

TINKER AIR FORCE BASE FACILITY STANDARD

2019 Edition



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[*] Incorporated by Reference, Published Separately]

Part 1: Project Procedures



Defense Information Systems Agency: Building 3900

1. Executive Summary

1.1. Introduction

The Tinker AFB Facility Standard (referenced hereafter simply as the Standard) identifies the minimum requirements for construction quality and life safety features for *all* real property improvements and for *all* equipment installation projects executed on Tinker Air Force Base.

All projects which permanently attach equipment to real property via hard-wired electrical connections and/or structural anchorage, such as systems furniture installation, hydraulically-operated crane assembly, or repair of existing similar components, shall also be subject to compliance with this Standard.

All work encompassed within these categories shall be identified hereafter by the word *project* or *projects* as appropriate to the context.

All individuals or companies who provide design and/or construction services for execution of projects on the Base shall be identified hereafter by the word *contractor*.

1.2. Office of Primary Responsibility (OPR):

The Standard is maintained and annually updated under the authority of the Base Civil Engineer. All questions and recommendations for improvement to this document shall be directed to the 72 ABW/CE.

1.3. Application of the Standard

The Standard applies to Military Construction projects (MCP or MILCON), Simplified Acquisition of Base Engineering Requirements (SABER) projects; Multiple Award Construction Contract (MACC); Indefinite Delivery/Indefinite Quantity (IDIQ) contracts; Utility Energy Service Contract (UESC) delivery orders, Service contracts, Performance Oriented Construction Activity (POCA) projects, Contract By Requestor (CBR) projects, Self Help projects, and AFCEC GSA Contracts. Requirements contained herein shall be applied to all design and/or construction services affecting real property and/or equipment within TAFB, whether designed by 72 ABW/CE, the US Army Corps of Engineers, DLA, HPO, AAFES, NAVFAC, private design consultants, private construction companies, or any other person or business.

1.4. How to use the Standard

Requirements of the Standard shall be incorporated to design documentation beginning with pre-design and pre-construction services including programming, design analyses, and site planning phases of project

designs. The Standard shall be the basis by which all CE approval of projects for Base execution shall be granted or denied.

1.5. TAFB 72 ABW/CE as the Authority-Having-Jurisdiction

All design and construction services executed for the US Air Force and/or any of the Federal organizations residing within TAFB are subject to the review, approval, and inspection of the Base Civil Engineer (BCE) as the local Authority-Having-Jurisdiction. The TAFB Facilities Standard is the principal information source by which BCE project requirements are defined and administered.

1.6. BCE Project Submittal Requirements

As part of the project review process, both hardcopy and electronic documents shall be provided to the BCE by project designers for review prior to the completion of each design stage. All BCE review comments communicated to the project designer which implement requirements of the TAFB Facility Standard shall be incorporated in the Project design prior to the next design phase submittal and prior to issue of any/all drawings and specifications issued for construction.

- 1.6.1. All Project Drawings and Specifications, for each phase of design required for submittal, shall be delivered in digital format using AutoCAD and MS **Word for Windows** software for Specifications as identified in Chapter 5, CADD Requirements. The designer shall provide an unbound hard copy suitable for reproduction.
- 1.6.2. The schedule and number of design submittals shall be in accordance with the design documentation requirements of the project's contract.

1.7. BCE Function at TAFB

Located within a Federal military installation, the BCE performs the functions of capital improvement programming, urban planning, environmental management, civil and facilities maintenance, maintenance of roads and grounds, air field pavements, air field related lighting, barriers, provision and repair of municipal utilities, and community services and fire protection.

2. TAFB Civil Engineering Records

- 2.1. **Base Maps:** TAFB maps in paper format are available from the following office:

**Engineering Support Division
72 ABW/CE
Second Floor, Building 400
7535 5th Street
TAFB, OK 73145-9010**

- 2.1.1. Electronic media records of base infrastructure and facility improvements are also available upon written request to the Office of 72 ABW/CE, also at the above street address.

3. Design Criteria

3.1. Order of Project Requirements:

- 3.1.1. All projects shall comply with this Standard. All projects which permanently attach equipment to real property via hard-wired electrical connections and/or structural anchorage, such as systems furniture installation or hydraulically-operated crane assembly, are also subject to compliance with the Standard.
- 3.1.2. The term "standard" shall be taken to mean both the body of requirements stated here as well as stated in the attachments and publications incorporated –by-reference.
- 3.1.3. The primary Building Code reference for Tinker AFB is the Unified Facilities Criteria – **DoD Building Code (General Building Code Requirements)** UFC 1-200-01 latest edition. UFC 1-200-01 defines the portions of the International Building Code that are to be used in conjunction with the related UFC publications.

- 3.1.4. Refer to **Part 3** and **Part 4** of this Standard for specific/additional design requirement for applicable projects.
- 3.1.5. Where mandatory references cite differing provisions for similar construction or life safety features, the Project shall then meet the most stringent requirement.

3.2. Construction Documents - Signed/Sealed requirement

All Contractors are required to have final construction documents signed/sealed by a Registered Architect, registered in the State of Oklahoma, unless the Code Use Group by size/stories/capacity is specifically exempt from the provisions of the State Architectural and Registered Interior Designers Act. Reference the July 1, 2010 Oklahoma State Architectural and Interior Designers Act (OS 59-46 .1, Paragraph 46 .21b) which requires final construction documents to be signed/sealed by a Registered Architect.

3.3. Design Publications incorporated by reference to the Standard

Project designers shall prepare design and construction documents in accordance with (IAW) the most current editions of the following publications as they apply to the project: Refer to the mandatory and advisory requirements incorporated-by-reference to the standard as listed below.

- 3.3.1. Code of Federal Regulations (CFR)
- 3.3.2. AF Military Handbook Series (MILHDBK)
- 3.3.3. AF Instruction Series (AFI)
- 3.3.4. AF Regulation Series (AFR)
- 3.3.5. AF Manual Series (AFM, AFMAN)
- 3.3.6. Handbook Series (AFH)
- 3.3.7. AF Pamphlet Series (AFP, AFPAM)
- 3.3.8. AF Engineering Technical Letter Series (ETL)
- 3.3.9. AF Engineering Guidance Letter Series (EGL)
- 3.3.10. AF Construction Technical Letter Series (CTL)
- 3.3.11. Department of Defense Design Guide Series (DOD)
- 3.3.12. Unified Facilities Guide Specifications (UFGS)
- 3.3.13. USACE Engineering Manual Series (EM)
- 3.3.14. Unified Facilities Criteria Series (UFC)
- 3.3.15. Airfield Striping, ETL 04-2 Standard Airfield Marking Schemes
- 3.3.16. Airfield and Heliport Planning and Design, UFC 3-260-1
- 3.3.17. UFC 3-530-01 Interior and Exterior Lighting Systems and Controls

Most of the publications can be found at the following links:

<http://www.wbdg.org/ffc/af-afcec/corporate-facilities-standards-afcfs>

<http://www.e-publishing.af.mil/>

3.4. Model Building Codes and Construction Regulations

The most current edition of the International Code Council publications is hereby incorporated by reference to the Standard:

- 3.4.1. Code of Federal Regulations (CFR)
- 3.4.2. International Building Code
- 3.4.3. Uniform Plumbing Code; (Backflow Prevention)
- 3.4.4. International Plumbing Code
- 3.4.5. International Mechanical Code
- 3.4.6. International Fuel Gas Code
- 3.4.7. International Maintenance Code

Refer to UFC 1-200-01 for applicability and UFC governance.

3.5. Occupational Safety and Health Act / OSHA Regulations

OSHA Safety and Health Standards, as published in the CFR, USACE EM 385-1-1 Safety and Health Requirements Manual, and the Air Force Policy on Ozone Depleting Chemicals (ODC) regulate all

construction practices, systems operation, and maintenance on base.

3.6. National Fire Protection Association

All current National Fire Code, including **NEPA 101 Life Safety Code**, as published by the National Fire Protection Association (NFPA), apply to base projects.

3.7. Accessibility

The **Architectural Barriers Act (ABA)** is the governing standard for all projects.

3.8. Sources of Technical and Procedural Requirements

The United States Government has many agencies of technical support. The following list directs the project designers and engineers to access design and construction publications which may be incorporated-by-reference to the standard.

Acronym Abbreviation	Federal Agency	Internet Address
USAF	United States Air Force	http://www.e-publishing.af.mil/
DOD	United States Department of Defense	http://www.dtic.mil/whs/directives/index.html
USACE	United States Army Corps of Engineers	http://www.usace.army.mil
AFCEC	Air Force Civil Engineer Center	http://www.afcec.af.mil
USGPO	United States Government Printing Office	http://www.access.gpo.gov
NAVFAC	US Naval Facilities Engineering Command	http://www.navfac.navy.mil
	Whole Building Design Guide	http://www.wbdg.org/

3.9. Responsibilities of the Contractor:

The contractor shall be responsible for accessing or obtaining all required publications referenced above that are recommended, mandatory, or applicable to the project's design and engineering.

3.10. Model Variance from the Standard:

During the design and construction phases of TAFB projects, the contractor(s) shall each be responsible, during their respective phases, to notify the project's Contracting Office (CO) immediately of all project deficiencies relative to compliance with the TAFB Facility Standard and all other publications incorporated by reference hereto. The CO shall review the impact of all deficiencies to the original project scope and determine if a change in scope is warranted. Should a change in requirements be desirable on the part of the Government due to project limitations, written permission from the Office of the BCE is required.

4. Cost Estimating

4.1. General:

All cost estimates submitted in support of design and/or construction contracts for TAFB shall be based on costs of materials, equipment, and labor rates appropriate to the Oklahoma City area and shall be in full compliance with the current rule of the Federal Acquisition Regulations. All cost estimates shall be developed IAW UFC-3-740-05 Handbook: Construction Cost Estimating.

4.2. Change Order Documentation

All estimates for change orders and the 8A Small Business Set Aside Program shall be prepared on AF Form 3052, and shall include labor hours, material, and bonding costs. The cost estimates for change orders and the 8A Program shall be presented in considerable detail.

5. Design Documentation Format

5.1. CE Recordkeeping

Drawings, specifications, renderings, and graphics which are provided in fulfillment of design and construction contracts shall meet the following requirements:

- 5.1.1. GIS (Geographical Information System) files shall be included for full design contracts which substantially change a facility footprint or install/replace substantial portions of utilities. GIS files shall include.
- 5.1.2. Data dictionary(s) shall follow current version of SDSFIE (3.1.1) Standard. Preferred Datum is North American Datum 1983, Grid Oklahoma North #3501. Units shall be measured in US Survey Feet. If other data is used, the contractor shall furnish a "read-me" file indicating datum, grid and working units. Utilities information shall include, at a minimum, the installation date, pipe sizes and pipe materials.

5.2. Dual Records

The Contractor shall furnish AutoCAD design files and PDF files of final drawings along with the hard copy final design plans.

When the contractor requirement calls for as-constructed drawings, all hard copies, design sheet files and image files shall so state "AS-BUILT" and date(s) of revision.

Additionally, an electronic listing of drawings which detail Sheet Number, Sheet Sequence Number, Sheet Title, CADD file name, and Image File Name shall be provided in both hardcopy and electronic copy.

5.3. Delivery Media

Complete copies of all CADD data and files developed shall be delivered to the Government on electronic digital media at both construction-issue and as-built phases of the project. For projects with electronic digital files the electronic digital data and files shall be provided on either Read/Write optical disk (CDRW), or compact disc read-only memory (CD-ROM). CDRW and CD-ROM are the preferred media. The electronic digital media shall be in a format which can be read and processed by the Government's target CADD system. See CADD file formats below.

- 5.3.1 The external label for each electronic digital media shall contain, at a minimum, the following information:
 - 5.3.1.1 AF Project Number, Contract Number, Delivery Order Number (if applicable), and date of submission;
 - 5.3.1.2 Type of submission (i.e. preliminary design, final design, or as-built);
 - 5.3.1.3 Format and version of operating system software; i.e. WINDOWS 10.
 - 5.3.1.4 Name and version of utility software used for preparation (e.g. compression/decompression) and copying files to the media; i.e. WIN ZIP.
 - 5.3.1.5 Sequence number of the digital media;
 - 5.3.1.6 Schedule of filenames (to be contained in a "text" file on CD).

5.4. CADD File Formats

Before a CADD file is placed on electronic digital media to be submitted to 72 ABW/CE, the following procedures shall be performed;

- 5.4.1. Remove all extraneous graphics outside the border area and set the active parameters to a standard setting or to those in the government-furnished seed file.
- 5.4.2. Make sure all reference files are attached without device or directory specifications.
- 5.4.3. Where compression is required, compress and reduce all design files using "PKZip" or other compatible file compression/decompression software approved by the Contracting Officer. If the

file compression/decompression software is different from that specified above, then electronic digital media copy of the file compression/decompression software shall be purchased for 72 ABW/CE by the submitting consultant/contractor and provided with the submitted media.

- 5.4.4. Include all files, both graphic and non-graphic, required for the project (i.e. color tables, pen tables, font libraries, line style files, cell libraries, user command files, plot files, etc.).
- 5.4.5. Make sure that all support files such as those listed above are in the same directory and that reference to those files does not include device or directory specifications.
- 5.4.6. Include all standard sheets (i.e., abbreviation sheets, standard symbol sheets, etc.) that are necessary to completely describe the project.

5.5. Documentation.

Document any fonts, tables, etc. developed by the A-E or not provided among the Government-furnished materials. The contractor shall obtain Government approval before using anything other than the Government's standard fonts, line-types, tables or cells/blocks.

5.6. Image Files.

Each finished drawing (sheet) shall have its own separate image file. The image file for each finished drawing shall be provided to the Government in Portable Document File (PDF) format.

5.7. CADD File Formats

Due to the fact many file formats are proprietary and not completely interchangeable; flexibility is required for file formats used. The following CAD file types may be furnished with the idea that context of information is maintained. The electronic format of all shall be in Autodesk AutoCAD 2013 or later.

- 5.7.1. AUTOCAD (DWG): Files in AutoCAD format shall NOT include XREFs or shape files as separate files, but rather be bound into the drawing furnished. Specific font files (shx) used by any add-on software shall be included with the text file mentioning their inclusion.

5.8. CADD Standards

When submitting drawings, designers shall follow the A/E/C CADD Standards (Release 6.0 or later) as published in the National CADD Standard. Also, the standards can be found at the web site <https://caddbim.usace.army.mil>. The A/E/C CADD standard contains supplemental materials and DOD specific requirements not addressed in the National CAD Standards. File structure, nomenclature and assignment of layers, levels and/or entities shall conform to those of the requesting organization. This information is to be provided by the Technical Representative of the Contracting Officer/TRCO.

- 5.8.1. Text index must be included on the media of the drawings as well as a description of the method of composition (attachment information).
- 5.8.2. Standard borders and cover sheets are provided at the CAD/BIM website <https://caddbim.usace.army.mil>. Border sheets are available in ANSI Standard A through E. ANSI-D size borders (22" x 34") are the preferred size.

5.9. Specifications Formatting

Project designers shall submit all technical specifications to the 72 ABW/CE for review and compliance with project requirements. All specifications shall be formatted for desktop publishing in MS Word for Windows electronic format using the Unified Facilities Guide Specifications (UFGS) or SPECSINTACT.

5.10. Base General Requirements TAFB

Standard Specifications Section 00 70 00 (General Requirements) and Section 00 72 00 (Environmental Requirements) shall be incorporated without amendment to all minor Construction and all Repair Projects' construction specifications. Military Construction Projects shall also incorporate Sections 00 70 00 and 00 72 00 with amendments as approved by 72 ABW/CE.

5.11. Additional Geographic Information Systems Data

For contract deliverables that also require/include Geographical Information System (GIS) data and printed

materials as part of the product, the Tri-Services Spatial Data Standards for Facilities, Infrastructure and Environment SDSFIE (release 2.0 or later) shall be the minimum standard to which the delivered product must comply.

- 5.11.1. GIS products must include a hard copy and electric copy in ESRI ArcGIS format version (9.1 – 10.2).
- 5.11.2. Any file structure and naming convention that falls outside the current SDSFIE specifications must be in accordance with, and be defined by, the requesting organization. This information should be provided by the Technical Representative of the Contracting Officer/TRCO. Geographic Datum, Projection System, and Working Units should also be provided by the TRCO.
- 5.11.3. If not otherwise indicated in the contract, any database material should be done in MS Access 2003 or later version. All products should be done in accordance with the current Operating System of Tinker AFB, i.e. MS Windows 10.

Part 2: Base Infrastructure



Satellite Image of Tinker Air Force Base

6. Utility Systems and Infrastructure on TAFB

6.1. Water Supply

The Tinker AFB domestic water distribution system is supplied by both groundwater wells and by connections to the Oklahoma City municipal system.

- 6.1.1. For most situations on TAFB, new fire hydrants must be flow tested and painted IAW NFPA Standard 291. Automatic fire protection sprinkler systems shall be served by the base domestic water distribution system IAW NFPA 13.
- 6.1.2. Important exceptions to the above requirement is Base Hangar facilities must conform to the requirements of UFC 4-211-01 Aircraft Maintenance Hangars.
- 6.1.3. Well water is chlorinated at the pump or at the end of collection lines. Chemical analysis of the water may be obtained from the Base Environmental Management office upon request.
- 6.1.4. Corrosion control for all new water supply lines shall be provided as part of a project's scope.
- 6.1.5. Water usage shall be metered in accordance with UFC 3-400-01 ENERGY CONSERVATION Section 2-5 METERS.
- 6.1.6. New meters and replacement of existing analog meters shall, as a minimum, be provided with

pulse counter which can communicate with AMRS system at Tinker. Daily data is required for a minimum of 90 days. Contractor shall consult with and comply with the requirements of the TAFB Meter Management Group before installation of meter(s).

- 6.1.7. All Base equipment connections shall be designed and constructed to eliminate cross-connection and/or backflow hazards. Such connections include Heating Ventilating and Air Conditioning (HVAC) systems and automatic fire sprinkler systems. Construct backflow prevention components respective of the degree of hazard. Follow the Uniform Plumbing Code/UPC and AFI 32-1066 Backflow Prevention Program for design, installation, and maintenance requirements. (**Should obtain a copy for reference)
- 6.1.8. All landscape irrigation systems design and construction served by potable water systems shall include backflow prevention to protect the potable water supply.
- 6.1.9. All buildings or facilities equipped with a Siamese fire department water connection shall incorporate a reduced pressure principle back flow prevention device to protect the potable water supply.

Project specifications shall call for "approved" backflow prevention devices as required by AFI 32-1067 and the Uniform Plumbing Code.

6.2. Wastewater Treatment

Industrial wastewater is piped to one of the two treatment facilities located in Districts 2 and 5. Industrial wastewater is then treated by filtration and clarification processing. For projects which are large producers of industrial wastewater, the designer shall verify that the capacities of both the collection system and the treatment plant are adequate to respectively transport and treat the discharge. All base sanitary sewer wastewater is channeled to the Oklahoma City municipal system for treatment. .

- 6.2.1. Design contribution to existing sanitary sewer system shall be estimated at 30 gallons per capita per day.
- 6.2.2. Wastewater collection systems shall be designed in accordance with the Water Environment Federation and American Society of Civil Engineers Manual of Practice MOP FD-5/ASCE MOP 60 Gravity Sanitary Sewer Design and Construction.
- 6.2.3. Design requirements for drinking fountains, water closets, lavatories, showers, and laundry washers shall be based on building occupancy.

6.3. Piping, Utilities, and Manholes

No physical connections shall exist between sewer and water supply systems. Minimum construction precautions and separation distances to ensure against utility cross-contamination between water and sewer utility lines shall be maintained as identified below. Where these minimum practices cannot be provided, the 72 ABW / CE may prescribe additional construction measures to provide an equivalent measure of utility integrity and maintainability.

- 6.3.1. Sewer and water lines shall be located at least 10 feet apart horizontally. In utility projects where the bottom of the water pipe is at least 12 inches above the top of the sewer, the horizontal spacing may be a minimum of 6 feet.
- 6.3.2. Where conditions require a sewer to cross above a water line, the sewer shall be constructed of cast iron, steel or other pressure pipe for a distance of 10 feet in both directions from the crossing. Within these distances there shall be no occurrence of sewer pipe joints.
- 6.3.3. The earth cover for sanitary sewers shall be at least 30 inches deep to protect the pipe from superimposed live loads of ordinary traffic.

6.4. Sanitary Water Supply

All Base equipment connections shall be designed and constructed to eliminate cross-connection and/or backflow hazards. Such connections include Heating Ventilating and Air Conditioning (HVAC) systems and automatic fire sprinkler systems. Construct backflow prevention components respective of the degree of hazard. Follow the Uniform Plumbing Code/UPC and AFI 32-1067 3.3.4 Backflow Prevention Program for design, installation, and maintenance requirements. (**Should obtain a copy for reference)

- 6.4.1. All landscape irrigation systems design and construction served by potable water systems

shall include backflow prevention to protect the potable water supply.

- 6.4.2. All buildings or facilities equipped with a Siamese fire department water connection shall incorporate a reduced pressure principle backflow prevention to protect the potable water supply.
- 6.4.3. Project specifications shall call for "approved" backflow prevention devices as required by AFI 32-1067 and the UPC.

6.5. Sanitary Sewer Collection Systems

- 6.5.1. To ensure maintainability, the minimum size pipe allowed for base facilities shall be six inches diameter for housing connections and eight inches for all other facility connections.
- 6.5.2. Adequate manholes and clean-outs shall be provided for all collection piping for maintainability. Sanitary sewer manholes shall be provided at all changes in direction and at maximum intervals of 500 feet.
- 6.5.3. All sanitary collection systems shall be designed for gravity collection. Pressurized force main and lift station design for base sanitary sewers are prohibitive without the consent in writing of the 72ABW/CE. Where lift stations are permitted, their construction shall feature dual "ejectors pumps" fitted with controls for alternate cycling of lead pump function. Manual override of automatic cycling control shall be included.
- 6.5.4. Lift stations shall be designed to preclude bypass/overflow. Provide adequate sump storage for short power outages. Provide an electrical outlet and transfer switch to permit connection of an emergency power generator on large lift stations or where overflow/bypass can create a health hazard or pollution problem. An approved alternative energy power solution can replace the emergency power generator requirement.
- 6.5.5. Crossing potable water lines and sewage lines shall be installed in accordance with Water Environment Federation publication Gravity Sanitary Sewer Design and Construction.

6.6. Industrial Wastes

- 6.6.1. All facilities generating wastewater (other than sanitary sewage waste) shall be connected to the industrial waste sewer system (IW). All new industrial wastewater connections which connect to a dual-wall IW collection main or to an existing lift station shall be dual-wall polypropylene pipe with a leak detection system compatible with the existing system. Wastes shall be identified, both in characteristics and quantities, in project design analysis, and compared to the capabilities of the receiving treatment plant.
- 6.6.2. Materials for industrial waste drains, sewers, tanks, pumps, and other features shall be carefully selected for suitability based on worst case expected waste characteristics. Once selected, these materials shall be clearly and thoroughly specified in project specifications. Material substitutions shall be avoided to the greatest extent possible.
- 6.6.3. Where necessary, pretreatment at the source should be provided. This may include physical, chemical, or a combination pretreatment. Flammables and troublesome solids shall be removed at the source.
- 6.6.4. For projects which are large producers of industrial wastewater, the designer shall verify that the capacities of both the collection system and the treatment plant are adequate to respectively transport and treat the discharge.

6.7. Oil Separators

Many small, proprietary oil/grease separators on the market do not provide adequate detention times nor have sufficient volumetric capacities to function properly. These devices shall not be used for base construction.

- 6.7.1. All oil separators shall have a submerged tee (or other submerged feature) as an outlet. This feature allows the separator to function as a two-stage separator, thereby preventing discharge of oils which pass to the outlet chamber. A tee may not be required if the two-stage-effect is provided by other means.

6.8. Storm Drainage System

All new facilities shall be designed so that the finished floor elevation (FFE) is above the 100-year flood elevation. Rainfall intensity shall be based on local intensity-duration-frequency data. The designer shall analyze the project's effects of increased watershed runoff before tying into an existing system at any particular location. If post-project runoff is projected to be greater than previously recorded, then post construction storm water controls shall be constructed to prevent increase of flood potential downstream.

6.9. Natural Gas Delivery Systems

All natural gas systems shall be installed in accordance with Unified Facility Criteria, International Fuel Gas Code, and American Gas Association standard.

