.3.2. Threat Specific Standards. In addition to the minimum standards described above this interim standard provides guidance for incorporating additional measures to mitigate specific threats. That guidance includes design strategies for mitigating the effects of specific aggressor tactics to defined levels of protection and the effect on building cost of applying those measures. Refer to Appendix 1 for design strategies and Appendices 3 and 4 for guidance on determining cost.

#### C1.4. RECORDING FORCE PROTECTION COSTS ON DD FORM 1391.

C1.4.1. The following provides interim guidance for recording costs for force protection on DD Form 1391 in accordance with DoD FMR 7000.14R (reference b). It should not supercede any service or agency guidance on filling out DD Form 1391. Instructions for determining the costs to which this paragraph refers are included in Appendix 4.

C1.4.1.1. Where there is no specific threat identified, add 0.5 percent to the primary facility costs for buildings of one or two stories and add 1 percent for buildings of three or more stories. Enter the percentage as described below.

C1.4.1.2. Where there is a specific threat identified, enter the enhanced construction cost for the building as a cost per square foot as a separate line item under "Primary Facility" on the DD Form 1391. The line item should be titled "Antiterrorism Force Protection/Physical Security Measures." Those costs should include measures such as special structural improvements and bullet resistant glass, etc. They should not include costs for security measures that are mandated elsewhere.

C1.4.1.3. Where land acquisition serves a specific purpose such as providing standoff distance for force protection, the acquisition shall be listed as a separate antiterrorism/force protection line item under the primary facility.

C1.4.1.4. Where applicable, enter costs for site improvements for antiterrorism/force protection that are specifically applied to mitigate the effects of a threat (such as the vehicle barriers, fencing, berms, and landscaping, etc.) on a separate line item under "Supporting Facilities" on the DD Form 1391. Use the same title used for the primary facility.

C1.4.1.5. List the specific antiterrorism/force protection measures and considerations that the project provides in the applicable paragraph of the DD Form 1391 in accordance with component guidance. Include reference to the design criteria used to determine the enhanced costs.

C1.5. ADDITIONAL ASSISTANCE. Additional assistance in applying this standard is available from the sources listed in Table C1.T1.

Table C1.T1. List of sources

Component	Organization	Point of Contact	Phone Number	E-Mail Address
DoD Agencies	Joint Staff (J-34)	LTC Vincent Kam	(703) 693-7551	kamvw@js.pentagon.mil
Air Force	Air Force Civil Engineer Support Agency	Mr. James Lafrenz	(850) 283-6332	jim.lafrenz@afcesa.af.mil
Army	HQ Corps of Engineers	Mr. Ray Navidi	(202) 761-0223	ray.g.navidi@usace.army.mil
	Corps of Engineers Protective Design Center	Mr. Curt Betts	(402) 221-4918	Error! Bookmark not defined.
Marine Corps	HQ U.S. Marine Corps (POS)	Capt Thomas Mockbee	(703) 614-4177	Mockbeetb@hqmc.usmc.mil
	HQ U.S. Marine Corps Land Use and Military Construction Branch	Ms. Jane Brattain	(703) 695-8321	Brattainhj@hqmc.usmc.mil
Navy	NCIS/N-34	Mr. Bruce Bittenbender	(202) 433-9087	Bbitten@ncis.navy.mil
	Naval Facilities Engineering Service Center	Mr. Mitch Hardin	(805) 982-1571	Error! Bookmark not defined.

## AP1. APPENDIX 1

### PLANNING AND DESIGN STRATEGIES

AP1.1. INTRODUCTION. The design strategies presented in this appendix apply to the development of protective measures beyond the minimum standards presented in Appendix 3. Summaries of design strategies are provided to help you understand the basis for determining the costs of mitigating the effects of the tactics included in this standard. They include both the basic design strategies and the more specific design strategies associated with different levels of protection. By understanding the levels of protection you will know what risk you are accepting with each level. These strategies are discussed in more detail in references c, e, and f.

#### AP1.2. VEHICLE BOMB TACTICS.

AP1.2.1. Moving vehicle tactics include the moving and stationary vehicle bomb tactics. In both of these tactics, aggressors attack facilities to destroy, damage, injure, or kill people or assets within them using a vehicle laden with explosives. In the moving vehicle bomb tactic, the aggressor drives the vehicle into the target structure and detonates the explosives. In the stationary vehicle bomb tactic, the aggressor parks the vehicle near the structure and detonates the explosives remotely or by a time delay. When one threat severity level is selected, the threat also includes all lower threat severity levels. The basic design strategy and levels of protection are described below.

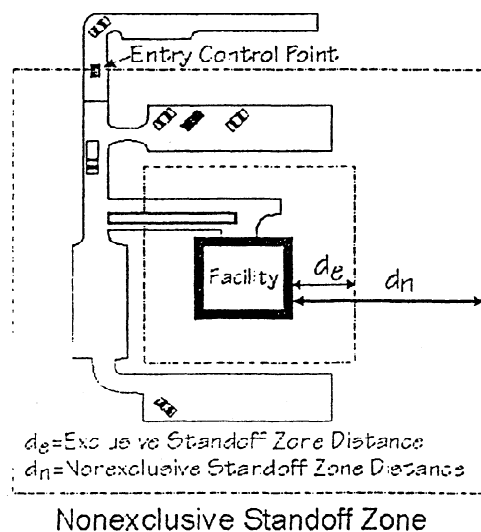
AP1.2.1.1. Standoff Distance. Blast pressures near an exploding vehicle bomb are very high, but they decrease rapidly with distance from the explosion. The design strategy for these tactics is to maintain as much standoff distance as possible between the vehicle bomb and the structure and then, if necessary, to harden the structure for the resulting blast pressures. The standoff distance will be considered to be the distance from the face of the target structure (at any point) to the point on the site at which you can effectively establish a perimeter within which you can control vehicle access. Alternatively, where there is an area of a structure that does not meet the requirements of an inhabited structure, that area can be considered to be part of the standoff distance. In that case, the standoff distance would be from the site perimeter to the face of that portion of the structure constituting the inhabited structure. The standoff distance is maintained by barriers on the perimeter of the resulting standoff zone. See the passive vehicle barrier cost graph in Appendix 4 (Table AP4.T.20.) to establish perimeter cost for a facility.

AP1.2.1.1.1. Exclusive Standoff Zone. Exclusive standoff zones may be used at all threat severity levels. Only emergency response, delivery, and service vehicles are allowed into the exclusive standoff zone. Give special consideration to allowing unimpeded access to the exclusive standoff zone for emergency response vehicles.

AP1.2.1.1.2. Nonexclusive Standoff Zone. Nonexclusive standoff zones may be used for the high, very high, and special case threat severity levels to minimize limitations on land use. Where the nonexclusive standoff zone is employed, it encloses an exclusive standoff zone. The inner perimeter is set at the distance associated with the 220 pound TNT threat and the outer perimeter is set at the distance associated with the truck bombs. Cars can enter the outer perimeter with only cursory visual searches, but are not allowed within the inner perimeter. Trucks cannot enter the outer perimeter without being searched. Note that these searches require manpower, which is not accounted for in this standard.

AP1.2.1.2. Vehicle Barriers. The difference between the moving and stationary vehicle bomb tactics is that the aggressor using the moving vehicle bomb tactic will attempt to crash through the vehicle barriers, and the aggressor using the stationary vehicle bomb tactic will not. Therefore, vehicle barriers for the moving vehicle bomb tactic must be capable of stopping the moving threat vehicle at the perimeter of the standoff zone. For the stationary vehicle bomb tactic, vehicle barriers must mark the perimeter of the standoff zone but are not required to stop the moving threat vehicle. Perimeter barriers extend around the entire perimeter ending only at entry points. They are applied for both non-exclusive and exclusive standoff zones. Active barriers are installed at all entry points and can be raised or lowered to allow vehicles to pass. See Figure AP1.F1. For barriers to resist the moving vehicle tactic, including means to slow vehicle approach will decrease the requirements for both perimeter and active vehicle barriers.

Figure AP1.F1. Nonexclusive standoff zone  
 AP1.2.1.3. Levels of Protection.





AP1.2.1.3.1. Low Level of Protection: Damaged, Unrepairable. The structure or protected space will sustain a high degree of damage without collapse. Although collapse is prevented, occupants may be injured and other assets may be damaged but will survive. Damaged building components, including structural members, will require replacement. Depending on the scale of the blast damage, its location, and structure characteristics, the structure may be completely unrepairable, requiring demolition and replacement. The damage allowed may make surviving assets vulnerable to subsequent attack. Majority of personnel will suffer lacerations and blunt trauma from window glazing fragments and other non-structural debris.

AP1.2.1.3.1.1. Windows will break and be propelled into the room up to a few feet.

AP1.2.1.3.1.2. Doors will only be hollow metal.

AP1.2.1.3.2. Medium Level of Protection: Damaged, Repairable. The structure or protected space will sustain a significant degree of damage, but the structure will be reusable. Occupants and other assets may sustain minor injuries or damage. Damaged building components other than structural members may require replacement, but damaged structural members can be repaired. Personnel will suffer mostly minor and some serious lacerations and blunt trauma from window glazing fragments and non-structural debris.

AP1.2.1.3.2.1. Windows will break, but will not fall out of the frame.

AP1.2.1.3.2.2. Doors will be blast resistant.

AP1.2.1.3.3. High Level of Protection: Superficial Damage. The structure or protected space will sustain only superficial damage. Occupants and other assets will also incur only superficial injury or damage. Personnel will suffer only minor lacerations and blunt trauma from window glazing fragments and non-structural debris.

AP1.2.1.3.3.1. Windows will not break.

AP1.2.1.3.3.2. Doors will be blast resistant.

AP1.3. PLACED BOMB TACTIC. In this tactic the aggressor carries an explosive device up to a structure, places it, and detonates it either remotely or on a time delay. The basic design strategy is to establish a standoff zone as for the vehicle bomb

tactics and maintain it with a fence. Levels of protection are the same as the vehicle bomb tactics.

AP1.4. BALLISTICS TACTIC. In this tactic aggressors fire small arms at assets within the structure. The basic design strategy is dependent on the level of protection. The strategy for the low level of protection is predicated on the assumption that aggressors will not shoot at what they cannot see; therefore, protection is limited to obscuring the assets from views from outside the building. Obscuration might be achieved by installing reflective fragment retention film on the windows and glazed doors of the building or blocking sightlines from uncontrolled vantage points with vegetation, walls, or other structures. At the high level of protection the design strategy involves ensuring that all building components, including windows and doors are bullet resistant.

## AP2. APPENDIX 2

### DOD ANTITERRORISM/FORCE PROTECTION MINIMUM STANDARDS

#### AP2.1. SECURITY ENGINEERING STANDARD 1: SITEWORK.

##### AP2.1.1. Facility Access.

AP2.1.1.1. Eliminate, minimize, or mitigate lines of approach perpendicular to inhabited structures.

AP2.1.1.2. Minimize vehicle access points.

AP2.1.1.3. Coordinate with the installation master plan to site facilities with large non-DoD visitor populations away from inhabited structures where possible.

##### AP2.1.2. Facility Characteristics.

AP2.1.2.1. Avoid conditions within 30 feet of inhabited structures that permit concealment of aggressors or that would obscure the view of objects or packages 6 inches in height from the view of security personnel.

AP2.1.2.2. Minimize exposure to surveillance and observation of assets within inhabited structures from uncontrolled natural or man-made vantage points.

AP2.1.3. Facility Standoff / Separation. Facility standoff distances are intended to prevent the progressive collapse of structures. For all cases below, standoff distances will be to the face of that portion of a structure that meets the criteria of an inhabited structure or a troop billeting or primary gathering structure. Portions of structures with lesser occupancies may be located within the stated standoff distances. When that standoff distance is not available design the structure to sustain an equivalent degree of damage to what it would experience from a 50 pound TNT explosive placed at 30 feet. Alternatively, design the exterior walls, roof, windows, and doors to the low level of protection against a 50 pound TNT explosive. Costs to achieve the low level of protection are included in Appendix 4.

AP2.1.3.1. Maintain a minimum standoff distance of 80 feet from inhabited structures to installation perimeters.

AP2.1.3.2. For troop billeting and primary gathering structures, maintain a minimum standoff distance of 150 feet from the structures to installation perimeters.

AP2.1.3.3 Locate trash containers at least 30 feet from inhabited structures.

AP2.1.3.4. Locate trash containers at least 80 feet from troop billeting and primary gathering structures.

AP2.1.3.4. Maintain a minimum building separation of 50 feet for troop billeting and primary gathering structures.

## AP2.2. SECURITY ENGINEERING STANDARD 2: PARKING.

AP2.2.1. Parking beneath inhabited structures is strongly discouraged. If unavoidable, mitigate by designing columns assuming loss of lateral support at any one floor level (i.e., a laterally unsupported length equal to two stories) to avoid progressive collapse and control access to the parking structure.

AP2.2.2. To limit the possibility of progressive collapse, locate parking lots at least 80 feet from troop billeting and primary gathering structures. Portions of such structures with lesser occupancies may be located within the stated standoff distance, however. When this standoff distance is not available, design the structure to sustain an equivalent degree of damage to what it would experience from a 50 pound TNT explosive placed at 80 feet. Alternatively, design the exterior walls, roof, windows, and doors to provide a low level of protection against a 50-pound TNT explosive. Costs to achieve the low level of protection are included in Appendix 4.

## AP2.3. SECURITY ENGINEERING STANDARD 3: BUILDING LAYOUT.

AP2.3.1. Minimize or mitigate exposure of personnel in inhabited structures to potential glass fragment hazards.

AP2.3.2. Design circulation within inhabited structures to provide detection of people approaching controlled areas or occupied spaces.

AP2.3.3. Locate activities with large non-DoD visitor populations within or around inhabited structures away from protected assets where possible.

AP2.3.4. When possible, position exterior doors on inhabited structures so they cannot be easily targeted from the installation perimeter or uncontrolled vantage points.

## AP2.4. SECURITY ENGINEERING STANDARD 4: SUPERSTRUCTURE.

AP2.4.1. Structural. The intent of these requirements is to minimize the possibility of progressive collapse. Where these requirements cannot be met for major MILCON funded renovations or existing structures, design the renovation to provide as much mitigation as is practical.

AP2.4.1.1. For inhabited structures of three stories or more, use a lateral load resisting support system and design in structural redundancy that allows the loss of one primary vertical or one primary lateral load-carrying element without progressive collapse.

AP2.4.1.2. For all multistory inhabited structures, design all multistory vertical load carrying elements assuming loss of lateral support at any one floor level (i.e., a laterally unsupported length equal to two stories).

AP2.4.1.3. Exterior masonry walls will be reinforced in all inhabited structures.

AP2.4.1.4. On multistory inhabited structures, run concrete floor slab reinforcement continuously through both faces of the slab and into the beams and columns to improve capability to withstand load reversals.

AP2.4.1.5. Exterior walls in inhabited structures will employ one-way wall elements spanning vertically to minimize blast loads on columns.

AP2.4.1.6. Structurally separate portions of inhabited structures with lesser occupancies from the inhabited portions of the structure when th portions with lesser occupancies are located within prescribed standoff distances.

AP2.4.2. Non-structural. Attach interior ceiling mounted fixtures to the supporting structural system (i.e., use seismic detailing from Technical Manual 5-809-10) in inhabited structures. This includes suspended ceilings, light fixtures, and mechanical and electrical ducting and pipes.

AP2.4.3. Exterior Windows. For single glazed windows in inhabited structures, use a minimum of ¼-inch (6-mm) annealed laminated glass. For insulated glass units, the inner pane should be a minimum of ¼-inch (6-mm) annealed laminated glass.

AP2.4.4. Exterior Doors. Use a minimum of ¼-inch (6-mm) annealed laminated glass for exterior door glazing in inhabited structures.

AP2.5. SECURITY ENGINEERING STANDARD 5: MAILROOMS.

AP2.5.1. Avoid routing key utilities (including communications, fire detection and alarm, water mains, etc.) through or on common walls to mailrooms in inhabited structures.

AP2.5.2. Locate mailrooms on perimeters of inhabited structures.

AP2.6. SECURITY ENGINEERING STANDARD 6: MECHANICAL AND UTILITY SYSTEMS.

AP2.6.1. Locate air intakes above the first story ceiling (for two-story or higher inhabited structures) or on the roof of single-story inhabited structures, and restrict access to the intakes.

AP2.6.2. Control access to roofs of inhabited structures. Avoid external ladder access by providing entry from internal stairways or ladders such as in mechanical rooms. Alternatively, secure external ladders.

AP2.6.3. Include an emergency shutoff switch in the control system that immediately shuts down the heating, ventilation, and air conditioning (HVAC) system of inhabited structures.

AP2.6.4. Ensure that redundant utilities in inhabited structures do not run in the same locations or chases.

AP2.6.5. Secure exterior access to power/heat plants, gas mains, water supplies, communications, electrical service, or other support facilities or infrastructure.

AP2.6.6. Construct fire protection systems in inhabited structures using seismic detailing.

## AP3. APPENDIX 3

### THREAT SPECIFIC CONSTRUCTION GUIDANCE

AP3.1. THREAT SPECIFIC CONSTRUCTION GUIDANCE. The security engineering documents listed as references c through f (Army TM 5-853/Air Force AFMAN 32-1071 series and the Navy MIL HNDBK 1013/1A) provide detailed guidance for developing protective measures to mitigate the effects of the threats described by this standard. Those documents will be considered to be the acceptable means of implementing this standard and for developing protective measures for DoD assets associated with new construction and major renovations for inhabited structures. References g, h, and i can also be used. In addition to the guidance presented in this standard and in its references, the costs for protection can be further optimized by having a qualified team perform vulnerability assessments of sites.

### AP3.2. ANTITERRORISM/FORCE PROTECTION DESIGN CRITERIA.

AP3.2.1. Planning and design criteria are developed and recommended for projects by local planning teams. These criteria must include the elements described below. Detailed discussion of these issues may be found in TM 5-853-1/AFMAN 32-1071, Volume 1 and MIL HNDBK 1013/1A. For areas within specific CINC's areas of operations, refer to the applicable CINC Operations Orders or regulations (references k, l, and m) for guidance.

AP3.2.1.1. Assets. The user must identify the assets to be protected and the design criteria must be focused on those assets. This interim standard focuses on people as assets, as opposed to buildings, equipment, or other objects. It does not preclude providing antiterrorism/force protection for mission critical or otherwise important assets.

AP3.2.1.2. The Design Basis Threat. Threat that generates requirements for design must be described by the installation commander in terms of the tactics aggressors are likely to use in attempting to compromise assets and the weapons, tools, and explosives that they will use in carrying out those tactics. For this interim standard, those threats will be limited to explosives and ballistics threats. Additional threats will be addressed in the DoD Security Engineering Manual. The explosive threats in this standard may include both vehicle and placed bombs. The tactics and threat parameters addressed in this interim standard are described below. The specific threat parameters associated with those tactics are described by threat severity levels of low, medium, high, very high, and special case as detailed in Table AP3.T1. Design basis threats are not the same as the National Threat Level Systems. While national level threats apply to a geographic area, design basis threats apply to specific assets within facilities.



AP3.2.1.2.1. Vehicle Bomb Tactic. This can take the form of either a moving or stationary vehicle bomb. In a moving vehicle bomb scenario an aggressor drives an explosive laden vehicle into a target structure or along a target perimeter road and detonates it. In the stationary vehicle bomb scenario the aggressor parks an explosive laden vehicle near a target structure, leaves, and detonates the explosive either remotely or on a time delay.

AP3.2.1.2.2. Placed Bomb Tactic. In this tactic the aggressor carries a man portable explosive to a structure and places it in a position near the structure. The bomb is either detonated remotely or via a time delay. This tactic is referred to as the exterior tactic in TM 5-853-1 / AFMAN 32-1071, Volume 1. It is included under the stationary tactic in MIL HNDBK 1013/1A.

Table AP3.T1. Threat parameters (interim standard)

Tactic	Threat Severity Level	Weapon	Tool
Vehicle bomb	Special Case	20,000 pounds TNT	60,000-pound truck
(Moving and Stationary)	High	1000 pounds TNT	5000-pound truck
	Medium	500 pounds TNT	4000-pound car
	Low	220 pounds TNT	4000-pound car
	Minimum	50 pounds TNT	4000-pound car
Placed bomb		50 pounds TNT	
Mail bomb		2 pounds TNT	
Ballistics	Very high	7.62 mm Armor Piercing	
	High	7.62 mm	
	Medium	.44 Magnum	
	Low	.38 Special	

AP3.2.1.2.3. Mail Bomb. In this tactic aggressors deliver bombs or incendiary devices to the target in letters or packages.

AP3.2.1.2.4. Ballistics Tactic. In this tactic aggressors fire small arms at target facilities with the intent of hitting people inside the facilities.

AP3.2.1.2.5. Chemical, Biological, and Radiological Threats. These threats can come from a wartime attack, a terrorist attack, or from an industrial accident.

AP3.2.1.3. Levels of Protection. Levels of protection addressed by this interim standard reflect the degree to which the assets will be protected against the threat. These levels of protection reflect different levels of damage to inhabited structures and injury to occupants from the effects of specific tactics. These levels of protection

provide protection beyond that provided by applying the minimum standards in appendix 2. They should be applied where a design basis threat is specified by an installation planning team. The levels of protection specific to each of the above tactics and the level of protection provided by applying the minimum standards are described in Table AP3.T2.

### AP3.3. FORCE PROTECTION COST TOOLS.

AP3.3.1. Appendix 4 provides estimates of the costs of force protection enhancements for new construction projects subjected to threats described above. The cost tables are for costs to achieve protection to levels of protection over and those associated with applying the minimum measures in Appendix 2. The tables provide increases in the costs per square foot of floor space for a variety of construction baselines. The costs in those tables include the costs of applying the minimum standards. There are

separate tables for each of the threat parameters detailed above, and a separate chart for perimeter barrier costs. The costs in the cost tables reflect construction that will be adequate to mitigate the effects of the applicable threats to the applicable level of protection. Including these costs will identify funding required for force protection requirements.

Table AP3.T2. Levels of protection

Tactic	Level of Protection	Potential Structure Damage	Potential Injury
Bombing tactics	Minimum	Significant damage, but no progressive collapse	Majority of personnel suffer serious injuries. There are likely to be a limited number of fatalities
	Low	Damaged – unrepairable No collapse, but structural members will require replacement	Majority of personnel suffer lacerations and blunt trauma injuries from window glazing and non-structural elements
	Medium	Damaged - repairable Damaged structural elements can be repaired	Mostly minor and some serious lacerations and blunt trauma from window glazing and non-structural elements
	High	Superficial damage	Only superficial lacerations and blunt trauma from non-structural elements
Ballistics tactic	Low	Limited - screening	Unlikely
	High	Superficial – hardened	None

AP3.3.2. Costs for protection against mail bombs and chemical, biological, and radiological threats are not specifically addressed in this interim standard except as measures incorporated into the minimum standards.

AP3.3.3. Appendix 1 provides descriptions of the basic design strategies used in developing the protective measures that were used as the basis for the cost calculations. The protective measures include perimeter barriers and building components designed to resist weapons and explosives effects, including walls, doors, windows, and roofs. Understanding the design strategies allows the user to understand the basis for the costs.

**AP4. APPENDIX 4**

**COST TOOLS**

AP4.1. INTRODUCTION. These tools can be used in formulating costs for antiterrorism/ force protection for MILCON projects. They are only to be used in programming for new construction. This interim standard does not include cost increases for major renovations, which are likely to be higher than those for new construction.

AP4.2. FORMULATION OF TOOLS. The tools described in this appendix were developed by determining the ballistics and blast resistance of various "hardened" building components to applicable levels of protection and estimating the costs of buildings built using those components. The relative costs of the hardened buildings were tabulated as increases over baseline costs for six common building categories in terms of percentage cost increase per square foot of floor space. The relative costs reflect all construction, labor, and material costs for the buildings. They also include the costs of applying the minimum standards in appendix 2. The costs in the tables in this appendix must be corrected with area cost factors, building area factors, escalation, and any other special construction considerations commonly programmed into DD Forms 1391 at your installation or for the applicable type of facility. The baseline construction for walls, doors, windows, and roofs for each of the six building categories is summarized below. The six structure types selected represent a majority of recent military construction. They can be used to represent other structure types that are similar from the standpoint of function and basic construction.

Table AP4.T1. Baseline construction

Structure Category	Building Component Construction			
	Walls	Doors	Windows	Roofs
288 Person Barracks (interior corridor) (3 stories) (115,000 gross sf)	Concrete masonry unit	3' X 7' Hollow metal and 6' X 7' glazed pairs	Aluminum frame / sliding	Standing seam metal
288 Person Barracks (exterior entrances) (3 stories) (102,000 gross sf)	Concrete masonry unit	3' X 7' Hollow metal and 6' X 7' glazed pairs	Aluminum frame / sliding	Standing seam metal
Dining Facility (1 story) (14,000 gross sf)	Brick veneer / metal stud	Hollow metal and glazed, 3' X 7' & 6' X 7' pairs	Aluminum frame / fixed	Standing seam metal
Administrative Facility (2 stories) (26,000 gross sf)	Brick veneer / metal stud	Hollow metal and glazed, 3' X 7' & 6' X 7' pairs	Aluminum frame / fixed, projected, & storefront	Standing seam metal
Medical Clinic (1 story) (40,000 gross sf)	Brick veneer / metal stud	Hollow metal and glazed, 3' X 7' & 6' X 7' pairs	Aluminum frame / fixed	Built-up roofing
Special Structures	Concrete masonry unit	Hollow metal and glazed, 6' X 7' pairs	Aluminum frame / fixed	Standing seam metal



Table AP4.T2. Examples of facility construction types represented by baseline

Baseline Structure	Occupancy Classification	Examples of Facility Construction Types Represented
Barracks, External Entrances	Housing	<ul style="list-style-type: none"> <li>• Enlisted Barracks</li> <li>• Trainee Barracks</li> <li>• Transient Unaccompanied Personnel Housing</li> <li>• Unaccompanied Enlisted/NCO/Officers Quarters</li> </ul>
Barracks, Internal Corridor	Housing	<ul style="list-style-type: none"> <li>• Enlisted Barracks</li> <li>• Trainee Barracks</li> <li>• Transient Unaccompanied Personnel Housing</li> <li>• Unaccompanied Enlisted/NCO/Officers Quarters</li> </ul>
Administration Facility	Office	<ul style="list-style-type: none"> <li>• Airfield Operations Building</li> <li>• Aviation Unit Operations Building</li> <li>•</li> <li>• Brigade/Battalion/Company Headquarters</li> <li>• Cargo Handling Office Building</li> <li>• Community Services Center</li> <li>• Courtroom</li> <li>• Dispatch Building</li> <li>• Emergency Operations Center</li> <li>• Field Operations Building</li> <li>• National Guard/Reserve Center</li> <li>• School</li> <li>• Child Development Center</li> <li>• Ship Operations Building</li> </ul>
Medical Clinic	Medical	<ul style="list-style-type: none"> <li>• Ambulance Garage/Fire Station/Police Station</li> <li>• Dental Clinic</li> <li>• Laboratory</li> <li>• Medical Center/Hospital</li> <li>• Pharmacy</li> <li>• Red Cross Building</li> <li>• Troop Dispensary/Health Clinic</li> <li>• Veterinary Facility</li> </ul>
DINING FACILITY Facility	Services	<ul style="list-style-type: none"> <li>•</li> <li>• Dining Facility</li> <li>• Drug/Alcohol Abuse Center</li> <li>• Laundry</li> </ul>
Special Structures		<ul style="list-style-type: none"> <li>• Auditoriums</li> <li>•</li> <li>• Chapels</li> <li>• Gymnasiums</li> <li>• Theaters</li> </ul>

AP4.3. USING THE TOOLS.