- 6.9.1. All underground and natural gas distribution piping and accessories, including but not limited to fittings, valves, and accessories, shall be designed and rated for a minimum of 100 PSI minimum working pressure.
- 6.9.2. All underground natural gas pipes shall be buried at a minimum of 60" cover.
- 6.9.3. Preferred material for underground gas pipe are steel pipe for highly congested areas or High Density Polyethylene Pipe.
- 6.9.4. All underground natural gas piping shall be provided with trace wire.
- 6.9.5. All underground piping shall be provided with location tape at least 12" above pipe.
- 6.9.6. All natural gas lines that pass under roadways shall be sleeved. All sleeves shall be installed and vented in accordance with ODOT (Oklahoma Department of Transportation) requirements.
- 6.9.7. Natural gas usage shall be metered in accordance with UFC 3-400-01 ENERGY CONSERVATION Section 2-5 METERS.
- 6.9.8. New meters and replacement of existing analog meters shall as a minimum be provided with pulse counter which can communicate with AMRS system at Tinker. Daily data is required for a minimum of 90 days. Contractor shall consult with and comply with the requirements of the TAFB Meter Management Group before installation of meter(s).
- 6.9.9. Reference the TAFB Base Mechanical Standard for additional requirements.

6.10. Liquid Fuel Supply Systems

- 6.10.1. Pipelines and Hydrant Systems. All pipeline and hydrant system designs shall be installed in accordance with UFC 3-460-01. All designs shall ensure that maintenance personnel are able to physically perform routine tasks with tools and equipment readily available on Base. Items of consideration include:
 - 6.10.1.1 Ensuring that parallel or crossing pipelines are at least one foot apart to permit repair and/or equipment use in-between the pipes. Large diameter pipes require greater separation.
 - 6.10.1.2 Providing hydrant outlet pits or equipment pits large enough for tool use in the pit while replacing or maintaining valves, flanges, pumps, nuts and bolts, and flange gasket replacement.
 - 6.10.1.3 Assuring that sufficient flanges are installed to permit ease of pipe and equipment repair or replacement. For example, because pipe cutting or welding is not permitted in a pump house, flanges are required.
 - 6.10.1.4 Providing sectionalizing valves in piping systems to shut down piping sections for repair, maintenance, and pressure testing.
- 6.10.2. Fuel Storage Tanks and Welding:
 - 6.10.2.1 Dikes or basins around storage tanks shall be designed so that tank cleaning, maintenance, and repair equipment can be easily transported into the diked area. This includes providing clear access to the tank manholes without climbing over or under pipelines. Provide cathodic protection (CP) inserts in the concrete basin of the dike for CP testing.
 - 6.10.2.2 Clearance shall be provided between parallel buried tank structures and between other structures to allow individual tank excavation and removal. Separation of adjacent tank installations shall accommodate the use of mechanized equipment in tank excavation,

maintenance, removal, and replacement. Also, cathodic protection systems for a given tank structure shall be shielded from adjacent tanks where sufficient clearance is not provided.

- 6.10.2.3 All welding shall be performed by a welder certified in accordance with ANSI B31.1 or API 1104 codes. Welds shall be made and inspected in accordance with ANSI B31.8 requirements.

7. Exterior Signage

A consistent system of signage not only encourages smooth navigation of the base but is also an important tool in establishing unifying visual images for the precinct of the specific facility, for its larger planning district, and for the Base overall.

7.1. Standard Facility signs



All exterior signage shall be developed and designed in accordance with the *Unified Facilities Criteria* UFC 3-120-01 Air Force Sign Standard. This document is accessible via the following hyperlink:
http://www.wbdg.org/ccb/DOD/UFC/ufc_3_120_01.pdf

Design sign panel thickness and support columns as required to resist all imposed wind forces. Reflective sheathing shall conform to the requirements of Federal Specification LS300C, Type I, Table III, Reflectivity II and the **Manual of Uniform Traffic Control Devices** (MUTCD).

All exterior signs, except traffic control, shall be Spectrum Paint Cleveland Brown MP#80YR 09/163 with reflective white letters. The building number sign shall be Type B4 sign as stated in UFC 3-120-01

Exception: In the Navy Area Machine Blue shall be used for all sign fields. Reflective numbers and letters shall meet Federal Specification LS300C, Type I, Table III, Reflectivity II and be Helvetica medium style.

All painted frames shall match as closely as possible 3M Company, Scotchlite, #3680-29, Russet Brown

Exception: In the Navy Area sign frames shall be painted Machine Blue to match sign fields.

Existing exterior signage that does not comply with base standards shall be replaced as needed, due to wear.

The AFMC logo and shield shall be used to establish corporate identity; however, use shall be limited to gate signs, selected towers, billeting, base operations and headquarters buildings.

7.2. Zip + 4 Program Implementation

The Zip + 4 program is a DOD directive mandating that Bases such as Tinker shall develop street addresses for all Base Facilities in addition to the long-time standard facility numbers. Questions about the program shall be directed to the Base Comprehensive Planner.

Office of the Base Planner
72ABW/CEAO
7535 5th Street, Building 400
TINKER AFB OK 73145-9010
(405) 734-2074

7.3. Logos and Super Graphics

Painted logos, super graphics, and racing stripes are prohibited Base wide. All exterior signage proposals shall be submitted to the Base Architectural Compatibility Board and be subject to its review and approval.

7.4. Highway Standards and Traffic Control

The Air Force Sign Standard recognizes the importance of signage consistency between Base rights of way and those in the community to which they connect.

- 7.4.1. Highway Standards are defined as that group of signs which regulate Base traffic.
- 7.4.2. For design and construction of these types of signs refer to the Federal Highway Administration's Standard Highway Signs and Manual of Uniform Traffic Control Devices. These publications can be accessed at the following hyperlinks:

<http://mutcd.fhwa.dot.gov/> (Manual of Uniform Traffic Control Devices)

http://mutcd.fhwa.dot.gov/ser-shs_millennium.htm (Standard Highway Signs)

7.5. Identification of Hazardous Storage

See Chapter 10 Life Safety, Paragraph 10.1 for the special signage requirements of hazardous materials storage occupancies.

8. Traffic Engineering

8.1. Traffic Considerations

The vehicle circulation system at TAFB provides primary means of movement of both people and materials throughout the Base. The infrastructure of roads, pedestrian systems, and open spaces links the individual structures on Base into a complete and functioning military installation.

- 8.1.1. Pedestrian and vehicle occupant safety are the first priorities in all roadway, parking lot, and sidewalk projects.
- 8.1.2. All sidewalks interrupted by vehicle rights-of-way shall feature barrier-free pedestrian crosswalk design and pavement marking and signage as recommended by the MUTCD.
- 8.1.3. Projects which include parking lot pavements shall also include traffic control signage, stall striping, crosswalk marking, and directional lane markers as part of the project scope of work.
- 8.1.4. Circulation and parking facilities shall conform to UFC 3-210-02.

8.2. Signage

All facility signs shall comply with **UFC 3-120-01 Air Force Sign Standard**.

All traffic signage shall comply with those standards set forth in the **Manual of Uniform Traffic Control Devices** (MUTCD) as published by the U.S. Department of Transportation and the Federal Highway Administration.

8.3. Parking

The Office of 72 ABW/CE is the authority for assigning reserved parking spaces. Parking requirements for new facilities shall be in accordance with **AFI 3-218, Tinker Supplement**.

- 8.3.1. A standard parking space is 9 feet wide by 18 feet long.
- 8.3.2. A standard motorcycle parking space is 4.5 feet wide by 12 feet long.
- 8.3.3. Parking accommodations for all Base facilities shall include an appropriate number of spaces designed and constructed in compliance with the Architectural Barriers Act (ABA) accessibility standard for DoD facilities.
- 8.3.4. The number of accessible parking spaces for each facility shall not be less than that set out in the ABA, but may be more as the need is identified by the resident organization of the subject project.

9. Environmental Regulations Compliance

9.1. Mandatory publications

Requirements of this section include but are not limited to those found in **AFI 32-1052 Facility Asbestos Management**, current edition.

9.2. Asbestos Containing Materials (ACM)

No ACM shall be used in work performed at Tinker AFB. Several facilities on Tinker AFB contain asbestos in the form of pipe insulation, boiler and tank insulation, wall and ceiling materials, floor tile, exterior siding, roofing, and flexible duct connectors. The government will generally perform preliminary surveys to determine the presence of asbestos in facilities where work is to be performed.

- 9.2.1. In some cases the designer may be required to perform asbestos field surveys and testing to determine the extent of ACM present. All survey work shall be accomplished by a certified industrial hygienist or personnel trained and certified IAW federal, State of Oklahoma, and Air Force regulations. Field surveys shall fully describe locations, types (chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite) and quantities. Include percentage of asbestos and composition of material.
- 9.2.2. Submit documentation and certifications of personnel trained to take ACM samples to the CO prior to beginning asbestos surveys.
- 9.2.3. Submit samples for ACM testing to a certified laboratory. The designer shall submit to the CO the laboratory results and other pertinent information of samples sent for testing for ACM as soon as they become available.
- 9.2.4. Refer to TAFB Specification Section 00 72 00 Attachment 2 for abatement requirements. The designer shall be required to provide Scope and Location of Asbestos Containing Materials. All projects' construction documentation shall be coordinated through the 72 ABW/ CEIE Base Environmental Management Directorate.

9.3. Lead-Based Paint

No lead-based paint shall be used in work performed at TAFB. The government will generally perform preliminary surveys to determine the presence of lead-based paint facilities where work shall be performed.

- 9.3.1. In some cases the designer may be required to perform field surveys and testing to determine the extent of lead-based paint present. All survey work shall be accomplished by a certified industrial hygienist or personnel trained and certified IAW the applicable federal, State of Oklahoma, and Air Force regulations. Field surveys shall fully describe locations and quantities.
- 9.3.2. Submit documentation and certifications of personnel trained to take lead-based paint samples to the CO prior to beginning field surveys.
- 9.3.3. The designer shall submit to the project's CO the laboratory results and other pertinent information of samples sent for testing as soon as they become available.
- 9.3.4. Refer to TAFB Specification Section 00 72 00 Attachments 3 and 3A for abatement requirements. All projects' abatement design drawings and specifications shall incorporate these Specifications. All projects' construction documentation shall be coordinated through the 72 ABW/ CEIE Base Environmental Management Directorate.

9.4. PCB Filled Ballast and Universal Waste Lamps

Refer to TAFB Specification Section 00 72 00 Attachment 4 for abatement requirements. All projects' ballast and lamp abatement design drawings and specifications shall incorporate these specifications. All projects' construction documentation shall be coordinated through the 72 ABW/CEAN Base Environmental Management Directorate.

9.5. Historic Preservation

The Air Force and all tenant organizations residing within TAFB are bound to comply with all requirements of the National Historic Preservation Act and CFR 36 Part 800.

- 9.5.1. It shall be the responsibility of each project's contractor to verify the need for 72 ABW/CEIEC review relative to historic preservation regulations. Project contractors shall, when requested by 72 ABW/ CEIEC, provide documentation as necessary to establish compliance with CFR 36 Part 800.
- 9.5.2. Projects which potentially affect any of the historic resources situated within the perimeter of

TAFB shall be fully coordinated among the 72 ABW/ CEIEC, 72 ABW/CE, and the State Historic Preservation Office (SHPO).

9.6. Aging Facilities

- 9.6.1. There are many structures on TAFB that exceed 50 years of age.
- 9.6.2. Some of these structures have been classified as “significant” based on their integrity of architectural style and/or their relationship to historic events within American history.
- 9.6.3. These facilities may derive historical significance from Tinker Field’s development during World War Two or even from later historic American events in response to the “Cold War”.
- 9.6.4. All projects which affect TAFB facilities and grounds, whether or not they have been determined to be contributing or non-contributing resources of historical significance in American history, shall be coordinated with 72 ABW/ CEIEC. 72 ABW/ CEIEC Cultural Resource Manager will then determine the appropriate level of project review and whether consultation with the SHPO is necessary.

9.7. Base Historic Preservation Officer (BHPO)

- 9.7.1. 72 ABW/CEIEC Natural Infrastructure Management are responsible for coordination of all historic preservation regulation compliance issues with the SHPO, State of Oklahoma, 72 ABW/CE, and all appropriate agencies. The Base BHPO can be contacted at telephone (405) 734-4579 and at the following address.

**72 ABW/CEIEC
7535 5th Street
TINKER AFB, OK 73145-9010**

- 9.7.2. All potential candidates for the National Register of Historic Places (NRHP) which are situated within TAFB shall be identified by the BHPO with the full consultation of the SHPO prior to formal nomination to the NRHP.

9.8. State Historic Preservation Officer (SHPO)

- 9.8.1. Throughout the State of Oklahoma, the Office of the State Historic Preservation Office (SHPO) is responsible for validating candidates for the National Register of Historic places. The SHPO acts in conjunction with the Federal Advisory Council on Historic Preservation (regional office- Washington, DC) and is the sole authority in the approval of candidates for the National Register of Historic Places.
- 9.8.2. Once a facility has been identified as being eligible for the National Register of Historic Places, all projects which propose to repair or alter the interior or exterior of the facilities infrastructure in any way shall be reviewed and approved by the Cultural Resource Program Manager, 72 ABW/CEIEC, and concurred upon by the Oklahoma SHPO prior to execution of the project.
- 9.8.3. Design documents for potential construction projects must be submitted to 72 ABW/CEIEC Cultural Resource Program Manager for review and comment. Direct consultation with the SHPO is to be initiated only by 72 ABW/CEIEC Cultural Resource Program Manager. The time necessary for SHPO consultation varies with the resource and project scope.

9.9. Solid Waste Tracking

- 9.9.1. All non-hazardous solid waste shall be managed and accounted by Base construction contractors in accordance with the Standard Specification Section 00 70 00 General Requirements for Construction on Tinker Air Force Base.

9.10. POL Storage Tanks

- 9.10.1. Mandatory publications: Requirements of the section include but are not limited to those found in AFI 32-7044 Storage Tank Environmental Compliance. Design criteria for storage tanks containing POL shall comply with technical design requirements of the UFC, applicable industrial standards and Federal, State and local regulations. To minimize the risk to human health or the environment, any new tanks installed on base will be aboveground with secondary containment or vaulted below ground. The materials of construction and designed storage conditions for all

tanks are compatible with the materials stored.

9.10.2. Applicable Design Criteria:

- a. UFC 3-460-01 Design: Petroleum Fuel Facilities
- b. UFC 3-460-03 O&M: Maintenance of Petroleum Systems
- c. Title 40, CFR Part 112 SPCC Rule
- d. Title 40, CFR Part 280 UST Rule
- e. Applicable state and local regulations
- f. AFI 32-7044, Chapter 2 Storage Tank Compliance
- g. National Fire Protection Association (NFPA)
- h. Petroleum Equipment Institute (PEI)
- i. Steel Tank Institute (STI)
- j. American Petroleum Institute (API)
- k. National Electric Code (NFPA 70)
- l. Occupational Safety and Health Administration (OSHA)

9.10.3. Standard Tank Designs:

- a. STD 123-335-03 DoD Military Service Station and Factory Fabricated Tank Engineering Standard
- b. AW 78-24-27 DoD Aboveground Vertical Steel Fuel Tanks with Fixed Roofs
- c. AW 78-24-28 DoD Pressurized Hydrant Fueling System Type III
- d. AW 78-24-29 DoD Pressurized Hydrant Direct Fueling System Type IV
- e. AW 78-24-33 DoD Cut-N-Cover Standards
- f. STD 121-122-01 USAFE/NATO, Airfield Standard Design US, Jet Fuel Storage Dispensing Systems for Tactical and Wide Body Aircraft

9.11. Affirmative Procurement Plan for TAFB

Project designs shall comply with the requirements of "Green Procurement Program for TAFB"

<https://www.epa.gov/greenerproducts/recommendations-specifications-standards-and-ecolabels-federal-purchasing>

Part 3: TAFB Facility Design



The Gateway Dormitories looking north along Arnold Street

10. Life Safety Systems

10.1. Identification of Hazardous Systems and Materials Storage

- 10.1.1. The NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response shall be followed for signage of all hazardous storage occupancies and also for the temporary construction facilities in support of permanent project improvement contracts.

10.2. Anti-terrorism and Force Protection at TAFB

All base facility alterations and all new construction shall comply with the Unified Facilities Criteria UFC 4-010- 01 DOD Minimum Antiterrorism Standards for Buildings. Unified Facilities Criteria UFC 4-010-02 DOD Minimum Antiterrorism Standoff Distances for Buildings (FOUO) is required for new construction. These documents can be accessed at the following hyperlink: http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

10.3. Analytical Design for Projects with High Design Basis Threat and/or Level of Protection

The UFC 4-020-01 DoD Minimum Antiterrorism Standards for Buildings shall be used for detail structural design analysis whenever project requirements are designated with specific **(DBT/LOP)** Design Basis Threat and/or Level of Protection.

11. Facility Programming

11.1. Mandatory References

Applicable to this section include but are not limited to current editions of the following:

Publication Number	Title
AFI 32-1024	Standard Facility Requirements
UFC 3-260-01	Airfield and Heliport Planning and Design

11.2. Facility Siting

Proper facility siting in accordance with TAFB land use plan and Executive Order 13693, *Planning for Federal Sustainability in the Next Decade* (published 19 Mar 2015), is critical to ensure that every effort is made to avoid incompatible land usage. *Implementing Instructions—Sustainable Locations for Federal Facilities* (published 15 Sep 2011) and *Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes* (31 Oct 2011) provides recommendations to achieve this goal. The Base's Facilities Board, through the review and recommendation of the Facilities Board Working Group (FBWG) approves all siting requests for all new construction as well as for all projects which alter existing facility exteriors.

- 11.2.1. The review process of the FBWG can extend over the term of several agendas, so the importance of project siting to the prompt expedition of a project's approval process cannot be overestimated.
- 11.2.2. Written requests in the form of AF Form 332's shall be submitted by all organizations in need of project siting.
- 11.2.3. All submissions of 332's shall be delivered to the 72 ABW/CE Work Order Service Desk in Building 414.

11.3. Area Development Plans (ADP)

- 11.3.1. When proposed construction requires planning beyond the limits of a single facility, designers should pursue the creation of area development plans in order to facilitate thoughtful planning of the relationship facilities have with one another.
- 11.3.2. All Area Development Plans shall be consistent with and implement the goals of the TAFB General Plan and the TAFB Integrated Natural Resources Program (INRMP).

11.4. Air Installation Compatibility Use Zone (AICUZ)

- 11.4.1. The Tinker AFB AICUZ Study provides an assessment of noise levels and statistical analysis to determine aircraft Accident Potential Zones (APZ). The goal of the Study is to provide protection of the public and compatible development adjacent to the airfield.
- 11.4.2. Any project sited within proximity of the airfield shall assess, as part of the project design analysis, the noise contours of the Study and their impact to the completed project's mission and facility operation.
- 11.4.3. Project design analysis shall provide recommendations to 72 ABW/CE on how to eliminate and/or minimize potential sound abatement problems.
- 11.4.4. Construction of occupied facilities shall be avoided within all Accident Potential Zones.
- 11.4.5. Project contractors who require access to the TAFB AICUZ Study shall contact 72 ABW/CE at the following address.

Architectural Compatibility Coordinator
72 ABW/CE
7535 5th Street
Tinker AFB, OK 73145

11.5. Tenant Organization Responsibility

It shall be the responsibility of each tenant organization residing within TAFB to be informed of and in compliance with their command design policies as well as the requirements of the **TAFB Facility Standard**

12. Barrier-Free Access

12.1. Handicapped Accessibility

It is the goal at Tinker AFB to create a Base environment that is accessible to all people.

- 12.1.1. TAFB policy is to not apply the UFAS Military Exclusion for facility accessibility. In this way optimum flexibility of use and occupancy can be maintained by 72 ABW/CE in regard to continuing development of TAFB missions and facilities.
- 12.1.2. Designers working on projects for existing facilities can review the Tinker Air Force Base ADA Survey 1998 available in the B400 offices of 72 ABW/CE. This is a detailed survey of 150 buildings citing facility deficiencies and ADA non-compliant construction as of 1998.
- 12.1.3. Excerpt findings of the study will be provided upon written request to the 72 ABW/CE Architectural Compatibility Coordinator.
- 12.1.4. Projects whose scope includes repair or alteration of existing TAFB facilities shall remove, whenever feasible, all architectural barriers to accessibility which are located within the limits of the project.

12.2. Uniform Federal Accessibility Standards (UFAS)

- 12.2.1. The ABA (Architectural Barriers Act) is the applicable standard pertaining to handicapped accessibility at TAFB. The ABA standardizes handicapped accessibility requirements in all Department of Defense facilities.
- 12.2.2. The ABA documents present uniform standards for the design, construction, and alteration of buildings so that physically handicapped persons will have ready access to them and use of them. Projects including maintenance repair and new construction scopes of work must comply with the Architectural Barriers Act (ABA).

12.3. Maintenance and Repair

- 12.3.1. If existing elements, space, essential features, or common area are altered, then each such altered element, space, feature, or area shall comply with the applicable provisions of the ABA.
- 12.3.2. All facilities that are eligible for listing in the National Register of Historic Places shall comply with the ABA accessibility requirements.

13. ARCHITECTURAL COMPATIBILITY PLAN
72ND AIR BASE WING CIVIL ENGINEER DIRECTORATE



13.1 Introduction

"The intention is not to limit creativity, but to aid the designer in reaching decisions consistent with the goal of this program and to create a unified AFMC image."

AFMC Facility Quality Program

The Tinker Air Force Base Architectural Compatibility Plan (ACP) shall serve as a guide to direct the creative design efforts of the architect, designer and planner toward a future unity of architectural expression throughout the communities of TAFB.

The ACP will provide guidance, both suggested and mandatory, to be applied in all aspects of exterior design. Due to current world events, the Department of Defense has imposed additional stringent force protection requirements that will impact both site and building designs. The implementation of these requirements is mandatory. The goal of the ACP is to provide design guidance so that the force protection elements are planned as an integral part of the project design. Compatibility is accomplished through common design forms, details, materials, site features, and streetscapes.



The primary audience includes all businesses that provide design and/or construction services for execution of projects on Tinker Air Force Base.

Also included are installation leadership, programmers, designers, project managers, design agents, A/E consultants and constructors.

What is Architectural Compatibility?

Compatibility is generally defined as “capable of existing together in harmony, or to be consistent”.

Architectural Compatibility results from designing and building facilities in harmony with their natural and man-made surroundings and environment.

Architectural Compatibility at (Historical) Tinker AFB

The USAF in an attempt to achieve Architectural Compatibility throughout all the AFMC bases created a **Base-Wide Paint Scheme**.

The exterior of all buildings on Tinker AFB were painted to match this color scheme. Only brick and clay tile walls were not painted.

Below is the current color number reference to the Base-Wide Paint Scheme:



Field Color:	Sherwin Williams SW 9102 Quinoa
Trim Color:	Sherwin Williams SW 7705 Wheat Penny
Accent Color:	Sherwin Williams SW 7520 Plantation Shutters

This paint scheme remains throughout TAFB today and it will continue to be a design element that ties the defined Architectural/ Planning Districts together. Although there are several painted buildings on TAFB, new building designs that include site-painted color schemes will be discouraged.

The **Base-Wide Paint Scheme** remains as a color tie between the new and the historic. New exterior wall colors shall be an integral part of the finish wall material and compatible color wise with the **Base-Wide Paint Scheme**. Refer to **Wall Systems** for recommended wall facing materials.



How to Use This Plan

Tinker AFB divided by several areas of functional activity.

The ACP defines these areas into eight Architectural/Planning Districts.

These districts were originally established as a boundary surrounding a community of buildings and/or site development of compatible functions.

This compatibility of function also influenced the Architectural compatibility of the district through the development and siting of buildings of similar massing, construction types and design.



13.2 The Architectural/Planning Districts for Tinker Air Force Base are as follows:

Visual District A	38th Cyberspace Engineering Installation Group (CEIG) District
Visual District B	Airfield District
Visual District C	East Side Depot Maintenance District
Visual District D	North Side Industrial District
Visual District E	South Forty District
Visual District F	South East Side Munitions District
Visual District G	West Community District
Visual District H	South Side Depot Maintenance District



38th Cyberspace Engineering Installation Group (CEIG)

District - Visual District A

Description and Map – This district is located one-half mile east of the base proper along 59th Street and is the home of the 38th Cyberspace Engineering Installation Group. The CEIG District contains administrative offices, educational facilities and several outdoor recreational areas. This area was an old dormitory community that once housed support personnel for TAFB.

The District is evolving from the old renovated wood-framed dormitories and board-formed concrete structures to a new community with its own architectural expression as visualized in the design of the 38th CEIG Headquarters Building #4064 and Administration Building # 4057. The simple exterior wall massing of brick and glass with a plaster architrave of these two buildings have re-defined the architectural direction of this District.

District A – Exterior materials and colors:

Walls:

Face Brick color - Oxford Brown by Acme Brick Co.

Plaster (EIFS) color -Sandalwood Beige # 112 by Dryvit

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5

Roofs (Sloped)

Pre-finished Standing Seam

Color to match Sherwin Williams Bronzestone

Door and Windows

Baked coat finish to match Anodized Dark Bronze



Airfield District - Visual District B

Description and Map – This district is comprised of the airfield and the supporting facilities of airfield operations

and maintenance activities located in adjacent districts and are surrounded by open space for safety and integrity. Refer to map (above).

District B – Exterior materials and colors:

Walls:

Face Brick color – French Vanilla by Acme Brick Co.

Door and Windows

Baked coat finish to match Anodized Dark Bronze

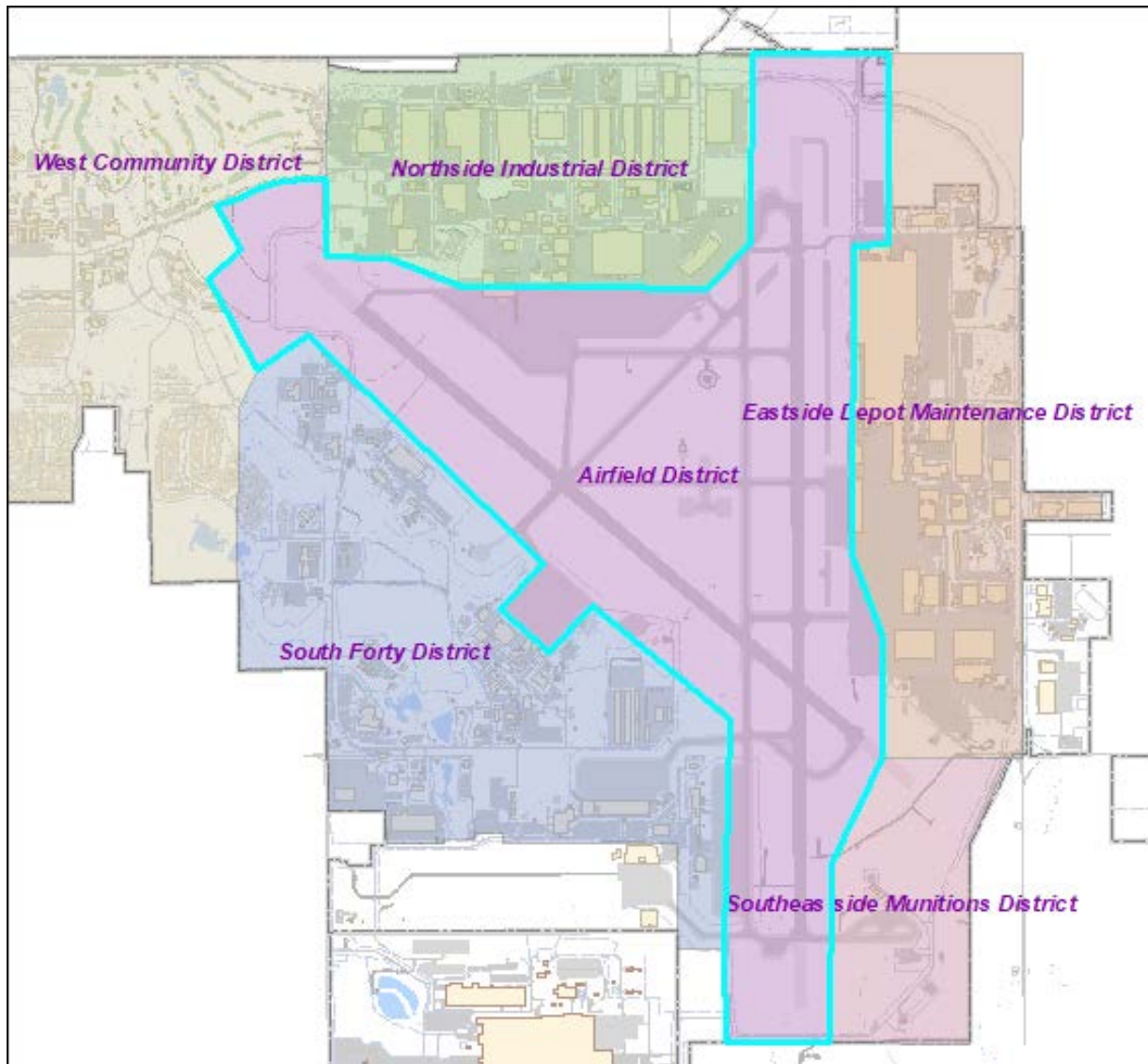
Roofs (Pitched)

Pre-finished Standing Seam

Color to match Sherwin Williams Bronzetone

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5



Eastside Depot Maintenance District - Visual District C

Description and Map – This district contains the primary depot maintenance facilities for the Base. Most of the buildings in this district are massive warehouses and aircraft hangars, with Building 3001 housing most of the depot maintenance workload. This building, acquired in 1943, contains 2,702,040 square feet; is approximately 5/8 of a mile long, and encompasses approximately 53 acres under one roof. This facility dominates the district.

District C – Exterior materials and colors:

Walls

Face Brick color – Garnet by
Acme Brick Co.

Door and Windows

Baked coat finish to match Anodized Dark Bronze

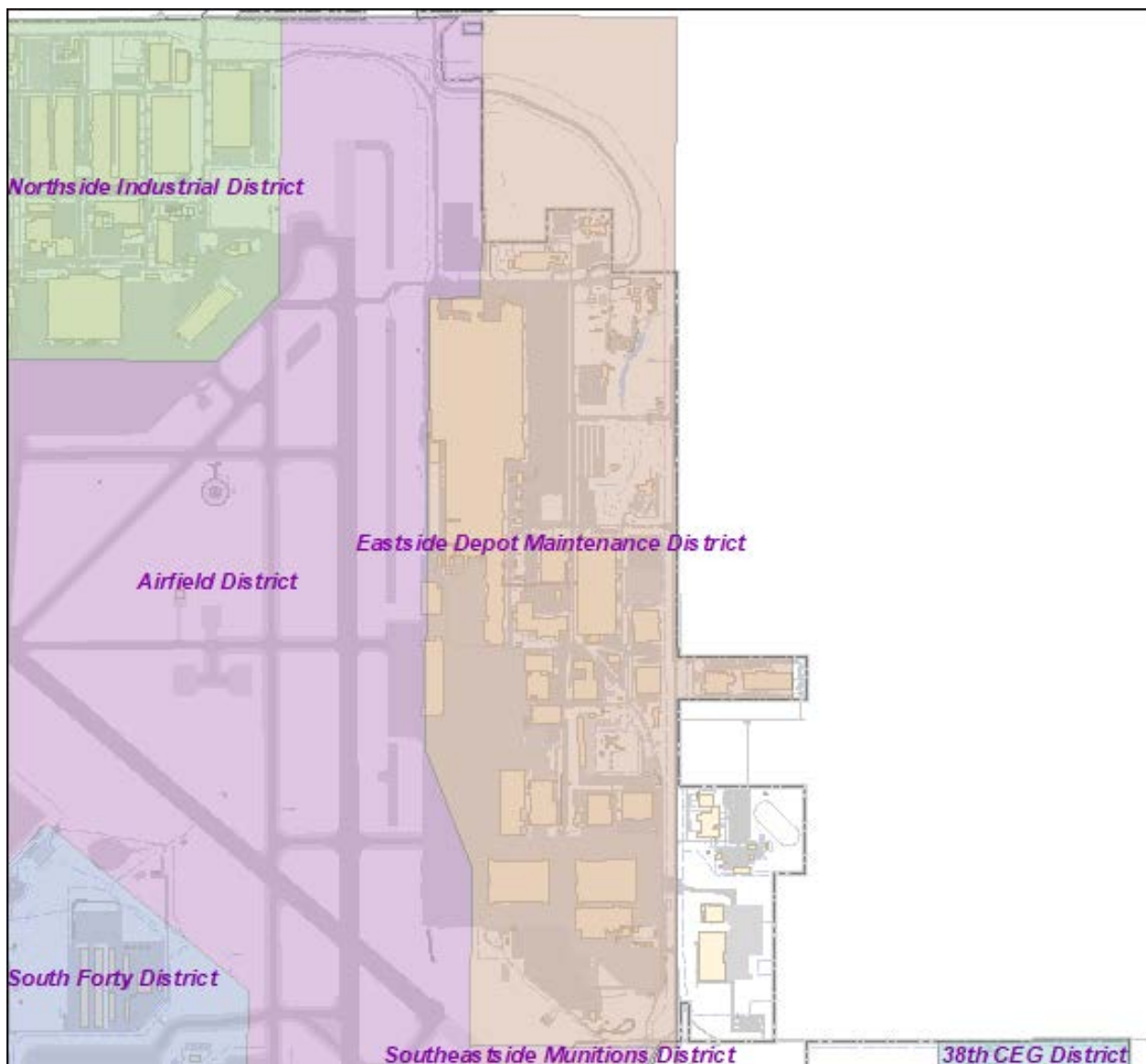
Roofs (Pitched)

Pre-finished Standing Seam

Color to match Sherwin Williams Bronzetone

Roofs (Low slope)

White surface EPDM single-ply membrane – Re:
Section 13.5



Additional Exterior Materials

Brick: Color to match - Building 3001

Wall Cap: Pre-finished extruded aluminum coping – color to match or complement wall color.

Walls: Wall accent bands Plaster or cast stone to match cast stone color on Building 3001 or brick to complement surrounding brick color.

Pre-finished Metal Wall Panels: Use “MBCI” Rustic Red wall panels for additions and buildings adjacent to building 3001. All other metal wall panels to match or compliment Sherwin Williams SW 9102 Quinoa.

Note: Use only on large hangar type buildings where economics justifies the use.

Paint Colors (historical)

Base-Wide Paint Scheme + Sherwin Williams SW 6327 Bold Brick.



North Side Industrial District - Visual District D

Description and Map – This district contains a mixture of aircraft operation and maintenance uses, warehouse/industrial uses, administrative offices, community service and community/commercial land uses. The district is characterized by a variety of structure types due to the mixed development conditions.

District D – Exterior Materials and Colors

Walls

Face Brick color – Royal Oak by Acme Brick Co.

Roofs (Pitched)

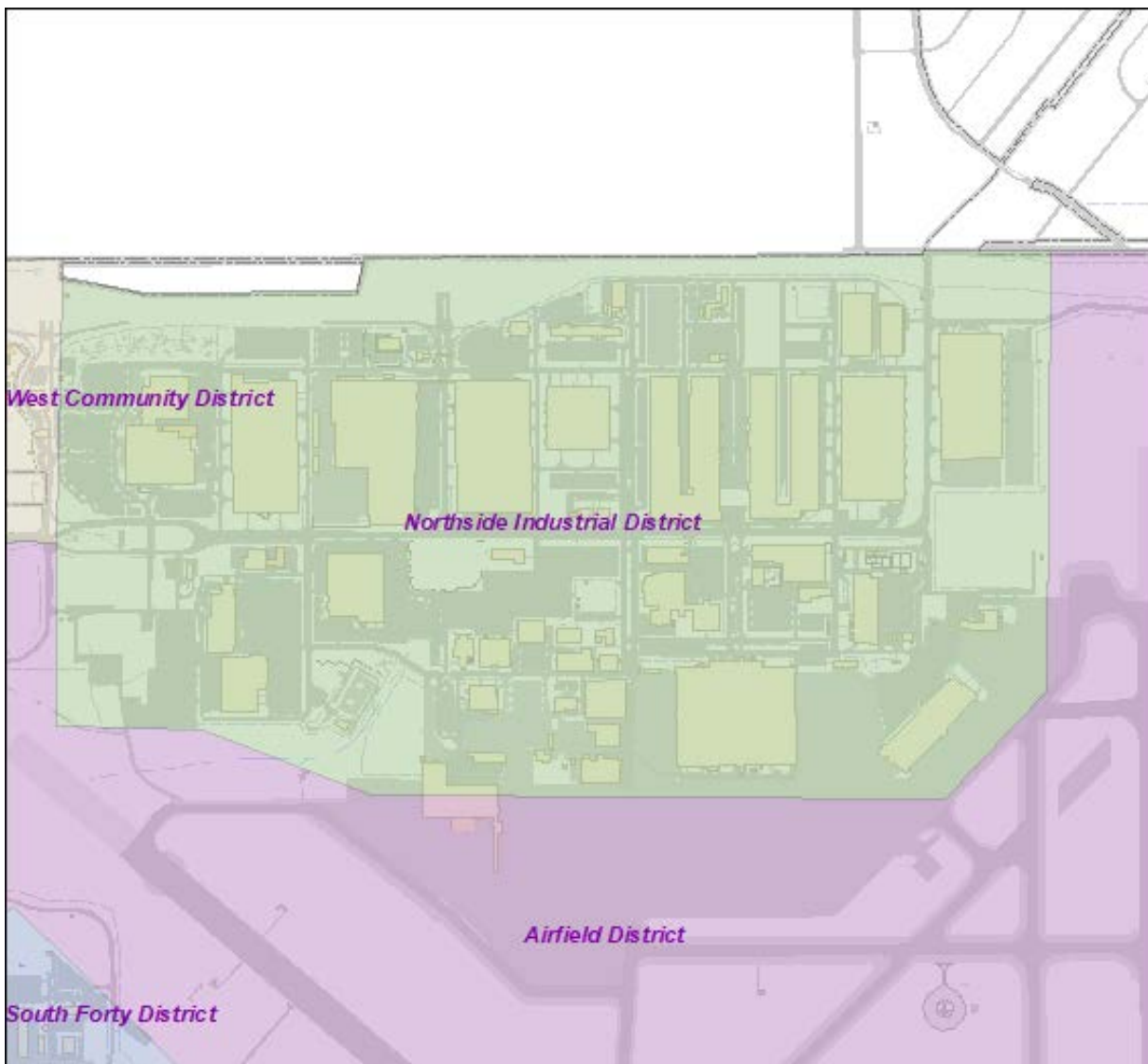
Pre-finished Standing Seam
Color to match Sherwin Williams Bronzetone

Door and Windows

Baked coat finish to match Anodized Dark Bronze

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5



Visual District E – South Forty District

Description and Map – This district is spread out over a large expanse of land. The area contains a mixture of industrial, operations and maintenance, administrative offices, open space, and outdoor recreation land uses. This district also houses all Navy complexes. This district contains many lakes, streams, and other natural features that should be considered and integrated into any future design.

District E- Exterior Materials and Colors:

Walls

Face Brick color – French Vanilla by Acme Brick Co.

Door and Windows

Baked coat finish to match Anodized Dark Bronze

Roofs (Pitched)

Pre-finished Standing Seam

Color to match Sherwin Williams Bronzetone

Roofs (Low slope)

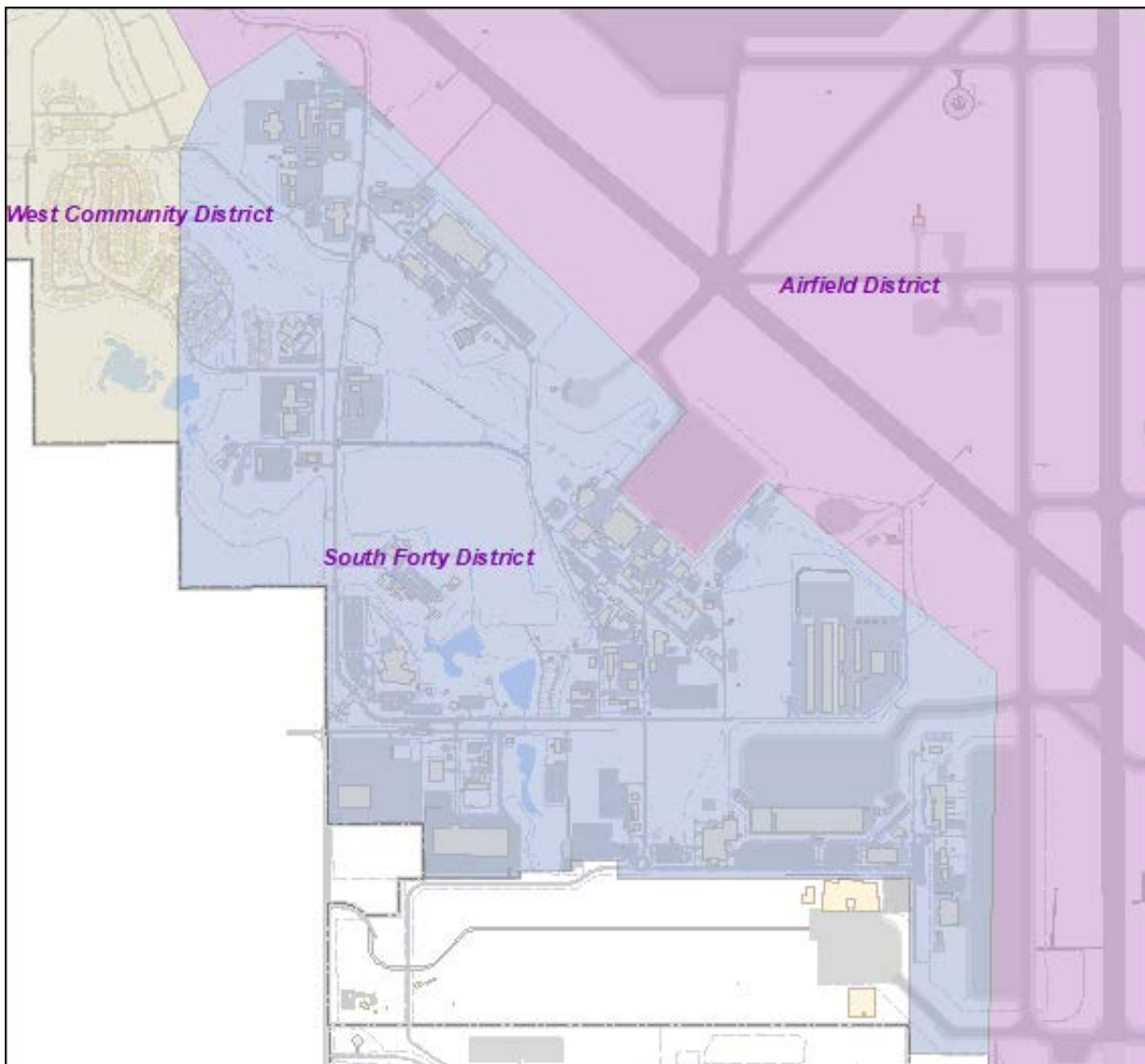
White surface EPDM single-ply membrane – Re: Section 13.5

Navy Complex - Paint

Base: Sherwin Williams SW 0054 Twilight Gray

Trim: Sherwin Williams SW 0048 Bunglehouse Blue

Accent: Sherwin Williams SW 7046 Anonymou



Visual District F – Southeast Side Munitions District

Description and Map – This district houses a munitions loading cargo pad extending from the main runway and a variety of munitions handling and storage structures. Most of this area is covered by quantity/distance explosive safety zones.

District F-Paint – Southeast Side Munitions District

Walls:

Face Brick color – French Vanilla by Acme Brick Co. or Steel Gray by Acme Brick Co.

Door and Windows

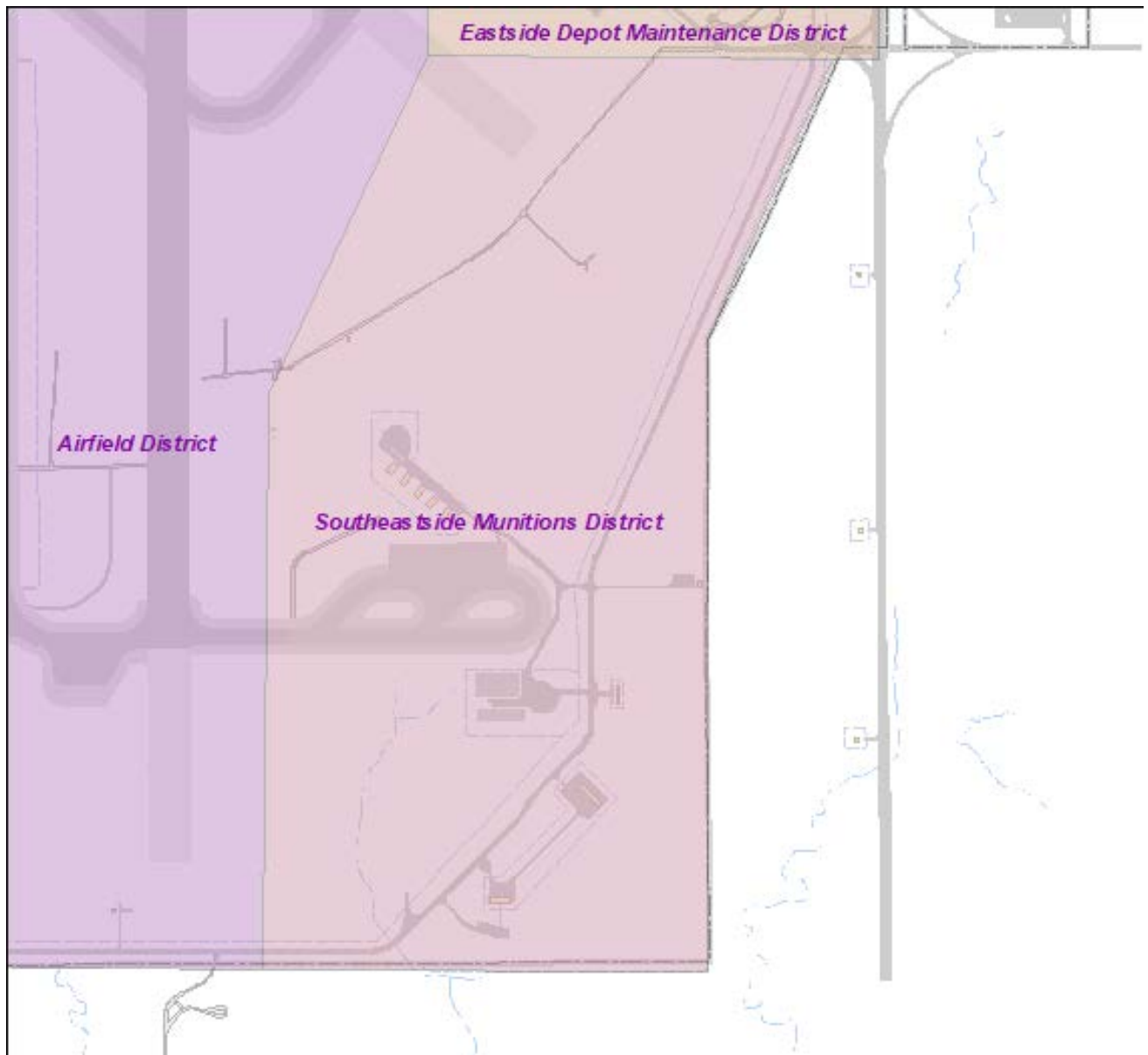
Baked coat finish to match Anodized Dark Bronze

Roofs (Pitched)

Pre-finished Standing Seam
Color to match Sherwin Williams Bronzestone

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5



Visual District G – West Community District

Description and Map – This district houses a mixture of accompanied/unaccompanied housing units, indoor & outdoor recreation, community services and community commercial facilities, medical facilities necessary to serve the base residents. Several facilities are located within the clear zone of the crosswind runway.

8000 Area Walls:

Face Brick color – Golden Sunset by Acme Brick Co.