AP4.3.1. Using the construction cost increase tables.

AP4.3.1.1. Select a baseline structure category using Table AP4.T1 or AP4.T2. The baseline facility types can be extrapolated with Table AP4.T2. Then select the

table that applies to the bomb size or ballistics threat and level of protection that is being programmed using Table AP4.T3. for explosives or Table AP4-T19. for ballistic.

#### AP4.3.2. Using the tables for bomb threats.

AP4.3.2.1. Enter the table with the standoff distance (in feet) from the site perimeter to the target structure. The standoff distance will be considered to be the distance from the face of the target structure (at any point) to the point on the site at which you can effectively establish a perimeter within which you can control vehicle access. Alternatively, where there is an area of a structure that does not meet the requirements of an inhabited structure, that area can be considered to be part of the standoff distance. In that case, the standoff distance would be from the site perimeter to the face of that portion of the structure constituting the inhabited structure.

AP4.3.2.2. Follow the line to the structure category that corresponds to your facility type. That cost increase (as a percentage of the square foot cost) will correspond to the cost above "conventional construction" to provide the construction required to mitigate the postulated design basis threat to the applicable level of protection.

AP4.3.2.3. Multiply the percentage cost increase per square foot by the square foot cost for the baseline construction for the planned facility. That cost may be the baseline cost for the type of facility being programmed as found in the Military Construction Pricing Guide or other baseline cost guidance. Because these costs are presented as percentages, they are not specific to any particular year and do not have to be escalated separately from the total project cost.

#### AP4.3.3. Using the tables for ballistic threats.

AP4.3.3.1. Select Table AP4-T19. for the appropriate level of protection (high or low).

AP4.3.3.2. For the low level of protection, select the percentage cost increase that corresponds to your structure type.

AP4.3.3.3. For the high level of protection, select the percentage cost increase for your structure under the desired threat severity level.

AP4.3.4. Using the vehicle barrier cost chart (Figure AP4.F1.). This chart is only necessary when the moving vehicle bomb tactics apply. Note that the costs in this chart are current for Calendar Year 1999. Application for future years will require cost escalation factors.

AP4.3.4.1. Perimeter Barriers. Use the standoff distance used above to estimate the total perimeter vehicle barrier cost. Read the total cost associated with that standoff distance from figure AP4.F1 for the vehicle applicable barrier rating (refer to Table AP4.T20.). Alternatively, determine perimeter length and apply the unit cost in Table AP4.T20.

AP4.3.4.2. Active Barriers.

AP4.3.4.2.1. Assume the number of egress and ingress locations through the perimeter based on traffic volume. The barrier costs as tabulated are for a 12-foot traffic lane. Commonly an entry point will have two lanes, each of which needs a barrier.

AP4.3.4.2.2. Enter the active vehicle barrier Table AP4.T21. and multiply the cost by the number of lanes assumed.

AP4.3.5. Multiple Tactic Costs. Costs associated with protecting a structure from more than one threat (i.e., ballistics and explosives) will be considered to be multiple tactic costs. In this interim standard, the costs for multiple tactics are conservatively considered to be additive.

AP4.3.6. Vehicle Bomb Example. Consider a 288-person barracks with interior corridors for which the planning team has postulated a low threat severity level (220 pounds TNT) for the moving vehicle bomb threat. The required level of protection is low. The baseline cost is \$142 per square foot from the Military Construction Pricing Guide. The available standoff distance is limited to approximately 80 feet. Based on expected traffic to the facility, assume you will need 4 entry/exit lanes through the perimeter.

AP4.3.6.1. Determine the additional construction cost for the primary facility.

AP4.3.6.1.1. Select Table AP4.T7. that corresponds to the 220-pound explosive/low level of protection for the 288-person barracks with interior corridors.

AP4.3.6.1.2. Enter the table at the available standoff distance of 80 feet.

AP4.3.6.1.3. Read across the table to the column that corresponds with baseline facility type (barracks interior corridor) to find the percentage cost "increase." In this example it is 3.2 percent.

AP4.3.6.1.4. Determine the additional cost. 3.2 percent X \$142 per square foot is \$4.54 per square foot additional cost. That additional cost would be entered into the DD Form 1391 on the force protection line item under "primary facility."

AP4.3.6.2. Determine the vehicle barrier costs.

AP4.3.6.2.1. Determine the perimeter barrier costs by entering the perimeter barrier Figure AP4.F1. with 80 feet of standoff distance.



AP4.3.6.2.2. Read Figure AP4.T1. for an estimate for the low level of protection at 80 ft standoff: \$70,000.

AP4.3.6.3. Refer to the active barrier Table AP4.T21. at the low to medium rating and read \$25,000 per lane. Multiply \$25,000 by four lanes for a total of \$100K.

AP4.3.6.4. Total Vehicle Barrier Cost. Add the passive vehicle barrier system \$70,000 to the active vehicle barrier system \$100,000 for a total of \$170,000.

AP4.3.7. Multiple Threat Example. There is a requirement to build a dining facility that will provide a high level of protection against a medium severity level ballistic threat and a medium level of protection against a 1000-pound explosive device. Available unencumbered land will make it possible to place a perimeter around the building at a 300-foot standoff distance. The perimeter must stop a 15,000-pound truck traveling at speeds of up to 30 miles per hour. The building perimeter must have two entrances and two exits.

AP4.3.7.1. Vehicle Barrier Costs.

AP4.3.7.1.1. Active vehicle barrier cost. From Table AP4.T21., each entrance and exit lane will require an active vehicle barrier that costs approximately \$25,000. Therefore, since two entrance barriers and two exit barriers are required, \$100,000 should be planned for procurement and installation of four active vehicle barriers located around the perimeter.

AP4.3.7.1.2. Passive Vehicle Barrier Cost. From Figure AP4.F1., the passive barrier system cost for a building requiring 300 feet of standoff is \$140,000

AP4.3.7.1.3. Total vehicle barrier cost for active and passive barrier systems.

\$ 140,000 – Passive Vehicle Perimeter Barrier System  
\$ 100,000 – Active Vehicle Barrier Systems  
\$ 240,000 – Total Vehicle Barrier Cost

AP4.3.7.2. Structure Hardening Cost to Protect against Explosive Attack. From Table AP4.T14., (1000 lbs TNT medium level of protection) the cost increase per square foot of floor space for a DINING FACILITY with 300 feet of standoff is 10 percent. Assuming that the average cost per square foot for a DINING FACILITY is \$209.65 per square foot, the increase is  $(0.10 \times \$209.65/SF = \$20.96/SF)$ .

AP4.3.7.3. Structure Hardening Cost to Protect against Ballistic Attack. From Table AP4.T19., the cost per square foot increase is 3.9 percent for a DINING FACILITY that requires a high level of protection against a medium threatseverity level ballistic attack.

Assuming that the average cost per square foot for a DINING FACILITY is \$209.65 per square foot, the increase is  $(0.039 \times \$209.65/\text{SF} = \$8.18/\text{SF})$ .

AP4.3.7.4. Total Facility Hardening Cost.

Ballistics Threat Cost Increase ----	\$ 8.18/SF
Explosives Threat Cost Increase --	\$20.96/SF
Total Cost Increase -----	\$29.14/SF

AP4.3.7.5. Estimated Costs for Antiterrorism/Force Protection.

\$ 240,000 – Total vehicle barrier cost

\$ 29.14/SF – Estimated additional cost of the DINING FACILITY with ballistic and blast protection.

Table AP4.T3. Index of tables for various bomb sizes and levels of protection

TNT	Levels of Protection		
	Low	Medium	High
50 LBS	AP4.T4	AP4.T5	AP4.T6
220 LBS	AP4.T7	AP4.T8	AP4.T9
500 LBS	AP4.T10	AP4.T11	AP4.T12
1,000 LBS	AP4.T13	AP4.T14	AP4.T15
20,000 LBS	AP4.T16	AP4.T17	AP4.T18

Table AP4.T4. 50 lbs TNT low level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
30-34	4.7	4.7	10.3	20.5	8.0	6.7
35-39	3.4	3.4	9.0	12.7	6.8	4.8
40-49	3.3	3.3	8.9	12.1	6.7	4.6
50-69	2.8	2.8	8.5	10.3	6.3	3.5
70-89	2.8	2.8	8.4	10.0	6.2	3.4
90-149	2.7	2.7	8.3	9.5	6.1	3.3
150-	1.1	1.3	7.3	7.4	4.7	0

Table AP4.T5. 50 lbs TNT medium level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
30-34	26.7	6.9	11.9	24.7	15.4	14.1
35-37	26.2	6.3	11.4	21.6	14.8	13.3
38-39	25.8	5.9	11.1	21.0	14.6	12.1
40-45	25.0	5.2	10.3	16.4	13.8	11.0
46-49	17.5	4.4	9.0	14.5	12.0	8.7
50-62	17.3	4.2	8.8	13.0	11.7	8.3
63-74	17.0	3.9	8.6	12.7	11.6	7.6
75-89	17.0	3.9	8.5	12.4	11.5	7.5
90-99	2.7	2.7	6.1	9.5	8.3	3.3
100-149	2.6	2.6	6.1	9.2	8.3	3.2
150-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T6. 50 lbs TNT high level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
30-31	28.7	9.1	14.1	27.7	17.3	20.4
32-34	28.4	8.7	13.8	27.2	17.0	19.2
35-37	27.3	7.6	12.8	23.2	16.1	16.7
38-39	26.7	6.9	12.1	22.3	15.7	14.7
40-42	26.5	6.6	11.9	22.0	15.5	13.8
43-45	26.2	6.3	11.4	21.6	14.8	13.3
46-50	18.8	5.7	10.2	20.3	13.2	11.2
51-74	17.4	4.3	8.9	13.7	11.9	8.5
75-79	17.3	4.2	8.8	13	11.7	8.3
80-89	17.2	4.1	8.7	12.7	11.7	8.2
90-109	2.8	2.8	6.2	10.0	8.4	3.4
110-149	2.6	2.6	6.1	9.2	8.3	3.2
150-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T7. 220 lbs TNT low level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
40-43	7.6	7.9	11.1	27.1	13.1	15.1
44-45	7.3	7.5	10.8	26.5	12.8	13.8
46-47	6.8	6.9	10.3	25.7	12.4	12.1
48-49	6.5	6.6	9.8	25.3	11.8	11.6
50-51	4.6	4.8	8.1	14.5	9.9	8.9
52-53	4.0	4.1	7.5	13.6	9.5	6.9
54-64	3.6	3.7	7.1	12.4	9.2	5.8
65-70	3.6	3.6	7.0	12.0	9.1	5.7
71-74	3.2	3.2	6.7	11.5	8.8	4.5
75-89	3.2	3.2	6.6	11.3	8.8	4.5
90-109	3.1	3.1	6.5	11.0	6.7	4.4
110-124	3.1	3.1	6.5	10.6	8.6	4.3
125-129	2.8	2.8	6.3	10.3	8.5	3.5
130-339	2.8	2.8	6.2	10.0	8.4	3.4
180-339	2.6	2.6	6.1	9.2	8.3	3.2
340-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T8. 220 lbs TNT medium level of protection

<b>STANDOFF DISTANCE IN FEET</b>	<i>Percentage Building Cost Increase</i>					
	<b>BARRACKS EXTERNAL ENTRANCES</b>	<b>BARRACKS INTERIOR CORRIDOR</b>	<b>DINING FACILITY</b>	<b>ADMIN FACILITY</b>	<b>MEDICAL CLINIC</b>	<b>SPECIAL STRUCTURE</b>
<b>40-42</b>	60.6	13.9	21.1	38.4	25.6	35.3
<b>43-45</b>	58.8	12.0	19.4	35.8	24.3	29.6
<b>46-49</b>	44.0	10.8	17.0	33.2	21.0	25.4
<b>50-54</b>	42.2	9.0	15.3	22.4	19.2	22.7
<b>55-57</b>	42.0	8.8	15.2	21.6	19.0	22.7
<b>58-59</b>	41.7	8.4	14.8	21.0	18.7	21.2
<b>60-64</b>	41.2	7.8	14.3	20.3	18.4	19.5
<b>65-68</b>	41.1	7.7	14.2	19.9	18.3	19.4
<b>69-81</b>	40.2	6.8	13.4	18.6	17.7	16.6
<b>82-87</b>	39.9	6.5	12.8	18.0	17.0	15.9
<b>88-89</b>	25.1	5.3	10.5	15.5	13.8	11.8
<b>90-109</b>	24.7	4.9	10.1	14.6	13.5	10.5
<b>110-147</b>	24.7	4.8	10.0	14.3	13.4	10.4
<b>148-149</b>	17.3	4.2	8.8	13.0	11.7	8.3
<b>150-165</b>	17.2	4.1	8.7	12.7	11.7	8.2
<b>166-179</b>	17.0	3.9	8.5	12.4	11.5	7.5
<b>180-189</b>	2.8	2.8	6.2	10.0	8.4	3.4
<b>190-339</b>	2.6	2.6	6.1	9.2	8.3	3.2
<b>340</b>	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T9. 220 lbs TNT high level of protection

<b>STANDOFF DISTANCE IN FEET</b>	<i>Percentage Building Cost Increase</i>					
	<b>BARRACKS EXTERNAL ENTRANCES</b>	<b>BARRACKS INTERIOR CORRIDOR</b>	<b>DINING FACILITY</b>	<b>ADMIN FACILITY</b>	<b>MEDICAL CLINIC</b>	<b>SPECIAL STRUCTURE</b>
39	61.7	15.2	22.6	40.1	27.1	38.6
40-41	61.3	14.7	21.9	39.4	26.1	37.8
42-45	60.6	13.9	21.1	38.4	25.6	35.3
46-49	45.8	12.8	18.8	35.9	22.3	31.2
50-52	44.0	11.0	17.2	25.6	20.6	28.6
53-71	42.3	9.1	15.4	23.0	19.3	22.9
72-74	41.7	8.4	14.8	22.1	18.8	20.8
75-83	41.2	7.8	14.3	20.3	18.4	19.5
84-87	40.3	6.8	13.4	19.0	17.8	16.7
88-99	25.5	5.7	11.0	16.5	14.5	12.5
100-114	25.4	5.6	10.9	15.9	14.4	12.3
115-147	24.8	4.9	10.1	14.9	13.5	10.6
148-159	17.4	4.3	8.9	13.7	11.9	8.5
160-179	17.2	4.2	8.8	12.7	11.8	8.3
180-199	3.0	3.0	6.5	10.3	8.6	4.2
200-214	2.9	2.9	6.3	9.5	8.4	4.0
214-339	2.6	2.6	6.1	9.2	8.3	3.2
340-	1.2	1.0	4.7	7.0	7.3	0



Table AP4.T10. 500 lbs TNT low level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
50-53	7.6	8.1	11.2	18.9	12.5	18.2
54-68	5.9	6.1	9.5	16.3	11.3	12.5
69-72	5.2	5.4	8.8	15.4	10.8	10.4
73-74	4.9	5.1	8.6	14.9	10.6	9.4
75-83	4.8	4.9	8.4	14.1	10.4	9.2
84-87	4.2	4.3	7.8	13.2	10.0	7.2
88-89	3.6	3.7	7.1	12.4	9.2	5.8
90-115	3.6	3.6	7.0	12.0	9.1	5.7
116-119	3.2	3.2	6.6	11.3	8.8	4.5
120-149	3.1	3.1	6.6	11.0	8.8	4.4
150-189	3.1	3.1	6.5	10.6	8.6	4.3
190-207	3.0	3.0	6.4	10.3	8.6	4.2
208-278	2.8	2.8	6.2	10.0	8.4	3.4
279-519	2.6	2.6	6.1	9.2	8.3	3.2
520-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T11. 500 lbs TNT medium level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
50-51	81.6	14.7	23.7	32.4	29.1	41.3
52-59	80.9	13.9	23.0	31.3	28.6	38.9
60-68	66.1	12.7	20.6	28.8	25.3	34.7
69-74	64.4	10.7	18.9	26.3	24.1	29.0
75-89	56.9	10.0	17.6	24.1	22.3	26.7
90-91	56.2	9.2	16.9	22.8	21.8	24.5
92-99	55.9	8.9	16.6	22.4	21.5	23.6
100-104	55.8	8.9	16.5	22.1	21.5	23.5
105-107	41.0	7.7	14.2	19.6	18.3	19.3
108-119	40.2	6.7	13.3	18.4	17.7	16.5
120-129	40.2	6.7	13.3	18.1	17.6	16.4
130-144	39.9	6.4	12.8	17.7	17.0	15.9
145-149	39.5	6.0	12.4	17.1	16.7	14.7
150-209	39.5	6.0	12.4	16.8	16.7	14.6
210-266	24.6	4.7	10.0	14.0	13.4	10.4
267-269	24.7	4.5	9.7	13.6	13.1	9.6
270-354	24.2	4.3	9.6	12.8	13.0	9.3
355-449	16.8	3.7	8.4	11.6	11.4	7.3
450-518	2.6	2.6	6.1	9.2	8.3	3.2
520-	1.2	1.0	4.7	7.8	7.3	0

Table AP4.T12. 500 lbs TNT high level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
50-51	84.2	17.2	26.7	42.0	32.6	46.2
52-59	83.5	16.5	25.8	41.0	31.5	44.5
60-65	67.6	14.2	22.4	32.3	27.2	38.4
66-69	66.9	13.4	21.7	31.3	26.7	36.1
70-71	66.7	13.2	21.5	30.0	26.5	35.8
72-74	66.2	12.8	20.7	29.3	25.4	34.9
75-79	58.8	12.2	19.5	28.1	23.8	32.8
80-104	57.1	10.2	17.8	25.5	22.6	27.0
105-106	42.1	8.9	15.2	21.6	19.1	22.5
107-109	41.5	8.2	14.6	20.7	18.7	20.5
110-129	41.2	7.8	14.3	20.3	18.4	19.5
130-139	40.3	6.8	13.4	19.0	17.8	16.7
140-174	40.2	6.7	13.3	18.4	17.7	16.5
175-189	39.9	6.3	13.0	17.8	17.4	15.3
190-209	39.6	6.1	12.5	17.4	16.8	14.8
210-224	24.8	4.9	10.1	14.9	13.5	10.6
225-229	24.7	4.8	10.0	14.3	13.4	10.4
230-289	24.6	4.7	10.0	14.0	13.4	10.4
290-341	24.5	4.6	9.8	13.2	13.2	10.1
342-354	24.2	4.3	9.6	12.8	13.0	9.3
355-449	16.8	3.7	8.4	11.6	11.4	7.3
450-519	2.6	2.6	6.1	9.2	8.3	3.2
520-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T13. 1000 lbs TNT low level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
50-54	8.4	9.0	12.1	20.1	13.1	20.9
55-59	8.3	8.9	11.9	19.9	13.0	20.6
60-80	7.6	8.1	11.2	18.9	12.5	18.2
81-99	5.8	6.1	9.4	16.3	11.2	12.4
100-103	5.7	5.9	9.3	15.4	11.1	12.2
104-109	5.1	5.3	8.7	14.5	10.6	10.2
110-119	4.8	4.9	8.4	14.1	10.4	9.2
120-122	4.7	4.9	8.4	13.7	10.4	9.1
123-124	4.1	4.2	7.8	12.8	9.9	7.1
125-134	3.8	3.9	7.5	12.2	9.7	6.2
135-149	3.5	3.6	7.0	11.8	9.1	5.7
150-169	3.5	3.6	7.0	11.5	9.0	5.6
170-184	3.1	3.1	6.6	11.0	8.8	4.4
185-249	3.1	3.1	6.5	10.7	8.7	4.3
250-309	3.0	3.0	6.4	10.3	8.6	4.2
310-339	2.8	2.8	6.2	10.0	8.4	3.4
340-739	2.6	2.6	6.1	9.2	8.3	3.2
740-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T14. 1000 lbs TNT medium level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
50-54	82.9	15.9	25.5	34.2	31.3	44.3
55-62	82.6	15.6	25.2	33.7	31.0	43.2
63-69	82.2	15.2	24.6	33.2	30.2	42.5
70-74	81.7	14.8	23.8	32.5	29.1	41.7
75-94	66.1	12.7	20.6	28.8	25.3	34.7
95-97	58.7	12.1	19.5	27.6	23.7	32.7
98-99	57.0	10.2	17.7	25.0	22.5	26.9
100-119	56.9	10.0	17.6	24.1	22.3	26.7
120-127	56.8	9.9	17.5	23.7	22.2	26.5
128-129	56.1	9.2	16.8	22.6	21.7	24.5
130-131	41.3	8.0	14.5	20.1	18.5	20.3
132-149	41.1	7.7	14.2	19.6	18.3	19.3
150-169	40.4	7.0	13.5	18.1	17.8	17.3
170-184	40.2	6.7	13.3	18.1	17.6	16.4
185-199	40.1	6.6	13.2	17.8	17.6	16.3
200-209	39.8	6.4	12.7	17.4	16.9	15.8
210-219	39.5	6.0	12.4	16.8	16.7	14.6
220-269	24.7	4.8	10.0	14.3	13.4	10.4
270-349	24.6	4.7	10.0	14.0	13.4	10.4
350-399	24.5	4.6	9.8	13.1	13.2	10.1
400-437	24.2	4.3	9.6	12.8	13.0	9.3
438-562	16.8	3.7	8.4	11.6	11.4	7.3
563-739	2.6	2.6	6.1	9.2	8.3	3.2
740-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T15. 1000 lbs TNT high level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
60-62	84.9	17.9	27.5	45.3	33.5	47.4
63-64	84.7	17.8	27.2	45.0	33.1	47.0
65-69	84.5	17.5	27.0	43.6	32.9	46.6
70-74	83.9	16.9	26.4	41.5	32.4	45.2
75-89	68.1	14.7	23.1	33.0	28.1	39.5
90-94	67.4	14.0	22.2	31.0	27.0	38.1
95-110	59.3	12.6	20.3	28.7	24.8	33.7
111-119	57.6	10.7	18.6	26.2	23.6	27.9
120-124	57.1	10.2	17.8	25.5	22.6	27.0
125-129	56.9	10.0	17.6	24.1	22.3	26.7
130-148	42.1	8.9	15.2	21.6	19.1	22.5
149-174	42.1	8.9	15.2	20.7	19.1	20.5
175-178	41.1	7.7	14.2	19.6	18.3	19.3
179-219	40.2	6.7	13.3	18.4	17.7	16.5
220-244	25.4	5.6	10.9	15.9	14.4	12.3
245-289	25.1	5.2	10.6	15.3	14.2	11.1
290-299	24.9	5.0	10.4	14.4	14.0	10.9
300-379	24.6	4.7	10.0	14.0	13.4	10.4
380-437	24.5	4.6	9.8	13.2	13.2	10.1
438-489	17.1	4.0	8.6	11.9	11.6	8.1
490-739	16.9	3.8	8.4	11.6	11.5	7.3
740-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T16. 20,000 lbs TNT low level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
176-186	9.8	10.5	14.0	23.6	15.5	24.6
187-199	9.5	10.1	13.7	23.1	15.3	23.3
200-204	9.4	10.0	13.6	22.9	15.2	22.8
205-233	9.2	9.7	13.4	21.6	15.0	22.5
234-239	8.4	9.0	12.0	20.5	13.1	20.9
240-242	8.3	8.9	11.9	19.9	13.0	20.8
243-258	7.6	8.1	11.2	18.9	12.5	17.9
259-279	7.2	7.8	10.7	18.4	11.8	17.3
280-282	7.1	7.6	10.6	17.6	11.6	17.1
283-310	5.4	5.7	8.9	15.0	10.4	10.2
311-319	4.8	5.0	8.2	14.1	10.0	7.8
320-373	4.7	4.9	8.2	13.7	9.9	7.7
374-379	4.4	4.6	7.9	13.3	9.7	6.5
380-410	4.4	4.5	7.8	13.0	9.6	6.4
411-465	3.8	3.9	7.2	12.1	9.2	4.0
466-569	3.5	3.6	6.9	11.8	9.0	3.0
570-625	3.4	3.5	6.9	11.2	8.9	2.8
626-799	3.1	3.1	6.5	10.6	8.6	1.4
800-997	3.0	3.0	6.4	10.3	8.6	1.3
998-1059	2.8	2.8	6.2	10.0	8.4	1.3
1060-2659	2.6	2.6	6.1	9.2	8.3	1.3
2660-	1.2	1.0	4.7	7.0	7.3	1.3

Table AP4.T17. 20,000 lbs TNT medium level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
178-185	85.7	18.9	29.1	39.8	35.3	53.0
186-199	84.4	17.4	27.8	37.7	34.3	47.6
200-204	69.6	16.2	25.4	35.2	31.1	43.4
205-215	69.4	16.0	25.2	33.9	30.9	43.1
216-239	67.9	14.5	22.9	31.7	27.9	39.5
240-259	67.7	14.3	22.7	31.1	27.7	38.9
260-273	60.3	13.7	21.5	29.8	26.1	36.8
274-279	59.4	12.9	20.2	28.6	24.2	35.2
280-281	59.3	12.8	20.0	27.8	24.1	35.0
282-291	58.6	12.0	19.3	26.7	23.6	32.2
292-319	58.3	11.7	18.8	26.2	22.8	31.6
320-335	58.2	11.6	18.7	25.9	22.7	31.5
344-349	56.5	9.6	17.0	23.3	21.5	24.5
350-372	41.7	8.5	14.6	20.8	18.3	20.4
373-379	41.1	7.8	14.0	19.9	17.9	17.9
380-444	41.1	7.8	14.0	19.7	17.8	17.9
445-494	40.7	7.4	13.6	19.2	17.5	16.7
495-569	40.1	6.7	13.0	18.3	17.1	14.2
570-574	40.0	6.6	12.9	17.7	17.0	14.1
575-674	39.8	6.3	12.7	17.3	16.8	13.1
675-766	25.0	5.2	10.3	14.8	13.6	8.9
767-799	24.7	4.8	10.0	14.8	13.4	7.5
800-1059	24.6	4.7	9.9	14.0	13.3	7.4
1050-1099	24.5	4.6	9.8	13.1	13.2	7.2
1100-1237	17.1	4.0	8.6	11.9	11.5	5.1
1238-2659	16.8	3.7	8.4	11.6	11.4	4.2
2660-	1.2	1.0	4.7	7.0	7.3	4.2



Table AP4.T18. 20,000 lbs TNT high level of protection

STANDOFF DISTANCE IN FEET	Percentage Building Cost Increase					
	BARRACKS EXTERNAL ENTRANCES	BARRACKS INTERIOR CORRIDOR	DINING FACILITY	ADMIN FACILITY	MEDICAL CLINIC	SPECIAL STRUCTURE
227-251	69.6	16.2	25.4	35.2	31.1	43.4
252-254	69.3	15.8	25.1	34.8	30.9	42.1
255-261	69.1	15.6	24.9	33.4	30.6	41.8
262-317	60.4	13.8	21.6	30.3	26.2	37.0
318-322	59.5	13.0	20.2	29.1	24.3	35.4
323-329	58.8	12.2	19.5	28.1	23.8	32.5
330-349	58.5	11.9	19.0	27.6	23.0	31.9
350-364	43.7	10.7	16.6	25.1	19.8	27.7
365-407	43.5	10.5	16.4	23.7	19.6	27.4
408-470	41.8	8.5	14.7	21.2	18.3	20.5
471-509	41.1	7.8	14.0	20.2	17.9	18.0
510-524	41.1	7.8	14.0	19.8	17.8	17.9
525-604	40.7	7.4	13.6	19.2	17.5	16.7
605-674	40.1	6.7	13.0	18.3	17.1	14.2
675-773	25.4	5.6	10.7	15.8	13.9	10.1
774-859	25.1	5.3	10.4	15.4	13.7	9.1
860-964	25.0	5.1	10.3	14.5	13.6	8.8
965-1099	24.6	4.7	9.9	14.0	13.3	7.4
1100-1159	17.2	4.1	8.7	12.7	11.7	5.3
1160-1516	17.1	4.0	8.6	11.9	11.5	5.1
1517-2659	16.8	3.7	8.4	11.6	11.4	4.2
2660-	1.2	1.0	4.7	7.0	7.3	0

Table AP4.T19. Ballistic threat low and high levels of protection

Structure Type	Percentage Building Cost Increases				
	Low Level of Protection	High Level of Protection			
		Low Threat Severity	Medium Threat Severity	High Threat Severity	Very High Threat Severity
DINING FACILITY	0.19	2.6	3.9	5.4	6.1
Administration Bldg.	0.81	17.5	25.3	27.8	30.4
Medical Clinic	0.12	3.1	4.4	6.8	6.5
Barracks, Exterior Entrance	0.13	6.4	8.1	15.0	17.0
Barracks, Corridor Entrance	0.13	3.1	4.5	5.2	5.7
Special Structures	0.18	4.2	5.0	9.7	11.9

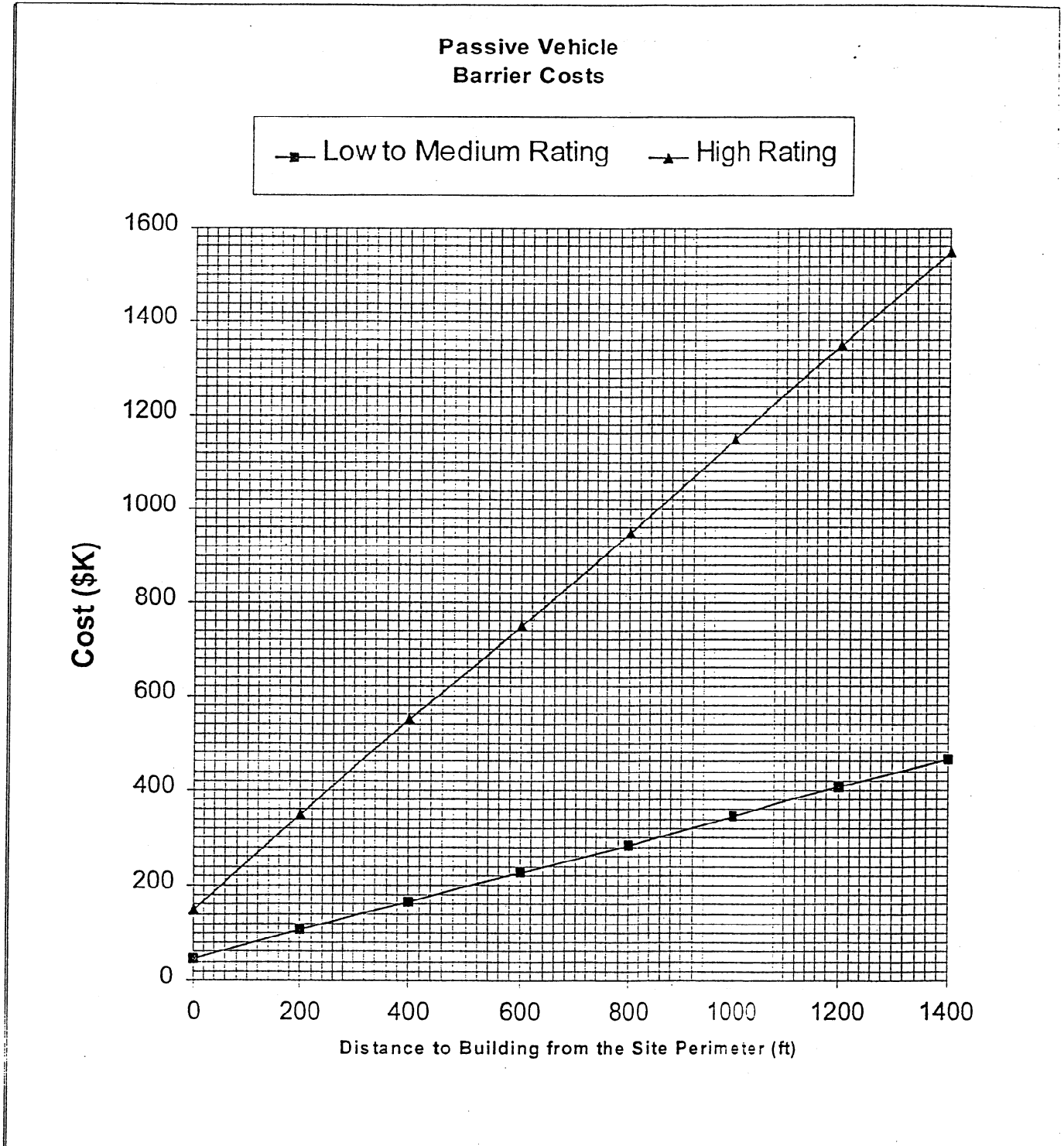
Table AP4.T20. Passive vehicle barrier costs and ratings

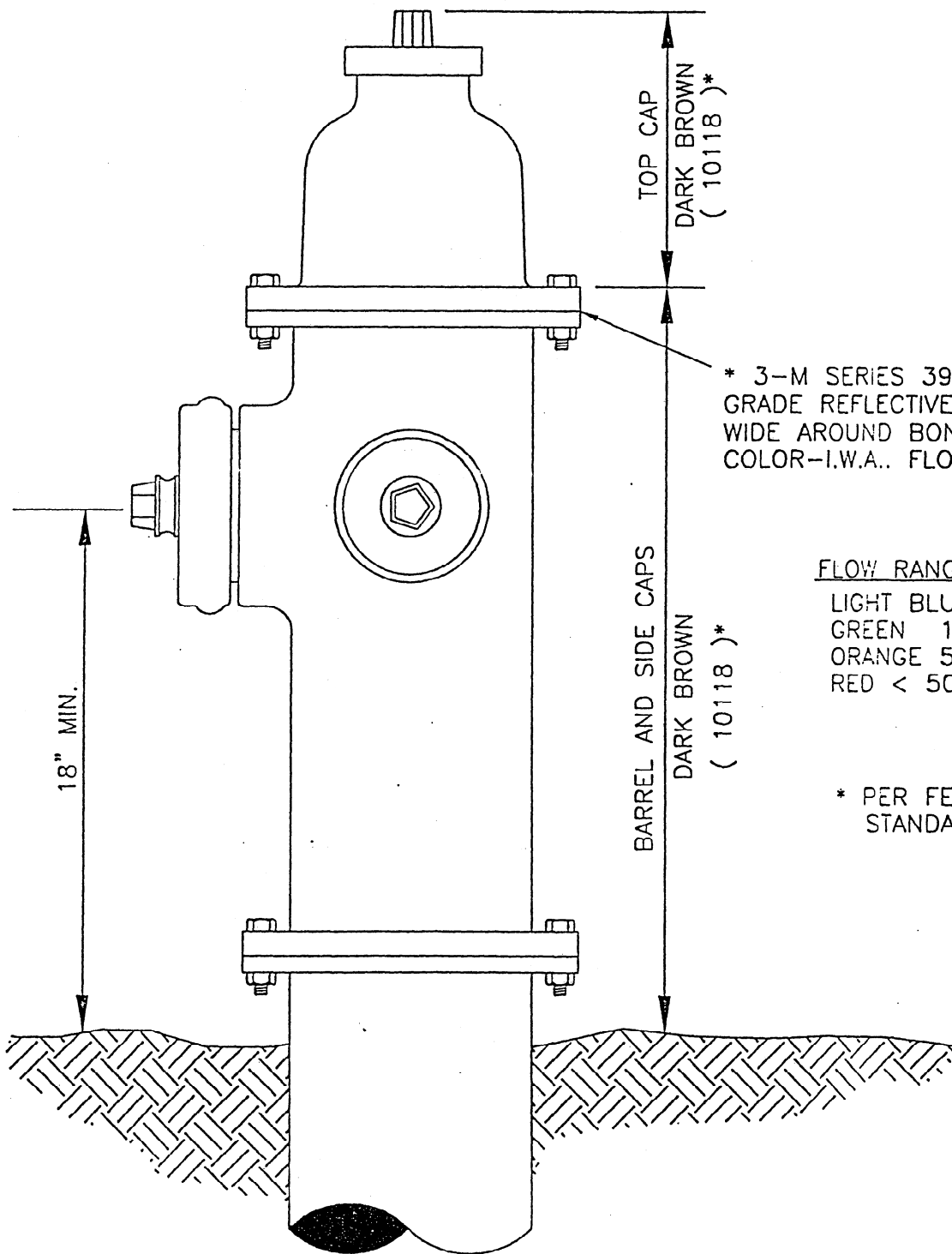
Rating	Cost Per Foot	Vehicle Weight (in lbs)	Vehicle Speed MPH
High	\$100	60,000	Up to 25
High	\$100	15,000	30-50
Low to Medium	\$30	15,000	Up to 30
Low to Medium	\$30	4,000	Up to 55

Table AP4.T21. Active vehicle barrier costs per vehicle entrance/exit

Rating	Cost Per Vehicle Lane	Vehicle Weight (in lbs)	Vehicle Speed MPH
High	\$42,000	60,000	Up to 25
High	\$42,000	15,000	30-50
Low to Medium	\$25,000	15,000	Up to 30
Low to Medium	\$25,000	4,000	Up to 55

Figure AP4.F1. Total cost for passive vehicle barrier systems versus distance to building from the site perimeter





**APPENDIX 9**

DATE: DECEMBER 1998

CONSTRUCTION  
STANDARDS

FIRE HYDRANT  
COLOR CODE  
No. FH-01

SECTION 01705

EQUIPMENT-IN-PLACE LIST

PART 1 GENERAL

1.1 SUBMITTALS

Data listed in PART 3 of this section shall be submitted in accordance with section 01300 SUBMITTALS. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 Submittal:

The final equipment-in-place list shall be completed and returned to the Contracting Officer within 30 calendar days of the final inspection. The Contracting Officer will review all final Equipment-In-Place Lists for accuracy and conformance to the requirements contained in DIVISION 1 - GENERAL REQUIREMENTS. The lists shall be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the lists to the Contracting Officer within 7 calendar days of receipt.

3.2 EQUIPMENT-IN-PLACE LIST:

Contractor shall submit for approval, at the completion of construction, a list of equipment-in-place. This list shall be updated and kept current throughout construction, and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. A sample form showing minimum data required is provided at the end of this section. The EQUIPMENT-IN-PLACE LIST shall be comprised of all equipment falling under one or more of the following classifications:

- a. Each piece of equipment listed on the mechanical equipment schedules.
- b. Each electrical panel, switchboard, and MCC panel.
- c. Each transformer.
- d. Each piece of equipment or furniture designed to be movable.
- e. Each piece of equipment that contains a manufacturer's serial number on the name plate.
- f. All Government furnished, Contractor installed equipment per a. through e. (price data excluded)

The equipment listed above shall be entered in the RMS CQC Module furnished by the Government under the "Installed Property" menu selection.

### 3.3 PAYMENT:

All costs incurred by the Contractor in the preparation and furnishing of Equipment-In-Place Lists shall be included in the contract price and no separate payment will be made for this work. Approval and acceptance of the final Equipment-In Place Lists shall be accomplished before final payment is made to the Contractor

### 3.4 RMS CQC SOFTWARE MODULE

The Contractor is required to use the RMS CQC Software module to manage the above required Equipment - In - Place data. See specification section 01400 - CONTRACTOR QUALITY CONTROL, paragraph 3.12, IMPLEMENTATION OF GOVERNMENT RESIDENT MANAGEMENT SYSTEM FOR CONTRACTOR QUALITY CONTROL OF CONTRACT.

**EQUIPMENT-IN-PLACE LIST**

**CONTRACT NO.:** \_\_\_\_\_

Specification Section: \_\_\_\_\_ Paragraph No. \_\_\_\_\_

**ITEM DESCRIPTION:** \_\_\_\_\_

Item Name: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Model Number: \_\_\_\_\_

Capacity: \_\_\_\_\_ Replacement Cost \_\_\_\_\_

**ITEM LOCATION:**

Building Number: \_\_\_\_\_ Room Number: \_\_\_\_\_

or Column Location: \_\_\_\_\_

**MANUFACTURER INFORMATION:**

Manufacturer Name: \_\_\_\_\_

Trade Name (if  
different from item name): \_\_\_\_\_

Manufacturer's Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

**WARRANTY PERIOD:** \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

END OF SECTION

98015/RL  
RENOVATE DORMITORIES 740 AND 764

939011



SECTION 01704

FORM 1354 CHECKLIST

PART 1 GENERAL

1.1 Procedures

The form which is a part of this specification section shall be completed for any project having revisions to real property. The following page contains the basic instructions applicable to the form.

1.2 Submittal

This form shall be submitted for approval, and be approved a minimum of 30 days before final inspection of the project. Failure to have this form completed and approved in time for the final inspection will result in delay of the inspection until the checklist is completed.

PARTS 2 AND 3 NOT USED

## INSTRUCTIONS FOR DD FORM 1354 CHECKLIST

The following checklist is only a guide to describe various parts of new and modified construction. Alter this form as necessary or create your own document to give complete accounting of the real property added or deleted for this contract. All items added, deleted, replaced, or relocated within the building 5 foot line, or on site 5 feet beyond the building perimeter must be accounted for completely. Only a few of the most common items beyond the 5 foot line are included on the checklist under UTILITIES/SURFACE CONSTRUCTION, add additional items as required by the construction accomplished.. Attach a continuation sheet and use the checklist format to describe other work related to this particular project. Listed on the last page are additional items with units of measure and descriptive terms.

Costs for each item must include material, tax, installation, overhead and profit, bond and insurance costs. This form should be filled out as each item is installed or each phase of work is completed.

TOTAL FOR ALL ITEMS INCLUDING CONTRACT MODIFICATION COSTS ADDED TOGETHER SHOULD EQUAL THE TOTAL CONTRACT PRICE.

### KEY TO ABBREVIATIONS

AC - Acres  
BL - Barrels, Capacity  
BTU - British Thermal Unit  
CY - Cubic Yards  
EA - Each  
GA - Gallons, Capacity  
HD - Head  
KV - Kilovolt-Amperes, Capacity (KVA)  
KW - Kilowatts, Capacity  
SE - Seats  
SF - Square Feet  
SY - Square Yard  
MB - Million British Thermal Units  
MI - Miles  
LF - Linear Feet  
KG - Thousand Gallons Per Day, Capacity  
TN - Ton  
# - Number; How Many

**DD FORM 1354 CHECKLIST**  
Transfer of Real Property

**CONTRACT NUMBER:** \_\_\_\_\_

**CONTRACT TITLE:** \_\_\_\_\_

**LOCATION:** \_\_\_\_\_

1. **DEMOLITION** (Describe each item removed and the cost of removal.)\*

2. **RELOCATION** (Describe each item relocated and the cost of relocation.)\*

3. **REPLACEMENTS** (Describe each item replaced and replacement cost.)\*

\*Use a continuation sheet if more space is required. Items should be described by quantity and the correct unit of measure.

**4. NEW CONSTRUCTION OVERVIEW: BUILDING(S)/ADDITION(S) TO A BUILDING - Use a separate checklist for each building and/or addition.**

**(1) Outside Dimensions: Length x Width**

- (a) Main Building \_\_\_\_\_
- (b) Offsets \_\_\_\_\_
- (c) Wings \_\_\_\_\_
- (d) Basement \_\_\_\_\_
- (e) Attic \_\_\_\_\_

**(2) Number of Usable Floors: \_\_\_\_\_**

**(3) Construction: Exterior Materials Used**

- (a) Foundation (such as concrete) \_\_\_\_\_
- (b) Floors (such as wood, concrete) \_\_\_\_\_
- (c) Walls (such as wood siding, metal, CMU) \_\_\_\_\_
- (d) Roof (such as metal, comp., built-up) \_\_\_\_\_

**(4) Utilities ENTERING Building: Measure LF from Bldg entry to next larger size of pipe**

- (a) Water (size & type of pipe; number of LF) \_\_\_\_\_
- (b) Gas (size & type of pipe; number of LF) \_\_\_\_\_
- (c) Sewer (size & type of pipe; number of LF) \_\_\_\_\_
- (d) Electric (phase, voltage, size & type of wire, connected load in amps) \_\_\_\_\_

**(5) Air Conditioning:**

- (a) Type \_\_\_\_\_
- (b) Capacity (TONS) \_\_\_\_\_
- (c) SQ YDS covered by system \_\_\_\_\_

**(6) Heating:**

- (a) Source \_\_\_\_\_
- (b) Fuel \_\_\_\_\_

**(7) Hot Water Facilities:**

- (a) Capacity (GAL) \_\_\_\_\_
- (b) Temperature Rise \_\_\_\_\_

BUILDING COST: \_\_\_\_\_

**5. BUILDING SYSTEMS (INTERIOR)**

**A. FIRE PROTECTION:**

Property Code

- (1) (880 50/880-211) CLOSED HEAD AUTO SPRINKLERS - SF & HD (wet or dry pipe; # of LF of service pipe; type of pipe & # of heads; # of SF covered by system)

DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (2) (880 50/880-212) OPEN HEAD DELUGE SYSTEM - SF & HD (# of LF of service pipe; type of pipe; # of heads; # of SF covered)

DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (3) (880 10/880-221) AUTO FIRE DETECTION SYSTEM - SF & EA (# of alarms-horns, bells, etc.; # of smoke detectors; # of heat detectors; # of fire alarm panels; # of radio transmitters/antennae)

DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (4) (880 20/880-222) MANUAL FIRE ALARM SYSTEM - EA (# of pull stations; # of alarm horns; # of fire extinguisher cabinets)

DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(5) (880 60/880-231) CO2 FIRE SYSTEM (# of bottles & size of bottles in lbs)  
DESCRIPTION:

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COST: \_\_\_\_\_

(6) (880 60/880-232) FOAM FIRE SYSTEM - EA (# of tanks - capacity in lbs)  
DESCRIPTION:

---

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COST: \_\_\_\_\_

(7) (880 60/880-233) OTHER FIRE SYSTEM - EA  
DESCRIPTION:

---

---

---

COST: \_\_\_\_\_

(8) (880 60/880-234) HALON 1301 FIRE SYSTEM - EA (# of bottles & size of bottles in lbs)  
DESCRIPTION:

---

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COST: \_\_\_\_\_

**B. SECURITY:**

(1) (880 40/872-841) SECURITY ALARM SYSTEM - EA (name of system installed)  
DESCRIPTION:

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---

COST: \_\_\_\_\_

**C. HEATING/COOLING SYSTEMS**

(1) (826 10/890-126) A/C WINDOW UNITS - TN & SF-(# of units installed; amount of SF covered per unit; size & capacity of each unit)  
DESCRIPTION:

---

---

---

COST: \_\_\_\_\_

(2) (826 14/890-125) A/C PLT LESS THAN 5 TN - TN & SF-(# of TN; # of SF covered)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(3) (826 13/890-121) A/C PLT 5 TO 25 TN - TN-(# of TN; # of SF covered)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(4) (826 12/826-122) A/C PLT 25 TO 100 TN - TN-(# of TN; # of SF covered)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(5) (826 11/826-123) A/C PLT OVER 100 TN - TN-(# of TN; # of SF covered)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(6) (821 33/821-115) HEATING PLT 750/3500 MB - MB-(# of MBH; type of heating  
system - Ex: Warm air furnace, central)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(7) (821 32/821-116) HEATING PLT OVER 3500 MB - MB-(# of MBH; type of heating  
system)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(8) (811 60/811-147) ELEC EMERGENCY POWER GENERATOR-KW-(size of engine;  
rating of generator in kilowatts & voltage)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(9) (81190 or 82320-gas) STORAGE TANK FOR HEATING or GENERATOR FUEL-GA; TYPE;  
FUEL-(Size, type of tank, kind of fuel & # of gallons)  
DESCRIPTION:

---

---

COST: \_\_\_\_\_

**SITE WORK**

**6. UTILITIES/SURFACE CONSTRUCTION:**

(1) (812 41/812-223) PRIM DISTR LINE OH-LF-(# LF of wire; size & type of wire;  
# of poles; voltage)  
DESCRIPTION:

---

---

COST: \_\_\_\_\_

(2) (812/81360) TRANSFORMERS-KVA  
POWER POLES-LF  
(# poles; # transformers - pad or pole mounted; KVA of wire; # LF of wire)  
DESCRIPTION:

---

---

COST: \_\_\_\_\_

(3) (812 40/812-224) SEC DISTR LINE OH-LF-(voltage; size & type of wire;  
# transformers; KVA; # LF of wire; # of service drops; # poles)  
DESCRIPTION:

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---

COST: \_\_\_\_\_

(4) (812 42/812-225) PRIM DISTR LINE UG-LF-(KVA; voltage; type of conduit &  
size(encased or direct burial); size & kind of wire inside conduit; LF of wire  
& conduit)  
DESCRIPTION:

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---

COST: \_\_\_\_\_



(5) (812 42/812-226) SEC DISTR LINE UG-LF-(type of conduit & size; type & size of wires in conduit; LF of conduit & wire inside conduit; voltage)

DESCRIPTION:

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COST: \_\_\_\_\_

(6) (812 30/812-926) EXTERIOR LIGHTING-EA-(streets or parking area lights) (# & type of lights; whether pole mounted or not; # LF of connecting wire if pole mounted)

DESCRIPTION:

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COST: \_\_\_\_\_

(7) (824 10/824-464) GAS MAINS-LF(size, type, & # of LF of pipe)

DESCRIPTION:

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COST: \_\_\_\_\_

(8) (831 90/831-169) SEWAGE SEPTIC TANK-KG-(size, kind of material, & capacity)

DESCRIPTION:

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COST: \_\_\_\_\_

(9) (832 10/832-266) SANITARY SEWER-LF-(sizes & types of pipes - # of LF of each; # of cleanouts; # & size of manholes)

DESCRIPTION:

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COST: \_\_\_\_\_

(10) (842 10/842-245) WATER DISTR MAINS (POTABLE)-LF-(# LF & size, type of pipe)

DESCRIPTION:

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COST: \_\_\_\_\_

(11) (843 11/843-315) FIRE HYDRANTS-EA-(#; size & type)  
DESCRIPTION:

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COST: \_\_\_\_\_

(12) (851 90/851-143) CURBS & GUTTERS-LF-(# LF; material; width & height)  
DESCRIPTION: (Is curb extruded or standard?)\_

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---

COST: \_\_\_\_\_

(13) (851 90/851-145) DRIVEWAY-SY-(SY; material used; thickness)  
DESCRIPTION:

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---

COST: \_\_\_\_\_

(14) (851 10/12/851-147) ROAD-SY & LF-(SY; material used; thickness; LF)  
DESCRIPTION:

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---

COST: \_\_\_\_\_

(14) (85210/11 /852-262) VEHICLE PARKING-SY-(SY; material used; thickness; # of bollards; # of wheel stops; # of regular parking spaces; # of handicap spaces)  
DESCRIPTION:

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---

COST: \_\_\_\_\_

(15) (852 20/852-289) SIDEWALKS-SY & LF-(# SF & LF; dimensions of each section & location; thickness; material used)  
DESCRIPTION:

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COST: \_\_\_\_\_

(16) (871 10/871-183) STORM DRAIN DISPOSAL-LF-(# LF of pipe; sizes & types of pipe; # of catch basins & manholes & sizes of each)  
DESCRIPTION:

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COST: \_\_\_\_\_

(17) (872 15/872-247) FENCE, SECURITY (ARMS)-LF-(# of LF; fence material; # & type of gate(s); # strands of barbed wire on top)  
DESCRIPTION:

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COST: \_\_\_\_\_

(18) (87210/12/872-248) FENCE, INTERIOR-LF-(# of LF; fence material; # & kind of gate(s))  
DESCRIPTION:

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---

COST: \_\_\_\_\_

(19) (890 70/890-187) UTILITY VAULT(4 or more transformers)- SF(# SF; dimensions of vault; # of xfmers)  
DESCRIPTION:

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COST: \_\_\_\_\_

(20) (135 10/135-583) TEL DUCT FACILITY-LF-(# of LF; size & type of conduit; type of wire)  
DESCRIPTION:

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COST: \_\_\_\_\_

(21) (135 10/135-586) TEL POLE FACILITY-LF-(# LF & type of wire; # of poles)  
DESCRIPTION:

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COST: \_\_\_\_\_

**7. INSTALLED EQUIPMENT:** Furnish an Equipment-In-Place List. Any price related to equipment should already be included in this checklist.