Dorms:

Base: (Field Color) – Sherwin Williams SW 9102 Quinoa

Accent: (Base Wainscot) – Sherwin Williams SW 7705 Wheat Penny

Trim: (Windows, Doors, Railings, Posts and frames) - SW Bronzetone

Roofs (Pitched)

Pre-finished Standing Seam

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5

Door and Windows

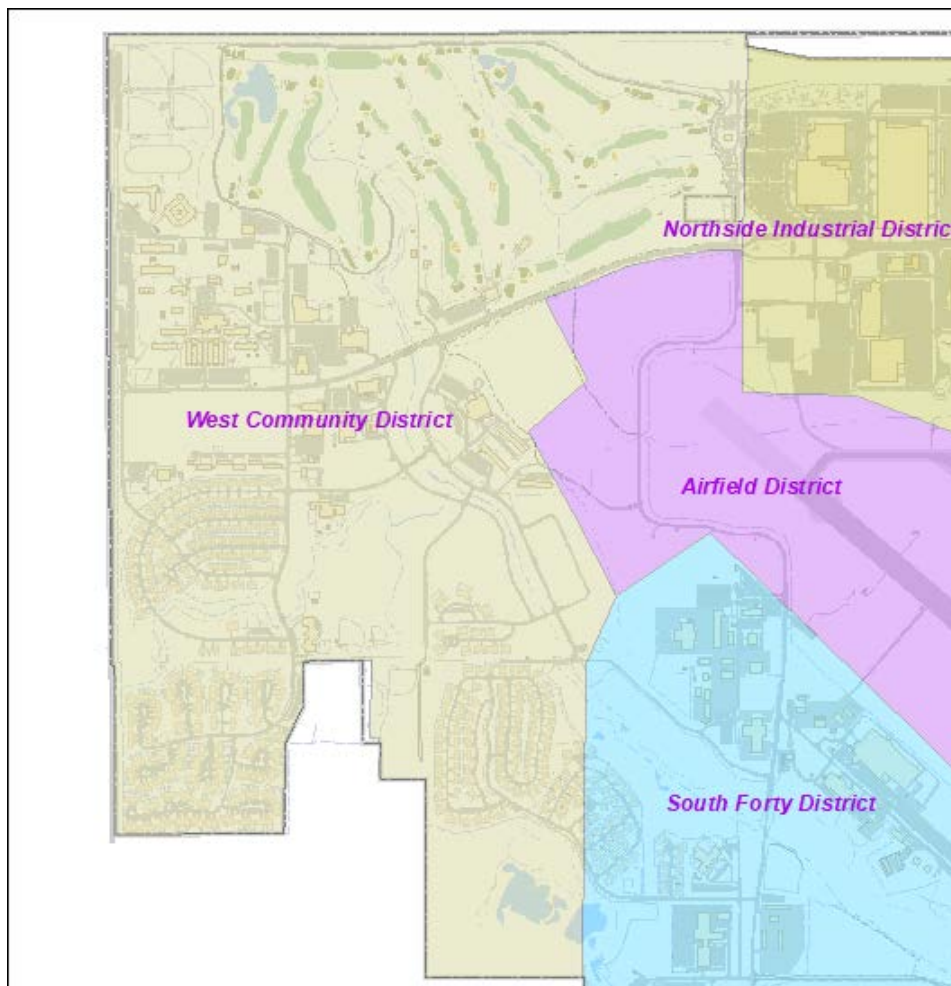
Baked coat finish to match Anodized Dark Bronze

New Construction**Windows and Door Frames, Pavilions (exposed structure and metal roof system):**

Kawneer Permanodic Anodized Finishes –Dark Bronze #40

Berridge Kynar 500 or Hylar 5000 – Aged Bronze

Note: Use of color numbers allows each print manufacture an equal opportunity to formulate as approved color match for any type of coating selected pending approval by the base AERP Architectural Engineering Review Panel. Color to match Sherwin Williams Bronzetone.



South Side Depot Maintenance District - Visual District H

Description and Map – This district contains Building 9001, the former GM Assembly plant and the developing KC-46A Depot Maintenance area. Building 9001 is the largest building on the Base, covering more than 3.2 million square feet. The KC-46A area will have two bay Depot Maintenance Hangar constructed first, followed by a single bay Depot Maintenance Hangar.

District H– Exterior materials and colors:

Walls

Face Brick color – Match B9001 Brick

Door and Windows

Baked coat finish to match Anodized Dark Bronze

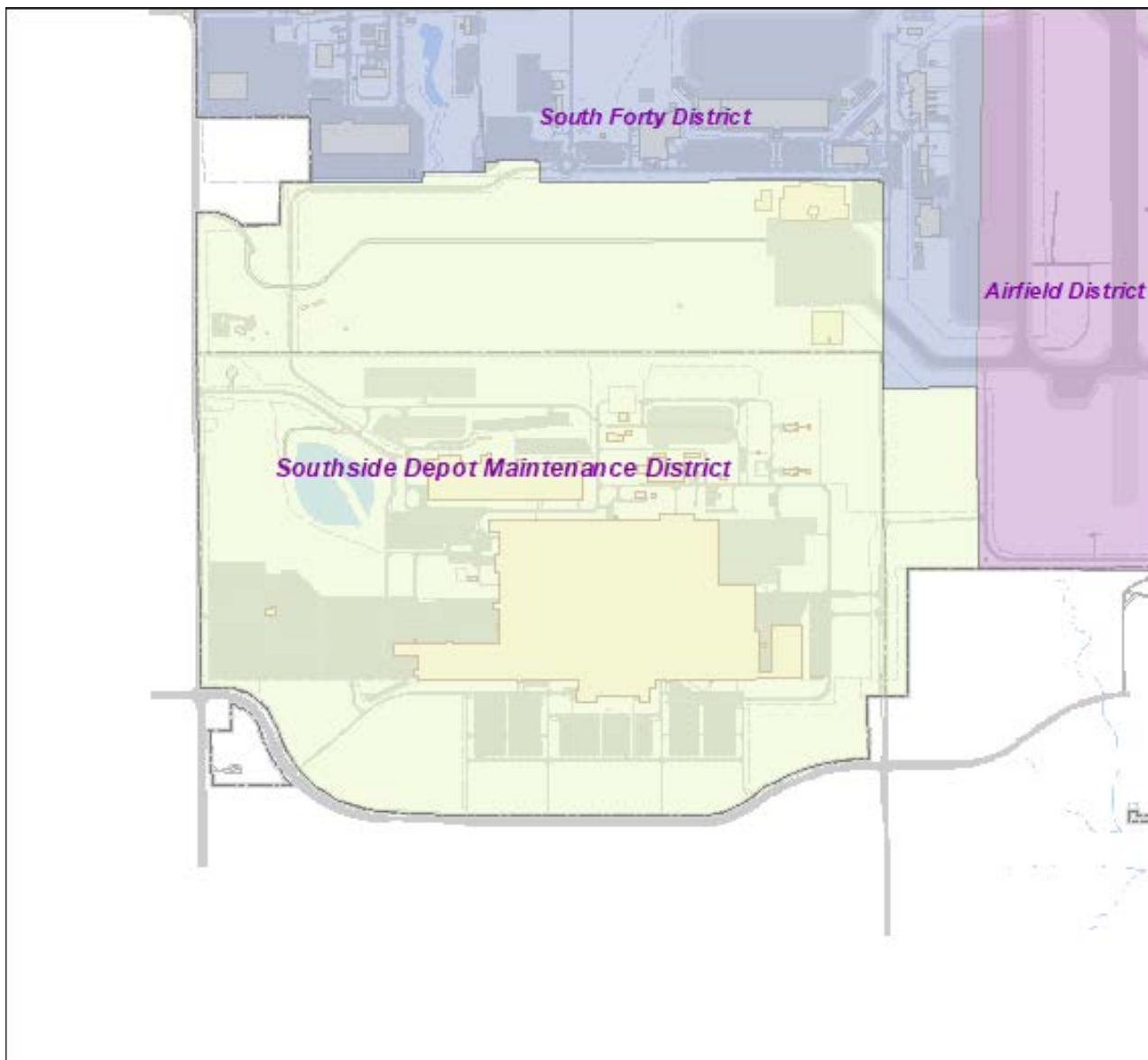
Roofs (Pitched)

Pre-finished Standing Seam

Color to match Sherwin Williams Bronzetone

Roofs (Low slope)

White surface EPDM single-ply membrane – Re: Section 13.5



13.3 Building Design Standards

The requirements of this Architectural Compatibility Plan (ACP) shall be incorporated to project design beginning with the earliest phase appropriate to the project. For all projects, the ACP application begins with pre-design/pre-construction services of programming, design analysis, and site planning. The ACP shall be the basis for all 72 ABW/CE project approvals.

General and specific design standards for all buildings are included in the **Base-Wide** section of this ACP. Base wide standards shall be applied to all projects. The individual **Visual Districts** will provide additional and specific design guidance which will also apply.

The Implementation Section of the ACP outlines key elements to ensure success in designing and constructing excellent facilities. It discusses the traditional design process, highlights the importance of site analysis, and describes the role of the Architectural Engineering Review Panel (AERP). The implementation section defines methods to facilitate the coordination and approval of design submittals.

Finally, the Appendices, References, and Attachments provide additional information including an index; a list of building materials, site amenities, paint colors, and landscape materials; a checklist for the ACRB and project personnel. Follow the established standards found in this section except on building additions or alterations projects where existing materials palettes should be preserved. Use the Appendices in conjunction with the general text of the ACP as a quick reference to specific materials and color specifications.

13.3.1 Base-Wide

Design standards for building and supporting elements are outlined in this section. These standards encourage architectural compatibility through the use of common forms, materials, colors, and architectural details.

The first priority is to achieve architectural compatibility for Tinker Air Force Base as a whole. The second priority is compatibility within an architectural district or sub-area. Outstanding designs for individual buildings or facilities are the third priority. The goal is to design excellent facilities that satisfy all of these priorities.

Tinker AFB has several structures that are 50 or more years old. These structures have been classified as "significant" based on their integrity of architectural style and on their contribution to the history of Tinker AFB. Refer to site map of historically significant Facilities as shown elsewhere within this ACP.

The existing architecture depicts a predominant earth toned color palette. The following design standards are applicable to the entire installation, to both host and tenant organizations. They are based on the existing architecture and encourage contemporary adaptations of the vernacular.

Site planning and site development issues contribute significantly to the architectural context. Building setbacks and the scale and definition of space are fundamental to creating architectural compatibility and consistent façade designs. Features such as esplanades, promenades, parkways, plazas and courtyards create an organizing bond between buildings and the landscape. Achieving compatibility among buildings is essential in creating an Architecture of Community. Develop facilities with a common design theme and character to enhance architectural compatibility. Unity as opposed to conformity is the goal.

13.3.2 Style/Form

Scale - amounts to the relative size of things, and the scale of TAFB is large. Small facilities can be at odds with the scale of the aircraft hangars. Intricate detail on larger TAFB facilities can be overshadowed much like the simple majesty of the runway, and all of its supporting facilities.

13.3.3 Scale

Reduce the monumental appearance of large structures by developing smaller massing components along the ground plane. Recall a human scale in brick facades, belt courses, sills and coping.

13.4 Wall Systems

13.4.1 General

The Department of Defense made mandatory the planning, design and construction requirements as set forth in UFC 4-010-01, DOD MINIMUM ANTITERRORISM STANDARDS FOR BUILDINGS. The UFC 4-010-01

requires that all existing and new building wall systems shall meet the Antiterrorism Force Protection requirements of the UFC 4-010-01 as applicable.

13.4.2 Brick

Brick is a desired architectural finish throughout all districts, where applicable, due to its low maintenance needs and its durability. All brick shall be laid in a running bond, with minimum differing brick detail to provide an accent only. The designer shall submit proposed brick colors to the base Architectural Engineering Review Panel for approval. Designers shall give careful attention to matching brick and mortar color for all maintenance and repair projects as well as for new construction projects to assure compatibility with existing facilities. Tinker AFB has used several brick colors throughout the Visual Districts of the base and the AERP will be reluctant to approve additional colors. Refer to the individual Visual Districts for approved brick color for the district.



13.4.3 Architectural Precast Concrete Panels (APC)

APC includes both plant cast and site cast tilt-up panels. Architectural Precast Concrete (APC) panels are an acceptable exterior wall facing material only when used within Visual Districts where existing buildings have used APC panels in the expression of its elevations. Refer to Architectural Districts for Visual Districts allowing use of APC Panels.

APC panels with only a flat smooth finish will not provide an acceptable facing material finish for building elevations. Building designers are encouraged to visually reduce large flat wall areas by re-massing the wall through the use of rustication joints, accent textures, architectural details and color.

Note: The use of Precast Concrete panels as an exterior face material can offer a high blast resistance envelope for a building structure. Precast concrete panels also provides an excellent structural wall system with high blast resistance that can be finished with Brick or CMU veneer systems, or applied Plaster systems. Precast Concrete Panels are an acceptable building material.

13.4.4 Concrete Masonry Units (CMU)

CMU is an acceptable exterior wall facing material only when used within Visual Districts where existing buildings have used CMU in the expression of the elevations. Refer to Architectural Districts for Visual Districts allowing use of CMU. CMU shall be laid in a running bond pattern. Standard smooth finished CMU are not an approved exterior building facing material. Ground Face, Split Face, and Ribbed Split Face CMU can be used as accent bands within exterior elevations of CMU and Brick Masonry. Architectural CMU styles and color must closely match with the CMU of existing buildings within approved Visual Districts. When new CMU colors cannot be matched with existing block color then contractor is encouraged to stain block to match existing. Painted CMU is discouraged due to maintenance and general upkeep problems. Mortar color shall match the block color or block stain color.

Note: The use of CMU as an exterior wall facing material can offer a high blast resistance envelope to the building structure. CMU wall systems also provide an excellent structural wall system that other finish wall materials can be applied or veneered over.

13.4.5 Stucco (Exterior Wall Plaster Systems)

Preferred - Traditional three-coat stucco with the finish coat being synthetic-based plaster.

Optional - EIFS (Exterior Insulation Finish Systems)

Stucco and EIFS are not a desired wall finish due to maintenance needs and the adverse effects it has due to Oklahoma's weather. The use of this material must be approved through Tinker's Architectural and Engineering Review Board (AER). Stucco will only be used as an accent material to other surrounding or adjacent wall finish materials. However, where the architectural wall massing requires the use of large areas of stucco, the designer is encouraged to provide as a minimum a 30" high masonry wall base for protection from damage by ground equipment.

Note: Stucco finish system over metal stud framing is not a desirable exterior wall system due to its low blast resistance.

13.4.6 Prefinished Metal Wall Panels

Prefinished Metal Wall Panels are an acceptable exterior wall facing material only when its use is granted within an individual Visual District. Refer to Architectural Districts for Visual districts allowing use of Prefinished Metal Wall Panels. Limit use to special applications and large industrial facilities where other approved facing materials would either be too heavy or uneconomical for the application. Example: large repair hangar.

13.4.7 Wall Components

Integrate all mechanical, electrical, lighting, and other building components including downspouts into the overall architectural design. Utility components, such as speakers, cameras, and antennae should have their location clearly defined as part of the building design. Exposed conduits, cables, and piping on exterior walls are prohibited. All vents, louvers, grilles, and electrical boxes shall match the surrounding wall color in which they are mounted. Wall-mounted light fixtures must be part of the façade composition. Louvers shall be provided with bird screens.

13.4.8 Applied and Integral Colors

Joint sealants shall match the color of adjacent surfaces. Paint freestanding pipes and above-ground utility systems components ICI #317 Cleveland Brown when in a remote location.

13.5 Roof Systems

13.5.1 Configuration

HQ USAF has published policy directives for the conversion of flat roofs to sloped Prefinished Standing Seam Metal Roofing Systems.

This policy authorizes conversion of built-up roofs to sloped standing seam metal roof systems provided:

- The existing roof needs to be replaced due to its deteriorated condition.
- No functional space is added to the facility.
- The useful life of the facility exceeds the life-cycle economic analysis.
- The selection of the sloped roof system is justified as the most economical method on a life cycle economic analysis.
- Cost-effective repair of existing built-up roofs is the most significant factor driving the conversion to sloped roofs. Where conversion to sloped roofs is not cost-effective repairs, the existing roof shall be replaced with a low sloped roof system that meets the UFC 3-110-03.

13.5.2 Standing Seam Metal Roofing Systems (SSMR)

(SSMR) and Structural Standing Seam Metal Roofing Systems (SSSMR) are approved roof systems for use throughout the base. The approved prefinished standard base wide color is "Berridge Kynar" 500 – Aged Bronze unless noted otherwise within a specific Visual District.

Building roof slope where SSMR systems are used should be designed as a complement to the building elevation. However, SSSMR systems for large industrial buildings may be installed with the minimum slope

recommended by the roofing manufacturer.

The approved base wide panel for SSMR and SSSMR systems is 16" wide 24 gauge steel panel, unless the determined roof system is a low slope roof. Structural design will determine the panel widths and gauge for low slope roof SSSMR systems. When specified as a cool roof for sloped roofs 2:12 slope or greater the SRI (Solar Roof Index) must be 29 or greater.

13.5.3 EPDM Single-ply Membrane

EPDM (Ethylene Propylene Diene Monomer) is the preferred low slope roof system. 90 mil white surface membrane is the standard. Warranty shall be 30 year NDL (no dollar limit) with 2" hail warranty. Walk pads should be provided between roof access point and roof top equipment and around equipment.

13.5.4 Built-up Roofing (BUR)

BUR systems are extensively used on large buildings with large flat roof areas throughout the base. Refer to UFC 3-110-3. 4ply SBS modified bitumen membrane consisting of three-ply of type IV felt and one ply granulated cap sheet, over a recovery board and polyisocyanurate rigid insulation board shall be used. Average R value for insulation and recovery board shall be R33. When specified as a cool roof the granulated cap sheet must have an SRI of 64 or greater.

13.5.5 Weldable Thermoplastic membrane

Polyvinyl Chloride (PVC) and Thermoplastic polyolefin (TPO) are the approved weldable thermoplastic systems. All Thermoplastic membrane systems must be 72 mil thick or greater, have a 20 year NDL warranty and must have an SRI of 78 or greater.

13.5.6 Parapets: Copings / Cap and Fascia

Kynar 500 or Hylar 5000 pre-finished 24 gauge or greater steel; limited painting will only be allowed with base approval through the AER meetings.

13.5.7 Fascia, Gutters, and Downspouts

Integrate fascia, gutters and downspout design and color(s) to complement architectural details and match or provide complementary color with that of the wall. Sheet metal shall be minimum 24 gauge steel with a PVDF (Kynar 500 or Hylar 5000) finish. Complementary color selection must be approved by AER.

13.5.8 Roof Vents and Elements

Minimize, consolidate and organize roof penetrations. Combine roof vents whenever possible and place them on the least visible slope of the roof. Do not use rooftop mechanical units unless mandatory; screen them when required.

13.6 Entrances

Entrances serve as the transitional element from exterior to interior and provide design opportunities to enhance the facility. The entrance should be the focal point on the façade with its size and architectural detailing used to delineate the relative importance of the building in the community.

13.6.1 General

Define access and the importance of a facility by emphasizing the entryway. Align site access so that the building entrance is clearly visible and highlighted as a prominent feature. Develop the scale of entrances to be consistent with the building using the base's approved material palette.

13.6.2 Primary Entrances

Provide primary entrances with an overhead enclosure for weather protection. Use columns, arches, and other entrance features as appropriate for the vernacular style.

13.6.3 Secondary Entrances

Reflect the character of the building's primary entrance at a smaller scale. Provide an overhead enclosure for weather protection.

13.6.4 Handrails and Guardrails

Handrails and Guardrails shall be finished with a powder-coated surface. Integrate handrail and guardrail designs with the facility design. Handrail/guardrail designs shall comply with the requirements of the Architectural Barriers Act (ABA). The approved base-wide color for handrails/guardrails is SW Bronzestone.

13.6.5 Service Entrances and Emergency Egress

Provide unobtrusive service entrances near service drives or parking areas. Weather protection may be excluded at doors used only for emergency access.

13.6.6 Loading Areas/Docks

Minimize visual impact with proper siting and access. Use walls to screen and separate loading docks areas.

13.7 Windows and Doors

13.7.1 Doors and Frames

Use regularly spaced windows to establish contextual rhythms. Window and door frames shall be dark bronze. Sealants applied adjacent to windows and doors should match the color of the frame.

13.7.2 Skylights

Develop clerestories or low profile skylights integrally with the building design.

13.7.3 Security Screens

Electronic security systems are preferred to physical screens or bars.

13.8 Ancillary Structures

13.8.1 General

Promote continuity in outdoor spaces and reduce visual clutter by designing compatible ancillary structures. All outbuildings should be of a consistent design, reflecting the character of the surrounding architecture. They shall follow the design criteria of the area, relying on the surrounding area for materials, color and details. Integrate the structure with landscaping.

13.8.2 Bus Shelters

Coordinate the placement of bus shelters with landscaping and other site elements.

13.8.3 Kiosks

Use to display community flyers for upcoming sales and events. Design kiosks with metal roofs, brick, and concrete details compatible with surrounding architecture.

13.8.4 Pavilions

Organize pavilions to create gathering areas with an internal focal point. Minimize the number of pavilions in the main Base area. Centrally locate pavilions between several facilities for multipurpose use.

13.8.5 Bike Storage Structures

Bike storage structures should match the materials of the adjacent facility.

13.8.6 Arbors / Trellises / Pergolas

Use arbors, trellises, and pergolas to integrate landscaping into community seating areas. Incorporate a place for notes and flyers when applicable. Design these elements with materials and details that are compatible with the surrounding architecture. Incorporate these elements into the building designs when appropriate.

13.8.7 Seating Walls

Incorporate seating walls in plazas, courtyards, and high-use sites. Design wall caps and copings to accommodate seating or provide freestanding seating. Integrate seating walls with landscaping.

13.9 Landscaping

Use consistent landscaping to unify the base and enhance the appearance of individual facilities.

13.9.1 Maintenance

Select low maintenance plant materials. See Attachment "A" Tinker Native Landscaping Plant Material List for approved plant materials. Allow shrubs to mass naturally and avoid ornamental pruning.

13.9.2 Formal Planting

Use formal plantings along all primary roads, entrance gates and high visibility sites. Create formal planting by regular spacing and symmetrical layout. Provide accent plantings at main intersections to enhance the circulation network without blocking lines of sight. Consistent recurring plantings contribute to the Base's identity.

13.9.3 Informal Planting

Use mixed species in an informal planting style for community facilities and residential settings. Design randomly spaced plantings and tree massing. Reinforce pedestrian routes with informal landscaping to add user appeal.

13.9.4 Ground Cover

Use turf in heavily used pedestrian areas, such as recreation fields, parade grounds, and formal lawns.

13.9.5 Edging

Separate and define all planting areas from sod areas with edging.



13.10 Screens and Enclosures

Screens and enclosures help to minimize the visual impact of undesirable features and provide separation and security where necessary. Both architectural and landscape screens – separately and in combination – can be applied to achieve visual continuity throughout the base

13.10.1 General

Locate utility components in the least visible area with adequate access to minimize the need for screening and enclosures. Ensure screens are high enough to conceal equipment, vending machines, and utilities.

13.10.2 Landscape Screens

Reduce the negative visual impacts of parking areas and other unsightly features with landscape screening. Where possible, use landscaping instead of walls for screening. Use a three-tier landscaped screen that combines ground covers, shrubs, and small trees. Use shrubs and landscaped berms to soften the impact of parking areas.

13.10.3 Walls

Use walls to screen utility equipment. If adjacent to a structure, coordinate with the facility's wall material and color.

13.10.4 Dumpster Enclosures

Locate dumpsters to minimize visual impact. For new facilities, construct enclosures as part of the building service area. Design enclosures to include planting areas and pedestrian access. Provide concrete pads and concrete access pads in front of enclosure.



13.10.5 Fencing

Fencing and screening on Tinker AFB is used primarily for security purposes and visual screening. Great care shall be given to screening considerations. Properly designed screens should not draw attention and should be used minimally.

13.10.6 Split Rail Fencing:

Cedar split-rail fencing is acceptable to separate natural and/or park-like areas from areas of higher maintenance. Fencing shall be 3-rail style, standard weight (also called jumbo weight) with posts 6.5' long; 18" minimum girth and rails 8' long; 12" minimum girth.

13.10.7 Chain Link Fencing:

This type of fencing is acceptable in the housing area and for perimeter security fencing.

13.10.8 Brick and Wood Fencing:

Wooden fences are acceptable for screening when used in conjunction with brick columns. The style, configuration, height, and finish shall be approved by the Base Architectural Compatibility Manager. Brick color shall match the district's color scheme. Each brick column shall have a cast stone or pre-cast concrete cap. For shorter lengths of fencing the brick shall not only be used as columns, but on at least the bottom 2' of the fence as well.