**8. SYSTEMS NOT PREVIOUSLY LISTED:** Attach a separate sheet and use the same format to describe the system(s). Example: CATV system, intercom system, or other utilities and surface construction not described on this checklist.

**9. ASBESTOS REMOVAL:** Furnish a description by building of the number of LF of asbestos removed, number of LF of reinsulation, number of SF of soil encapsulation, and number and size of tanks, etc., where asbestos was removed. Also, identify buildings by their numbers and use.

**10. MAINTENANCE/RENOVATIONS:** List by building number and describe all additions and deletions by quantity and the correct unit of measure. Furnish a cost per building.

**UTILITIES/SURFACE CONSTRUCTION** - Listed below are some additional items which may or may not apply to your contract. EACH item installed on site should be listed and priced separately even if not included on this checklist.

- (1) IRRIGATION SYSTEM-(LF of pipe; size & type of pipe; number and type of heads)
- (2) UNDERGROUND/ABOVEGROUND STORAGE TANKS-(GA, type of tank; material stored)
- (3) (833-354) DUMPSTER ENCLOSURE-(SF & dimensions)
- (4) (890-152) UNLOADING PAD-(SY; material)
- (5) SIGNAGE-(Dimensions; material)
- (6) (12580) CATHODIC PROTECTION-(MI; LF)
- (7) (87270) LIGHTNING PROTECTION-(LF)
- (8) (81290) POLE DUCT RISER-(LF, type of material)
- (9) RAMPS-(SF, material; CY if concrete-use code for sidewalk if concrete)
- (10) (89080/890-158) LOAD AND UNLOAD PLATFORM-(SF)
- (11) (83240/832-255) INDUSTRIAL WASTE MAIN-(LF)
- (12) WHEEL STOPS-(EA; size & material)
- (13) (81350) OUTDOOR INTEGRAL DISTR CTR-(KVA)
- (14) (45110) OUTDOOR STORAGE AREA-(SF)
- (15) (73055/730-275) BUS/WAIT SHELTER-(SF)
- (16) (690-432) FLAGPOLE-(EA; dimensions)
- (17) (93210) SITE IMPROVEMENT-(JOB)
- (18) (93220) LANDSCAPE PLANTING (Acre; EA; SF)
- (19) (93230) LANDSCAPE BERMS/MOUNDS-(SY)
- (20) (93410) CUT AND FILL-(CY)
- (21) (843-315) FIRE HYDRANTS-(EA; Type)
- (22) (14970) LOADING AND UNLOADING DOCKS AND RAMPS (not connected to a Bldg)-(SF) (23) BICYCLE RACK-(EA)
- (24) (85140/812-928) TRAFFIC SIGNALS-(EA)
- (25) (87210) FENCING OR WALLS-(LF)
- (26) (15432) RIPRAP-(LF & SY)
- (27) (75061) GRANDSTAND OR BLEACHERS-(EA; SE)
- (28) 87150/871-187) RETAINING WALLS-(LF; SY; material)

NOTE: 5 Digit Codes-Army; 6 Digit Codes-Air Force

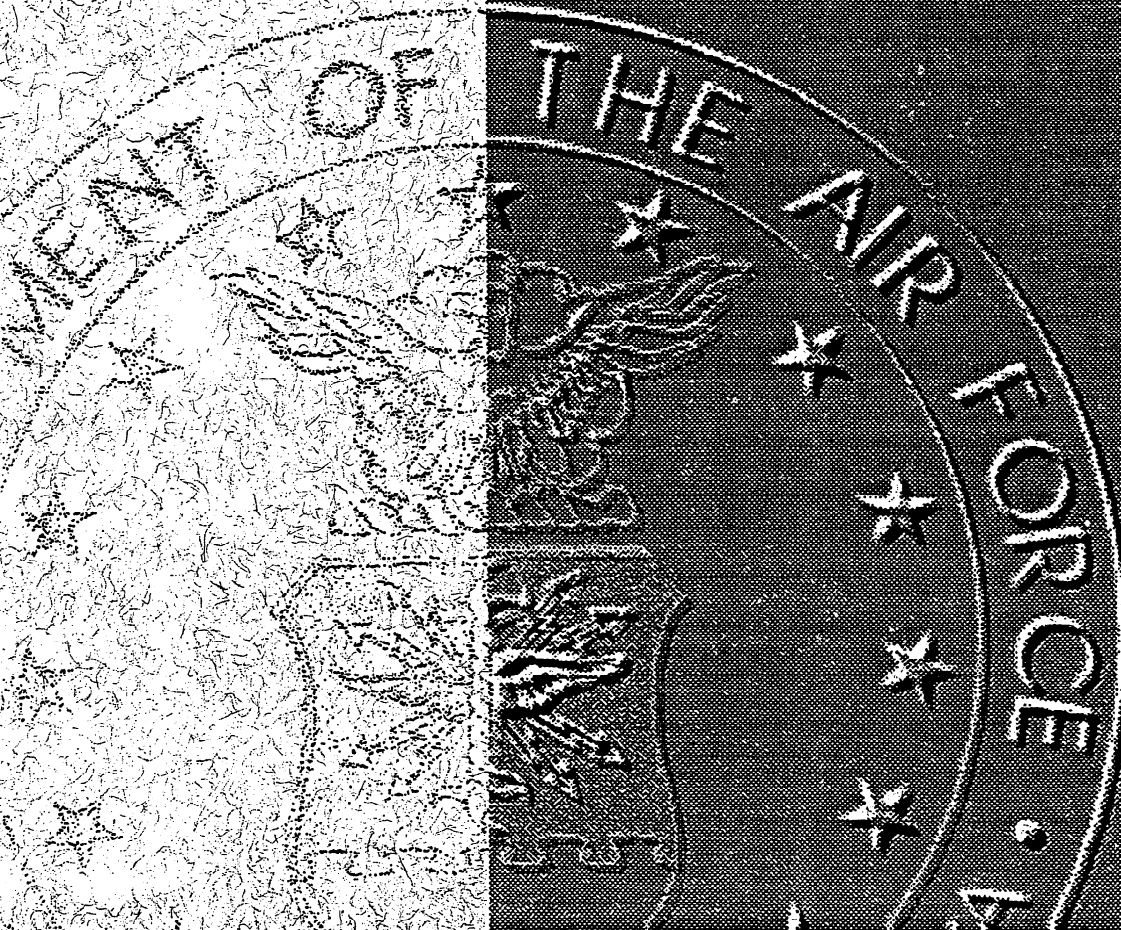
END OF SECTION

98015/RL  
RENOVATE DORMITORIES 740 AND 764

939011

AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE

INTERIOR DESIGN  
PRESENTATION  
FORMAT



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NOVEMBER 1996

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## **INTRODUCTION**

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This manual covers interior design services for the Air Force. It explains the two types of design services available, Structural Interior Design and Comprehensive Interior Design, and gives detailed guidelines on presentation requirements for each type. Chapter 1 is an overview of interior design for the military. Chapter 2 explains the required presentation format for interior design projects and discusses standards for health, safety, accessibility, and environmental quality. Chapter 3 gives specific information on assembling a Structural Interior Design submittal. It includes a submittal matrix listing each submittal element, and which elements are required at each submittal phase. Chapter 4 provides specific information on assembling a Comprehensive Interior Design submittal. It includes the submittal matrix, detailed information on requirements unique to Comprehensive Interior Design, information on furnishings sources, and cost guidelines. The manual concludes with a Glossary of Government Contract Terms, an Index of Referenced Standards containing useful information about terms and concepts discussed in the manual, and several Appendixes containing sample forms and documents.

## 1

OVERVIEW OF MILITARY INTERIOR DESIGN

The Air Force has two categories for interior design: *Structural Interior Design* (SID) and *Comprehensive Interior Design* (CID). The two types of services cover different aspects of the interior environment and are funded through different sources. Structural Interior Design is the design of building related interior finishes such as walls, ceilings, floor coverings, built-in casework, etc., and may also include furniture systems. With the exception of furniture systems, which are funded with operations & maintenance (O&M) or non-appropriated funding (NAF), Structural Interior Design is funded with military construction funds appropriated by Congress, (known as MCA, MCP, or MILCON funding), or with NAF.

Comprehensive Interior Design is the design of interior furnishings and the finishes related to them. CID projects are typically funded by the installation with operation and maintenance funds or with non appropriated funds provided by the major command. This type of funding is called O&M, OMA, RPM, or NAF funding.

The Scope of Work for a project states the requirement for a SID and CID component. The Scope of Work is found in Appendix A to the A-E Contract or on the DD Form 1391.

*Structural Interior Design*

Typical SID projects are maintenance facilities that have limited furniture needs but require highly durable, low maintenance interior finishes. Completion of a SID involves the selection and sampling of all applied finishes for the building's interior features, and may include drawings and specifications for furniture systems. The SID package will include interior floor plans, finish schedules, and interior color samples. If necessary, it should include interior elevations showing finish placement and all information for furniture systems. The products and materials specified are purchased and installed by the General Contractor.

*Comprehensive Interior Design*

CID services should be provided for all people oriented as opposed to object oriented facilities. Completion of a CID involves the selection and sampling of the furnishings components of the interior environment in addition to the structural interior design. This may include furniture systems, freestanding furniture, artwork, and accessories. The CID package will include furniture placement plans, information on all freestanding furnishings and accessories, furniture cost estimates, and order data sheets. The products and materials listed are purchased by the Government.

*Furniture System/  
Prewired  
Workstations/  
Systems Furniture*

Furniture systems are part of a SID project if they are specifically identified on the DD Form 1391. If so identified, they are O&M funded and are an integral part of the construction project in the same manner as built-in casework and finish materials. Furniture systems are listed on the DD Form 1391 as a non-add entry in Block 9 for Equipment Provided from Other Appropriations. In Block 12b, list the equipment as an O&M funded item, the fiscal year the funds are requested, and the line item cost. The entry must be verified at the command level by those responsible for budgeting O&M appropriations. *Prewired workstations* is an obsolete term which was formerly used when furniture systems were MILCON funded. The term furniture systems is used in lieu of *systems furniture* to denote the many types of systems available today.

## 2

**SID/CID REQUIREMENTS & INFORMATION**

This chapter provides general and technical information that applies to both SID and CID packages. It covers the required presentation format and gives specific information about each type of drawing required for each type of package.

*Cutting and Fitting*

The interior designer should identify items in the SID or CID that require attachment to the building by cutting or fitting and should prepare construction drawings and specifications to cover these operations. These items must be properly coordinated with other work on the project.

*Trade Names & Non  
proprietary  
Disclaimers*

When indicating manufacturers' product styles and colors for a project, use a Color Guide Specification (Appendix D). This guide includes the brand names for color selections of the exterior and interior materials, products which will be exposed to view in the finished construction, and products which are sampled in the SID and CID binders. Specific locations where materials are to be installed will be shown in the drawings via a standard material, finish, and color schedule. Key the color codes used in the drawings with the products indicated in the Color Guide Specification. The Color Guide Specification should include a non proprietary disclaimer that reads: "Trade names indicated are non-proprietary and are intended only to indicate color, texture, & pattern."

*Federal Standard  
Colors*

Federal Standard Colors are not required on interior design projects, but may be used if desired.

**PRESENTATION FORMAT**

SID and CID information and samples are to be submitted in 210 x 280 mm (8 1/2" x 11") format in separate three inch ring binders with pockets on the inside of the covers. When there are numerous pages with thick samples, more than one binder should be used. Large D-ring binders are preferred to O-ring binders. Fold out items should have a maximum spread of 640 mm (25 1/2").

Each binder should be labeled on the outside spine and front cover with the following information:

- Phase %
- Date
- SID or CID
- A-E firm
- Project Title and Number
- Volume Number
- Location

(example: Vol. 1 of 3)

Each sheet within the binder should be labeled with the project title, location, A-E firm name, and sheet number.

*Color Boards*

SID finish samples should be grouped into color schemes organized by Color Placement Zones. A Color Placement Zone is all spaces or areas within a building that have like finishes. For example, all toilet rooms might have the same color scheme and would then

comprise one Color Placement Zone. The general office areas might have another color scheme and would then comprise another Color Placement Zone.

If a finish is used in more than one zone, it must be displayed in each one. Large samples, such as ceiling tiles or carpet samples can be provided separately from the color board in a loose sleeve that can be moved from one scheme to another.

Label all finish samples with the material codes used in the Contract Documents.

Color boards should be sturdy enough to support all samples. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double faced foam tape rather than rubber cement or glue. Samples which are difficult to fasten should be labeled with the finish code so they can be identified independently.

Material and finish samples should indicate true pattern, color and texture. Photographs or colored photocopies of materials or fabrics will be disapproved. Carpet samples should be large enough to show a complete pattern or design. If the specified carpet has a large pattern, provide a color photograph showing the overall pattern in addition to the carpet sample. Color photocopies of artwork and plants are acceptable.

## REVIEWS AND REVISIONS

All SID and CID packages will be reviewed by the Government during each phase of the project, and written annotated comments will be provided to the A-E. These review comments and the A-E's written responses should be placed in the front inside pocket of the first volume of the next SID or CID binder submittal.

The designer should revise the binders after each review to respond to review comments. Printed information on existing pages may be revised with white-out. If the binders are not returned to the A-E after review, the A-E may simply provide updated inserts to the Government. Note: Some MAJCOM's require that any changes made after submittals have been approved be resubmitted to the MAJCOM for re-approval.

## INFORMATION ON REQUIRED DRAWINGS & DOCUMENTS

### *Renderings & Sketches*

Renderings or black and white perspective sketches may be required in the Statement of Work or design task for some projects. Verify that renderings or sketches are a contract requirement. All renderings should be professional in appearance. The A-E shall submit a sample or a copy of a previous rendering indicating the proposed artistic style. The actual rendering should not be executed until the artistic style and selected view are approved. Black and white sketches should emphasize spatial relationships, furnishings, patterns, and texture. Illustrate one major area which may be used as a basis for a color rendering in the final package.

### *Composite Floor Plan*

The Composite Floor Plan should show all panels, components and free-standing furniture in relationship to the building and the building systems. This includes information on locations of light switches, fire pull boxes, mechanical devices, and other wall mounted items. It should be a full size contract drawing showing furnishing item numbers (where

applicable). The gross and net square footage of each floor should be noted on the composite floor plans.

*Workstation Panel Plan*

The Panel Plan should include a panel symbol legend, panel placements, critical dimensions of aisle widths, and critical dimensions tying the panels to the building's structure and electrical/mechanical system. Panels must not block access to mechanical, electrical or fire controls. Each panel should be coded with the following system:

N (non-powered) or P      Width (in centimeters)      Height (in centimeters)  
(powered)

For example, a non-powered panel 610 mm (two feet wide) and 1727 mm (five feet eight inches high) would be noted on the plan as N **61 172.7**.

*Workstation Electrical, Voice, & Data Plans*

The Electrical, Voice and Data Plans should show any panel placements, all receptacles used in each workstation, height and location of all light switches and mechanical control devices, and a symbol legend. The workstation designer must coordinate the Electrical, Voice and Data Plans with the building's communication and mechanical engineering drawings.

*Furniture Systems*

Furniture systems should be designed using generic components and work surfaces sold by many manufacturers. Use one manufacturer as a basis for design, and indicate that manufacturer's name and finishes on the contract drawings. This will provide sufficient information for competitive bid purposes

In the Color Guide Specifications on Furniture Systems, indicate the fabric width, fiber content, and construction method for the workstations. The vendor should be indicated on the drawings and in the Color Guide Specifications. Do not indicate a vendor in the Furniture Systems Specifications.

*Workstation Types & Number Codes*

The workstations should be classified into groups of like configuration and features, and each group or type should be given a single letter code (A, B, etc.). For example, all similar reception stations might be type A and all similar offices might be type B. Each workstation should also be given a unique number code similar to a room number but separate from the building room numbering system. Every workstation should be identified on every plan with the composite code composed of the letter identifying the type and the workstation number code. For example "A110" would indicate that workstation number 110 is a type A station.

*Workstation Isometric/Elevation & Inventory Drawings*

The Workstation Isometric/Elevation and Inventory drawings should show an elevation or isometric of each type of workstation with a related inventory list of all the panels and components used, and the method of attachment (i. e. wall hung, floor mounted, etc.). The inventory list should describe components generically rather than using specific part numbers.

*Workstation Finishes*

It is suggested that only two fabric finishes be used for furniture systems: one color for panels and one for tackboards and flipper doors. A third color may be used to unify workstations used by the same organizational group in order to aid in pathway finding in

large open office areas (see page 8). It should be noted that some installations have color and finish restrictions. The A-E should comply with any local or MAJCOM standards.

*Workstation Costs*

The average cost of a furniture system is \$4,500. The Air Force considers an ergonomically designed chair as part of the workstation and should be included in the workstation design and cost. The total available funding for furniture systems for a project is listed as a non-add entry on in block 9 of the DD Form 1391. In block 12b, list the equipment as an O&M funded item, the fiscal year the funds are requested, and the line item cost.

*Workstation Components*

The following items are some of the typical workstation components and options that must be selected and specified.

- *Panels*
  - Acoustical/non acoustical
  - Powered/non powered
- *Components*
  - Work Surfaces
  - Drawers
  - Shelves (with doors/without doors)
  - Files (lateral, panel hung/bins)
  - Task lights/special purpose
  - Counter tops
  - Drafting surface
  - Freestanding components
- *Accessories*
  - Tackboards
  - Locks
- Shelf dividers
- Reader stand
- Paper flow devices
- Marker/chalk boards
- Computer turntable
- Printer stand
- Coat rack
- Wire guides
- Keyboard trays
- Mouse pads
- Wrist rest/Foot rest
- Disc storage
- *Signs*
  - Organization signs
  - Workstation name signs

**HEALTH, SAFETY, ACCESSIBILITY, AND ENVIRONMENTAL QUALITY**

Some of the issues designers must consider in creating a quality working environment are safety, health, disabled access, and environmental standards. Many of these concerns are regulated by code authorities and quantified by standardized testing. Designers should be aware of the pertinent regulations and should cite them in the contract documents. Reference standards are listed and indexed in the *Index of Reference Standards* on page 21. An asterisk by a topic indicates that there is a reference in the Index.

*Health & Safety Criteria*

Fire safety is one of the paramount concerns in any design. Designers must comply with all appropriate fire safety codes and provide for safe egress in the event of fire. Code requirements on this issue are stringent and several different codes exist. See *\*egress*

There are several regulations relating to flammability of interior materials and furnishings. See *\*fire, flame spread*.

Designers should provide protection against injury and death from falls, chemical emissions, electronic emissions, and microbial conditions. See *\*falls*. No reference standards exist for chemical emissions, electronic emissions, or microbial conditions. OSHA has a proposed regulation in relation to indoor air quality standards. Comments to this regulation are currently being reviewed at OSHA. See *\*indoor air quality*.

*Accessibility*

All designs, including signage, must comply with the Americans with Disabilities Act (ADA) or the Uniform Federal Accessibility Standards (UFAS), whichever is the most stringent. The only exceptions to this requirement are facilities which limit their access to able bodied military personnel in accordance with the exclusion in Paragraph 4.1.4. of the UFAS. See *\*accessibility*.

*Environmental Quality*

Designers must be concerned with providing an environment that is comfortable, welcoming, and conducive to work. Contributing factors include ergonomically correct furniture, appropriate efficient lighting, and good acoustical control.

Furnishings and equipment provided for SID/CID should be comfortable, sturdy, and designed for anthropomorphic fit and stability. See *\*furnishings*.

Lighting is an important tool in shaping the ambiance of the environment. Careful consideration should be given to lighting in order to produce a comfortable environment that is easy to live and work in. Reflectance should be minimized and task lighting should provide glare free illumination of work surfaces. See *\*lighting*.

Provide adequate acoustical control to ensure a good working environment. See *\*acoustics*.

*Pathway Finding*

Interior design for military facilities should incorporate the concept of pathway finding. The space plan, the use of color and pattern, and the interior sign package should coalesce to form a well organized, comprehensible interior environment that guides users and visitors through the building to their destination.

## 3

**SPECIFIC INFORMATION FOR SID SUBMITTALS**

This section gives information on assembling an SID package. The Submittal Matrix gives the sequence of assembly and tells what information must be included in each submittal if that work is a part of the design contract. Not all projects will have a formal 65% design review stage. If that is the case, those items may move to the 90% submittal. Note that Interior Design Submittals **must** run concurrent with Architectural Submittals.

*Submittal Matrix  
Summary for SID  
Packages*

Item	Description	PD*	65%**	90%	RTA
1	Title Page	X	X	X	X
2	Table of Contents	X	X	X	X
3	Narrative of Interior Design Objectives	X	X	X	X
4	Interior Color Zone Key Plan (1/8" = 1' - 0" scale or 8 1/2" x 11" size)	X	X	X	X
5	Interior Color Boards (relating to color placement plan)	X	X	X	X
6	Interior Signage Color Boards		X	X	X
7	Furniture System Color Boards		X	X	X
8	Interior Floor Plan (1/4" = 1' - 0" for full size drawings. Use metric scale when required.)	X	X	X	X
9	Room Finish Schedule / Color Key	X	X	X	X
10	Signage Plan			X	X
11	Furniture System Composite Floor Plans	X	X	X	X
12	Furniture System Cost Estimate		X	X	X
13	Furniture System Panel Plans		X	X	X
14	Furniture System Electrical/Voice/Data Plans		X	X	X
15	Furniture System Elevation/Isometric and Inventory Drawings			X	X
16	Enlarged Perspective (optional) of Furniture System Configurations	X	X	X	X
17	Diskette of all Drawings/Plans/Schedules				X

\*PD: Project Definition

\*\*65%: When required.

Separate sign drawings should be prepared which indicate plaque size, type, location, and message for all signs. Submit a sample of the sign color in the SID.

*Typical SID Items*

Some of the items which are usually included in an SID are listed below:



- Carpet
- Resilient Floor Coverings
- Ceramic Tiles and Stones
- Terrazzo
- Paint
- Wallcoverings
- Wood Stains
- Wall Base
- Ceiling Tiles and Grid
- Plastic Laminates
- Built-in Casework
- Auditorium Seating (Fixed)
- Blinds and other Window Coverings
- Marker Boards/Bulletin Boards
- Furniture Systems
- Toilet Partitions
- Moveable Room Dividers
- Cubicle Curtains
- Signage
- Stage Curtains
- Trim and Hardware Finishes
- Decorative Light Fixtures.

Also see Chapter 2, SID/CID Requirements and Information.

## 4

**SPECIFIC INFORMATION FOR CID SUBMITTALS**

This section gives information on assembling a CID package. The Submittal Matrix gives the sequence of assembly and tells what information must be included in each submittal if that work is a part of the design contract. Not all projects will have a formal 65% design review stage. If that is the case, those items may move to the 90% submittal. Note that Interior Design Submittals **must** run concurrent with Architectural Submittals. CID Services normally **include** SID services.

If the client is purchasing and installing the systems furniture, all systems furniture should be shown in the contract drawings with the note "FOR INFORMATION ONLY".

*Submittal Matrix  
Summary for CID  
Packages*

Item	Description	PD*	65% **	90%	RTA
1	Title Page	X	X	X	X
2	Table of Contents	X	X	X	X
3	Narrative of Interior Design Objectives	X	X	X	X
4	Photo of Proposed Rendering Technique	X			
4A	Photo of Completed Interior Color Rendering(s) (only if required by contract)			X	X
5	Black and White Sketch Perspective(s) (only if required by contract) One will be approved for the interior rendering.		X	X	X
6	Generic Composite Floor Plans with Conventional and Furniture System on full size sheet. (Use metric scale when required.)	X	X	X	X
7	Furniture System Panel Plans (Only if client is buying and installing furniture system.)		X	X	X
8	Furniture System Electrical/Voice/Data Plans (Only if client is buying and installing furniture system.)		X	X	X
9	Furniture System Elevation/Isometric and Inventory Drawings (Only if client is buying and installing furniture system.)		X	X	X
10	Manufacturer's Summary Lists			X	X
11	Conventional Furniture Placement Plans (Use metric scales as req.) All areas (include item #'s)		X	X	X
12	Conventional Furniture Illustration Sheet (sample form only)	X			
12A	Conventional Furniture Illustration Sheets with number codes (all areas)		X	X	X
13	Artwork Illustration Sheets /Artwork Placement Plans		X	X	X

14	Itemized Furniture Cost Estimate		X	X	X
15	Order Data Sheets (sample form only)	X			
15A	Order Data Sheets (all areas)		X	X	X
16	Letter of Justification for Waiver (if required)		X	X	X
17	Diskette of all Drawings/Plans/Schedules				X

\*PD: Project Definition

\*\*65%: When required.

*Manufacturer's Summary List*

The Manufacturer's Summary List is a list of all the manufacturers whose products are used in the CID package. For each manufacturer, provide the name, address, phone number, fax number and a point of contact.

*Furniture Placement Plans*

A Furniture Placement Plan is a plan of one room showing each furniture component in the room. There will be one Furniture Placement Plan for each room in the Composite Floor Plan that contains furniture. Furniture Placement Plans are drawn at 1:50 (1/4" = 1'- 0") if possible, or at 1:100 (1/8" = 1'- 0") if the room or area illustrated is very large. Each Furniture Placement Plan should include the following information:

- The job name, location, and date
- The footprint of the room
- The furnishings
- The room name and number
- A Furnishing Item Number for each furnishing item
- Quantity of each product specified for the CID

*Furniture Illustration Sheets*

Provide one Furniture Illustration Sheet for each item of furniture in the CID. The Furniture Illustration Sheet should include all of the following information.

- The job name, location, and date
- A picture or line drawing of the product specified
- The furnishing item number which keys the product to the Composite Floor Plan and the Furniture Placement Plan
- The options specified, if any
- Specification data on the finishes and fabric
- Samples of the finishes and fabric
- A comprehensive list giving all occurrences of the item, broken down by room. For example:  
     4 each Room 104 Commander  
     2 each Room 103 Receptionist

Furniture Illustration Sheets should be arranged in numerical order by furnishing item number. The furnishing item numbers should begin with 001. See Appendix A for an example Furniture Illustration Sheet.

*Artwork Placement Plan*

An Artwork Placement Plan shows the spatial relationship between the furniture and the artwork in a room. There will be one Artwork Placement Plan for each room in the Composite Floor Plan that contains artwork. Assign a furnishing item number to each piece of artwork. The Artwork Placement Plan will include the furnishing item number for the artwork and but will show the furniture without item numbers. Artwork Placement Plans are drawn at 1:50 (1/4" = 1'- 0") if possible, or at 1:100 (1/8" = 1'- 0") if the room or

area illustrated is very large. Each Artwork Placement Plan should include the following information:

- The job name, location, and date
- The room name and number
- A plan of the room locating the artwork
- An elevation of each wall containing artwork showing mounting height
- A Furnishing Item Number for each artwork item
- Quantity of each product specified for the CID

*Artwork Illustration Sheets*

Provide one Artwork Illustration Sheet for each piece of art in the CID. The Artwork Illustration Sheet should include the following information:

- The job name, number, location, and date
- The title of the artwork and the artist's name.
- A picture of the proposed artwork. Color photos are acceptable
- The furnishing item number, which keys the artwork to the Composite Floor Plan and the Artwork Placement Plan
- Name and number of the room where artwork will be displayed
- Frame description and sample of mat colors
- Mounting height and installation instructions
- Specify security mounting if required

*Itemized Furniture Cost Estimate*

The itemized furniture cost estimate lists all furnishings and indicates quantities, unit costs and totals. It is organized according to UNICOR and GSA/FSC Group, Part, and Section of the FSC Schedules. The cost estimate should also include a 10% general contingency and 7% installation listed as separate line items. Estimated freight charges that are not included in furniture cost should also be a separate line item.

*Order Data Sheets*

The Order Data Sheets provide all information necessary to order the furnishings specified in the CID. Only one item should be listed per data sheet. The sheets should be in numerical order. The Order Data Sheet should include the following information:

- Furnishing item number.
- The job name, location, and date
- FSC Group, part, and section
- GSA Contract Number, Special Item Number (SIN), and contract expiration date
- Maximum Order Limitation
- Source and manufacturer's name (Include ordering address, telephone number & fax number)
- Product name
- Product model number or National Stock Number (NSN)
- Finish name and number
- Fabric name and number
- Dimensions
- Weight
- Description (Include construction information, fabric content, finish application, etc.)
- Justification (Example: "These guest chairs are coordinated to match the task seating at each workstation. The size of the guest chair is critical because of

the limited space where they are to be placed. If this company is not selected, coordinate the newly proposed finishes with furniture item numbers #001, 002, 003.”)

- Item location by room number
- Quantity per room
- Total quantity
- Unit price
- Total price
- Estimated freight charges, 7% of item cost (Note whether or not freight charges are included in the price of the CID item.)
- Special instructions (if any)

Note: Some MAJCOMs require that the A-E fill out the government purchase request in lieu of the Procurement Information Sheet. Verify which method is preferred. Items will be purchased using one of two different forms: DD Form 1348-6 or AF Form 9. A copy of each of these documents is provided in Appendix E.

### GENERAL DESIGN/COST INFORMATION FOR CIDS

#### *Furnishings Sources*

Furniture may be obtained from three categories of sources: UNICOR, GSA Federal Supply Schedule, and open market. Every effort should be made to use UNICOR or GSA Stock/Federal Supply Schedule items for CID projects. There may be occasions when there is no current FSS/GSA or UNICOR resource for a furnishing requirement, or when items available on FSS/GSA contract or from UNICOR do not meet the functional requirements of the project. If the latter occurs, the Base Contracting Officer must submit a Request for Waiver to UNICOR. (See the following example.) The A-E shall assist in the waiver process by providing the information within the brackets of the sample letter below. GSA sources are not mandatory for DoD projects, but all procurement procedures must be followed as stated in the FAR. Open market line items over \$2,500 will require a justification letter. Open market line items over \$25,000 will have to be solicited by bid, and solicitation documents including detailed specifications will be required. Line items under GSA contract that exceed the Maximum Order Limitation (MOL) will also require a formal solicitation for bid.

Projects that are funded with non-appropriated funds (NAF) are exempt from the UNICOR mandatory resource, and a waiver is not required in order to use open market sources on these projects. The Air Force Non-Appropriated Fund Purchasing Office (AFNAFPO) has contracts with many furnishings vendors and are an additional resource for these types of projects. Their address is:

Air Force Services Agency / SVCKH  
9504 IH 35 N, Suite 370  
San Antonio, TX 78233  
Phone: (210) 652-6931  
Fax: (210) 652-6309

#### *Request for UNICOR Waiver*

Revised waiver procedures for UNICOR products will follow in a future addendum.

*Typical CID  
Furnishings*

The furnishings which are usually included in a CID are listed below.

- ADP tables/printer stands/support furnishings
- Artwork
- Audio-Visual support furnishings
- Beds, wall units, night stands, chests, mirrors, refrigerators
- Bedspreads, bedding, mattresses, box springs, bed frames or boxes
- Bookcases
- Bulletin boards, projection screens/marker boards (if NOT attached to structure)
- Carts
- Chairs - all seating types except those attached to structure
- Desks - unless included in furniture system
- Drafting tables
- Draperies
- Files
- Freestanding partitions
- Lamps
- Library furniture
- Lounge furniture - sofas, chairs, occasional tables
- Mobile furnishings - unless included in furniture system
- Modular desk units
- Podiums, lecture stands
- Silk plants
- Storage - all kinds
- Furniture system workstations (if not in SID)
- Planters, waste and ash receptacles
- Tables - all kinds
- Wardrobes (if not in the construction contract)

*CID Furnishings  
Costs Guidelines*

Following are guidelines for material costs for CID. These numbers are to be used for preliminary budgeting purposes only. The information is given first as cost per total square foot, then as cost per unit. The numbers do not include associated costs such as contractor's overhead, profit, and shipping. They are based on the Air Force FY 95 Costs Guide, so an appropriate inflation factor should be included for subsequent years. On overseas projects costs may vary from country to country and with the current exchange rate.

Cost per Square  
Foot

FACILITY TYPE	COST/SQ METER	COST/SQ FOOT
Administrative Space (Conventional Standard)	86.00	8.00
Administrative Space (Conventional Executive)	161.00	15.00
Administrative Space (Systems Furniture)	377.00	35.00
Airmen Club (excluding kitchen equipment)	140.00	13.00
Alert Facilities	140.00	13.00
Auditorium (fixed seating)	377.00	35.00
Base Ops DV Lounge	215.00	20.00
Chapel	280.00	26.00
Child Development Center	150.00	14.00
Classroom	150.00	14.00
Clinic/Dental Clinic (not including equipment)	172.00	16.00
Conference Room (Standard)	215.00	20.00
Conference Room (Executive)	581.00	54.00
Dining Facility (excluding kitchen /serving line)	377.00 - 484.00	35.00 - 45.00
Distinguished Visitor's Suite (in Lodging)	323.00	30.00
Family Housing Office	172.00	16.00
Fire Station	140.00	13.00
Golf Clubhouse	161.00	15.00
Judge Advocate Facility (including Courtroom)	269.00	25.00
Library	269.00	25.00
Lodging Office	161.00	15.00
Open Mess (NCO or Officers)	323.00 - 377.00	30.00 - 35.00
Physical Fitness Center (not including equipment)	129.00	12.00
Recreation Center	129.00	12.00
Temporary Lodging Facility (TLF)	172.00	16.00
Training Center (miscellaneous types)	151.00	14.00
Open Mess (NCO or Officers)	183.00	17.00
Unaccompanied Enlisted Personnel Housing (UEPH)	194.00	18.00

FACILITY TYPE (CONTINUED)	COST/SQ METER	COST/SQ FOOT
Unaccompanied Officer Personnel Housing (UOPH)	215.00	20.00
Visiting Airmen's Quarters (VAQ Single Occupancy)	183.00	17.00
Visiting Officers Quarters (VOQ)	183.00	17.00
Youth Center	140.00	13.00

*Cost per Unit*

FACILITY TYPE	COST/UNIT
Administration Space (furniture system per workstation: includes installation and one ergonomic chair)	4,500.00
Lodging Office/Lobby <ul style="list-style-type: none"> <li>• without front desk</li> <li>• with front desk</li> </ul>	15,000.00 to 20,000.00 40,000.00 to 100,000.00
Distinguished Visitor Suites <ul style="list-style-type: none"> <li>• One bedroom suite</li> <li>• Two bedroom suite</li> <li>• 2 to 3 bedroom apartment (Including dining room)</li> </ul>	15,000.00 - 20,000.00 25,000.00 - 36,000.00 40,000.00 - 45,000.00
Temporary Living Facility (TLF)	17,500.00
Unaccompanied Enlisted Personnel Housing (UEPH) (per person)	5,000.00
Unaccompanied Officers Personnel Housing (UOPH) <ul style="list-style-type: none"> <li>• Bedroom only</li> <li>• Small apartment</li> </ul>	7,000.00 9,000.00 - 10,000.00
Visiting Airmen Quarters (VAQ)	5,000.00 per person
Visiting Officers Quarters (VOQ) <ul style="list-style-type: none"> <li>• Single room</li> <li>• Single suite</li> <li>• Double suite</li> </ul>	8,000.00 10,000.00 15,000.00



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## **GLOSSARY OF GOVERNMENT CONTRACT TERMS**

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**A-E - Architect-Engineer** - The architectural, engineering, or design firm selected to perform a government project.

**BCE - Base Civil Engineer**

**CBD - Commerce Business Daily** - This publication is the federal government's want ads. It provides advance notice of contracting actions and requests for A-E Services.

**CID - Comprehensive Interior Design** - The selection and sampling of all furnishings necessary to complete the interior environment; the submittal includes furniture illustrations, fabrics, finish samples, footprint plans, and furniture ordering information. These projects are funded with O & M, OMA, or NAF funds, and the materials are purchased by the installation and not the General Contractor. See also **SID**.

**DD Form 1391 - Department of Defense Form 1391** - A programming document initiated by the installation and submitted through the Major Command to Congress for funding. It includes an outline of basic needs for a proposed facility and an estimated cost to fulfill them.

**Design Build** - A method of contracting in which a single entity takes responsibility for both design and construction of a facility. Performance requirements are outlined using the RFP format.

**Environmental Products Guide** - For GSA Catalog supply items. This guide can be obtained by contacting:

GSA Centralized Mailing List Service  
(7CAFL)  
P.O. Box 6477  
Fort Worth, TX 76115  
(817) 334-5215

**FAR - Federal Acquisition Regulations** - The laws governing how the government buys products and services. Title 18 of the U. S. Code allows for direct purchase from UNICOR without competitive bids. (FAR) 8.6 identifies UNICOR as a mandatory procurement source to all federal agencies for products that meet the requirements of the ordering office. See also UNICOR.

**FSN 595b - Federal Standard Number 595b** - A collection of standard colors used by the various departments or agencies. Colors are classified as full gloss, semi-gloss, or flat. The use of Federal Standard colors is not required for interior design projects.

**FSN 595b Fan Deck** - Federal Standard colors are available in a paint fan deck which can be ordered for under \$10.00 from the following addresses. Use order # NSN 7690-01-162-2210.

General Services Administration  
(3F-BP-W)  
Specification Unit, Suite 8100  
470 L'Enfant Plaza, SW  
Washington, DC 20407  
(202) 755-0325/0326

or, send request in the form of a letter to:

Naval Publications and Forms  
Center  
5801 Tabor Avenue  
Philadelphia, PA 19120

**FSS - Federal Supply Schedules** - Catalogs which list commercial items available at established prices in indefinite quantity for direct order by government agencies. These publications can be ordered from the following address:

Furniture Commodity Center (3FN-CO)  
Crystal Mall 4, Rm. 403  
Washington, DC 20406  
(703) 305-5056

**Furniture Systems** - Furniture systems refers to workstations which are assembled to create custom designs by the arrangements of miscellaneous components such as work surfaces, shelving, drawers, etc. Furniture systems may be a panel-supported system, a floor-supported system, a desk-based system, it may be available in cluster configurations, or any of a number of methods to arrange various components. Usually it requires professional installation service. The CID designer needs to coordinate the furniture system with the building systems and provide plans and specifications in the contract documents.”

**FY - Fiscal Year** - a) October 1 through September 30 of the calendar year. b) "FY-...." at the beginning of a project title identifies the year Congress will fund the Construction Contract Award.

**GSA FSC/FSG - General Services Administration Federal Supply Classes/Federal Supply Groups** - Government contracts with private manufacturers that have a fixed price, a Maximum Order Limitation, and fixed expiration date. A list of products on GSA contract can be ordered from the following address:

GSA Centralized Mailing List Service (7CAFL)  
P.O. Box 6477  
Fort Worth, TX 76115  
(817) 334-5215

**IFB - Invitation For Bid** - One of the ways the government solicits construction services. The IFB is comprised of contract documents with clearly defined requirements, specifications and terms that are not negotiable. Any proposal prepared in response to an IFB should strictly adhere to the terms. The award is typically based on the lowest bid meeting the requirements and specifications. See also RFP.

**JOC --Job Order Contract** - The Army's equivalent of the Air Force SABER (Simplified Acquisition of Base Engineering Requirements ). This is how an installation contracts for repair work. The Contracting Officer and a contractor agree upon unit prices for work, then individual job orders are negotiated for specific scopes of repair work.

**MCA - Military Construction** - Funds appropriated by Congress for new construction under fixed price contracts. MCA is the abbreviation used by the Army for this type of funding. Has the same meaning as MCP and MILCON.

**MCP - Military Construction** - Funds appropriated by Congress for new construction under fixed price contracts. MCP is the abbreviation used by the Air Force for this type of funding. Has the same meaning as MCA and MILCON.

**MILCON - Military Construction** - Funds appropriated by Congress for new construction under fixed price contracts. MILCON is the abbreviation used by the Air Force for this type of funding. Has the same meaning as MCA or MCP.

**MOL** - *Maximum Order Limitation* - The limit on the amount that can be purchased from a given vendor under GSA Federal Supply Class/Federal Supply Group contracts.

**NAF** - *Non-Appropriated Funds* - Funds that are generated by sales and services on military installations, such as open messes, golf courses, child development centers, bowling alleys, etc.

**O & M** - *Operation and Maintenance* - Funds provided to each installation by the Major Command and used for the day to day operations of the installation. These funds may be used for the renovation of existing buildings or for the purchase of furniture. Funds not spent to award a contract disappear at the end of the FY and cannot be recovered. O & M is the abbreviation used by the Air Force for this type of funding. Has the same meaning as OMA.

**OMA** - *Operation and Maintenance* - See O & M.

**Open Market** - Designation for products that are not on a GSA contract.

**PD** - *Project Definition* - The requirement validation and schematic design phase of the design process. It satisfies the requirement for early preliminary design (35%) previously required by Congress. Project Definition begins at the pre-definition conference with the selected A-E and often involves two sub-phases: a requirements analysis phase and a schematic design phase.

**Prewired Workstations (PW)** - This term formerly connoted the funding method of Systems Furniture. Prewired workstations were identical to Systems Furniture, except they were funded with MILCON dollars. All furniture systems are now O&M funded, but still may be supplied by the General Contractor.

**RFP** - *Request For Proposal* - One of the ways the government solicits design-build services. An RFP defines a problem and a conceptual solution and allows those who respond to propose a final solution (plans and specifications), construction strategy, and cost estimate. The RFP is much more flexible than the IFB. (See also IFB, Invitation for Bid.)

**RFQ** - *Request For Quotation* - An informal request for a price for a standard item.

**SABER** - *Simplified Acquisition of Base Engineering Requirements* - The Air Force equivalent of the Army's JOC (Job Order Contract). This is how an installation contracts for repair work. The Contracting Officer and a Contractor agree upon unit prices for work, then individual job orders are negotiated for specific scopes of repair work.

**SF 254 & SF 255** - *Standard Forms 254 and 255* - Résumé forms that state the qualifications of A-E firms responding to a CBD announcement. See also CBD, Commerce Business Daily.

**SID** - *Structural Interior Design* - a) The selection and sampling of the building related finishes. b) A submittal with samples of proposed building materials for a particular project. Materials and finishes are purchased and installed by the General Contractor. These projects are funded with MILCON or MCA funds, except for Furniture Systems, which are O&M funded.

**SIN** - *Special Item Number* - A categorization of products contained within a GSA schedule, i. e. SIN 496-4 Bar Stools is contained in the FSC Group 71, Part III, Section H Multipurpose Seating Schedule.

**Statement of Work** - The contractual scope of work for A-E contracts which outlines the requirements including the specific deliverables and the schedule of design submittals.

**Systems Furniture** - Systems furniture consists of components, such as work surfaces and storage pieces, which can be configured in various methods to create customized workstations. Traditionally, systems furniture implies panel-supported workstations. Also see the definitions of prewired workstations and furniture systems. The designer coordinates the footprint plans with the building systems and provides the plans in the contract documents for information only.

**UNICOR** - The trade name for the Federal Prison Industries Inc. (FPI), a wholly owned government corporation established in 1934. UNICOR provides a variety of products and services to the federal government.

## INDEX OF REFERENCED STANDARDS

- |                           |  |
|---------------------------|--|
| <b>accessibility</b>      | <ul style="list-style-type: none"> <li>• Americans with Disabilities Act: ASTM 117.1</li> <li>• Uniform Federal Accessibility Standards</li> </ul>   |
| <b>acoustics</b>          | <ul style="list-style-type: none"> <li>• Airborne Sound: ASTM C423, PBS C.1</li> <li>• Speech Privacy: SPP, Speech Privacy Potential</li> <li>• Impact Sound Transmission: ASTM C 423-66, PBS C-2</li> </ul>   |
| <b>egress</b>             | <ul style="list-style-type: none"> <li>• NFPA 101 Fire Safety Code - (Most current year)</li> <li>• National Building Code, BOCA</li> <li>• Standard Building Code</li> <li>• Uniform Building Code, ICBO</li> </ul>   |
| <b>falls</b>              | <ul style="list-style-type: none"> <li>• ASTM D-2047 - Test for Slip Resistance of Hard Surfaces</li> </ul>  |
| <b>fire, flame spread</b> | <ul style="list-style-type: none"> <li>• ASTM E-84 Steiner Tunnel Test.</li> <li>• BS 476, Part 7 Flammability Standard (UK and Belgium)</li> <li>• CAL TB-133 Flammability Test Procedure for Seating Furniture for Use in Public Occupancies</li> <li>• CAL TB-117 (Sections A through E) Test Procedures for Testing the Flame Retardant of Resilient Filling Materials Used in Upholstered Furniture</li> <li>• DIN 4102, B1 Flammability Standard (German)</li> <li>• DOC FFI-70 Standard for the Surface Flammability of Carpet and Rugs Methenamine Pill Test)</li> <li>• NFPA-701-1 / 701-2 Standard Method of Fire Test for Flame Resistant Textiles and Films</li> <li>• NFPA-705 Field Flame Test for Textiles and Films</li> <li>• NFPA 80 Fire Test of Door and Windows</li> <li>• NFPA-220 Standard on Types of Building Construction</li> <li>• NFPA-253 Flooring Radiant Panel Test</li> <li>• NFPA-255 Standard Method of Test of Surface Burning Characteristics of Building Materials</li> <li>• NFPA-258 Research Test Method for Determining Smoke</li> </ul> |

Generation of Solid Materials

- NFPA-259 Potential Heat of Building Materials
- NFPA-260 Methods of Tests and Classification System for Cigarette Ignition Resistance of Components
- NFPA-261 Method of Test for Determining Resistance of Mock-up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes
- NFPA-264 Standard Test Method for Heat Release Rates for Upholstered Furniture Components or Composites and Mattresses Using an Oxygen Consumption Calometer
- NFPA-265 Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings
- NFPA-267 Standard on Mattress Subjected to Open Flame Ignition Using an Oxygen Consumption Calometer
- NFPA-701
- NFPA-703 Standard for Fire Retardant Impregnated Wood and Fire Retardant Coatings for Building Materials
- UBC 8-2-(94) Test Method for Textile Wall Coverings.
- UL-1056 Fire Test of Upholstered Furniture

**furnishings**

- ANSI/BIFMA X5.6-86 Standard for Office Furnishings

**lighting**

- ANSI E-97
- ASTM E-97-ES

**indoor air  
quality**

- ASHRAE 62-1989R Ventilation Standard for Acceptable Indoor Air Quality

FURNISHING ITEM: \_\_\_\_\_

ITEM NUMBER: \_\_\_\_\_

(Place photograph here)

FABRIC  
 (Fabric Name)  
 (Fabric Number)

(Place sample here)

FINISH  
 (Finish Name)  
 (Finish Number)

(Place sample here)

OPTIONS (if any)

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**ROOM**  
 (Enter Room number and name)  
 (Enter Room number and name)  
 (Enter Room number and name)

**QUANTITY**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Firm Name  
 Firm Name  
 Date

**FURNITURE ILLUSTRATION SHEET**  
 \_\_\_\_\_ % Submittal

Project Name  
 Project Address  
 Contract No.: \_\_\_\_\_

Project Name	Contract No. XXXXXXX-XX-XXXXX
Project Location	Firm Name
Date:	Firm's Project No.

**Order Data Sheet**

Item Number:	00X
Item Description	(example: Mail Sorter Cabinet)

Department:	
-------------	--

Manufacturer:	
---------------	--

Source:	(include ordering address, phone number, & fax number)
---------	--

GSA Contract #	Expiration Date:
----------------	------------------

FSC Group:	SIN #
------------	-------

FSC Part, Sect.	MOL Amount:
-----------------	-------------

	Number:	Price:	Qty.	Total
Component:				
Component:				
Component:				
Component:				
Component:				
Component:				
Component:				

Fabric Name:	Number:	Price:	Qty.	
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Finish:	
---------	--

Description:	
--------------	--

Weight:	Dimensions:
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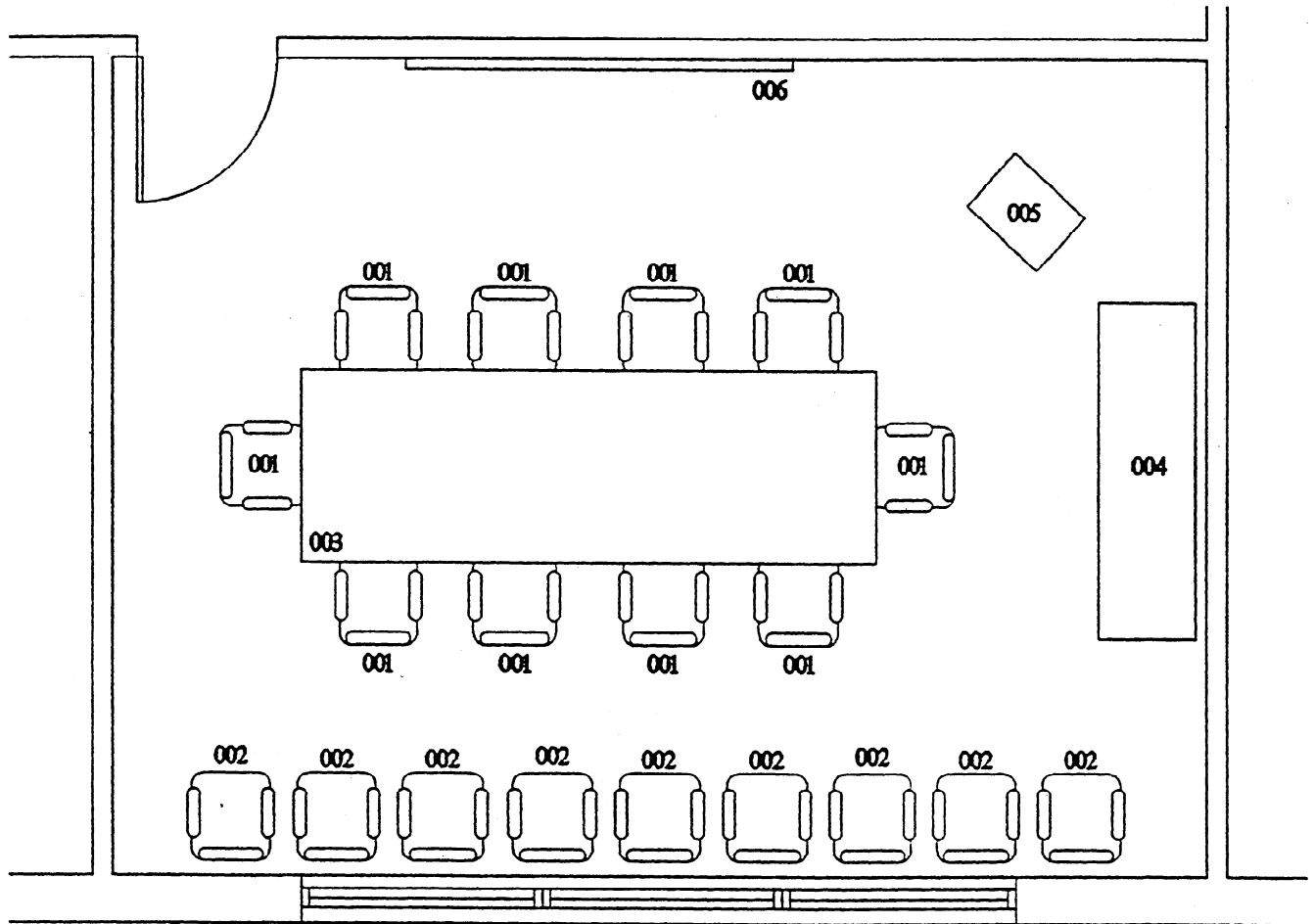
	Room:	Quant.:		
Department:				
Department:				
Department:				
Department:				
Department:				
Department:				
Department:				

Estimated or Actual Freight Charges:	
--------------------------------------	--

Total Quantity:	Item Price:	Total:
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Special Instructions:	

Justification:	



ROOM: (ENTER ROOM NAME & NUMBER HERE)

SCALE: 1/32" = 1'-0"

ITEM NUMBER	DESCRIPTION	QUANTITY
001	CONFERENCE CHAIRS, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	10
002	GUEST CHAIRS, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	9
003	CONFERENCE TABLE, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	1
004	CREDENZA, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	1
005	PODIUM, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	1
006	VISUAL BOARD, (SUPPLY MANUFACTURER'S NAME & STYLE NO.)	1

FIRM NAME  
 FIRM NAME  
 DATE

FURNITURE PLACEMENT PLAN  
 PHASE PERCENT

PROJECT NAME  
 PROJECT NAME  
 PROJECT LOCATION  
 CONTRACT NUMBER



(SAMPLE ONLY)  
**COLOR GUIDE SPECIFICATIONS**

**PART 1 - GENERAL**

**1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designations only.

Federal Standards (Fed-Std)  
Fed-Std 595 (Rev B) Color Used in Government Procurement

**1.2 GENERAL**

This section covers only the color of the exterior and interior materials and products that are exposed to view in the finished construction. The word "color" as used herein includes surface color and pattern. Requirements for quality and method of installation are covered in other appropriate sections of the specifications. Specific locations where the various materials are required are shown in the drawings. Items not designated for color in this section may be specified in other sections. When color is not designated for items, the Contractor shall propose a color for approval.