13.10.9 Brick and Wrought Iron:

Wrought iron with brick columns and brick at the bottom 2' shall be used when the fence is intended for minimizing accessibility to a site, and not primarily to screen an area. All fencing shall be at a height to visually screen all

intended materials and equipment. If fence height exceeds 6'- 0", landscaping shall be employed to visually reduce the perceived height of the fence.

13.10.10 Force Protection

Observe force protection requirements, integrating physical measures with architecture. Integrate security walls with the building design. Use a combination of brick and wrought iron in walls, gates and screens.

13.11 Roads

13.11.1 Service Drives

Maintain a minimum 33-foot setback between the building and service drive. Minimize the visual impact of service drives through correct placement of drives and landscape screening.

13.11.2 Paving

Provide asphalt for most roadways. Provide concrete paving in loading areas and sites used by heavy vehicles. Use gravel for patrol and outlying roads.

13.11.3 Curb and Gutter

Provide concrete curbs and gutters for all roads and drives as required. For patrol roads and service drives in outlying areas, curbs and gutters may not be required.

13.12 Parking

13.12.1 General

Develop functional lots with clear circulation and a positive appearance that complements the facility. Provide a pleasant transition from the parking lot to the facility. Parking layout must address maintenance issues including safety and landscaping. Use a 90-degree parking configuration when possible. Coordinate layout for the light poles with the islands. Use the minimum number of light poles to provide the required illumination.

13.12.2 Setbacks

Maintain a 20-foot setback from streets where possible. Provide a 33-foot minimum separation between building and parking areas.

13.12.3 Reserved Parking

Where required, use curb mounted signs. Consolidate reserved parking into sections instead of having individual spaces.

13.12.4 Paving

Provide asphalt paving as the standard. Use concrete where required for heavy vehicles, motorcycle parking, and where fuel spills may occur.

13.12.5 Curb and Gutter

Use concrete curbs and gutters for parking areas. Asphalt curbs, wood timbers and precast wheel stops are prohibited.

13.13 Walkways and Paths

13.13.1 General

Develop a consistent pedestrian circulation system of walkways and paths to enhance the community environment. Connect bus shelters, outdoor pavilions, parks, and other pedestrian gathering sites into the overall circulation

network.

13.13.2 Paving

Provide broom-finished concrete walks in all developed areas. Use an asphalt or crushed-fine surface for jogging and bike paths.

13.13.3 Walkway and Path Layout

Keep sidewalks back 6 to 10 feet from the curb where conditions permit. Design curvilinear paths in recreational areas, dorms, housing and open areas.

13.13.4 Ramps and Crosswalks

Construct concrete curb ramps with a parallel tooled joint pattern. Use flared curb ramps.

13.14 Signs



13.14.1 General

All signs shall comply with UFC 3-120-01.

Signs are an important and positive element in the overall base appearance. Their purpose is to clearly communicate necessary or helpful information for directions, identification and customer service without adding visual clutter.

All traffic control signs shall comply with Better Military Traffic Engineering, SDDCTEA Pamphlet 55-17

Use concise, clear signing in accordance with Air Force Sign Standards. Minimize the number of signs used for each facility. Signs must be consistent in style, placement, color and language.

13.14.2 Color

All exterior signs shall be brown with reflective white letters, unless in the Navy Area, where machine blue shall be used. All painted frames shall match as closely as possible 3M Company, Scotchlite, #3680-29, Russet Brown, unless in the Navy Area to match the blue as existing. Existing exterior signage that does not comply with base standards shall be replaced as needed, due to wear.

13.14.3 Typeface

Use Helvetica Medium, upper and lower case, for primary information and Helvetica light for secondary information. For special identification signs used with community facilities, key intersections, and entrances, consider a serif typeface.

13.14.4 Identification Signs

Use these to identify installation entry gates, facilities, housing areas, and building numbers. Use monument signs at entry gates, headquarters, housing, and special facilities with ACRB approval. Facility identification signs are generally freestanding. Avoid mottoes or individual titles on identification signs.

13.14.5 Direction Signs

Use to identify highly frequented or special interest destinations and street names.

13.15 Site Furnishings

13.15.1 General

Site furnishings shall provide comfort and service to the users of the pedestrian system and outdoor spaces. The furnishings must be located in response to the need of users and have a consistency of design. Designers shall strive to achieve compatibility of site elements within each district. When no apparent consistency exists, the designer shall coordinate material selection with the Base Architectural Compatibility Manager.

13.15.2 Seating / Benches

Provide seating along walkways, near building entries and in courtyards. There is an approved bench style available on GSA schedule. To meet TAFB standards purchase in brown.

13.15.3 Picnic Tables

There are approved picnic tables in both rectangular and hexagon shapes. These meet EPA guidelines and are available on the GSA schedule in recycled material. To meet TAFB Standards, purchase in brown.

13.15.4 Freestanding Planters

Minimize the use of freestanding planters, unless used as part of a security measure to define established setback distances from a facility.

13.15.5 Bike Racks

Place bike racks in accessible locations along established bike routes and nearby secondary building entrances. Use a bollard-style bike rack that can accommodate a minimum of two bicycles. Align bollards at sites to provide multiple racks.

13.15.6 Barbecue Grills

Limit built-in barbecue grills to recreational areas, dormitories, and fire stations. Use materials that complement adjacent facilities. Locate pedestal-mounted grills near pavilions, parks, and recreation areas for convenience and greater use.

13.15.7 Bollards

For force protection use an 8-inch diameter, concrete filled, steel pipe bollard with a domed top, minimum four feet high. The standard finish color is OSHA Yellow with 2 strips of 2" wide white reflective tape, 2" from the top and 2" between them. Embed pipe four feet in concrete footing unless bollard is located on airfield paving. In that case, provide ¾" thick base plate with four 5/8" wedge anchors embedded 5".

13.15.8 Drinking Fountains

Use a vandal-resistant, winterized, surface-mounted, handicapped-accessible metal fountain.

13.15.9 Playground Equipment

Locate playground equipment at recreational areas, family housing areas, child development centers, and youth centers. Incorporate landscaping to provide shade and seasonal color. Provide safe play surfaces, such as Safe-deck. Provide adjacent seating for supervision. Use a consistent style throughout the base.

13.15.10 Flag Poles

Use a brushed aluminum pole, mounted on a concrete base.

13.16 Exterior Lighting

Exterior lighting is a system that has direct and indirect impacts on the visual qualities of the Base. During the day the fixtures and poles are visible. At night the light becomes dominant to provide safety and security and to enhance the visual character of the Base. The use of consistent lighting components and the reduction of overhead utilities will help unify the base appearance.

13.17 Site Utilities

13.17.1 Utility Lines and Structures

Place utilities underground and screen above-ground equipment to minimize their visual impact. Exposed conduits, cables, and wires are prohibited. Construct underground utility system components as elements of any new or renovated facilities. When this is unfeasible, locate screened equipment on the least visible side of the building.

13.17.2 Fire Hydrants

Locate fire hydrants in accordance with NFPA 24 unless modified by UFC 3-600-01.

13.18 Visual District Standards

This is a long-term expression of a military installation's compatibility. Over time, buildings aggregate around a neighboring mission or function, and share functionality as well as utilities, materials, and colors. Their quality of design and construction become apparent with ensuing years of service. Facilities' adaptability and quality of preservation determine their importance in maintaining the visual image of TAFB districts among generations of personnel and commands.

13.18.1 Implementation

The ACP is a multipurpose tool that shall be used throughout the entire planning, programming, and design process, from inception to project completion for any project on Base.

The ACP is implemented by the Base Civil Engineer.

While architectural designers are the primary users of the plan, it must also be used by project managers, programmers, planners, engineers, maintenance and operations personnel, self-help personnel, SABER personnel, and the Architectural Compatibility Review Board (ACRB).

In the next three pages, key elements in the implementation process are highlighted.

Any items purchased for the exterior of buildings – including those purchased with impact cards – must conform to the colors prescribed in the ACP.

13.18.2 Key Elements

Adhering to key elements of the implementation process leads to success in designing excellent facilities that will be compatible with and a part of the whole community.

- Distribute the ACP.
- Establish the Architectural Compatibility Review Board (ACRB).
- Hire good designers.
- Respect the General Plan.
- Process proper submittals.
- Cross-reference all planning and design documents to the ACP.

13.18.3 Distribute the ACP

Distribution of the plan should be as wide as possible. On Base, provide copies to commanders of all major units and tenants, the Civil Engineering Directorate, branch chiefs, Base architect, and community planner. Provide copies to the major command and headquarters representatives. The Public Affairs Office maintains extra copies for general distribution, distinguished visitors, and other guests.

13.18.4 Architectural Engineering Review Panel

The AERP is the installation approval authority for all designs and visual features on the installation.

The AERP is organized by the Base Civil Engineer (BCE). The BCE is the chairperson unless otherwise assigned. Members include the Base architect, community planner, chief engineer, and others as determined by the chairperson. The Base architect reviews designs regardless of AERP involvement. The AERP meets as required or as a subgroup of the installation Facilities Board (FB). Most projects, regardless of size are approved by the AERP. The chairperson makes the determination on review requirements. Design projects are submitted to the AERP by the Base-assigned project manager. Project managers are encouraged to submit projects to AERP early in the design progress.

13.18.5 Respect the General Plan

All new projects must agree with the goals and objectives outlined in the installation master plan to ensure that the siting of new projects is compatible with adjacent facilities.

13.18.6 Process Proper Submittals

All design projects are reviewed by the AERP. This includes Requirement Documents, Concept Design and Final Design submittals. Submittals shall include all the required information and data at the appropriate times and the process shall allow adequate review time.

13.18.7 Requirements Document

In the initial submittal, the A-E defines with the help of the AF the requirements for the project. It may explore potential solutions, but more importantly, it includes bubble diagrams depicting the relationships of major functional elements and site/facility development options. This submittal is reviewed by the AERP. Each submitted package will include the following:

- Scope/Programming Requirements
- Project Description
- Goals and Objectives
- Sub-area Development Plans
- Site Inventory/Site Analysis
- Spatial Relationship Analysis (i.e. relationship to site)
- Adjacent Facilities and Project Site Photos
- Site Inventory/Site Analysis includes but is not limited to, vehicular traffic patterns, view, climatic conditions, environmental safety, utility constraints, and geographic conditions.

13.18.8 Bird Nesting Prevention

Refer to Appendix F for Bird Proofing Facilities.

13.18.9 Concept Design

This submittal must include adequate information to fully describe the project design, allowing customers/clients to easily comprehend the proposed solution. The goal is to achieve AF customer understanding and approval early in this process. Multiple submittals may be required for large or complex projects. Generally, completion of the concept design requires two submittals. The initial submittal presents a conceptual approach to the solution, while the final submittal presents a refined and more detailed design. These submittals shall be design presentation documents rather than construction documents. Develop a site plan, floor plans, roof plans, and building elevations concurrently to ensure the proposed solution is a comprehensive design. Floor plans must be developed with consideration of the site and building massing.

The AERP reviews the packages as part of the concept development process. If the initial submittal is rejected, or there are significant concerns or comments, a resubmission is required prior to proceeding to the next design stage.

Each submittal will be comprised of a complete comprehensive package including:

- Concise Verbalized Design Concept
- Systems Description

- Adjacent Facilities and Project Site Photo
- Site Plan and Floor Plan(s)
- Roof Plan
- Composite Elevations
- Mechanical / Electrical Communications Entrances and Equipment Locations and configurations
- Building Sections
- Massing Sketches or Perspective Sketches
- Cost Estimate

13.18.10 Final Design

The final design shall demonstrate that the project remains consistent with the approved concept design. It includes highly developed drawings that further refine and detail the visual and functional quality of the design. Each submittal will be comprised of a complete comprehensive package that includes, without being limited to:

- Formal Colored Rendering
- Material / Color Boards (interior and exterior)
- Catalog Cuts (photos)
- Design Analysis
- Cost Estimate
- Construction Documents

13.18.11 Contract Documents (CDs)

Contract Documents must include comprehensive drawings in AutoCAD and specifications to ensure that a project can be constructed to meet all the requirements and standards defined by the ACP and review directions given by the AERP. All mechanical and electrical drawings must be consistent with the architectural drawings.

13.18.12 ACRB Project Checklist

All projects and service contracts are to be reviewed by the ACRB using the checklist included in this guide. The Base project manager is responsible for providing the design checklist to the ACRB for completion.

13.19 Project Checklist

Project Checklist

This checklist applies to all projects large and small including self-help projects. Before building, purchasing, or installing items, the project manager will submit the following documentation for review and approval by the Architectural Compatibility Review Board (ACRB). Large projects requiring professional design services must submit this form along with the design package at each phase of the project. The list of items below the phase title is representative of what must be submitted at each phase. Project continuation is contingent on phase approval. Smaller projects not requiring full design services must submit project documentation as designated by the ACRB chairperson. All projects must comply with the ACP standards as verified by this checklist and the ACRB, unless a specific exception is approved by the chairperson.

Project Title: _____

Project Number: _____ **Project Address:** _____

Submitted by: _____

ACP Provided to Designer? ☐ Yes ☐ No

Programming Documents Reviewed by ACRB? ☐ Yes ☐ No

REQUIREMENT DOCUMENTS

- | | | |
|--|--|--|
| ☐ Scope | ☐ Coordinated with Other Planning Documents and Policies | ☐ Project Description |
| ☐ Goals | ☐ Preliminary Solutions Allow for Full Compliance of ACP (design not finalized until concept design complete) | ☐ Objectives |
| ☐ Site Inventory / Site Analysis | | ☐ Adjacent Facilities Photos |
| ☐ Coordinated with Subaru Development Plans | | ☐ Future Project Considerations |
| | | ☐ Other: _____ |

CONCEPT DESIGN

Building

- | | | |
|---------------------------------------|--|---|
| ☐ Style / Form | ☐ Scale | ☐ Massing |
| ☐ Proportions | ☐ Materials | ☐ Colors |
| ☐ Wall Systems | ☐ Details | ☐ Ancillary Structures |
| ☐ Lighting | ☐ Signs | ☐ Roof Systems |
| ☐ Entrances | ☐ Windows / Doors | |

Site Development

- | | | |
|--------------------------------------|--------------------------------------|--|
| ☐ Siting | ☐ Setbacks | ☐ Utilities |
| ☐ Lighting | ☐ Signs | ☐ Screens / Enclosures |
| ☐ Furnishings | ☐ Landscaping | ☐ Future Expansion Considered |

Circulation

- | | | |
|-----------------------------------|--|---------------------------------------|
| ☐ Roads | ☐ Paths / Walks | ☐ Other: _____ |
| ☐ Lighting | ☐ Signs | |
| ☐ Parking | ☐ Landscape | |

FINAL DESIGN

- | | | |
|---|--|---|
| ☐ Final design remains consistent with approved concept design and elements listed above | ☐ Catalog Cuts | necessary) Comply with ACP |
| ☐ Materials / Color Board (interior and exterior) | ☐ Architectural Details | ☐ Coordinated with Other Planning Documents and Policies |
| ☐ Rendering | ☐ Landscape Development | ☐ Coordination of Mechanical and Electrical Elements |
| | ☐ Construction Documents | ☐ Other: _____ |
| | ☐ Fascia / Gutters / Downspouts | |
| | ☐ Cost Reduction Proposal (if | |

JUSTIFICATION FOR NONCOMPLIANCE

Explain: _____

Design Does Not Comply with ACP Standards

By: _____

Date: _____

14. Interior Design

14.1. Program Components

A holistic approach to facility design should be taken to be seen as a balance between physical requirements and aesthetic ambiance so that occupant needs can be met. A comprehensive Interior Design Policy achieves this by improving quality of life, increasing productivity and protecting the health, safety, and welfare of facility occupants. Comprehensive Interior Design (CID) shall encompass the entire facility's interior environment to include not only furnishings and artwork but also structural interior design (SID) components such as building finishes, cabinetry, window treatments, graphics, signage, furniture, lighting, artwork and plants. Comprehensive Interior Design shall be an integrated part of the programming and design criteria used for the design, construction, and maintenance of all TAFB facilities.

- 14.1.1 The goal of this Chapter is to ensure that the interior appearance of each facility is based on well-established design standards and integrated design effort on the part of the designer.
- 14.1.2 TAFB interior design references UFC 3-120-10 for Interior Design with Change 1.
- 14.1.3 Further assistance may be obtained from the Tinker AFB CID Manager:

72 ABW/CE
Office of CID Manager
7535 5th Street
Building 400
Tinker AFB, OK 73145
(405) 734-2869

14.2. Specifications

Unified Facilities Guide Specification (UFGS) standard specification shall be used for all finishes.

<http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs>

14.3. Interior Finish Guidelines

Ease of maintenance is a critical factor in selection of interior finishes. TAFB policy is to use durable and low maintenance finishes appropriate for the function of the space. Neutral colors with medium-range muted or subdued accents shall be used for all SID finishes, except in certain MWR and distinguished visitors (DV) areas, where it is acceptable to introduce primary accents through artwork, furnishings and plants.

14.4 Carpet Policy

- 14.4.1 Air Force Furnishing Commodity Council (AF FCC) established a standardized set of carpet requirements with Tier I (pre-approved product vendors) and Tier II (installation vendors). The 72 ABW CE office will follow the guidelines for Tier I contracts and has created a Blanket Purchase Agreement for Tier II vendors. This is a mandatory-use policy for the procurement of carpet for Air Force installations.
- 14.4.2 All carpet tile specified for installation on Tinker Air Force Base shall be Solution/space dyed nylon for maximum range of color selection, and shall feature permanent stain resistant technology refer to ETL 07-4 AF for further information and specifications.
- 14.4.3 All work shall be performed by contractors/installers who are CFI Certified Floorcovering Installers (International Certified Floorcovering Installer Association) or manufacturer's approved installers.
- 14.4.4 Foremen on the jobsite must be "Certified C-II Minimum". Install all carpet in accordance with the installation guidelines set forth by the manufacturer and/or the guidelines set forth in CRI 104 -2002, Standard for Installation Specification of Commercial Carpet.
- 14.4.5 Provide a soil walk-off area for carpet in entry area and elevators- it will collect dirt before it reaches the carpeted area.

Note: It is Tinker's preference to restrict the use of carpet as a floor finish. The Designer, in the selection of floor finishes, shall give consideration to: appropriateness, occupancy duration, space,

acoustical needs, durability, maintainability, environmental impact, and life cycle cost.

14.4.6 Standard Carpet Policy allows patterned carpet only, regardless of area size, except in those facilities/areas indicated below:

- Medical facilities
- Computer areas
- Chapels and religious facilities Designated DV areas, or transient quarters

14.5 Suspended Ceiling Systems

Conference Rooms:

General requirements: Good acoustics, Humiguard plus performance, non-sag, anti-mold, anti-mildew, anti-bacterial, 30 year warranty (when used with Armstrong suspension systems).

Cirrus 584 2'x2'x 3/4" Tegular edge mineral fiber.

NRC: .70

CAC: 35

Light reflectance: .86

Reception Areas:

General requirements: Upscale visual, good acoustics, Humiguard plus performance, non-sag, anti-mold, anti-mildew 30 year warranty (when used with Armstrong suspension systems).

Ultima 1910 2'x2'x3/4" Tegular Edge mineral fiber.

NRC: .70

CAC: 35

Light reflectance: .90

General Use Areas:

General requirements: Upscale visual, modest price, Humiguard plus performance, non-sag, anti-mold, anti-mildew 30 year warranty (when used with Armstrong suspension systems).

Dune 1774 2'x2'x5/8" Tegular Edge mineral fiber.

NRC : .50

CAC: 35

Light reflectance: .83

Restroom/ Locker Rooms:

General requirements: Humiguard Max superior resistance to sagging in high humidity conditions including standing water and outdoor applications. (Suspended Ceiling Systems in Restrooms/ Locker Rooms are not recommended. Can only use with Base Approval)

Fine Fissured Ceramaguard 608 square edge mineral fiber

NRC: .55

CAC: 40

Light reflectance: 82%

NRC – Noise Reduction Coefficient – Overall Sound

CAC – Ceiling Attenuation Class – Airborne Sound

14.6 Standard-Restroom Design and Finishes

14.6.1 Standard Restroom (all occupancies other than Factory occupancy)

14.6.2 Refer to UFC 3-420-01, PLUMBING SYSTEMS for fixture requirements per occupant type and number. This UFC provides guidance in the design of plumbing systems, together with the criteria for selecting plumbing materials, fixtures, and equipment and is applicable to all elements of the Department of Defense (DoD) charged with planning military construction.

14.6.3 Note: Occupants under labor union contract may require toilet room facilities designed to meet

requirements as set forth in latest OSHA 1910.141.

- 14.6.4 Paint – Furrdowns – Sherwin Williams – Extra White SW-7006 –eggshell / Promar 200
- 14.6.5 Paint – Doors & Trim – Sherwin William - Cityscape SW 7067 – Alkyd Enamel Satin
- 14.6.6 Countertop - Corian Platinum solid surface
- 14.6.7 Cabinetry - Plastic Laminate – Wilsonart Windswept Pewter 4795-60
- 14.6.8 Toilet Partitions – HDPE – Floor-Mount Overhead Braced Scranton —Glacier Grey
- 14.6.9 Wall Tile – Dal-Tile – Desert Gray – X714 – Matt
- 14.6.10 Wall grout – Custom Building Products 546 Cape Gray (conforms to ANSI 118.7 N-2.3)
- 14.6.11 Floor Tile – Crossville – Graphite / slate – 12" x 12" Cut tile for base
- 14.6.12 Thin set –Custom Building Products FlexBond - conforms to ANSI A108.5, A118.4, and A118.11
- 14.6.13 Floor Grout – Custom Building Products Fusion Pro Single Component conforms to ANSI 118.7 N-2.3 - #19 Pewter 3/16" grout joint
- 14.6.14 Tile Installer Qualifications: Company performing the tile work shall have a minimum of five years documented experience. Installer is required to be a member of the NTCA (National Tile Contractor's Association) or a member of the Tile Contractors Association of America. Installer to employ certified installers or installers recognized by the US Department of Labor as Journeyman Tile Layers. Provide a layout plan, prior to starting work. When installing ceramic tile cove base use the flush installation method.

14.7 Toilets in Industrial Areas (All areas on the base other than administrative spaces):

- 14.7.1 All floors shall be low VOC epoxy non slip surfacing.
- 14.7.2 All walls shall be fiberglass faced gyp board, with Fiberglass Reinforced Panel (FRP) to ceiling height, with all appropriate trim pieces, inside, outside, and bullnose, coved base to produce a sanitary installation.
- 14.7.3 All ceilings shall be fiberglass faced gyp board with flat finish, with stainless locked access doors to valves.
- 14.7.4 All partitions shall be stainless steel or solid phenolic plastic, floor supported, overhead braced partitions.
- 14.7.5 All countertops shall be solid phenolic plastic, or artificial stone, with flush Vitreous China (VC) lavatories.
- 14.7.6 All mirrors shall be stainless framed individual units.
- 14.7.7 Life cycle cost consideration should be given to blade style (Dyson) hand dryers.
- 14.7.8 Urinals shall have integral infra-red operation mounted to the unit, not separate from the urinal.
- 14.7.9 Lavatories shall have infra-red operation.
- 14.7.10 All wall and ceiling coatings shall be antibacterial.

14.8 Toilet Room Accessories

- 14.8.1 Toilet Paper Dispensers – Kimberly-Clark #09551 Dual Jumbo Roll Tissue Dispenser.
- 14.8.2 Paper Towel Dispensers – Kimberly-Clark #09990 SaniTouch universal roll towel dispenser.
- 14.8.3 Soap Dispensers – GoJo #5255-06 2000 Foam soap dispenser, and if required, GoJo 7500 Pro 5000 grit soap dispenser.
- 14.8.4 Sanitary Napkin Receptacles – AJ Washroom Accessories #U582 Surface Mounted Stainless Steel #4 Satin finish.
- 14.8.5 Toilet Seat Cover Dispensers – Safe-T-Guard Smoke Cover Dispenser ½ fold #57748 Georgia Pacific.

- 14.8.6 Utility Shelf & Hook Strip – AJ Washroom Accessories #UJ30B Stainless Steel #4 Satin Finish.
- 14.8.7 Grab Bars – AJ Washroom Accessories #UG3 Stainless Steel #4 Satin Finish.
- 14.8.8 Trash Receptacles – Gamco #WR-12 Stainless Steel #4 Satin Finish with top, 21 gallon capacity, or if recessed is required Bobrick B-3644.