**1.3 SUBMITTALS**

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section \_\_\_\_\_ - SUBMITTAL DESCRIPTIONS:

SD 14 Samples  
Color Board; GA

Four (4) sets of color boards, 120 days after the Contractor is given Notice to Proceed, complying with the following requirements:

- 1.3.1 Color board shall reflect all actual finish textures, patterns, and colors required for this contract.
- 1.3.1 Materials shall be labeled with the finish type, manufacturer's name, the pattern, and the color reference.
- 1.3.3 Samples shall be on size A4 or 215 mm (8 1/2") boards with a maximum spread of size A1 or 640 mm x 825 mm (25 1/2" x 33") for fold outs. Color boards are to be organized and formatted in accordance with the SID and CID Submittal Matrixes in Chapters 3 & 4.
- 1.3.4 Samples for this color board are required in addition to samples requested in other specification sections.
- 1.3.5 Color boards shall be submitted to the following addresses:  
(Design Agents, BCE, MAJCOM, Construction Manager, etc.)

**PART 2 - PRODUCTS**

**2.1 COLOR REFERENCE**

## APPENDIX D

FED-STD 595 number are specified for color reference only. Where a product is specified to be a factory finished item, the color shall match the FED-STD 595 color. Federal standard colors are designated by 5 digit numbers, the first of which specifies luster. Since the luster is specified in Section \_\_\_\_\_ - PAINTING, GENERAL, luster is not referenced within this specification. The first digit of the designation is therefore replaced with an "X" when referenced.

### 2.2 REFERENCE TO MANUFACTURER'S COLOR

Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers.

### 2.3 FINISH SCHEDULE

The finish schedule lists the colors, patterns, and textures required for exterior and interior finishes, including both factory applied and field applied colors.

### 2.4 EXTERIOR FINISHES

Exterior wall colors shall apply to exterior wall surfaces including recesses at entrances and projecting vestibules. Conduit shall be painted to closely match the adjacent surface color. Colors shall be provided to match the colors listed below.

#### 2.4.1 ALUM - Aluminum

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
Alum-1	Kawneer	Permanodic No. 29 (Black)
Alum-2	PPG	Duranar Coatings UC43347 -Statuary Bronze

#### 2.4.2 COMPOSITE ALUMINUM PANELS - (Resin Core)

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
CAP-1	Alpocic	M9177 - Champagne Metallic

#### 2.4.3 BLINDS, INTEGRATED IN WINDOWS

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
		Match color to Alum-1

#### 2.4.4 BRICK

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
BRK-1	Chattahoochee Brick	Cambridge, Modular Size Red Brick, Roll Back Finish with a Flash Range 15% to 20% Black, with mortar US Cement 48-B, Crimson Red
BRK-2	Grasselli Brick	"Macy's" #7 Split Face Block (Off white color) with mortar US Cement 12-B, Ivory Buff. 200 mm x 400 mm x100 mm (8"h x 16"l x 4"d).

BRK-3	King's Mountain Brick	Light Gray Standard Torn Face Special shapes, See elevations (Matches color of BRK-2) with mortar US Cement 12-B, Ivory Buff
-------	-----------------------	---

**2.4.5 CER STEEL - Ceramic Steel**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
CER STL-1	Alliance	"Granite"

**2.4.6 CONC PV - Concrete Pavers with Natural Color Mortar**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
CONC PV-1	Stonescape Architectural Pavers	0131 Midnight Haze
CONC PV-2	Stonescape Architectural Pavers	0143 Mocha Mouse

**2.4.7 P - Paint**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
P-1	Benjamin Moore	Ironclad Retardo Deep Bronze 16362

**2.5 INTERIOR FINISHES**

Interior materials shall be provided to match the colors listed below.

**2.5.1 FLOORING**

**2.5.1.1 CPT - Carpet (Broadloom) and Carpet Tile**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
CPT-1	Harbinger	Adirondack Color 708, Potash Mountain
CPT-2	Harbinger	Champlain Color CHM 708, Old Forge
CPT-3	Harbinger	Colourado 38 Color 17314
CPT-4	Harbinger	Estuary Color 3130, Thames
CPT-5	Harbinger	Dividend Color 21737, Revenue
CPT-6	Harbinger	Exchange Color 20537, Takeover

**2.5.1.2 CTF - Ceramic Tile**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	TYPE & EXAMPLE COLOR
CTF-1	American Olean	50 mm x 50 mm (2" x 2") Unglazed Porcelain Ceramic Mosaic, A-34, Raven
CTF-2	American Olean	50 mm x 50 mm (2" x 2") Unglazed Porcelain Ceramic Mosaic, A-12, Pepper White

**2.5.1.3 VCT - Vinyl Composition Tile**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	TYPE & EXAMPLE COLOR
VCT-1	Armstrong	Standard Excelon, #51941, Polar White

**2.5.2 BASE**

**2.5.2.1 RB - Rubber Base**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
VB-1	Roppe	Color 00, Black
VB-2	Roppe	Color 85, Burgundy
VB-3	Roppe	Color 92, Teal
VB-4	Roppe	Color 87, Blue

**2.5.2.1 WB - Wood Base**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
WB-1		Match Mahogany Stain on NOVA Office Furniture

**2.5.3 PAINT**

**2.5.3.1 PT - Paint**

FINISH CODE ON DRAWINGS	EXAMPLE MANUFACTURER	EXAMPLE COLOR
PT-1	Sherwin Williams	SW 1921, Rose Attar
PT-2	Sherwin Williams	SW 1490, Dynasty Blue
PT-3	Sherwin Williams	SW 1497, Mood Indigo
PT-4	Sherwin Williams	SW 1287, Deep Maroon
PT-5	Sherwin Williams	SW 1280, Victoria Garnet
PT-6	Sherwin Williams	SW 1488, Bluefish
PT-7	Sherwin Williams	SW 1495, Veronica Blue

DOCUMENT IDENTIFIER			ROUTING IDENTIFIER				M & S	ITEM IDENTIFICATION* (NSN, FSCM/Part No., Other)															UNIT OF ISSUE	QUANTITY					DOCUMENT NUMBER					
								FSCM					PART NUMBER					REQUISITIONER																
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												2. MANUFACTURER'S NAME																						
3. MANUFACTURER'S CATALOG IDENTIFICATION										4. DATE (YYMMDD)					5. TECHNICAL ORDER NUMBER																			
6. TECHNICAL MANUAL NUMBER										7. NAME OF ITEM REQUESTED																								
8. DESCRIPTION OF ITEM REQUESTED															8a. COLOR																			
															8b. SIZE																			
9. END ITEM APPLICATION															9a. SOURCE OF SUPPLY																			
9b. MAKE					9c. MODEL NUMBER					9d. SERIES					9e. SERIAL NUMBER																			
10. REQUISITIONER (Clear text name and address)										11. REMARKS																								

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DD Form 1348-6, FEB 85 Edition of Apr 77 may be used until exhausted.

**DOD SINGLE LINE ITEM REQUISITION SYSTEM DOCUMENT (MANUAL - LONG FORM)**



The Civil Engineer:

Major General Eugene A. Lupia

Deputy Civil Engineer:

Dr. Robert D. Wolff

Director, Air Force Center for Environmental Excellence:

Mr. Gary M. Erickson, P.E.

Executive Director, Air Force Center for Environmental Excellence:

Colonel Michael F. McPherson

Director, Air Force Design Group:

Mr. Donald L. Ritenour, AIA

Interior Design Presentation Format Editor:

Ms. Sandra W. Warner, IIDA

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## RECYCLED BUILDING PRODUCTS

Numerous building products are available that contain recycled materials. While some of these products have limited applications, others can be used in day-to-day facility maintenance operations.

### Foundation:

- Waste fly ash concrete additive (up to 20%)
- Iron rebar from industrial remelt
- Masonry blocks with wood waste content
- Masonry block with recycled EPS bead

### Framing:

- Studs made from recycled steel
- Salvaged and remilled lumber

### Sheathing

- Recycled newsprint

### Exterior Siding

- Textured panel made from recycled plastic
- Engineered fiberboard made from wood waste

### Wall and Ceiling Finishes

- Wallboard with:
  - up to 18 % recycled waste newsprint
  - recycled gypsum content
  - byproduct gypsum
- Acoustical ceiling tiles made with 40-70% newsprint fiber and some mineral slag
- Wallpaper from 66% post consumer paper and 32% reclaimed wood chips
- Hardboard from recycled waste wood fiber
- Paint recycled from on-base collection programs

### Floor Coverings

- Carpet made from recycled plastic
- Tiles made with:
  - recycled glass content
  - reclaimed industrial slag
  - recycled plastic
- Reused wood

### Underlayment



- From recycled tire rubber
- From reclaimed and recycled textile fibers
- From recycled agricultural waste and paper
- From 100% recycled newsprint cellulose

#### Roofing

- Panels made from recycled aluminum or steel
- Organic asphalt shingles with:
  - a base of recycled mixed paper
  - recycled mineral slag for aggregate
- Shakes made from recycled plastic

#### Doors and Windows

- Frames and sills with a composite substrate of waste wood and recycled plastic
- Frames with a core of recycled wood fiber from pallets, crates and construction debris
- Cabinets
- Laminated board with waste straw as the core substrate
- Hardboard from recycled waste wood fiber insulation
- Loose fill cellulose made from recycled newsprint
- Loose fill and batts made from reclaimed metallurgical slag
- Insulation Board made from 100% recycled polystyrene

#### Attic and Ceiling Ventilation Baffles

- From recycled cardboard
- From recycled plastic (HDPE)

#### Shims

- From recycled plastic (HDPE)

#### Landscaping

- Benches, tables, fences and landscaping timbers made from recycled plastic
- Landscape lumber made from a composite of wood and plastic waste
- Drain aggregate from recycled glass cullet
- Irrigation tubing made from recycled rubber

#### Exterior Walkways

- Surface topping mix with recycled rubber content
- Walkway mats from recycled tire rubber
- Paving bricks made with oil-contaminated soil

#### Gutters and Downspouts

- Gutter guards made from recycled plastic (HDPE)

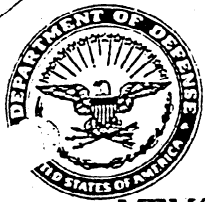
- Downspouts made from recycled vinyl

#### Chimney

- Surface brick from recycled plastic

#### Transportation

- Asphalt for roads and parking lots with recycled rubber content
- Signs, sign posts, bumper blocks, wheel chocks, and guard rails made from recycled plastic



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE SPACE COMMAND

CES/CC KRR  
CES/CD RYM  
CES/CEC

14 JUL 1995

MEMORANDUM FOR      21 CES/CC      721 CES/CC      45 CES/CC  
                                 50 CES/CC      750 MSS/CE      73 MSS/CC  
                                 90 CES/CC      341 CES/CC      30 CES/CC

FROM: HQ AFSPC/CEC  
150 Vandenberg St Ste 1105  
Peterson AFB, CO 80914-4150

SUBJECT: 35% Presentation Drawings

1. HQ AFSPC/CV letter of 25 Jan 95 at attachment 1 requires a wing briefing of all major projects at the 35% design phase. This letter provides guidance concerning the documents to be submitted at that briefing. It should be made available to the designer prior to execution of all future design contracts for which command design briefings are required. Depending on the status and cost impact, it may also be possible to modify some existing design contracts to accommodate this guidance.

2. In the past, a full-blown color rendering was usually prepared after the 35% design phase. These renderings were often rather idealistic, illustrating one or two elevations with fully developed landscaping and considerable artistic license. Usually they did not show surrounding buildings or streets, and utility equipment was often omitted, which ultimately detracted from the appearance of the finished facility. In short, they were sometimes more artistic than realistic.

3. The drawing requirements for the 35% design briefing are at attachment 2. The intent of the new procedure is to illustrate the facility, by simple pictorial sketches, as it will appear at the time of its completion and in its true surroundings. Example sketches are at attachment 3. These examples do not illustrate all the requirements for a 35% submittal, but are included to illustrate the simple line-drawing-with-color format.

4. It is anticipated that the cost of the sketches will be approximately the same as that of a color rendering; however, the need for a rendering, in addition to the sketches, must be made on a case-by-case basis. If a rendering is required, it should not be started before the 35% design has been approved at the briefing. Simply stated, we are trying to reduce workload on your staff, not increase it, by getting review accomplished early in the process.

5. Contact Mr. Joe Bonar, HQ AFSPC/CEC, DSN 692-5034 with any questions about 35% submittal drawings.

MICHAEL D. BRATLIEN  
Chief, Engineering Division

Attachments:

1. CV letter, 25 Jan 95
2. Submittal Requirements
3. Sketch Examples

## NARRATIVE REQUIREMENTS

Official Project Title

Type of Project: (MILCON, O & M, NAF, MFH, etc.)

Fiscal Year:

Project Number: (PDC, PCMS)

Location: (Installation)

Wing:

Designer:

Programmed Amount:

Current Working Estimate: (Include contingency and SIOH)

PA/CWE

Brief description of project: (scope, using agency(s), parking, revised streets, infrastructure, etc.)

Brief statement of purpose of project:

Description of architectural style/features/exterior materials

Description of dominant exterior materials

Describe how the project meets the design problems/objectives [Reason(s) for selecting style/features/exterior materials]

Explain compatibility with surrounding facilities: (Include photos of surrounding facilities if necessary)

List/describe roof-mounted equipment and all utility equipment within 50' of facility

Describe basic interior design theme (finish materials, colors, etc.)

## DRAWING REQUIREMENTS FOR 35% SUBMITTALS

### ELEVATION PERSPECTIVES:

These are to be sketches illustrating all the major elevations of the facility from a ground view. All existing and new utility equipment (air-handling equipment, transformers, meters, poles, etc.) that will be visible from that view of the finished facility will be shown, to scale, in its finished location, with an indication of finish color. ALL roof-mounted equipment, down to and including plumbing stacks, should be accurately shown if it will be visible on the finished facility. Streets, parking, sidewalks and all site amenities (benches, bicycle racks, screening, fences, etc.) must be accurately illustrated, along with signage, if included in the design contract. Building mounted lighting fixtures, lighting bollards and standards should also be shown. Landscaping is to be accurately shown at the size it will be at construction completion. The intent of these sketches is to show the facility from the ground level in its actual setting, as it will appear when construction is complete.

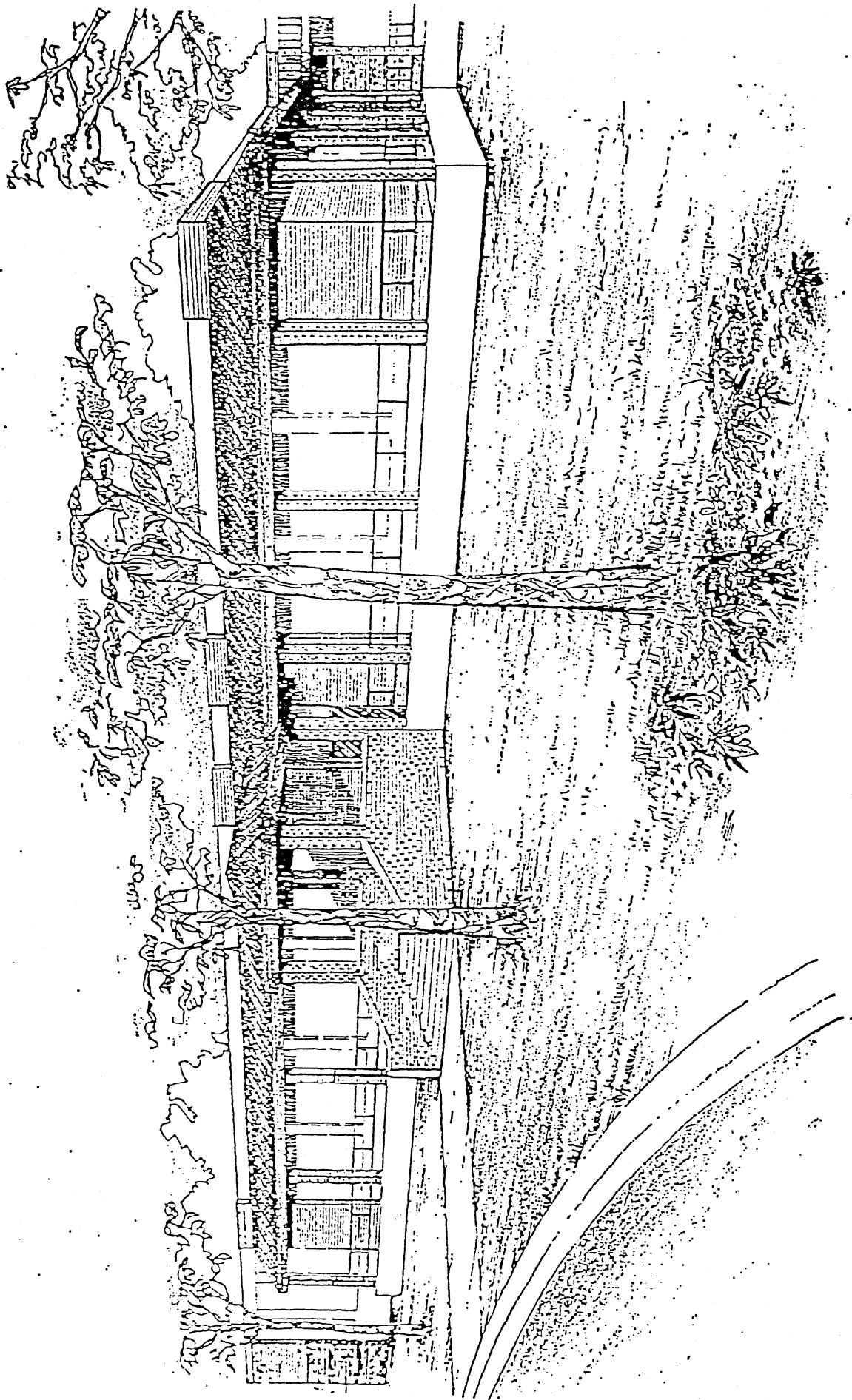
### SITE PERSPECTIVES:

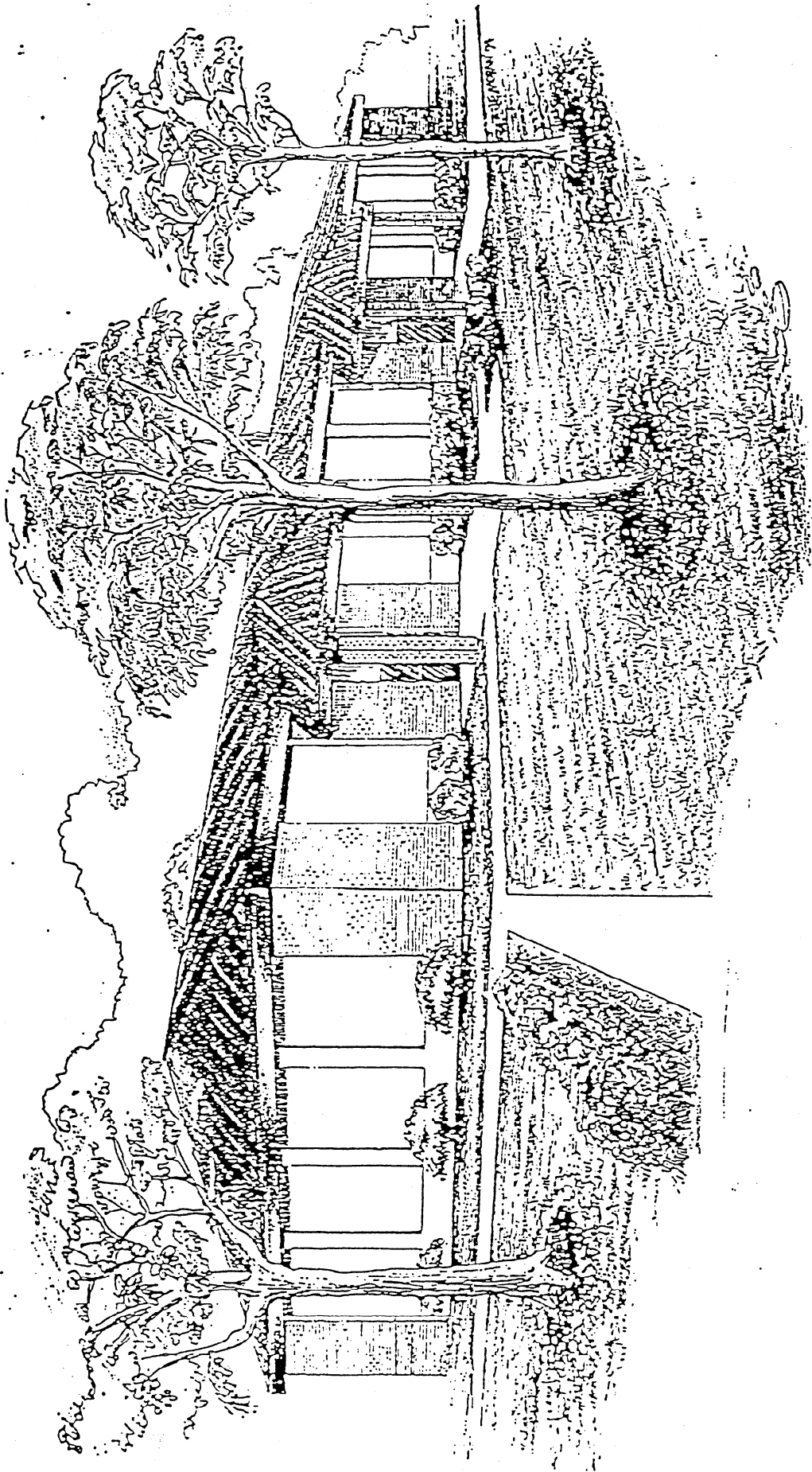
These are to be aerial sketches illustrating how the facility fits in the proposed setting. They should show all existing and new features over a broad view, including buildings, streets, parking, sidewalks, landscaping and all other site conditions. The intent is to show the integration of the facility with its surroundings, as it will appear when construction is complete. Normally more than one sketch will be required to show this integration in the several different directions.

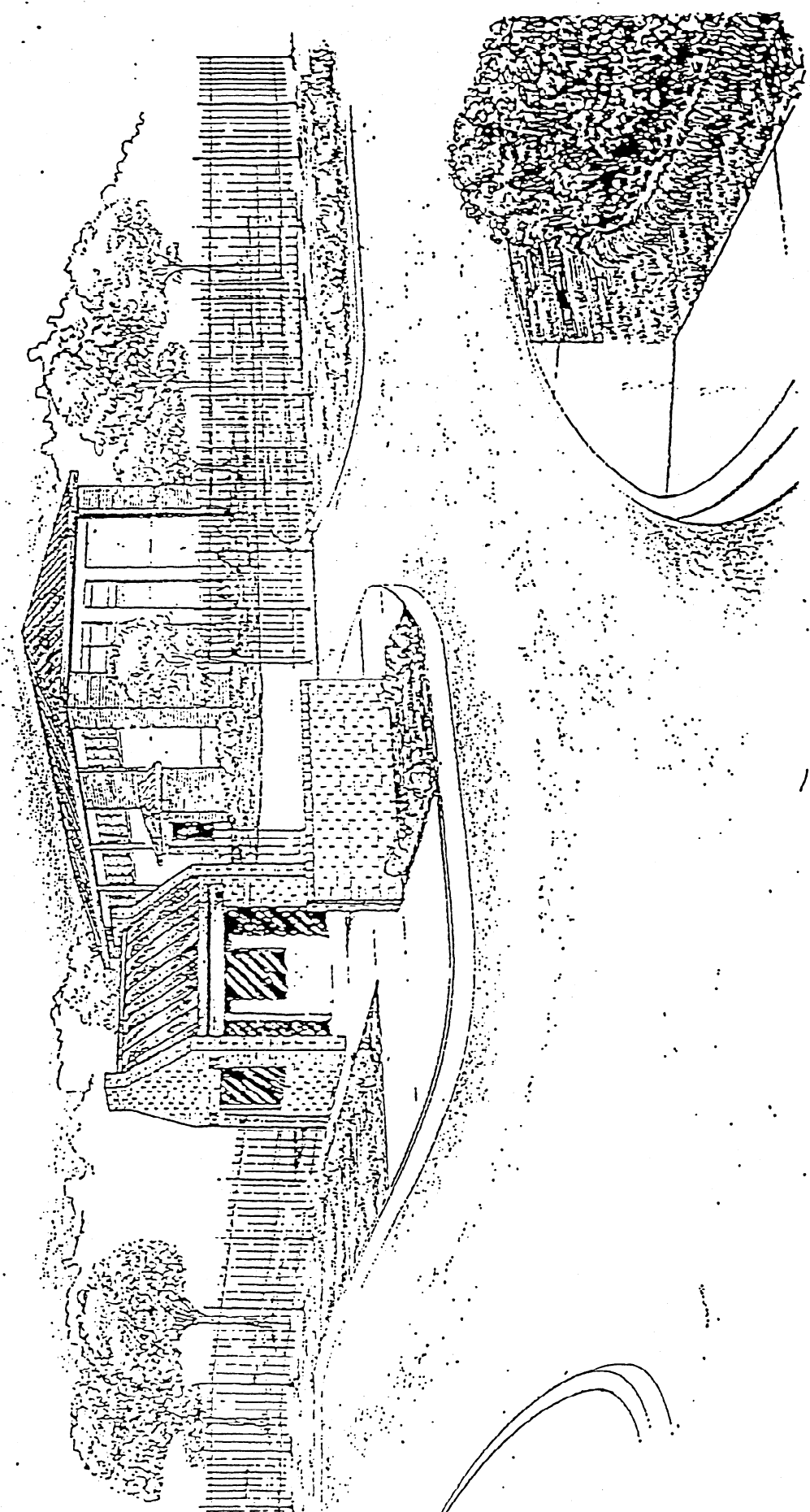
The above perspectives are to be simple 8-1/2" X 11" black-line sketches with colored pencil or marker overlay, which can be reproduced on a normal color photocopy machine. They should provide an indication of color for the major design elements, without becoming full-blown renderings. People and cars can be included, if they help illustrate scale.

### BUILDING, SITE, LANDSCAPING AND TRANSPORTATION PLANS:

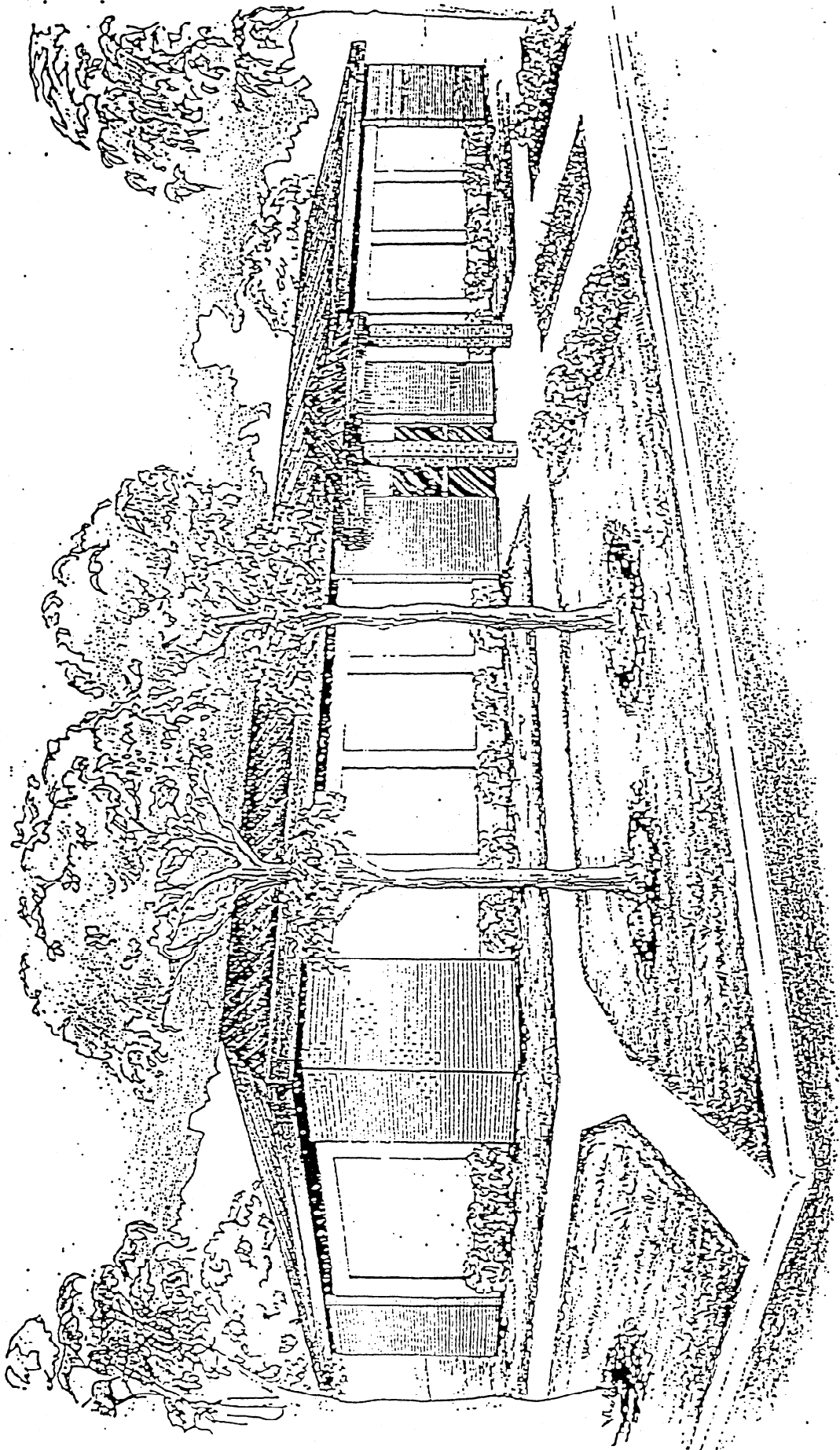
These drawings are to be traditional two-dimensional plans, with or without color, and will normally be larger than 8 1/2" X 11" to adequately illustrate the design details.











SECTION 01000  
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY OF WORK

Project titled:

Provide all items, articles, materials, operations, or methods listed, mentioned or scheduled on the drawings and/or as specified herein, including all labor, materials, equipment, and incidentals necessary and required for completion of the scope of this project.

1.2 UTILITIES:

All reasonable quantities of utilities will be made available from existing utilities to the Contractor without charge. Any temporary connection or lines that may be required will be installed, maintained, and removed by the Contractor at his own expense and in such a manner satisfactory to the Contracting Officer. Removal of such connections or lines will be accomplished prior to final acceptance of the construction. The Contractor shall provide any necessary portable power.

1.3 SAFETY:

The Contractor shall comply with all existing Occupational Safety and Health Act (OSHA) standards of safety at all times in the performance of this contract. Hazards to the safe use of the premises due to the Contractor's work and/or equipment shall be suitably marked at all times. Pedestrian and vehicle traffic ways shall be kept clear and unobstructed.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 INSPECTION:

There will be one primary inspector assigned to inspect for compliance. An alternate inspector will also be assigned and will perform all inspection duties in the absence of the primary inspector. The inspector will be the spokesman for compliance with the specifications and drawings. Controversies between the inspector and the Contractor

will be resolved by the Contracting Officer. If, for some reason, a change in the primary or alternate inspector is required, the Contractor will be notified. The Contractor shall coordinate Contractor activities with Construction Management, (731-6156).

### 3.2 CONTRACTOR VEHICLES AND EQUIPMENT:

3.2.1. The Contractor shall provide all vehicles and equipment necessary to accomplish the contract work. Power equipment shall be equipped with safety and noise limiting devices. The equipment shall be in a safe and efficient operating condition. The Contractor shall not park vehicles in the project area during non working hours. A designated parking area for vehicles and equipment will be provided. Vehicles will not be allowed on lawns or sidewalks without prior written approval. All equipment will be clearly marked with the Company name.

3.2.2. Truckload Limits: The following load limits shall apply to all contractor-operated equipment on this project:

April 1 to June 1	--	350 #/inch width of tire
All Other Times	--	400 #/inch width of tire

### 3.3 CONTINUED USE OF FACILITIES:

Building, structures, facilities, and utilities will continue in use by the Government during this contract. The Contractor shall notify Construction Management when a no-work condition will occur for more than one day by the Contractor or sub-contractors (except weekends and federal holidays).

### 3.4 MAINTENANCE OF AIR FORCE OPERATIONS

It is required and essential that the primary use of the facilities continue uninterrupted throughout the contract period. Work, once commenced, shall be carried to completion with a minimum of interruption to Government operations.

### 3.5 AS-BUILT FIELD DATA

3.5.1. General: The Contractor shall keep at the construction site a complete set of full size blueline prints of the contract drawings, reproduced at Contractor expense. During construction, these prints shall be marked to show all deviations in actual construction from the contract drawings. The color red shall be used to indicate all additions and green to indicate all deletions. The drawings shall show the following information but not be limited thereto:

3.5.1.1. The locations and descriptions of any utility line and other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features, and depth.

3.5.1.2. The locations and dimension of any changes within the building or structure, and the accurate location and dimension of all underground utilities and facilities.

3.5.1.3. Correct grade or alignment of roads, structures, and utilities if any changes were made from contract plans.

3.5.1.4. Correct elevations if changes were made in site grading from the contract plans.

3.5.1.5. Changes in details design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including, but not limited to, fabrication, erection, installation, and placing details, pipe size, pipe material, insulation material, dimensions of equipment foundations, etc.

3.5.1.6. The topography and grades of all drainage installed or affected as part of the project construction.

3.5.1.7. All changes or modifications from the original design and from the final inspection.

3.5.1.8. Where contract drawings or specifications allow options, only the option actually used in the construction shall be shown on the as-built drawings. The option not used shall be deleted.

3.5.1.9. These deviations shall be shown in the same general detail utilized in the contract drawings. Marking of the prints shall be pursued continuously during construction to keep them up-to-date. In addition, the Contractor shall maintain full size mark-up drawings, survey notes, sketches, nameplate data, pricing information, description, and serial numbers of all installed equipment. This information shall be maintained in a current condition at all times until completion of the work. The resulting field-marked prints and data shall be referred to and marked as "As-Built Field Data," and shall be used for no other purpose. They shall be made available for inspection by the Contracting Officer's representative whenever requested during construction and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. As-builts must be shown on the contractor's progress schedule as a measurable items for pay purposes.

3.5.2. Submittal of the As-Built Field Data: The As-Built Field Data shall reflect the exact installation performed and shall be submitted to the Contracting Officer for review and approval a minimum of three calendar days prior to the date of final inspection. If review of the preliminary as-built drawings reveals errors and/or omissions, the drawings will be returned to the Contractor for corrections. The Contractor shall make all corrections and return the drawings to the Contracting Officer within 10 calendar

days of receipt. The "Red LINE" drawings shall be reviewed at the final inspection for completeness.

**"SPECIFIER SELECT ONE OF THE FOLLOWING"**

**3.5.3. Preparation--As-Built Contract Drawing, Non AutoCAD Original Mylar Record Tracing:**

3.5.3.1. Approved preliminary as-built drawings will be returned to the Contractor along with one set of the contract drawing original record tracings. These drawings are part of the permanent records of this project and the Contractor will be held responsible for their protection and safety until they are returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced in like medium, quality and size as the originals at the Contractor's expense. The drafting work shall be performed by certified Engineering Technicians and/or individuals with a minimum of five years drafting experience. The name and qualifications of these individuals shall be submitted in writing to the Contracting Officer for approval.

3.5.3.2. Drafting of the data onto the contract drawing original mylar record tracings shall be done in a quality equal to that of the originals. Linework, lineweights, and lettering, and use of symbols shall be the same as the original line work, line weights, and lettering, and symbols. All revisions shall be noted in revision block with revision symbol in chronological sequence. This symbol shall also be placed on drawing where revision was made. Plastic drafting leads or ink shall be used. Graphite leads shall only be used where used on the original drawings. If additional drawings are required, they shall be prepared on the same medium and of equal size and quality as the original record tracings. Sufficient blank sheets for this purpose will be furnished by the government at no cost to the Contractor upon request. When final revisions have been completed, each drawing shall be lettered or stamped with the words "As-Built" in block letters at least 3/8 inch high placed above the title block of space permits, or if not, below the title block between the border and the trim line. The date of completion and the words "REVISED AS-BUILT" shall be placed in the revision block above the latest revision notation. Markings on the reverse side of the drawings will not be permitted. The submittal shall include the approved "Red Line" drawings and the revised original record drawings as stated above.

**3.5.4. Preparation--As-Built Contract Drawings, AutoCAD Original Record Tracing:**

3.5.4.1. Approved preliminary as-built drawings will be returned to the Contractor along with AutoCAD diskette (Release 13) of the original drawings. All work on the diskette will be accomplished by a Certified Engineering Technician and/or individuals with a minimum of five years drafting experience, at least three of which must be using AutoCAD. The name of these individual shall be submitted in writing to the Contracting Officer.

3.5.4.2. Modifications to the diskette shall be accomplished on the appropriate layer showing the work being changed. All revisions shall be done in the same format as the original drawing. On each sheet the words "AS BUILT" in block letters will be added to the discs. The size of the letters will be at least 3/8 inch high and be placed either above the title block or to the left of the title block. Fill in the revisions block with "REVISED AS-BUILT", date and initials. The submittal shall include the revised AutoCAD diskette, the approved "Red Line" drawings and a full size plot of the drawings from the revised diskette.

3.5.5. Preparation--As-Built Contract Drawing, Both AutoCAD and Non AutoCAD Original Record Drawings:

3.5.5.1. Approved preliminary as-built drawings will be returned to the Contractor along with the non AutoCAD original mylar record tracings and the diskette for the AutoCAD original drawings. These drawings are part of the permanent records of this project and the Contractor will be held responsible for their protection and safety until they are returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced in like medium, quality and size as the originals at the Contractor's expense. The drafting work shall be done by a certified Engineering Technician and/or other individual with a minimum of five years drafting experienced and at least three of those on AutoCAD.

3.5.5.2. For Non AutoCAD drawings, drafting onto the contract drawing original mylar record tracings shall be done in a quality equal to that of the originals. Linework, lineweights, lettering and use of symbols shall be the same as the original. All revisions shall be noted in the revision block with revision symbol in chronological sequence. This symbol shall also be placed on drawing where revision was made. Plastic drafting leads or ink shall be used. Graphite leads shall only be used where used on the original drawings. Additional drawings, if required shall be the same format, size and quality as provided on the AutoCAD diskette. The additional drawings will be added to the diskette provided.

3.5.5.3. For AutoCAD drawings, modifications to the diskette shall be accomplished on the appropriate layer showing the work being changed. All revisions shall be done in the same format as the original drawing.

3.5.5.4. When the final revisions have been completed, each drawing shall be lettered or stamped, for original record tracings and lettering added to the diskette with the words "AS-BUILT" in block letters at least 3/8 inch high. The lettering shall be placed either above the title block or to the left of the title block. The words "REVISED AS-BUILT" shall be placed in the revision block along with the date of completion and the initials of the reviser. The submittal shall include the approved "Red line" drawings, the revised original record tracings, the revised AutoCAD diskette and a print of the drawings from the revised diskette.

## "END OF OPTIONS"

3.5.6. The final as-built submittal shall be completed and returned together with the approved preliminary as-built drawings to the Contracting Officer within 30 calendar days of the final inspection. The Contracting Officer will review all final as-built record drawings for accuracy and conformance to the drafting standards and other requirements contained herein. The submittal shall be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the submittal to the Contracting Officer within seven calendar days of receipt.

3.5.6.1. All costs incurred by the Contractor in the preparation and furnishing of as-builts shall be included in the contract price and no separate payment will be made for this work. Approval and acceptance of the final as-built record drawings shall be accomplished before final payment is made to the Contractor.

3.5.6.2. List of Equipment-In-Place: In addition to the above requirements, the Contractor shall submit for approval, at the completion of construction, a list of equipment-in-place. This list shall be updated and kept current throughout construction, and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the contractor prior to submission of each monthly pay estimate. A sample form showing minimum data required is provided at the end of this section.

3.5.6.3. In addition to the above requirements, one set of marked-up as-built blueprints shall be furnished to the Contracting Officer at the time of system acceptance testing. These as-built blueprints shall be in addition to the requirements stated for the submission of the Operation and Maintenance Manuals.

### 3.6 CONCEALED WORK

All items of work to be concealed shall be Government inspected prior to concealment.

### 3.7 OPERATING AND MAINTENANCE INSTRUCTIONS:

Four complete sets of instructions, each in post-form binders, containing the manufacturer's operating and maintenance instructions for all equipment shall be furnished to the Contracting Officer. Where information or instructions are included for more than one model, the Contractor shall clearly mark the model actually installed on the job. The manuals shall be sectionalized using dividers with labeled tabs identifying the product/item behind the dividers. One complete set shall be furnished at the time test procedures are submitted, and the remaining sets shall be furnished before the contract is completed. Furnishing operating and maintenance instructions does not relieve the Contractor of the responsibility of furnishing framed instructions and schematics where specified. Each binder shall be indelibly marked on the exterior front

and edge with the project name, project number, contract number, name of contractor and the date.

### 3.8 CONTRACTOR FURNISHED EQUIPMENT DATA:

Ten days prior to final inspection and acceptance of work, the Contractor shall submit the following data:

3.8.1. Equipment List: An itemized equipment list showing unit retail value and nameplate data including serial number, model number, size, manufacturer, etc., for all Contractor furnished electrical and mechanical equipment installed under this contract.

3.8.2. Guarantees: Provide a list of all equipment items which are specified to be guaranteed, accomplished by a copy of each specified guarantee therefore. For each specific guaranteed item on the list shall include the name, address, and telephone numbers of the subcontractor who installed the item, the supplier, or distributor and the manufacturer. The completion data of the guarantee period shall correspond to the applicable specification requirements for each guarantee item.

### 3.9 MODEL UNITS (Delete if N/A)

When model units are required, one model unit will be inspected at all key stages of construction. All deficiencies noted during these various inspections will be corrected prior to proceeding with the work schedule. No exceptions.

### 3.10 SHOP DRAWINGS:

Shop drawings will include specially prepared technical data for this project and will consist of drawings, diagrams, performance curves, schedules, calculations, measurements, and will expand the general application to this specific project. Shop drawings show complete and accurate descriptions of specific equipment or systems to be installed. This will include detailed drawings showing routings, material types, installation and anchoring methods, component sizes, mounting methods, spacing, interface with existing systems, wiring and electrical systems, and all other details associated with the installation.

### 3.11 START OF WORK NOTIFICATION:

The Contractor shall notify the Construction Management (CM) Office (731-6156) and the Contracting Officer at least five work days in advance of the start of all work. This shall include, but is not limited to, notifying CM when the initial work shall begin; notifying CM when work shall resume after a work stoppage of more than three work days; notifying CM when work shall begin following the end of all specified exclusion periods. The Contractor shall be aware that the Notice to Proceed is not sufficient notification to CM when initial work will begin.



### 3.12 NOTICE OF FINAL INSPECTION:

The Contractor shall, after notifying the Project Inspector, schedule a date with the Contracting Officer for final inspection 14 days prior to his projected completion of the project. A final inspection shall not be held until all discrepancies found during the pre-final inspections have been corrected. The red line drawings shall be at the final inspection.

### 3.13 CONSTRUCTION NEAR UTILITY SYSTEMS:

3.13.1. Digging within three feet of buried communications cables, electrical cables, irrigation systems, and gas lines shall be performed by hand digging until the utility is exposed. The Project Inspector shall be notified three days prior to digging within a three-foot area near this utility. A representative from communications (Telco) must be present during excavation of Communications Cables. The cable piping routes must be marked prior to excavation in the area. A work clearance permit (AF Form 103) must be obtained from Construction Management prior to any excavation work. The Contractor shall be held responsible for any damage to a marked or identified utility by excavation procedures. Once the utility is exposed, mechanical excavation may be used if there is no chance of damage occurring to the cable or piping system. The contractor is responsible for marking all excavations he will do in white paint or flags, three (3) work days prior to needing existing utilities marked by the government.

3.13.2. Reburial of Exposed Utilities: When existing utility lines are reburied, a tape, detectable by pipe detector systems, shall be installed above the uncovered length of the utility at a depth of 12 inches below grade. Tape shall be a minimum five mil plastic tape with metallic tracer, minimum three inches wide, lettering on tape to show buried utility, and brightly colored.

3.13.3. Access to Communications Manhole or Handhole: No communications manhole or handhole shall be entered without first obtaining a fiber optic cable briefing. Coordinate through Construction Management with the Base Communications Officer.

3.13.4. All repairs due to cable cuts on scope exchange cables shall be the responsibility of the Contractor. Repair actions must be accomplished by the current scope exchange contractor and paid for and coordinated under this contract at no additional cost to the Government. Work to restore lost service must begin within one hour after the cut and must continue unceasingly until the job is completed, tested, and accepted. Work will be inspected by Communications Squadron and scope exchange personnel.

### 3.14 UTILITY OUTAGES

All utilities programmed to be interrupted during construction shall be scheduled at least 10 days in advance of the outage and at a time convenient for the government. The "Utility Outage Notice" will be completed by the Contractor and submitted to Construction Management for approval. No interruptions shall be made until an outage notice is approved and returned to the Contractor. Utilities will include all overhead and underground utilities and road closures or partial closures.

### 3.15 SUBMITTALS

Contractor shall submit four copies of all submittals, to be recorded on AF Form 3000. Submittal items, including samples, shall be marked with a number corresponding to the item number on the AF Form 3000, and the page and paragraph number of the specification requiring the submittal. Contractor shall hi-lite specifics when submitting catalogs, etc.

### 3.16 CONTRACTOR STORAGE AREA:

Prior to notice to proceed, Contractor will be provided a storage area on the base within three miles of the project site. Contractor is responsible for the security of assigned storage area (3,000 S.F., more or less). Temporary storage buildings (excluding tractor trailers) sited in the storage area shall conform to the base color scheme (Antique Linen, Fed. No. 23578). Architectural and structural features of all temporary facilities (including tractor trailers) shall be maintained in good repair as required by the Contracting Officer. Storage areas shall be enclosed by 6' chain link fence with access gates. Spare keys to any locked gates shall be provided to the base fire department dispatch office. Storage areas shall be clean, orderly, and free of debris, demolished materials, etc. If at any time during the life of the contract, the Contracting Officer determines that base standards are not being met, he/she may direct the Contractor to perform such actions as necessary to bring the area and/or facilities up to base standards at no additional cost to the Government. If the contractor fails to bring the area and/or facilities up to standards, the Contracting Officer may direct the Contractor to remove themselves and/or the facility/storage unit or materials from the base at no cost to the Government.

### 3.17 REPAIR OF ROAD CUTS

Asphaltic surface shall be completely in-place within 48 hours after placement of base gravel. Between placement of base gravel and pavement, road shall be kept in drivable and passable condition.

### 3.18 QUALITY CONTROL

3.18.1. General. THE CONTRACTOR IS RESPONSIBLE FOR QUALITY CONTROL WHICH IS CONSIDERED BY THE GOVERNMENT TO BE A MAJOR INSPECTABLE ITEM OF THIS CONTRACT. In addition to CONTRACT CLAUSE, INSPECTION OF

CONSTRUCTION, the Contractor shall comply with the Quality Control Provisions as specified herein. The Contractor shall perform all Quality Control inspection and/or testing required by this contract unless specifically designated to be performed by the Government. The Quality Control system must consist of personnel, plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction, and operations which comply with contract requirements. The system shall cover construction operations, including fabrication both on-site and off-site, and shall be keyed to the proposed construction sequence. If the Contractor fails to submit an acceptable Quality Control Plan within the time herein prescribed, the Contracting Officer will refuse to allow construction to start.

3.18.2. Quality Control Plan: General: Prior to the start of construction, the Contractor's Quality Control Plan must be accepted by the Government. Construction will be permitted to begin only after acceptance of the contractor's Quality Control Plan via AF Form 3000. The Contractor's Quality Plan shall identify the personnel, procedures, instructions, records, forms, and as a minimum, shall include the following:

3.18.2.1. A description of the Quality Control management organization including an organizational chart.

3.18.2.2. The number, classifications, qualifications, duties, responsibilities, and authorities of personnel: A copy of a letter, signed by an authorized official of the firm, which describes the responsibilities and delegates the authorities of the Quality Control manager shall be furnished. The Quality Control manager must have a minimum of five years of documented experience in the primary areas of construction included in this contract. Include qualifications in the submitted plan for Government approval.

"SPECIFIER SELECT ONE OF THE FOLLOWING"

1. This contract requires a full time Quality Control Manager to be on site daily and continuously when any construction activity is taking place. This individual may not have any other assigned functions within the contractor's organization.

or

2. This contract does not require a full time Quality Control Manager. The individual assigned may have other duties within the contractor's organization but must commit a minimum average of two hours per day towards fulfilling the QC requirements of this section. Hours dedicated to this function will be annotated on the submitted QC records.

"END OF OPTIONS"

3.18.2.2.1. The Contractor's Quality Control activities to be performed, include those of subcontractors, off-site fabricators, and suppliers. A job specific detailed work item list for inspection purposes will be developed by the contractor. The list will be broken into

sections identical to the contract specifications and will contain all inspection actions necessary to ensure full compliance with the contract. A sample from a simplified and generic project is included at Attachment 1 to indicate the level of detail expected in this checklist.

3.18.2.2.2. Quality Control testing procedures including corrective actions to be taken where non-compliance is noted by the Quality Control Manager.

3.18.2.2.3. Documentation format for Contractor's Quality Control activities and testing. The attached form is to be used for documenting daily inspections, corrective actions, etc.

3.18.2.2.4. Procedures for ensuring As-Builts are accurate and updated daily.

3.18.2.2.5. Safety program that ensures complete compliance with OSHA and the U.S. Army Corps of Engineers manual EM 385-1-1, Safety Health Requirements Manual. Any non-compliance issues are the responsibility of the Contractor and not the Government.

3.18.2.2.6. Methods to ensure scheduled appointments are met and documentation to verify arrival and departure times at the work site.

3.18.2.2.7. A listing of all required mechanical and electrical testing, balancing, and operational tests.

3.18.3. Acceptance: The Quality Control Plan will be reviewed and approved, if acceptable, by the Contracting Officer. The Contractor shall make such changes and additions necessary for clarity and completeness as requested by the Contracting Officer. Acceptance is conditional and the Government reserves the right to require the Contractor to make changes in the Quality Control Plan, personnel, and operations to correct deficiencies found by the Government during performance of work. No change shall be implemented prior to acceptance in writing by the Contracting Officer. Non-compliance with the Quality Control Plan will result in one or more of the following actions as the Government's discretion:

3.18.3.1. Directed removal and replacement of the QC Manager.

3.18.3.2. Reduced progress payments until corrections are made.

3.18.3.3. Cure notices and other applicable contracting actions up to and including possible contract termination for default.

3.18.3.4. Other contractual actions deemed appropriate by the Contracting Officer.

3.18.4. Quality Control Records: The Quality Control Records shall contain a record of daily inspections for all work accomplished. Specific items of work checked each day will be annotated. All work-in-place must be certified as complying with the contract plans and specifications. Non-compliance items must be clearly noted. Corrective actions must be outlined and detailed for non-compliance items. The Contractor shall maintain daily records, which will be on-the-job site and available for review by the Contracting Officer or his technical representative. Daily reports will be signed by the designated Quality Control Manager and will indicate hours spent on Quality Control that day. A copy of the QC daily reports shall be given to the project inspector.