14.9 Air Force Facility Guidelines for Interior Design

The Air Force has designated facilities into Groups 1-4 organized by the type of use; the visual character and detailing of systems, materials and finishes in Group 1 facilities may be more refined than those in Group 2. Group 2 may be more refined than Group 3. Group 4 is for residential applications and is not covered in this standard.

Facility Groups by Type:

14.9.1 Facility Group 1 – High Visibility Buildings

Design high-visibility buildings using features, materials and details that represent Group 1 as the most prominent facilities on an Installation. Create an architectural character using refined detailing, but avoid excessive ornamentation.

- Headquarters
- Wing/Group
- MAJCOMs
- Numbered Air Force
- Name/Numbered Division
- Unified Combatant Commands
- Entry Control Facilities
- Chapels
- Hospitals and Clinics

AFCFS

Acceptable Range of Facility Designs

Group 1 - Interiors

Too Elaborate



Ensure that daylighting and other features are life cycle cost effective. Avoid unnecessarily complex patterns and elaborate materials. Access to private outdoor balconies from personal offices is discouraged.

Acceptable Range



Provide open-plan configurations for office, administrative, operational and related activities and spaces for maximum flexibility. Use more durable long-lasting finishes in core areas for walls, ceilings, floor coverings and built-in casework reflecting Group 1. Limited focus areas may receive material and detailing accents.

Underdeveloped



The visual character and detailing of systems, materials and finishes in Group 1 facilities should be more refined than those in Groups 2, 3 and 4.

14.9.2 Facility Group 2- Professional Image Buildings

Provide building designs that are less prominent than Group 1. Create a visual character that represents a professional image using moderate detailing; avoid excessive use of architectural features and extravagant materials.

- Squadron Operations
- Alert Crew Facility
- Base Operations
- Civil Engineer Administration Facility
- Weather Squadrons
- Air Passenger Terminal
- Air Traffic Control Tower
- Flight Simulators
- Educational/Training Facilities
- Administration Facilities
- Dormitories
- Lodging
- Enlisted Personnel Dining Facilities
- Community Facilities
 - Recreational Facilities
 - Fitness Centers
 - Clubs
 - Libraries
 - Theaters
 - Youth Centers
 - Golf Clubhouses
 - Child Development Centers
 - Bowling Centers
 - Family Camps
 - Outdoor Recreation Equipment Rental
- Skills Development / Auto Hobby Shops / Carwash

AFCFS

Acceptable Range of Facility Designs

Group 2 - Interiors

Too Elaborate



Avoid elaborate designs, features and details that compete with Group 1. Large monumentally scaled lobby spaces are discouraged.

Acceptable Range



Design interiors that are less prominent than Group 1. Create a visual quality using moderate detailing to reflect Group 2; avoid excessive use of design features and extravagant motifs.

Underdeveloped



Relate the visual quality of finishes to Group 2; visual character and detailing of systems and materials should be less refined than those in Group 1, but must present a professional appearance. Avoid unorganized elements and clutter.

14.9.3 Facility Group 3 – Highly Durable Buildings

Provide building designs using highly durable materials and modest detailing to endure heavy wear and frequency of use. Understated architectural features and simplified detailing may be used at main entrance facades.

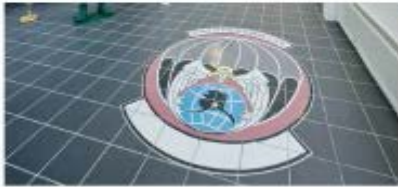
- Hangars
- Petroleum Ops Bldg
- Aircraft/Helicopter Maintenance Facilities
- Vehicle Maintenance Facilities
- General Purpose Maintenance Shops
- Civil Engineer Shops
- Supply and Storage Facilities
- Warehouse Facilities

AFCFS

Acceptable Range of Facility Designs

Group 3 - Interiors

Too Elaborate



Provide an appropriate visual character and detailing of systems, materials and finishes in Group 3 to reflect industrial use and that is less refined than Group 2. Avoid decorative permanently built-in elements and accents

Acceptable Range



Provide highly durable interiors with modest detailing to endure heavy wear and frequency of use. Understated architectural features and simplified details may be used at main entrance lobbies.

Underdeveloped



Ensure economical, easily cleanable and low maintenance features and elements without compromising a professional appearance. Avoid uncoordinated elements and clutter. Do not paint exposed equipment, piping, etc. bright colors, but match the color of the roof (or floor) decking.

Floors Standards Chart

	STEP 1 Determine Group Number				STEP 2 Apply These Factors on a Per Room Basis						
	Group 1	Group 2	Group 3	Group 4	High-visibility Location	Low-visibility Location	Initial Cost	Durability and Life Expectancy ¹	Maintenance Costs	Ancillary and Energy Costs ²	Flexibility and Expandability
Prepared Slabs ³											
Natural Stone and Terrazzo ⁴											
Quarry Tile											
Ceramic Tile ⁵											
Resilient Flooring ⁶ VCT, Sheet Vinyl, Linoleum and Rubber											
Carpet ⁷											
Rapidly-Renewable Products ⁸											

Less Desirable ← → More Desirable

Material selections must include appropriate regional and climatic considerations, availability of qualified trades, and energy use associated with material production and transportation. All selections must comply with Installation Facilities Standards (IFS).

¹ Include durability considerations in the Life Cycle Cost Analysis

² Consider costs of other systems required by the material; consider materials that contribute to energy efficiency

³ Stained or ground-and-polished concrete slabs are permitted in Group 1 and 2 and high-visibility locations; sealed concrete slabs are preferred for Group 3 facilities

⁴ Terrazzo is permitted only in high-traffic areas subject to extreme wear and when life-cycle cost effective

⁵ Tile is preferred in high-traffic and wet locations only

⁶ Rubber flooring (sheet goods and tile) is preferred for stairs and special applications such as fitness areas; linoleum may be used in break rooms

⁷ Carpet may be broadloom or tiles; tiles are evaluated for flexibility

⁸ Bamboo and cork may be used in low-traffic areas; wood (considered "rapidly-renewable" by some industries) may be used in gymnasiums and in Family Housing; linoleum may be counted as a "rapidly renewable" material

14.10 Design Proposals

14.10.1 All project interior design proposals shall be IAW all requirements of the Standard and be subject to the review and approval of the TAFB Comprehensive Interior Design Manager, 72 ABW/CE.

14.10.2 Use the Standard format for both Comprehensive Interior design (CID) and Structural Interior Design (SID) submittals. All color boards and FFE shall be submitted according to UFC 3-120-10 Interior Design format.

14.11 Color Boards

- 14.11.1 Material warranties and product maintenance information shall comply with ETL 89-2 Standard Guidelines for Submission of Facility Operating and Maintenance Manuals.

14.12 Installation of Artwork and Signage

- 14.12.1 Artwork and signage shall be a coordinated part of all CID design packages. Interior signage shall be coordinated throughout the building, allowing for updates and changes as building functions move. Interior signage policy can be found in the AFMC Interior Finish Guidelines, which provides guidance for the selection and placement of interior signage as part of CID. Signage and specifications shall be included in all comprehensive interior design packages for AFMC facilities.
- 14.12.2 Artwork and wall hangings shall be integrated into each design. Coordinate the subject of the artwork, frames and matting to create a consistent visual image. Include all waste receptacles, clocks, coat storage, drinking fountains, coffee, vending, and food equipment.

15. Systems Furniture

This policy is intended to provide our customers with procedures for the development of systems furniture projects on Tinker AFB. The procedures within this document will ensure the best possible cradle-to-grave management of systems furniture projects allowing full response to customer needs, enhancing end products and providing customer satisfaction. **Reference UFGS 12 50 00 Furniture Systems.**

15.1. TAFB Systems Furniture Policy

For the purpose of this policy, systems furniture will include panel supported furniture systems and desk supported furniture systems. A systems furniture project whether considered an “add-on” to an existing project/area or an initial project, including purchase and installation, re-configuration, or maintenance contract shall follow this policy regardless of funding source.

Goals: The primary goal of this policy is to reduce the costs of facilities. It does so by providing a more space and cost efficient alternative to conventional furniture systems while keeping with Quality of Life Initiatives. Organizations can use interior design questionnaires as a starting point to analyze their requirements. See questionnaires attachment.

15.2. Factors to Consider

Factors that contribute to work areas which positively affect worker job satisfaction and performance include:

- 15.2.1 Coordination or a sense of order which comes from well-coordinated colors and styles as well as properly sized, efficient storage and adequate work space.
- 15.2.2 Convenience, including access to utilities, ease of contact with others, and layout of workstations and auxiliary areas.
- 15.2.3 Comfort, both physical and psychological, including noise levels, color, ergonomics, and interior climate.
- 15.2.4 Corporate image and self-image with ranges of furnishing types and sizes to create a hierarchy of office work stations consistent with the organizational structure.

15.3. Responsibilities

All systems furniture projects shall be reviewed by and coordinated with 72 ABW/CE prior to any contracting activity. The project review shall include electrical/power requirements, communications support, impact on HVAC systems, 101 Life Safety Code compliance, ABA (Architectural Barriers Act) compliance, and the Base CID (Comprehensive Interior Design) Program.

15.4. CID Manager

All systems furniture projects shall be coordinated with the base CID Program Manager during the project development stage.

15.5. Workstation Costs

You may reference AFCEE Interior Design Guide, chapter 3 for a cost estimating guide.

For general planning purposes a budget figure of \$4,500 on average for a standard workstation including a task chair can be used. This figure is based on Air Force FY 2002 costs, so an appropriate inflation figure should be added for subsequent years, (approx. 3%). The figure does not include freestanding furniture or files because they are not part of the systems furniture components and must be ordered separately.

15.6. Space Criteria

The application of space criteria and guidance provided in this document complies with **AFMAN 32-1084**, and applies to all administrative facilities.

15.7. Terminology

Administrative Facility - A building or portion of a building in which the administrative affairs of a military establishment are conducted.

- 15.7.1 Net Floor Area. The total area in the building, less space taken up by outside walls, interior partitions, stair towers, elevator shafts, toilets, basements unsuited for office use, permanent hallways and corridors, machinery or equipment used for heating or ventilating the building, machinery or equipment used for furnishing light and power for building, water supply equipment and elevator machinery.
- 15.7.2 Net Office Area. The net floor area less administrative support space and special purpose space, and other miscellaneous rooms not used directly as office space. Net office area consists of net workstation area plus circulation in open office spaces.
- 15.7.3 Net Workstation Area. The net office area used for an individual workstation. The net workstation area is measured to the centerlines of surrounding workstation panels and to the face of any fixed walls defining the workstation.
- 15.7.4 Administrative Support Space. Support areas usually required in an administrative office such as rooms for central files, office conferences, mail handling, reproduction, coat rooms and break areas.
- 15.7.5 Special Purpose Space. Used to describe space which may be required to meet special needs; for example: auditoriums, conference centers, training rooms, drafting rooms, rooms housing automatic data processing (ADP) equipment, telecommunications, cafeterias, laboratories, libraries, and shipping and receiving rooms. It can also include unique areas within the work area such as a drafting table that are not generally included in administrative space allocations. This space may be included in an administrative area when justified by operational requirements. There are no specific space limitations for special purpose space.
- 15.7.6 Manned Workstation. Workstation which will be occupied and used as an individual's primary work place. This applies whether the individual is a full-time or part-time employee.
- 15.7.7 Unmanned Workstation. A workstation that will be occupied and used as an individual's secondary place of work. Examples would be workstations used for printers or other ADP equipment which are shared by a number of individuals on a temporary basis.
- 15.7.8 Traditional Office. An office using conventional floor supported furnishings.

15.8. Space Allowances

AFMC has waived requirement to 42 net sq ft for manned workstations for up to 25 percent of the total number of manned workstations on a project. Any variance to this requires a letter of exception to be routed through FM, 72 ABW/CE, and HQ AFMC, in turn. (See following exhibit for required content for letter of exception). Unmanned workstations such as computer workstations or reservist's workstations that are used occasionally for specific functions can be 36 net sq ft if enclosed by panels or less if they open onto a hall or into a common space. Worker satisfaction can be directly tied to workstation size. Only use these minimum sizes where space requirements become an overwhelming constraint and there is no other way to solve it. Maintain a minimum of three feet from unmanned areas to adjacent panels or furniture.

- 15.8.1 The following table is taken from AFMAN 32-1084 Facility Requirements and illustrates the

allowable net floor area per person in administrative facilities.

Item	Net Office Area	Administrative Support Space	Building Net Floor Area
Traditional Office	90 sq ft	40 sq ft	130 sq ft
Pre-wired Workstations	68 sq ft	40 sq ft	108 sq ft

15.9. Project Development

It is critical that qualified professionals are involved in the development of systems furniture packages. If qualified professionals are not involved, the customer will probably end up with unnecessary components or a lower quality package that does not satisfy their needs. Because the initial work use interview is the most critical and important phase of any systems furniture project, it is required that the Base CID Manager be involved in developing all systems furniture projects. The attached questionnaires can be a reference point.

- 15.9.1 The initial interview of the customer by the project designer shall cover the following topics as a minimum:
- 15.9.2 Adjacencies of personnel based on work process?
- 15.9.3 Traffic patterns?
- 15.9.4 Conference needs (formal and informal)?
- 15.9.5 Storage needs (individual and common)?
- 15.9.6 Machine support areas (FAX, copier, etc.)?
- 15.9.7 Reference materials, supplies, and other common use areas?
- 15.9.8 Seating?
- 15.9.9 Waiting areas and guest seating (individual and common)?
- 15.9.10 Telephone/networking requirements?
- 15.9.11 Lighting and power requirements?
- 15.9.12 Computer support requirements?
- 15.9.13 Requirements for confidentiality?
- 15.9.14 Security requirements (secure areas, safes, etc.)?
- 15.9.15 Flexibility for future personnel changes (up-front planning when possible)?
- 15.9.16 Budget limitations?
- 15.9.17 Schedule for design and delivery/installation?
- 15.9.18 Staging/storage areas required for installation?
- 15.9.19 Unusual requirements, special equipment support, stand-alone furniture to be supported within a system furniture setting (such as drafting boards), etc.?

15.10. Materials and Color:

Choose materials that are durable and will withstand years of abuse. Use plastic laminate work surfaces except in private executive (two- and three-letter) offices, where wood laminates can be used. Extravagances such as overly large workstations, luxury finishes, extra components, etc. are prohibited. All supporting free-standing furnishings, files, cabinets, etc. shall be metal in a coordinated color (except within executive offices where wood can be used to match the work surfaces). Chairs, panels, & tack surfaces shall be covered with heavy-duty tested, stain resistant fabrics. Predominantly earth toned or neutral color schemes are preferred, with coordinated mid-range color accents.

15.11. Life Safety:

Avoid mazes and labyrinths. Provide a straight forward circulation pattern that makes visual sense as you walk through it. People become disoriented in complex spaces, especially in a fire where toxic fumes fill the air. On a practical level, they're difficult and confusing to find your way around, especially to the firefighter or rescue worker. Systems furniture projects shall follow the NFPA 101 provisions.

15.11.1 The minimum aisle, corridor or passageway shall meet requirements set forth in NFPA 101 dependent upon new or existing occupancy type.

15.11.2 Travel distance, common paths of travel and dead end corridors shall meet requirements set forth in NFPA 101 dependent upon new or existing occupancy type.

15.11.3 Proposed workstation layouts shall be coordinated with Base architectural personnel to ensure compliance with UFC and NFPA criteria. Plans submitted for review shall be scaled drawings clearly showing area architectural features and workstation layouts.

15.12. Electrical Requirements:

All facilities' systems furniture electrical installations shall be in accordance with the current version of the TAFB **Base Electrical Standard**. Please refer to this Standard's Attachment B.

15.13. Standard Operating Policy for Systems Furniture Planning, Purchase, and Installation

1. Organizations and Base users visit with their vendors and make arrangements to purchase the new systems furniture.
2. The vendor then visits the job site to become familiar with the existing furniture lay-out versus the new lay-out. Vendor's site visit should include survey of the locations of all existing electrical panel boards.
3. The vendor should get in touch with the electrical contractor who is to connect the electrical circuits to the proposed electrical service panel board.
4. The vendor then provides the electrical contractor with a drawing (plan view) of the existing and new systems furniture layouts.
5. The electrical contractor then determines from which existing panel board and which circuits are providing power to the existing furniture lay-out. The electrician should take note of how many circuits will be available in each panel board after electrical demolition is completed. The electrician should also take note that connecting to any existing panel board that is not in NEC compliance shall not be allowed.
6. The electrician should then take the proposed new system furniture lay-out and lay-out the new proposed branch circuits. The new circuitry shall be designed in accordance with the current Base Electrical Standard.
7. After the electrician has done all his/her homework the results of findings should be directed back to the furniture vendor who will then relay the findings back to the user.
8. The user will then submit AF Form 332 and request a power study. The user will also attach a copy of all proposed plans and findings to the 332.
9. Once the 332 is processed it will be sent to 72 ABW/CE for further evaluation. Also a CE inspection of electrical hookups etc. needs to be included even when organizations go directly to a local vendor for design and installation services. A 332 work request must be submitted for contract by requestor services in order to ensure compliance with all Life Safety Codes and Base Civil Engineering requirements.

Benefits to be derived from the above procedure:

- a. Vendors of new systems furniture will be able to provide base users with a more realistic cost for completed systems furniture installations.
- b. The electrical evaluation of the proposed new systems furniture request will be processed in a more expeditious manner.
- c. Greater facility usability and satisfaction among base customers.
- d. Electrical engineering man-hours saved which are otherwise spent trying to gather electrical data.
- e. Ensures Life Safety Code requirements are adhered to.

15.14. Construction Submittal Requirements

Detailed shop drawings and product data shall be submitted for approval by the 72 ABW/CE prior to any contracting activity or installation of systems furniture for all facilities located on TAFB.

- 15.14.1 Shop drawings shall include systems furniture layout plans, to scale, and a complete schedule of equipment and electrical and electronic devices planned for use in each work station.
- 15.14.2 Shop drawings shall indicate clearly, via conventional drafting symbols, the number of circuits planned to serve each work station planned and include conduit routing, all junction boxes' locations and their sizes, the number of conductors in each circuit, and their individual wire sizes. An Electrical Symbols Legend shall be provided to ensure consistent meaning of the drawings among contractor, customer, and 72 ABW/CE.
- 15.14.3 Submittals shall include the system furniture manufacturers' catalog product data and specifications, which are clearly marked to indicate which type of system and products are proposed. Furniture systems' appearance, color, finish materials, construction details, and testing laboratory certifications shall also be provided as part of each project's construction submittal.

15.15. Maintenance

Window walls should be used as corridors when possible and be kept free of panel hung furniture to allow access to windows for fresh air and light. Do not block air handling units. Workmen must be able to get to mechanical, electrical, and telephone equipment, and all doors and windows to perform maintenance. Keep furnishings interior to the room and away from walls as much as possible. If you must place furnishings along walls, use freestanding panels instead so they can be moved easily.

15.16. Circular Systems

There are several circular types of systems furniture available on the market, such as the Resolve System. These types work well in large areas but create circulation problems and wasted space in smaller and irregular-shaped areas. Put simply, a circular system requires space around them to work well. Avoid these types of systems in all but the largest open office plans. Even then, look at them carefully. There is probably a more conventional system that will fill the requirements better.

15.17. Panels

Panels shall not exceed 66 inches in height for general office areas. Higher panels shall be reserved for directors' offices, along high-use corridors, security areas, noisy machine, and break areas, or at breaks between major organizations. The higher panels cut air circulation and light and tend to have a negative psychological effect, creating a trapped, "closed-in" feeling. In areas where conferences will take place or noise is a real problem, or in high security areas, consider floor to ceiling walls, conventional construction or modular, in lieu of panels. Workstation panels shall comply with the interior finish combustibility criteria that apply to stationary partitions and walls.

15.18. Lighting

Minimize glare, especially at computer terminals. Provide both general area lighting and task lighting at the workspace. Consider lighting as part of new systems furniture layouts please reference Attachment B section 3.7 and UFC 3-530-01.

15.19. Acoustics

Utilize as much sound absorbing material as possible. In extreme cases, "white noise" or "husher" systems can be introduced to counteract other sounds.

15.20. Power and Communications

The following power and communications requirements shall be met:

- 15.20.1 Surface mounted conduit and power poles are unsightly and generally indicate poor coordination of electrical and communications requirements. Early and thorough coordination by CE and the Communications Group, with the user, is essential. Use flat cable installations instead of power poles where possible. These systems require a great deal of coordination. If not installed in the proper locations, electrical and communication cords end up being run along the floor and create

a safety hazard.

- 15.20.2 For secure communications and power, red (secure) requires a minimum three foot separation from black (non-secure) lines and are usually required to be in an exposed raceway along the tops of panels. Early coordination is the key to avoiding an unsafe and unsightly condition. Please reference Attachment B – Base standards for Building/Utility Electrical Distribution Systems 3.6.

15.21. Ergonomics

Systems furniture is designed to fit the natural variations in human proportions. All work surfaces and chairs should be adjustable so they can provide back support and be adjustable for individuals. These requirements for variability should be worked into the statement of work and specifications for the furnishings, and be pre-programmed as much as possible. This includes the height of the work surfaces for each individual. This is difficult, however, so standardization of work surface heights initially is understandable. Be sure to make these types of adjustments part of any maintenance contract so users who are experiencing difficulty due to the work surface placement can have the problem corrected.

15.22. Accessibility

Program Access for People with Disabilities. The following guidelines are set forth by the **Uniform Federal Accessibility Standards**, (UFAS), and include requirements for the design of accessible office environments. It is desirable to exceed these requirements where feasible. Five percent (5%) of the total number of workstations in an office area and not less than 1 fully accessible workstation shall be provided in all systems furniture projects. UFAS does not permit the assumption that no person with a disability can do the job required; therefore, no accessible workstations are needed. Drawings are provided at the end of this document to illustrate the requirements listed below. Any questions regarding UFAS compliance and interpretation should be directed to the Architectural Compatibility Coordinator at 734-2868.

- 15.22.1 Circulation: Within office space, provide an entry/exit approach to all common use areas. Exit/entry approach is not required to other employee workstations. Common use areas shall be totally accessible and include but are not limited to copy areas, mail areas, conference rooms, kitchens, and break areas.
- 15.22.2 Wheelchair Passage Width: Minimum clear width for single wheelchair passage shall be 36 inches. Minimum clear width for two wheelchairs is 60 inches. Minimum door width shall allow for a minimum 32 inch clear passage.
- 15.22.3 Wheelchair Turning Space: The space required for a wheelchair to make a 180-degree turn is a clear space of 60 inches in diameter. Where hallways and aisle ways are less than 60 inches wide, T-spaces or intersecting 36 inch wide hallways shall be provided and designed into office circulation to provide turn-around areas.
- 15.22.4 Clear Floor Space for Wheelchairs: Seating spaces provided for wheelchair users at tables, counters, or work surfaces, shall allocate clear floor space. The minimum clear floor space required to accommodate a single, stationary wheelchair occupant is 30 inches by 48 inches. The minimum clear floor space for wheelchairs may be positioned for a forward or parallel approach to a table, counter, or work surface object. No more than 19 inches underneath a work surface or table may be counted as part of the clear floor space. In addition, seating provided at tables, counters, and work surfaces must also allow a knee space of at least 27 inches high, by 30 inches wide, and 19 inches deep.
- 15.22.5 Relationship of Maneuvering Clearance to Wheelchair Spaces. One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearances shall be provided.
- 15.22.6 Forward Reach. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 inches. The minimum low forward reach is 15 inches. In systems or conventional furniture applications, forward reach requirements extend to

overhead storage units or cabinets, file cabinets, and task light switches.

15.22.7 Side Reach. The maximum high side reach allowed shall be 54 inches and the low side reach shall be no less than 9 inches above the floor.

15.22.8 Work Surface Heights. Tops of tables and work surfaces shall be mounted between 28 and 34 inches. Work surfaces include laboratory stations, study carrels, tables, typing stands, ADP stations, drafting tables and other surfaces designed for the performance of specific tasks. The actual mounting height will depend on the individual's size and type of work being performed. Aprons, drawers, or keyboard trays which often encroach upon the knee space below counters and work surfaces shall be installed at a minimum of 27" from the bottom of the apron or drawer to the finished floor. File or drawer pedestals located underneath a work surface shall allow for clear toe space. Full height pedestals are not allowed unless they are on wheels and mobile.

15.23. Typical Workstations and Components

Standardize workstations as much as possible. Do not customize workstations except at the three- and two-letter office level. Flexibility is a major consideration in using systems furniture. Customizing defeats the purpose of using systems furniture to create a flexible environment. Create a hierarchy of spaces from the clerk/secretary level to office worker to various supervisory levels based on workstation size and additional components such as guest chairs and freestanding meeting tables. The following includes basic elements for systems workstations.

15.24. The basics of each workstation should include:

15.24.1 Panels (powered and non-powered)

15.24.2 Pedestal or drawer units with lock

15.24.3 Drawers: 1 general use (6 inch), 1 file drawer (12 inch), 1 pencil drawer (3 inch).

15.24.4 Primary work surface with a pencil drawer (24 inch by 48 inch minimum)

15.24.5 Secondary work surface for computer (30 inch by 36 inch minimum)

15.24.6 Overhead storage bins with flipper doors and locks. Include dividers and a task light mounted to the underside of the bin for at least the main work surface.

15.24.7 Paper flow organizers, either freestanding or mounted below an overhead bin.

15.24.8 Tack boards (preferably 2 behind main work surface)

15.24.9 Ergonomic seating

15.24.10 Coat hook

15.24.11 Name plate holder

15.24.12 Electrical outlets for computer, task light(s), and other general power uses as specified by the user, but no fewer than minimum required by the Base Standard for Building/Utility Electrical Distribution Systems

15.24.13 Ergonomic Keyboard and Mouse Tray

15.24.14 Countertop/transaction counter (most secretarial counter at 42 inches high, receptionists can go to 48 inches high)

15.24.15 Trash receptacles

15.25. Loose Furniture that may need to be supported within a workstation:

15.25.1 Individual conference tables

15.25.2 Side or guest chairs

15.25.3 Additional storage bins or cabinets

15.25.4 Trash receptacles

15.26. Additional items

15.26.1 File cabinets

15.26.2 Executive peninsula work surface

15.26.3 Wayfinding signage

15.26.4 Shelving

15.26.5 Storage cabinets

15.26.6 Framed artwork

15.26.7 Plants and planters

15.26.8 Common coat racks

15.26.9 Office equipment (copiers, printers, FAX, etc.)

15.26.10 Mission unique equipment

15.27. Sample Workstation Layouts and Clearances

The following pages include sample drawings and parts listing for various types of system furniture layouts. They are for use as a starting point for design. The hierarchy of sizes and spaces shown is typical for most office arrangements and shows a good delineation between workstations to accommodate a typical organizational structure. Adjust these as required to fit the individual user's needs but don't sacrifice standardization and flexibility. It is critical to plan for the ever-changing requirements of administrative spaces by making them as similar to one another as possible. Standardization promotes "briefcase moves", which should be the norm in administrative spaces.

15.27.1 Attached Typical Work Station Illustrations are as follows:



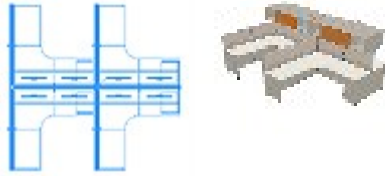
15.27.2 Typical Division Chief Work Station



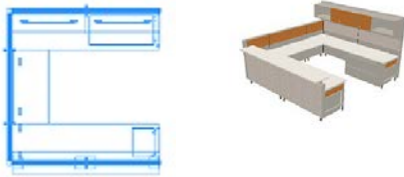
15.27.3 Typical Branch Chief Work Station



15.27.4 Typical Staff Work Station



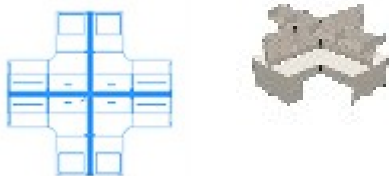
15.27.5 Typical Staff Work Station (Reduced Size)



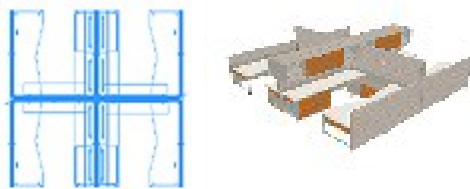
15.27.6 Secretarial Work Station #1



15.27.7 Typical Secretarial Work Station #2



15.27.8 Computer Work (not manned)



15.27.9 Typical Engineer/Architect/Drafting Work Station

15.27.10 Refer to ABA Accessibility Standards at the following link:

15.28 DEPARTMENT QUESTIONNAIRE INSTRUCTIONS

Objective is to collect information on the facility's operational requirements relating to furniture, fixtures, and equipment not attached to the building and shared by all organizations within the facility. The list only includes the most common FF&E. If these choices do not meet your needs, enter your requirements on separate attached sheets.

- Reception Areas: Describe seating capacities and arrangements required, equipment, and miscellaneous requirements.
- Conference Rooms: Describe seating capacities and table arrangements required, equipment, and miscellaneous requirements.
- File Rooms: Indicate types, sizes, and quantities in lineal feet. Include whether the material requires fireproofing, security, etc.
- Store Rooms: Indicate type of storage requirements (supplies, paper, boxes, equipment) Indicate quantity in lineal feet, size of storage, and whether the material requires fireproofing, security, etc.
- Work Room: Indicate type of equipment and storage requirements including types, sizes and special situations.
- Equipment: indicate type, quantity, sizes, electrical and HVAC requirements
- Miscellaneous items: Indicate type, quantity, sizes.
- Comment Sections: This is a special section for identifying any unusual requirements within the department, including ADA requirements, security, etc. Describe any significant future changes that might affect the types and quantity of people working within the unit and the types of effect that they will have.
- Attachments: Attach manufacturers' literature for special equipment requirements. Attach additional comments that cannot be accommodated herein.

15.29 INDIVIDUAL QUESTIONNAIRE INSTRUCTIONS

Objectives of the personnel questionnaire are to identify and to approximate all personnel spaces, furniture, fixtures, and equipment requirements *not* attached to the building within each department. In order to understand the adjacencies between individuals, the designer requests each department submit an organization chart of all personnel with the department.

Space Type: Identify whether the work area corresponding to each job category is private, semiprivate or open using the abbreviation P for private, SP for semiprivate and O for open space.

Meetings: Identify the number of visitors' chairs needed within the work space for meetings, the average number of meetings per week and those that are confidential.

Telephone: Identify average number of incoming and outgoing calls and those that are confidential.

Electrical: Identify types of office equipment at each individual work station. This is used to identify the number and types of receptacles required. Mark an "x" under the required types of office machines. For equipment not listed, mark an "x" under others and note under comments column. If there are any special wiring requirements, note under comments column.

Display: Identify width and height of large display materials that are required within the work space. Note special types of materials under comment column.

Shelving: Identify lineal inches of each required type of shelving under the specified depth. For extra deep shelving, identify quantity under others column and note the depth under comments column.

Filing: Identify lineal inches under each required type of filing. Note special files, security and fireproofing requirements under comment column.

Storage: Identify lineal inches under storage for general purpose storage such as business forms and stationery storage. Note special types and bulk sizes under comment column.

Comments: Identify any special conditions corresponding to each job category and/or personnel such as ADA requirements, security, etc.

Attachments:

- Attach manufacturers' literature for special equipment requirements. Attach additional comments that cannot be accommodated herein.
- Attach copies of the questionnaire for departments containing more than fourteen personnel.

16. Energy Conservation Requirements

Facilities shall include those energy conservation design features which can be economically justified. Principal considerations are building envelope and mechanical systems design and operation to minimize the use of fossil fuels per ASHRAE 90.1

For additional requirements refer to T.A.F.B. **Base Mechanical Standard**. (Please refer to Attachment C of this Standard.)

Part 4: Engineering Systems Requirements for Facilities



Occupational Health Facility TAFB

17. Civil Engineering Requirements

17.1. Traffic Control

The designer shall incorporate the following statements, as applicable, in project specifications for Traffic Control:

- 17.1.1 “Contractor shall maintain at least one lane of traffic open at all times on all two-lane streets, roads, and driveways and two lanes, one in each direction, open on all four-lane streets and driveways unless otherwise directed by the Contracting Officer (CO). The Contractor shall provide all required barricades and warning devices when working on roadways and streets and devices shall be IAW Manual on Uniform Traffic Control Devices.”
- 17.1.2 All truck traffic entering Tinker AFB shall use the truck gate (gate 33) at SE 59th and Air Depot.
- 17.1.3 Haul Route: The Contractor shall use the haul route as shown on the plans.
- 17.1.4 Utility Crossing Roadway: “In order to minimize traffic disruption, utilities shall be bored under paved surfaces whenever possible. Wherever boring is impractical, street crossings shall be limited to three (3) days maximum for any utility crossing roadway (includes trenching compaction

and replacement of existing pavements). Contractor shall provide steel matting sufficient to carry traffic loading over excavated area. No more than one half of the trafficable road surface can be removed from service by contractor utility crossing or road boring operations at any one time."

17.2. POV Parking Spaces

POV vehicle parking shall comply with UFC 3-210-02.

17.3. Curb and Gutter

- 17.3.1 All curb construction shall be of Portland cement concrete and be of integral 6" Barrier Curb-and-gutter design. Curbing design shall comply with Architectural Barriers Act (ABA) accessibility standard for DoD facilities.
- 17.3.2 Minimum width of the curb and gutter shall be 24 inches.
- 17.3.3 Minimum thickness of the gutter shall be 6 inches and shall match the thickness of the adjoining paving where of greater thickness.

17.4. Pavements

17.4.1 Airfield Pavements

- 17.4.1.1 All airfield pavements shall conform to the requirements of UFC 3-260-02 for a Modified Heavy Airfield.
- 17.4.1.2 All Type A, B and C Traffic Areas shall be Portland Cement Concrete (PCC).
- 17.4.1.3 Type D, Traffic Areas may be either PCC or Asphalt Cement.
- 17.4.1.4 Shoulders and Overruns shall be Asphalt Concrete.

17.4.2 Non-Airfield Pavements

- 17.4.2.1 All non-airfield pavements shall conform to the requirements of UFC 3-210-02, UFC 3-250-01 FA, and UC 3-250-18 FA.

18. Landscape Requirements

Landscaping on Tinker AFB encompasses not only the layout of plantings, but also takes into account pedestrian environments such as plazas and courtyards, recreational natural areas, site furnishings, lighting, and fencing. A well-executed design contributes greatly to the environmental and visual quality of TAFB.

18.1. Sustainable Land Design

The goal of landscaping and vegetation management on Tinker Air Force Base is to "Develop and manage the natural and urban landscape to provide a safe, attractive, functional, maintainable, and ecologically sound environment that is in character with the Oklahoma/Texas Plains and Central Great Plains eco-regions" as set forth in the **Tinker Air Force Base Integrated Natural Resources Management Plan (INRMP)**. An important component plan of the INRMP is the TAFB Green Infrastructure Plan which provides a comprehensive vision and guiding principles to managing natural areas and other green space on TAFB.

18.2. Regulatory Bases of Design

This shall be accomplished by, as a minimum, implementing requirements of:

- a. Presidential Memorandum, *Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds* (April 26, 1994),
- b. Presidential Memorandum, *Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators* (June 20, 2014)
- c. *Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes* (October 31, 2011), to include addendum *Supporting the Health of Honey Bees and Other Pollinators* (October 2014)

d. Executive Order 13693, *Planning for Federal Sustainability in the Next Decade* (March 19, 2015),

18.3. The preliminary stone material working list has been developed as a collaborative effort between CEAN and 72ABW/CENM and is as follows:

Stone material is divided into three categories: field stone to cover large areas, accent stone, and boulders. A maximum of two types of gravel stone and one color boulder are recommended for consistency and maintainability. Color schemes are suggested following the TBFS architectural districts.

18.4. Field Stone:

- 18.4.1 Cherokee Red River Rock- recommended for ALL architectural districts (A-F) with Green Limestone or Granite for accent and either Moss or Limestone Boulders
- 18.4.2 River Rock off white/beige- recommended for South Forty Visual District E and Limestone Boulders
- 18.4.3 “Dolomite” (Red) stone- recommended for Eastside Depot Maintenance District C with dark granite as accent and either Moss or Prague Boulders

18.5. Accent stone:

- 18.5.1 Green Limestone
- 18.5.2 Granite gravel as accent color (bronze)

18.6. Boulders of various sizes:

- 18.6.1 Limestone
- 18.6.2 Prague
- 18.6.3 Moss

18.7. Others previously used:

- 18.7.1 Red lava rock (import)- limited use

Other gravel/boulder combinations not outlined above will require approval prior to ordering of material.

Larger size gravel stone (2” and up) are recommended for ramp side frontage to minimize fod issues and for pedestrian traffic areas. Larger size gravel can more easily conceal leaves for maintainability purposes.

Boulders should be buried 1/3 to 1/2 below grade not just dumped on the ground.

Minimum depth of 4” of gravel stone (smaller than 2”) shall be installed. Larger gravel stone (2” and up) will require 6” in depth.

Industrial/Commercial grade filter fabric must be used to serve as weed barrier, and should be lapped up against curbs and boulders to prevent weeds from coming through on the edges.

[For areas where mulch will be used, the recommended material is Grade A Cypress Bark Mulch that does not wash away as easily and has good color retention capabilities.]

The Colorado Department of Local Affairs sponsored a best practices manual for the City of Lafayette and proposed a set of eight principles for smart planting that are “not imperative but still important to ensure healthy plant growth, reduce water waste and increase cost savings over time.” (p.2) These principles are:

- Principle #1 – Plan and design landscaping comprehensively.
- Principle #2 – Evaluate soil and improve, if necessary.
- Principle #3 – Create practical turf areas.
- Principle #4 – Use appropriate plants and group according to their water need.
- Principle #5 – Water efficiently with a properly designed irrigation system.
- Principle #6 – Use organic mulches to reduce surface evaporation of water and weeds.
- Principle #7 – Practice appropriate landscape maintenance.
- Principle #8 – Preserve existing landscape and natural areas.

Considering that each site is different, principle no. 1 above is consistent with our UFC 3-201- 02(2009) where the developed landscape areas must follow a definitive and deliberate design planting process. This “design process closely parallels all successful problem-solving methods, and consists of three basic steps: analysis, concept and implementation. “ (p.58)

- The analysis step identifies functional areas that greatly assist in plant material location and selection.
- Then the concept thinks in terms of general plant sizes and character and provides plant choices with commanders, nursery personnel, customers, facility users and other landscape professionals.
- And the implementation communicates elements of the final design on the planting plan.

18.8. Recommended Plantings

- 18.8.1 Where cost effective, as defined Presidential Memorandum, *Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds* (April 26, 1994), and to the maximum extent practicable, plant materials used for landscaping on TAFB shall be native (varieties/subspecies and select, Tinker-approved cultivars of native species are acceptable) to the local region.

Local region is defined as:

- a. Central Oklahoma/Texas Plains and Central Great Plains eco-regions as defined in Oklahoma's Biodiversity Plan: A Shared Vision for Conserving Our Natural Heritage, 1996
 - b. Prairie and Great Plains Region as defined in An Annotated List of the Ferns, Fern Allies, Gymnosperms and Flowering Plants of Oklahoma, 1994
- 18.8.2 Although not exhaustive, the plant materials which are listed in Attachment A include many trees, shrubs, vines, grasses, and wildflowers approved for planting on TAFB.
- 18.8.3 Change paragraph to read: Designers are cautioned that many of these native plants may not be readily available, or not available in the numbers required, from nurseries at the time of a given project's schedule for planting. Broad regional searches may be necessary to locate plant materials. Or, if plants are unavailable, they should be contract-grown to meet contract specifications.
- 18.8.4 Upon written request, the TAFB natural resources function (72 ABW/CEIEC) will provide a list of potential plant sources.
- 18.8.5 All trees and shrubs for planting on TAFB shall comply with the current edition of ANSI Z60.1 and the TAFB Urban Forestry Management Procedures.

18.9. Hard Landscape Features

Where possible, stone and boulder features that will be used for landscaping shall be native to the Oklahoma region. If strip Hackett stone be used, it shall be naturally-occurring and blue-brown to light purple in color.

18.10. Protection and Re-Use of Existing Vegetation

- 18.10.1 Protection of existing vegetation shall be accomplished to the maximum extent practicable. Generally, protection of existing vegetation applies to native trees, shrubs, and other native plants. All new plantings shall be adequately protected with tree guards and similar protective devices.
- 18.10.2 A vegetation assessment of the entire construction/demolition site shall be conducted prior to site layout development. The assessment shall identify trees, shrubs, and other plant materials to be retained, transplanted, or cut down.

18.11. Retained Trees

- 18.11.1 Trees that are to be retained in-situ shall be fenced off by the contractor using steel T- posts and high visibility barrier fencing prior to commencing land-clearing activities. Fencing shall be installed 10 feet beyond the drip line of each tree or cluster of trees. Where this is not

practicable, trees shall be fenced at the drip line, as a minimum. Tree care procedures for relocated trees shall be specified for the contract period. Barrier fencing shall be maintained in working order for the duration of the contract

18.12. Transplantable Trees

- 18.12.1 If trees cannot be retained in place, they shall be transplanted or cut down and removed. Transplantable trees are defined as healthy, native, well-formed trees (as determined by TAFB) with trunk diameters between 1" - 8" (measured at 6" above the ground). Transplantable trees shall be replanted on-site or at another Base location as approved by the Contracting Officer.

18.13. Cut-Down Trees

- 18.13.1 Trees that cannot be retained in place or transplanted shall be removed and processed as determined by the TAFB natural resources function (72 ABW/CEIEC). Depending on marketability, wood may be processed as mulch, firewood, sawtimber, or other salable products. Some removed trees may be hauled intact to a staging area or installed directly in base ponds for fish and wildlife habitat enhancement as directed by 72 ABW/CEIEC. For every live tree removed from the construction site, two replacement trees (1" – 2" caliper) shall be planted on the Base in locations approved by the Government.

18.14. Landscape Maintenance

- 18.14.1 All trees shall be temporarily irrigated during the growing season for three years following planting to ensure proper establishment. This may be accomplished with temporary subsurface drip irrigation, watering trucks, or devices such as 'Tree Gators'.

18.15. Additional objectives of Project Planting Schemes

- 18.15.1 All landscape plantings shall be hardy for this region. Plantings shall be specified with the following objectives:
- 18.15.1.1. low maintenance
 - 18.15.1.2. visual complement to TAFB facilities
 - 18.15.1.3. integration of facility exteriors with natural environment
 - 18.15.1.4. establish human scale among the landscape, facilities, and Planning Districts of TAFB
 - 18.15.1.5. reinforce and accent picturesque views
 - 18.15.1.6. screen views of lesser attraction on Base
- 18.15.2 All plant selections shall be subject to the review and approval of the TAFB Architectural Compatibility Board.

19. Structural Engineering Requirements

19.1. General Requirements

- 19.1.1 All structures designed and constructed for Tinker AFB shall meet the requirements of the current edition of UFC 3-301-01 except as modified by this document. The technical requirements of UFC 3-301-01 are based on the International Building Code (IBC), as modified by UFC 1-200-01. This information shall be used by structural engineers to develop design calculations, specifications, plans and design-build Requests for Proposals (RFPs). All structures shall be designed by a Professional Engineer licensed to practice structural engineering in the State of Oklahoma.
- 19.1.2 Minimum Risk Category for Buildings and Other Structures shall be II
- 19.1.3 Minimum Wind Exposure Category shall be C.
- 19.1.4 Minimum roof live loads of 20 pounds per square foot (psf) shall not be reduced for tributary (influence) areas.

19.2. Geo-technical Investigation

- 19.2.1 Soil borings and investigations shall be used to determine the average depth of bedrock and allowable bearing pressures of each type of geologic formation encountered in the investigation for all structures designed and constructed for Tinker AFB. Geotechnical Investigation Report shall be included in project documents and all soil boring logs shall be placed on the as-built drawings.
- 19.2.2 Engineer of Record (EOR) may elect to design foundation based on conservative assumptions made in accordance with the International Building Code in lieu of performing a geotechnical investigation. Engineer shall provide all calculations and basis for assumptions to 72 ABW/CE for approval with 35% design submittal.

19.3. Foundation Design

- 19.3.1 Selection of foundation type shall be based on recommendations made in the Geotechnical Investigation Report prepared by a geotechnical engineer.

19.4. Structural Economy

The most economical and efficient structural system of steel, concrete, and/or load-bearing masonry shall be utilized for building superstructures for all TAFB projects. The use of wood for building superstructures is prohibited.

19.5. Facility Hardening

- 19.5.1 For required Antiterrorism building structural hardening refer to: UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings, UFC 4-020-01 DoD Security Engineering Facilities Planning Manual and UFC 4-023-03 DoD Design of Buildings To Resist Progressive Collapse.
- 19.5.2 The Base Anti-Terrorism Office can be reached at 405-734-7120 or 405-734-6381. Anti-Terrorism Officers will assist project designers as to the incorporation of structural hardening requirements for proposed projects.

19.6. Roof Design

- 19.6.1 Due to potential changes in facility use, all low-slope roof structures, which are designed to support a built-up roof membrane, shall be designed for a minimum Roof Dead Load of 25 pounds per square foot (PSF).
- 19.6.2 This minimum value shall include the weight of proposed and future loads associated with the roofing system, including decking, insulation, suspended ceilings, mechanical ducts/diffusers, electrical lighting/conduit, and automatic fire suppression sprinkler systems.
- 19.6.3 A minimum Roof Dead Load of 20 PSFt may be used for standing seam metal roof systems.

19.7. Seismic Design

- 19.7.1 Seismic design shall be in accordance with the latest edition of the International Building Code, UFC 1-200-01, UFC 3-301-01 and UFC 3-310-04.
- 19.7.2 A soil site classification of "D" shall be assumed, unless proven otherwise by soil exploration testing.

19.8. Shelter Design

19.9.1. TAFB Storm Shelter Policy:

19.9.1.1 Organizations who would like to install or construct storm shelters (internal or external) at their facilities must submit a Base Civil Engineer Work Request (AF Form 332) to 72 ABW/CE in order to begin the assessment and approval process. All new storm shelters shall be above ground facilities.

19.9.1.2 New Facilities – (Mandatory) New occupied buildings must be constructed with internal storm shelters designed according to International Code Council 500 (ICC 500) standards and be sized to accommodate the maximum expected occupancy, as determined by civil engineering's siting criteria assessment.

19.9.1.3 Existing Facilities – (Optional) Dedicated ICC 500 rated storm shelters are authorized. Storm shelters shall be sized according to ICC 500 standards, comply with all applicable codes, and accommodate the maximum expected occupancy, as determined by the siting criteria assessment. Exterior storm shelters may be permitted when the siting criteria assessment deems the exterior solution the most feasible alternative.

19.9.1.4. Existing Facilities – (Mandatory) In occupied facilities that do not have designated areas of adequate refuge, major renovation projects must include the identification of structurally enhanced refuge areas if construction of new walls total 25% or more of the interior walls in the renovated area. Each project will be analyzed to determine the best solution.

19.9.1.5. Approval Process – (Mandatory) All storm shelters, even if incidental to renovation projects and even if interior to a facility, shall be approved by the Facilities Board to ensure compliance with this policy and the criteria herein. All renovation projects will be reviewed by the Civil Engineering Architectural/ Engineering Review Board (AERB) to ensure compliance with the structurally enhanced refuge requirement.

19.9.1.6 Shelter Priority Areas – Tinker AFB has determined that the following facilities should receive priority consideration when submitting shelter projects for funding and execution. They are: 1) Child Development Centers and Youth Centers; 2) Dormitories; 3) Air Traffic Control Tower; 4) Security Forces locations and gates; 5) Command Post; 6) Fire Department; 7) Base Defense Operations Center; and 8) Boiler Plant.

19.9.1.7 Policy Definitions:

- a. ICC 500 – This code standard applies to design, construction, installation and inspection of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornadoes and hurricanes.
- b. Occupied Buildings – A building shall be considered occupied at any time it meets any of the following criteria: 1) It is open for general occupancy; 2) It is open to the public; and 3) It is occupied by more than 10 persons.
- c. Storm Shelter – A storm shelter is any building, structure or portions thereof, constructed in accordance with the ICC 500 standard, designated for use during a severe wind storm event, such as a hurricane or tornado. A residential storm shelter serves occupants of a dwelling unit, with an occupant load of less than six people. A community storm shelter is defined as any storm shelter not classified as residential.
- d. Tornado Refuge Area – Tornado refuge areas are those in an existing building that have been deemed by a qualified architect or engineer to likely offer the greatest safety for building occupants during a tornado. It is important to note that refuge areas are not ICC 500 compliant, but they do offer the best protection in a given

area. People sheltering in the refuge area are more likely to survive than people sheltering in other areas of the building.