3.18.5. Submittals: The contractor will submit four copies of the proposed Quality Control Plan for approval not more than 15 days after Award. No work will start until acceptance is made by the Contracting Officer via AF Form 3000. No exceptions will be provided to this requirement.

### 3.19 1354 CHECKLIST

Contractor will complete the Property Inventory checklist and submit it to the Contracting Officer 10 days prior to final inspection. The checklist will be delivered to the Contractor at the Preconstruction conference.

### 3.20 WORK SCHEDULE

Working hours for the Contractor will normally be between the hours of 7:45 a.m. and 4:15 p.m. excluding Saturdays, Sundays, and Federal Holidays. If the Contractor desires to work during periods other than above, additional government inspection forces may be required. The Contractor must notify the Contracting Officer three days in advance of his/her intention to work during other periods to allow assignment of additional inspection forces when the Contracting Officer determines that they are reasonably available. If such force is reasonably available, the Contracting Officer may authorize the Contractor to perform work during periods other than normal duty hours/days. However, if inspectors are required to perform in excess of their normal duty hours/days solely for the benefit of the Contractor, the adjustments to the contract price may be made periodically as directed by the Contracting Officer.

### 3.21 AIR QUALITY

3.21.1. Burning of material is not allowed on base by the Contractor.

3.21.2. The maintenance and repair work to air conditioning and refrigeration systems shall require that all CFC handling standards be met. Maintenance and repair work on any equipment used or covered by this contract shall require all CFC handling standards be met.

3.21.3. The Contractor shall not vent or cause to be vented CFC and HCFC refrigerants (R-11, R-12, R-22, R-113, R-114, R-115, R-500, R-501, R-502 or other mixtures containing CFCs) to the atmosphere during repair or maintenance work on any equipment covered by this contract.

3.21.4. The Contractor shall have available refrigerant recovery or reclaim equipment to perform the work. Any recovered refrigerant from Government owned equipment shall be provided to the Government in EPA approved containers after coordination with the Project Inspector.

3.21.5. The Contractor personnel who operate refrigerant reclaim or recycling equipment shall possess the necessary state and local certifications for operating the equipment.

3.21.6. The Contractor shall be responsible for meeting all requirements, permitting, licensing and certification required by state or local ordinance to work on refrigerations systems.

3.21.7. Replacement compressors and other replacement equipment used in repairing CFC-Containing systems shall be compatible with CFC replacement refrigerants.

### 3.22 PAINT HAZARDS

Existing Paint: Existing painted surfaces may contain lead based paint. The Contractor is responsible for ensuring that no employee is exposed to concentrations of lead in excess of the permissible exposure limit (PEL) equal to an eight hour time weighted average of 50 micrograms per cubic meter (ug/m<sup>3</sup>). The contractor shall conform to all the requirements of 29 CFR 1926.62 Lead Exposure in Construction. Workers are to wear respirators unless air testing establishes that lower protection factors are sufficient. Engineering and work practice controls may be sufficient to reduce exposure to or below the PEL. Protective clothing shall be worn by all workers if required due to exceedance of the lead PEL. All other requirements of 29 CFR 1926.62 shall be adhered to by the contractor. The contractor shall keep a steady spray of water on any demolition work that may cause exposures. Runoff shall be contained on the work site to prevent contamination to any watersheds or the sanitary sewer system. The Contractor shall not contaminate the soil with lead due to excessive use of water. The site shall be limited to access by the public and the contractor is responsible for non-exposure of the public to any lead concentrations above the PEL.

### 3.23 HAZARDOUS WASTE:

3.23.1. Hazardous waste generated by the Contractor is the responsibility of the Contractor for legal disposal.

3.23.2. The Contractor shall handle hazardous waste in accordance with all regulatory requirements including the Resource Conservation and Recovery Act (RCRA).

3.23.3. The Contractor shall maintain Material Safety Data Sheets (MSDS) for all material used on base and the MSDS' shall be on file on site at the job site. An additional copy of the MSDS shall be provided to the Contracting Office for use by the Hazardous Materials Pharmacy.

3.23.3.1. The contractor shall provide to the Contracting Officer at the beginning of the contract and prior to usage, a listing of the types, sizes, and quantities of each hazardous material as defined by Federal Standard 313 that are expected to be used on the project. In addition, the Contractor shall:

- A. Provide updates to the listing to reflect any new hazardous materials to be utilized but previously not reported.
- B. Provide monthly reporting showing actual quantities by unit size for each type of hazardous material used during that reporting period.
- C. Prior to completion of the contract, provide a finalized report on the actual quantities used during the contract.
- D. All of the above data shall be submitted by the contractor as a formal contract submittal requirement.

3.23.4. All hazardous materials used by the Contractor on base shall be stored properly in special areas in accordance with all regulatory requirements.

3.23.4.1. Keep containers closed when not in use.

3.23.4.2. Label containers with warning labels.

3.23.4.3. Post hazardous signs if required.

3.23.4.4. Check routinely for leaks and spills.

3.23.4.5. Keep materials at central location.

3.23.5. PCBs:

3.23.5.1. Turn in all light ballasts or electrical equipment with PCB's to the Environmental Flight. Transformers, capacitors, switching gear, etc., often contain PCB's for cooling purposes.

3.23.5.2. If hermetically sealed equipment, then turn into Environmental Flight assuming it has a PCB concentration greater than the 500 ppm limit.

3.23.5.3. Contractor shall:

3.23.5.3.1. Count the number of units for turn in.

3.23.5.3.2. Place units in a DOT shipping container furnished by him.

3.23.5.3.3. Call Construction Management three days in advance to schedule contractor delivery to Bldg 411 on base.

3.23.5.3.4. Contractor shall deliver to Bldg 411.

### 3.24 SPILLS:

3.24.1. No hazardous materials are to be sprayed or spilled on the ground, asphalt, or concrete covered surfaces at job sites. The contractor will be charged for any cleanups and disposal costs done by base personnel. All spill cleanups will be handled by trained personnel only. Refer to 29 CFR 1910.120. Any hazardous product cleanup on base will be disposed of through MAFB only.

3.24.2. Spill Response Procedure:

3.24.2.1. Notify Construction Management and Base Fire Department of any spills.

3.24.2.2. Stop source of spill without undue risk of personnel injury. Use on site containment, safety equipment, and materials.

3.24.2.3. Make spill scene off limits to all non-cleanup personnel.

3.24.2.4. Restrict all sources of ignition if flammable material in spill.

### 3.25 STORM WATER AND WASTE WATER SYSTEM DISCHARGE

3.25.1. The Contractor shall not dump any restricted materials down the sanitary sewer or waste water disposal system without approval of the Air Force. All discharges to the sewer shall meet Federal, State, and Local regulatory requirements and shall meet the permit requirements limiting MAFB discharges. The base sewer discharge is tested weekly by the City of Great Falls for conformance requirements.

3.25.2. Restricted waste water materials include those that create a fire or explosion hazard; are toxic or poisonous; waters or wastes having a pH lower than 5.5 or higher than 9.0; solid or viscous substances that can obstruct the sewer flow; interfere with the biological activity of a treatment plant; inhibit biological activity by increasing the temperature; any fats, wax, grease, or oils in excess of 100 mg/1, noxious or malodorous liquids; contain metals in excess of iron-0.03 mg/1, chromium-16.72 mg/1, copper-15.13 mg/1, zinc-0.51 mg/1, arsenic-1.36 mg/1, cadmium-5.0 mg/1, lead-2.63 mg/1, mercury-0.06 mg/1, nickel-15.57 mg/1 or silver-0.70 mg/1, MAFB's industrial



permit allowable limits; contain phenols or dyes; are radioactive; that contain over 100 lbs per day of total suspended solids (TSS) or five day biochemical oxygen demand (BOD) or cause the Base waste water discharge to exceed 200 mg/1 BOD or 250 mg/1 TSS.

3.25.3. The Contractor shall not discharge any contaminated waters to the storm drain system. Prior approval from the Environmental Flight is required for any questionable liquid discharges.

3.25.4. 3.25.4. 3.25.4. The Montana Pollutant Discharge Elimination System (MPDES) regulations (ARM 17.30.1332) requires a storm water discharge permit for construction activity in which clearing, grading and excavation will result in the disturbance of >5 acres total or the disturbance of >1 acre if located within 100 feet of a surface water body (stream, river or lake). If required based on the above, the contractor shall provide an Erosion Control Plan designed by qualified personnel and subsequently approved by the Department of Environmental Quality prior to construction activities. The objective of the plan is to minimize erosion of disturbed areas during the construction and post construction phases of a project. The principles of an erosion control plan can be used for other construction, mining, etc. projects not requiring a MPDES permit for storm water but where erosion control is desirable.

### 3.26 SOLID WASTE

3.26.1. The Contractor is responsible for handling and disposal of all solid waste generated at the job site. He shall make all arrangements for disposal of any wastes including wastes requiring special handling such as asbestos, rubble, or non-hazardous chemical wastes. The Contractor is responsible for laboratory testing and any documentation submittals required by the landfill owner. Montana Department of Environmental Quality (MDEQ) requires written approval for any non-inert materials such as asphalt containing materials, asphalt roofing materials, steel containing materials, etc., that are to be disposed of in the Class III landfill site.

3.26.2. All non-hazardous wastes shall be properly disposed of through a licensed landfill site. No landfill site is available on base. Demolition rubble shall not be buried anywhere on base or at the work site. Any cleanups and the costs of these cleanups of improper waste disposals or removals of improperly placed hazardous waste materials shall be the responsibility of the Contractor.

### 3.27 DEMOLITION

The Contractor shall notify the MDEQ of all demolition and renovation work if load bearing members are removed.

### 3.28 RECYCLING INITIATIVE

All documents provided to the Air Force by the contractor will be on recycled paper and copied front and back whenever feasible. Exceptions include manufacture's literature, etc., that are beyond the contractors immediate control. In addition, the contractor will adhere to the requirements of 40 CFR 247 and Executive Order 12873. Items requiring recycled materials are listed below along with a utilization form (Attachment 2) to be submitted prior to project final acceptance.

### Recycled Construction Products

The recovered materials content levels for construction products are listed in the tables following:

#### Recovered Materials Content Levels for Building Insulation

Item	Recovered Materials (%)
Rock Wool	Slag 75
Fiberglass	Glass Cullet 20-25
Cellulose Loose-Fill and Spray-On	Postconsumer Paper 75
Perlite Composite Board	Postconsumer Paper 23
Plastic Rigid Foam Polyisocyanurate/ Polyurethane: Rigid Foam	Recovered Material 9
Foam-in-Place	Recovered Material 5
Glass Fiber Reinforced	Recovered Material 6
Phenolic Rigid Foam	Recovered Material 5

#### Recovered Materials Content Levels for Structural Fiberboard and Laminated Paperboard

Product	Postconsumer Recovered Paper (%)	Total Recovered Materials Content (%)
Structural Fiberboard		80-100
Laminated Paperboard	100	100

#### Recommended Specifications for Cement and Concrete Containing Recovered Materials

Cement Specifications	Concrete Specifications
ASTM C 595, "Standard Specification for Blended Hydraulic Cements?"	ASTM C 618, "Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement and Concrete"
ASTM C 150, "Standard Specification for Portland Cement"	ASTM C 311, "Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement"
AASHTO M 240, "Blended Hydraulic	AASHTO M 302, "Ground-Granulated Blast Furnace

Cements"	Slag for Use in Concrete and Mortars"
	American Concrete Institute Standard Practice ACI 226R1, "Ground-Granulated Blast Furnace Slag as a Cementitious Constituent in Concrete"

#### Recovered Materials Content Levels for Carpet

Product	Resin	Postconsumer Materials (%)
Polyester Carpet Face Fiber	PET	25-100

#### Recovered Materials Level for Floor Tiles and Patio Blocks

Product	Material	Postconsumer Materials (%)	Total Recovered Materials (%)
Patio Blocks	Rubber or Rubber Blends	90-100	90-100
	Plastic or Plastic Blends		
Floor Tiles (heavy duty/commercial use)	Rubber	90-100	90-100
	Plastic		

#### Park and Recreation Products

##### Recovered Materials Content Levels for Playground Surfaces and Running Tracks

Product	Material	Postconsumer Recovered Materials (%)
Playground Surfaces	Rubber or Plastic	90-100
Running Tracks	Rubber or Plastic	90-100

#### Landscaping Products

##### Recovered Materials Content Levels for Hydraulic Mulch Products

Hydraulic Mulch Products	Recovered Materials (%)
Paper-Based Hydraulic Mulch	Postconsumer Recovered Paper 100
Wood-Based Hydraulic Mulch	Recovered wood and/or Paper 100

### 3.29 NUCLEAR DENSOSMETERS

Where nuclear densometers or other devices containing radioactive elements are used on the project, the contractor must have proof of a Nuclear Regulatory Committee (NRC) permit for its use. The Contractor must also keep all radioactive equipment locked up when not in use and remove it from the base at completion of the work day.

### 3.30 PROJECT SIGNS

The Contractor shall provide and install a project sign located as approved by the Contracting Officer. Sign shall be per the two Project Sign sheets that follow this section.

### 3.31 NON-HAZARDOUS SOLID WASTE DISPOSAL & RECYCLE REPORT

A minimum of ten days prior to the final acceptance inspection, the contractor shall submit a report providing weight of non-hazardous construction and demolition debris disposed of from the construction site or recycled. The report shall consist of a cover letter with an attached management plan (see attached) which will indicate weight of all landfill disposal costs and the amounts of specific materials that were recycled. Comparative cost analysis is required as shown on the form to indicate estimated savings or additional costs incurred due to the recycling initiative. Copies of all landfill receipts for the project will be attached to the report.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01001 - SECURITY

**SAMPLE**

PART 1 - GENERAL

1.1 IDENTIFICATION OF EMPLOYEES

- A. The Contractor shall furnish a list of employees needing access on base to the Base Contracting Officer. Employees without a badge and identification in their possession will be denied access to the base and work areas. AF Form 75, "Visitor/Vehicle Pass," will be issued to those Contractor personnel who do not possess some form of company identification, and who will perform on the Contract for more than thirty (30) days. Persons performing on a contract for more than thirty (30) days who do not possess some form of company identification will be issued an Identocard 2000 Contractor ID Card upon presentation of a properly completed AF Form 355 from the Contracting Officer or designated representative. Contractor vehicles displaying company identification do not require issuance of a base decal. Those vehicles not readily identifiable as company vehicles shall be issued an AF Form 75 to permit entry of the vehicle and the contractor onto the base.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CONDUCT OF WORK

- A. Coordination and Access to Site: Coordination with using agencies shall be made through the Contracting Officer or designated representative to assist the Contractor in completing the work with a minimum of interference and inconvenience.
- B. General Area Requirements: Security requirements and procedures shall be coordinated with the 341 Security Forces Squadron, Operations Section (extension 731-6416/4341), Malmstrom AFB. Activities of the Contractor and the Contractor's employees and subcontractors and their employees while on the base, will be in accordance with base regulations, including those of the fire marshall, as well as security directives. This includes, but is not limited to, giving way to all emergency vehicles that are in a response mode. All personnel performing duties as an escort official(s) for contractors within a restricted area are briefed thoroughly on control methods and actions to take to enforce control. Contractors will be briefed on security procedures and their

responsibilities prior to the start of a contract. Contractors will be notified as necessary, to changes in security procedures.

1. Identification Credentials: All Contractor personnel, except those not under the Contractor's direct control, such as: material deliveries, will be required to process in and obtain an Application for Civilian Identification Card (Air Force Form 355 or AF Form 1172) from the Malmstrom AFB Contracting Office in Building 145. After completion of the AF Form 355 or AF Form 1172, proceed to the Visitor Control Center in Bldg 190, open 0730-1630, to obtain identification badge. In addition, all private vehicles requiring access to the base will be required to display a vehicle sticker (AF Form 75) which may also be obtained in Bldg 190 after presentation of vehicle registration and certification of vehicle insurance coverage. The Contractor shall notify the 341 Security Forces Squadron, Operations Section through the Contracting Officer, of any lost badges within 48 hours after the loss, by name, address, social security number, and badge number. Employees who have terminated employment or who have been dismissed must surrender their AF Form 75 Visitor/Vehicle Pass and Identocard 2000 Contractor ID Card to the Visitors Control Center through the Contracting Officer. Employees without a badge in their possession will be denied access to the base and work areas and may be subject to detainment until proper identification is made. The badge shall not be worn or displayed off the military base.
2. Commercial or company vehicles will be allowed access to the base provided company emblems are permanently attached to the sides of the vehicles. Magnetic signs are not acceptable.

END OF SECTION 01001

**SAMPLE**

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01001 - SECURITY

PART 1 - GENERAL

1.1 IDENTIFICATION OF EMPLOYEES

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2. Commercial or company vehicles will be allowed access to the base provided company emblems are permanently attached to the sides of the vehicles. Magnetic signs are not acceptable.

C. Restricted Area Requirements:

1. Scheduling of Work: The Contractor shall submit to the 341 Security Forces Squadron, Operation Section through the Contracting Officer a work plan delineating work areas, work crews, and the size of each crew. The work areas will be definitive showing their relationship to roadways, adjacent structures, and the restricted area. The approved work plan shall be kept current. Construction shall be scheduled to proceed in a logical construction sequence and sufficient approved materials shall be on hand to complete entire segments of work as scheduled.
2. Escorts: Planning shall stress the need for a minimum number of escorts by localizing each segment of work. One Air Force escort shall accompany each work activity of six people or less, depending upon the task to be performed. The escorts will normally be available from 7:30 a.m to 4 p.m., Monday through Friday. At the preconstruction conference, the Contractor shall be prepared to discuss the number of escorts they will require, and any work schedule change(s) proposals. When the work requires Contractor personnel to exit and reenter the



- area several times daily, they will be escorted between the work area and the Entry Control Point. Therefore, these activities shall be kept to a minimum.
3. Free Zone: No "Free Zone" will be established without a written request and the approval by the Installation Commander in concert with the Base Security Council. Free Zone Plans must be coordinated HQ AFSPC/SFO no later than 60 days before work starts. It must include an area map depicting the proposed free zone. Contractors must be under escort at all times while in the area.
  4. Work Area Restrictions During Air Force Inspections, Exercises, and Investigations: Contractor personnel may be required to leave the area or stop working and relocate within the area during Air Force inspections and exercises. For certain Air Force actions, the Contractor will be prohibited from entering specified areas. If personnel are already in the restricted area, they may be allowed to relocate or may be required to exit the area, entirely. (These actions can be expected to occur five (5) times for periods up to 1 hour per occurrence each week during the contract period). In addition, there is the possibility that for a single period of up to 10 working days during the contract the Contractor will be denied access to the Weapons Storage Area for a major Air Force Inspection. Notice of this exclusion period will be provided to the Contractor as soon as possible, but due to the nature of the inspection, this notification may be less than 48 hours in advance of the shutdown. During certain actual exercises and investigations, Contractor personnel will be under increased surveillance although they may not be working near the area affected. If the Contractor personnel are involved in the investigation, these personnel can continue with their work. Convoy movements of strategic Air Force resources may necessitate Contractor personnel being asked to relocate to an area sufficiently away from the convoy movement until convoy has safely passed.
  5. Entry Authority List (EAL): EAL(s) will be prepared by the unit or agency responsible for monitoring or administering the contract. The EAL(s) must be signed by the preparer's unit commander or agency chief, and then forwarded to the Installation Commander or designated representative for final approval. Contractor vehicles must be listed on the EAL(s) including year, make, model, and license number as stated on registration. Privately Owned Vehicle(s) are not authorized within the Weapons Storage Area. The Contractor shall submit a list of personnel, including subcontractors, who will work within or adjacent to the restricted area(s). This list, which shall contain the name (Last, First and MI), address, Civilian Agency Affiliation, clearance information (If applicable), and social security number of each employee, no later than 15 days prior to initial start of work. This list shall be submitted on stationary with the company's letterhead and be signed by a responsible member of that company. After the list has been submitted, it will be the Contractor's responsibility to keep the list current. In addition to the 72-hour notification as noted below, not less than every 2 weeks, the Contractor shall submit a complete up-to-date list of persons desiring access to restricted area to include any additions or deletions made to the list during the

preceding 2 weeks. The information listed above must be provided for new employees whose names were not listed on the initial list at least 72 hours prior to the time said new employees need access to the restricted areas. Employees who have terminated employment or who have been dismissed must be identified and removed as soon as possible from the entry authority list but no later than 24 hours after termination. Only those employees with base entry badges whose names are on the list will be permitted entry into the restricted area.

6. Entry Procedures: Contractor personnel will be subject to personal search and or transfrisk upon entering and leaving the WSA and will be escorted into the restricted area. Prior to entering and exiting the restricted area, Contractor personnel will be logged in and signed out on an Air Force Form at the entry control point by the escort official. The entry controller will check the employee's badge and one other form of photo identification against the prepositioned entry authority list prior to authorization of entry. Contractor personnel will be allowed access to the entrapment area on a first-come, first-serve, in-and-out basis with other personnel who may be requiring entry to or exit from the area. One exception to this is, emergency personnel responding (such as fire, ambulance and Security Forces) will be given priority entrance and exit at all times.
7. Vehicle search procedures will be in effect at all times upon entering and leaving the WSA. Each time a Contractor vehicle enters the vehicle entrapment area at the Weapons Storage Area, the vehicle will be searched by a Security Force member and observed by the escort official and escortee. Exterior bins and compartments shall be accessible for inspection. The entrapment area will accommodate one vehicle at a time. Primary emphasis of the searches will be placed on locating large obviously explosive devices, unusual objects, intruders, and other objects of suspicious nature. Contracting vehicles will be allowed access to the entrapment area on a first-come, first serve, in-and-out basis, with other vehicles requiring entry or exit from the area. The same two exceptions stated above apply.
8. Flame and Spark Producing Devices: The use of flame and spark producing devices within the Weapons Storage Area is discouraged. Flame and or spark producing equipment (i.e. Cutting torch, or similar devices) required to accomplish work will only be allowed after written approval from the Base Fire Department. The Contractor will submit an AF Form 592 and give the base fire department 24-hour prior notification so that arrangements can be made to have a base fire truck standby during the period the device is in use. Smoking is permitted in designated area's only.
9. The work area, if practical shall be fenced by the Government. Contractor personnel will be restricted to the project construction area within and adjacent to the restricted area. If fencing is erected, the fenced area cannot block access to other structures or hinder emergency or security forces.
10. Contractor shall not stockpile equipment within 30 feet of interior/exterior of a perimeter fence.

11. Existing lighting for security purposes must be functional at all times during the hours of darkness. Deficiencies in security lighting or power shall be repaired and replaced prior to the end of the workday.
12. Existing Power System: Power outages affecting intrusion detection system shall be requested in writing and approved a minimum of 48 hours in advance of the outage with the 341 Security Forces Squadron, Operations Section through the Contracting Officer.
13. Motorized Equipment:
  - a. Unattended vehicles inside or within 100 feet of a restricted area shall be rendered immobile by removing the keys or by other suitable means.
14. Fire Extinguishers: Motorized equipment operated within the WSA shall be equipped with fire extinguishers as follows:
  - a. Pickup truck or other light passenger vehicles, one extinguisher per vehicle, rating 5 BC.
  - b. All other trucks and heavy motorized equipment, two extinguishers per vehicle, rating 10 BC.

END OF SECTION 01001



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE SPACE COMMAND

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*for FAO's copy*  
U.S. AIR FORCE  
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29 DEC 1997

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MEMORANDUM FOR 21 CES/CC 30 CES/CC 45 CES/CC 50 CES/CC  
90 CES/CC 341 CES/CC 721 CES/CC 750CES/CC

FROM: HQ AFSPC/CEC  
150 Vandenberg Street, Suite 1105  
Peterson AFB, CO 80914-4150

SUBJECT: Architectural Renderings

1. This memorandum is to update and reconfirm the HQ AFSPC/CE policy for Architectural Renderings on MILCON projects. A copy of the attached memorandum should be given to the Design Manager during the pre-negotiation meeting or earlier for each MILCON project. A rendering for MAJCOM use is required for all MILCON projects unless waived in writing by HQ AFSPC/CEC. Request for the waiver must come from the Project Manager.
2. Any requests by the Wing CE for an architectural rendering is a separate requirement and your responsibility. Each Wing, IAW your Facilities Excellence Plan, may have different presentation specifications than SPC. This notification is to ensure no misunderstanding occurs regarding where the renderings will go.
3. Questions should be addressed to Mr. Jim Thompson at DSN 692-5034 or [jthompso@spacecom.af.mil](mailto:jthompso@spacecom.af.mil) or Ms Susan Boelman at DSN 692-3340 or [sboelman@spacecom.af.mil](mailto:sboelman@spacecom.af.mil).

*Michael D. Bratlien*  
MICHAEL D. BRATLIEN, GS-15  
Chief, Engineering Division

Attachment:  
Rendering Information



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE SPACE COMMAND



29 DEC 1997

MEMORANDUM FOR RECORD

FROM: HQ AFSPC/CEC  
150 Vandenberg Street, Suite 1105  
Peterson AFB, CO 80914-4150

SUBJECT: Architectural Renderings

1. We established a "gallery" in the Civil Engineering area several years ago to display MILCON projects. For the sake of consistency and professional appearance, it is necessary to establish some standards for the renderings.
2. The rendering specifications are as follows:
  - a. The size and orientation (vertical or horizontal) should be as required to best illustrate the design solution; however, the overall framed size should not exceed 30" X 36".
  - b. All renderings are to be matted with #789, Granite mat board by Bainbridge or a matching color by another manufacturer. If there are double mats, then the interior mat should be black, 3/16"-1/4" wide. Glazing is to be sheet plastic at least 1/8" thick.
  - c. Frames are to be metal, flat black, 1" deep (wall to face) and with a 1/4" – 3/16" face width, depending upon the rendering size. The frame material can be obtained from Nielson Frames, but other manufacturers of the same profile and color are acceptable. Install adjustable devices and picture wire for hanging.
  - d. The name of the project, the design firm, and the HQ AFSPC project manager are to be engraved or otherwise professionally applied to a small, black, metal or plastic plate adhered to the exterior of the glazing near the bottom center.
3. Questions should be addressed to Mr. Jim Thompson at DSN 692-5034 or [jthomps@spacecom.af.mil](mailto:jthomps@spacecom.af.mil) or Ms Susan Boelman at DSN 692-3340 or [sboelman@spacecom.af.mil](mailto:sboelman@spacecom.af.mil).

MICHAEL D. BRATLIEN, GS-15  
Chief, Engineering Division