- e. Siting Criteria Assessment – When determining the best location for a proposed storm shelter, civil engineering, in conjunction with the requestor, will consider: 1) Existing tornado shelter/refuge opportunities in or near the facility; 2) Cost effectiveness; 3) Land availability; 4) Architectural compatibility; 5) Accessibility; 6) Anti-terrorism/Force protection; 7) Environmental concerns; and 8) Facility personnel loading. This list is not all-inclusive, and some shelter siting proposals will have additional aspects to analyze.

- 19.9.1.8 Any approved shelter, regardless of the funding source, will be open to any personnel (with appropriate clearance/authorization) seeking protection.

20. Architectural Systems Requirements

20.1. Excellence in Design

20.1.1 Excellence in design is a primary goal for all construction projects.

20.1.2 Reaching this goal requires a commitment by designers and administrators to quality architecture.

Reference the following web links:

<https://www.wbdg.org/ffc/af-afcec/instructions-afi/afi-32-1023>

[f](#)
[Design and Construction Standards and Execution of Facility Construction Projects](#)

<http://www.wbdg.org/>

[Whole Building Design Guide](#)

20.2. Quality Architecture

20.2.1 The design of projects in harmony with the architectural character of existing facilities and the environment is a significant aspect in the definition of quality architecture.

20.2.2 Pay particular attention to project siting, economy, life cycle cost, functionality, energy conservation, interior and exterior details and accessibility.

For accessibility reference the following web link.

<https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards>

20.2.3 Take special care to avoid adversely affecting the historic value of property listed (or eligible for listing) on the National Register of Historic Places, or located within the boundaries of a Historic District.

20.3. Integration of Programming, Design, Engineering and Construction Excellence

20.3.1 There are very few places where an organization serves as its own project programmer, designer, engineer, and municipal authority-having-jurisdiction. At TAFB this is true every day for 72 ABW/CE.

20.3.2 Due in large part to the above responsibilities, a special and unique opportunity exists at TAFB for 72 ABW/CE to provide projects to AF customers which have the highest integration of design and construction value possible.

20.4. Sustainable Design of AF Facilities

- **Tinker AFB Policy:** Every project shall address the most economic and sustainable building practice to the fullest extent possible. Sustainable practices include those elements of planning, design and construction that promote the efficient use of energy and material resources, the conservation of water and the protection of land and water environments.
- Refer to the current TAFB Sustainability Guideline for requirements.

21. Interiors Systems

The interior of TAFB facilities is what helps our missions deliver. Being online and with lights, heat, water and working toilets is what keeps our missions going, and these entire “utilities” help make up our interiors. Although the Standard divides the multiple aspects of Base facilities among many disciplines and specialties, it is with interior environments that “it can all come together” to provide the facilities excellence which TAFB deserves.

21.1. Elements of TAFB Interior Systems

The major variables which combine to create a project interior include the following design considerations. It is important to note that all design aspects have at least one separate specialty organization on Base to address facility quality.

21.2. Safety

Building life safety in facility occupation by personnel is a different concern from worker safety relative to mission accomplishment and operation of process equipment.

Protection of occupants from exposure to hazard and injury during emergencies and the facilitation of occupant evacuations are the twofold missions of building life safety. Every building utility system, even the structure and architectural enclosure, contributes to a facility's level of life safety.

21.3. Access

The TAFB Disability Awareness Committee meets monthly to maintain open communications among the Committee members, the TAFB workforce at large, and ABW / CE. Projects which are undertaken to improve accessibility to facilities and amenities throughout the Base are discussed regularly.

Reasonable access to and from work areas for all personnel is the goal of 72 ABW/CE. Public and employee access is to be provided all Base personnel, resident military families, and visitors in compliance with the ABA.

Clearly, there are limits to the level of convenience which is afforded any given facility.

21.4. Function

Usually thought of as the first requirement for the successful interior project, the occupant's mission has to be facilitated and enhanced in the project.

21.4.1 Projects for TAFB facilities shall utilize Sample User Questionnaire Forms to optimize the common understanding of all projects' program requirements among AF customers, engineers & contractors.

21.4.2 Questionnaire Forms can follow the prototype given in Appendix 2-1 of the **United States Air Force Project Manager's Guide for Design and Construction**, 2000 Edition.

<http://www.wbdg.org/FFC/AF/AFDG/pmguide.pdf>

21.5. Lighting

Lighting fixture layouts and illumination levels have to orient personnel and clearly direct them in the safe and efficient use of their functional areas. Refer to UFC 3-530-01 Design of Interior and Exterior Lighting Systems and Controls. Consider Engineering Technical Letter (FTL) 10-18: Light-Emitting Diode (LED) Fixture Design and Installation Criteria of Interior and Exterior Lighting Applications.

21.6. Acoustics

The protection of personnel health & the provision of worker privacy contribute to long term productivity.

21.7. Comfort

For the Standard, interior comfort refers to the provision and maintenance of facility interiors year round at pre-determined "design" temperatures.

Without temperature control, personnel are distracted from their mission at best, and worker health can be compromised when fluctuations in temperature are frequent.

21.8. Indoor Air Quality

Ventilation and maintenance of fresh air levels within all interiors is the collective concern of the Air Base Wing and Environmental.

21.9. Security

- 21.9.1. Physical security includes construction such as doors and locks which limit and control a person's access within facilities.
- 21.9.2. Information security includes construction such as sound isolation design which prevents information in the form of speech and electronic signals from spreading beyond their intended audiences.
- 21.9.3. Electronic security includes electro-mechanical systems which detect and deter personal access to a facility or that facility's interior.

21.10. Interior Signage

Way-finding within many facilities can determine the efficiency at which the Installation operates.

- 21.10.1. Project signage shall be essential to include for all projects unless accepted through review and approval of 72 ABW/CE.
- 21.10.2. Signage design and construction shall comply with UFC 3-120-01 Air Force Sign Standard.

21.11. Aesthetics

- 21.11.1. The quality of positive visual composition is never to be sacrificed or ignored at the expense of any project.
- 21.11.2. The requirement for TAFB projects is to provide a positive visual image fitting to the customer.

22. Categories of Equipment

22.1. Office Equipment

This category shall include systems furniture, personal computers, copiers, vending equipment, coffee makers, telephones, and individual office conveniences.

22.2. Building Equipment

This category shall include facility physical plant components such as furnaces, boilers, direct expansion units, package chillers, water circulation pumps, water heaters, electrical transformers, service panels, switchgear, fire alarm control panels, and ventilation and exhaust fans.

22.3. Process Equipment

This category shall include all devices which are dedicated to the execution of mission-specific job production whether mechanical, electrical, or chemical in principle operation.

22.4. Project Equipment Schedules

Projects which include any or all of the above categories shall separately schedule and locate, as part of the construction documentation, the exact, size, function, energy consumption, and utility requirements of each equipment piece within the proposed design.

23. Fire Protection Engineering

23.1. Base Fire Suppression Systems

Design and construction of mechanical improvements to all real property on Tinker AFB shall comply with the **Base Mechanical Standard**. (Please refer to Attachment C of this Standard.)

23.2. System Design

All fire protection system designs shall be accomplished by a qualified Fire Protection Engineer. All fire protection systems shall be designed in accordance with **UFC 3-600-01 Design: Fire Protection Engineering for Facilities**, **UFC 3-601-02 Operations and Maintenance Inspection, Testing, and Maintenance of Fire Protection Systems**, **NEPA 13**, and the specific project's *Life Safety Fire Protection System Analysis*.

Hyperlink for UFC 3-600-01: <http://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-600-01>

Hyperlink for UFC 3-601-02: <http://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-1-200-02>

23.2.1. Design Submittal

23.2.1.1. The designer shall provide a preliminary fire sprinkler design, including hydraulic calculations no later than 60% design.

23.2.2. Minimum Wall Thickness for Piping

23.2.2.1. Minimum wall thickness for sprinkler piping using screwed joints shall be schedule 40 steel.

23.2.3. All new construction and/ or new equipment shall not block or impede access to utility or maintenance points.

23.3. Firewalls and Fire Area Limitations

All construction, including fire walls, fire area limitations, emergency lighting systems, means of egress and exit stairways, shall meet the more stringent requirement of both the **NEPA 101** and the **International Building Code**.

23.4. New construction and/ or new equipment shall not block or impede access to utility or maintenance points. ex: (vav boxes, bleed valves, room to pull coil)

24. Plumbing Requirements

24.1. Base Plumbing Systems

Design and construction of mechanical plumbing improvements to all real property on Tinker AFB shall comply with the **Base Mechanical Standard**. (Please refer to Attachment C of this Standard.)

25. Mechanical Engineering

25.1. Base Mechanical Systems

Design and construction of mechanical improvements to all real property on Tinker AFB shall comply with the **Base Mechanical Standard**. (Please refer to Attachment C of this Standard.)

26. Electrical Requirements

26.1. Base Electrical Systems

Design and construction of electrical improvements to all real property on Tinker AFB shall comply with the

Base Electrical Standard, most current Edition. (Please refer to Attachment B of this Standard.)

26.2. Related Requirements found elsewhere within the Standard

- 26.2.1. Telecommunication Utility requirements on Base are generally separate from telephone utility requirements. Please refer to Chapter 27 Telecommunication Requirements.
- 26.2.2. Systems Furniture Policy. Please refer to chapter 15.

27. Telecommunication (COMM) Systems Requirements

27.1. Utility domain of the 72 ABW/SC

Design and construction of COMM improvements on Tinker AFB shall comply with the Base Standards for **Base Electrical Standard**, most current edition. (Please refer to this Standard's Attachment B.)

- 27.1.1. All Contractors working on TAFB shall accommodate within their project areas and schedules the work necessarily completed by the Communications Directorate and its Contractor forces in order to provide the Government real property improvements which are complete in respect to telecommunication utility services.
- 27.1.2. Advance notice for demolition activities - No demolition of existing COMM utility raceways, panels, or control boxes can be undertaken without prior removal of COMM conductors by the personnel of 72 ABW/SC. Advance notice of at least 72 hours shall be provided 72ABW/SC prior to undertaking any demolition activity which potentially impacts either exterior or interior COMM utility construction.

27.2. Civil Provisions

- 27.2.1. Communications utilities construction Projects which install utilities between facilities shall include cable as well as duct. 72 ABW/SC shall be consulted for correct sizing of all new communications utility cabling and duct banks proposed to serve all existing and/or new Base Facilities. Approval of 72 ABW/SC shall be required of all project specifications which include replacement and/or new construction of duct banks and conductor systems on Base.

27.3. Telephone and Cable

- 27.3.1. Utility systems which interconnect TAFB organizations with off Base systems are accomplished by the Communications Directorate. The user shall complete and submit an AF form 3215 to request phone and cable connections.
- 27.3.2. Communications within this section refers to all telecommunications requirements that are not simply limited to telephone systems. Telecommunications covers any transmission, emission, or reception of signs, signals, writings, images, and sounds, or information of any nature by wire, radio, visual, optical or other electromagnetic systems. Similarly, cabling not only applies to only cable themselves, it includes a combination of all cables, wire, cords and connecting hardware. The soon to be released revised standard American National Standards Institute/Electronic Industry Association/Telecommunications Industries Association (ANSI/EIA/TIA)-568-C (currently in draft form as PN-2840), has changed its name to reference the term "cabling" as opposed to "wiring".

27.4. Contractor Responsibilities

- 27.4.1. The contractor shall coordinate all communications-computer system requirements with Base Civil Engineering, the using agency, and Base Communications. The A/E shall provide drawings specifically for Tinker requirements based upon all necessary provisions per Air Force Communications Command (AFCC) Technical Bulletin (TB) 90-02. The A/E shall include communications pre-wiring for buildings in all construction projects. Provide cable box rough in and conduit for connection by the Communications Squadron.
- 27.4.2. The contractor shall insure the construction contract specifies that all installation personnel must have a minimum of three years of experience. Further, the specifications shall require a detailed work plan be provided if a project requires re-routing or changing of the configuration of a base

communications cable or related equipment. The work plan shall explain the work required and how the work will be accomplished by the contractor. All new materials (i.e. telephone and data cable, splicing connectors, splice closures, etc.) shall conform to Government standards.

27.5. General Specifications for New Base Facilities

- 27.5.1. A building's communications backbone and horizontal distribution systems shall consist of 1) conduits, 2) sleeves, 3) cable trays/raceways, 4) communications rooms, 5) copper voice and data cable, 6) fiber-optic cable, 7) copper information outlets, 8) fiber-optic outlets, 9) fiber and copper data patch panels, 10) voice connecting blocks, and 11) Intermediate Cross-connects (ICs) and Horizontal Cross-connects (HCs).
- 27.5.2. For new administrative facilities the contractor shall utilize a raised floor system and under floor horizontal cable distribution system for general design of the building cable plant including the Communications Equipment Room (CER), primary Network Equipment Rooms (NER), and secondary NER as the preferred design method. The under floor horizontal cable distribution system shall include the underfloor conduits and solid cable trays. Conduits shall also extend from the cable trays to the raised floor information outlet boxes. The under floor horizontal cable distribution system shall be coordinated with the raised floor system to run without affecting the alignment of the raised floor system.
- 27.5.3. However, if utilization of a raised floor and under floor horizontal cable distribution system is not economically feasible or otherwise practical, the contractor shall utilize an overhead or in-ceiling delivery system for general design of the horizontal distribution cable plant for the building being constructed or renovated.

27.6. Communication Equipment Room

- 27.6.1. A Communications Equipment Room (CER) shall be included on the basement or the first floor level of the building.
- 27.6.2. The CER will house the Main Building Cross-Connect (MC) frame for copper and fiber-optic cabling into/out of the building. The CER may also house some common local area network (LAN) equipment for the building. The CER needs to be approximately 12 feet by 24 feet in area and have 24-hour, 7-day air conditioning.

27.7. Primary Network Equipment Rooms

- 27.7.1. At least one primary Network Equipment Room (NER) shall be included on each respective floor level of the building. Sufficient primary NER shall be included on each floor level to ensure backbone and horizontal distribution cable runs do not exceed maximum allowable lengths in accordance with Electronic Industry Association/Telecommunication Industries Association (EIA/TIA) 568-C and EIA/TIA- 569-B standards. The primary NER shall have 24-hour, 7-day a week environmental control.
- 27.7.2. The primary NER(s) within the building shall be vertically "stacked" directly over the one on the floor level below. A minimum of six 4-inch sleeves shall be used to interconnect the primary NER to the primary NER on the floor level directly above it. The 4-inch sleeves shall be placed between the adjoining floor/ceiling of the primary NER to provide vertical access for the copper and fiber backbone cable for the building.
- 27.7.3. If more than one vertical "stack" of primary NER is required, the primary NER on each respective floor shall be horizontally interconnected with a minimum of two 4-inch conduits for both initial and future tie cable requirements for the building. A minimum of one 4-inch conduit to/from the primary NER shall have four 1-inch inner ducts placed within the conduit for fiber-optic cable.
- 27.7.4. If an overhead or in-ceiling delivery system for general design of the horizontal distribution cable plant must be used, the contractor shall use a minimum of four 4-inch sleeves to route cables into the ceiling spaces to the work areas from the CER and all NER. The design shall include overhead ladder cable trays to route voice and data cables from the CER and the NER that are properly sized for the number of cables to be installed and to permit future cable expansion within the building. The design shall require the utilization of plenum cable and shall use power poles

and system furniture panels to deliver the cables to the individual workstations.

27.8. Secondary Network Equipment Rooms

- 27.8.1. A minimum of one secondary NER shall be included in all vault areas designated as secure areas. Each secondary NER shall be directly connected to the CER with a minimum of two 4-inch conduits for both initial and future cable requirements for the building. A minimum of one 4-inch conduit to/from each secondary NER shall have four 1-inch inner ducts placed within the conduit for fiber-optic cable.
- 27.8.2. In addition, each secondary NER shall be directly connected to the nearest primary NER on the respective floor using a minimum of two 4-inch conduits. One of these conduits shall have four 1-inch inner ducts installed for fiber-optic cabling.
- 27.8.3. The secondary NER(s) shall have 24-hour, 7-day a week environmental control

Part 5: Project Construction and Installation Procedures



28. Safety Requirements

28.1. General Health and Safety Work Practices on Base

All construction on Tinker AFB is subject to applicable federal, state and Air Force laws, rules and regulations. It is a condition of each contract, and shall be made a condition of each sub-contract, that contractors and subcontractors shall not require any laborer or mechanic employed in the performance of any contract, nor cause any Air Force military, civilian, or other contractor personnel to be exposed to any unsanitary, health, or safety hazard or condition. These requirements include at a minimum the following standards:

- 28.1.1. Title 29 Code of Federal Regulations, Parts 1910, General Industry Standards and Interpretations, and 1926, Construction Safety and Health Standards, United States Secretary of Labor.
- 28.1.2. Safety and Health Requirements Manual (EM 385-1-1), the US Army Corps of Engineers.
- 28.1.3. HQ AFMC/CEC EGL 92-2.
- 28.1.4. US AFI 91-202, "The US Air Force Mishap Prevention Program."
- 28.1.5. US AFI 91-204, "Safety Investigations and Reports"
- 28.1.6. US AFM 91-203, "Air Force Occupational Safety, Fire, and Health Standards"

28.2. Site Practices specific to TAFB

The following worker health and safety practices shall be maintained on all projects: Section 00 70 00 / 00 71 00 General Requirements.

29. Special Base Procedures

29.1. Requirements for all demolition and construction contracts on TAFB

For more specific information refer to Tinker AFB Specifications Section 00 70 00/00 71 00 GENERAL REQUIREMENTS. The current version of General Requirements is made a part of construction contract specifications issued at Tinker AFB by the Contracting Officer.

29.2. Demolition, Excavation and Construction Permits:

Contractors shall be required to obtain an approved Base Civil Engineering Work Clearance Request prior to starting any construction work.

29.3. Master keying and locks:

Tinker AFB utilizes the master keying system provided by the BEST Universal Lock Co. The designer shall clearly specify that only those cores which are compatible to BEST locksets with BEST 7-pin L-type keyways (no substitution) with 2-key blanks shall be used. Locks shall be supplied with construction cores. Individual locks shall be provided for in all areas except public toilets. Where existing locksets are to be replaced, ensure that the existing cores are turned in to the Base Lock Shop. Locks shall be shipped directly to the Base Lock Shop.

29.4. Procedures for non-standard work days:

The standard workday for the Base Civil Engineer Directorate at Tinker AFB is from 0715 (7:15 a.m.) to 1600 (4:00 p.m.). The contractor's workday shall be compatible with that schedule. Written requests for any deviations from the contractor's work schedule (overtime or night shifts) shall be made to the CO 48 hours in advance of the proposed scheduled deviation. Approval of such requests shall also be in writing and in advance of any proposed schedule deviation.

29.5. Utility outages and closures (street, sidewalk, aisle, etc.):

Refer to Tinker AFB specification section 00 70 00 General Requirements for Construction.

29.6. Contractor Identification credentials while on TAFB

Without exception, each company contracted to TAFB shall require all personnel at all times to display identification credentials appropriate to the area of the Base in which they are employed.

Security clearances: All contractor personnel are required to obtain a base pass from the Base Security Forces Squadron through the CO.

For work within "Controlled Access" areas, contractors shall provide names, birth dates, and social security numbers of everyone who shall need access to the site.

29.7. Soil and Foundation Conditions

All project designs shall consider the detail character of the geotechnical conditions prevailing TAFB, and exercise prudent engineering judgment in the evaluation of allowable foundation bearings for the site in question and both dead and live loads applicable to the building type proposed.

- 29.7.1. Corps of Engineers shall conduct a soil investigation as required to determine the site specific subsoil conditions. Frequently within TAFB the soil varies from sandy silt to sandy clay with areas of stratification of the various types.
- 29.7.2. Soil resistivity varies from a high of 26,100 ohm-cm to a low of 529 ohm-cm. There is no site specific soil resistivity data currently available to design and construction contractors.
- 29.7.3. Unless specifically waived by the CE, all foundation designs for facilities at Tinker AFB shall be

conventional pier and grade beam systems, separated from a "floating slab" or "slab on grade" by use of isolation and/or expansion joints. Formed voids shall be provided for all grade beam constructions, and all sub-grades immediately below grade beams shall be compacted to the same density specification as that required of under slab sub-grades.

29.8. Construction Facilities and Job Site Standards

The Government retains the right to limit the number and location of various construction and office trailers, temporary structures, and open storage and storage areas used by contractors. These facilities shall be clean, in good condition, and free of rust or surface deterioration. Rental trailers shall be of a neutral color. Specifications to enforce these requirements shall be included in each project.

- 29.8.1. Screening fences shall be installed around the site perimeter. The screening shall be approved by 72 ABW/CE Architects, due to differing conditions in Visual Districts around the base.
- 29.8.2. Project rooftop equipment shall be specified to feature exterior cabinet enclosures of factory finish to match the Standard field color specific to the District in which the Project is sited.

29.9. MILCON Requirements

Projects whose design agencies are provided by the USACE have particularly high standards of design documentation, and include the following procedures.

- 29.9.1. MILCON Solicitation Proposal Exclusions Statements. All design/build proposals for consideration of MILCON award shall offer under the cover of signed certification that all requirements of the Solicitation have been fulfilled unless taken specific exception within the same letter of certification.
- 29.9.2. Architecturally Significant Projects Process / ASP. The ASP Process is mandated by HQ AFMC and applies to specific MILCON projects which promise to contribute permanent and conspicuous improvements to the living and working environment within the Installation. The Process includes special design collaboration within the formulation of the Project Request for Proposals / RFP, and is oriented to providing the Base with the highest quality of facility design possible within the available design/construction funds, and to providing the Government optimal comprehension of the finished construction product features before design is complete.

30. Contractor Use of Available Utilities

Base services and utilities available to the contractor:

30.1. Electrical Service

The contractor may temporarily hook up to existing electric as required to accomplish the work. The contractor must turn off lights when an area is not occupied, turn off or reduce heat when an area is not occupied, provide enclosures to prevent unnecessary heat loss from the building envelope and institute similar actions to conserve energy.

30.2. Water

The contractor may temporarily hook up to existing water as required to accomplish the work. The contractor must use water only as required for construction purposes and must otherwise practice water conservation.

30.3. Sewage

The contractor shall provide portable toilets for construction crews.

30.4. Trash Disposal and Construction Debris

The contractor may not use trash dumpsters on the installation. All waste material generated by construction or demolition activities shall be hauled off-base by the contractor and disposed of at a legal dump site. The haul route shall be maintained free of debris, mud, rock, and trash by the contractor at all times.

30.5. Maps

Base utility and contour maps are available at the Base Civil Engineer office, Building 400. The designer shall have access to the Base Civil Engineering record drawings in order to perform any required research and investigation of existing as-built drawings. The designer shall be responsible to field verify all as-built drawings as the Government does not guarantee their accuracy.

31. Property Maintainability

31.1. Mandatory References

The following publications are mandatory references as applicable to this section:

ETL 01-1 Reliability & Maintainability Design Checklist 11 Oct 01

31.2. Re-use of Existing Materials

Contractors shall exercise caution in the planned reuse of any existing material, (or material that is to be Government Furnished Equipment). In the time period between project inception, design, and actual construction, either the condition of the material, or its availability may change. For major items of equipment, specify by manufacturer's name plate data exactly which items are to be used and their location.

31.3. Manufacturer's name plate, parts and maintenance manuals

Ensure that equipment items which require periodic maintenance and repair have sufficient manufacturer's identification data permanently affixed. Specify that the contractor shall provide copies of parts identification manuals and installation and maintenance instructions customarily furnished with the equipment.

31.4. Construction over Buried Utilities

New construction should not be placed over existing buried water, sewer, heating, compressed air, electric, or telephone utilities except in extraordinary situations and only if special provision is made for maintenance access. In NO case should any construction be placed over existing POL or natural gas lines.

31.5. Refuse Collection

All new building designs or major modifications shall show on the drawings the following:

31.3.1 Proposed refuse container location(s) and all screening, pads, walkways, or other pavements.

31.3.2 All needed features to facilitate possible recycling efforts.

Adequate pavement design to permit safe and easy approach, container handling, and maneuvering by refuse vehicles.

31.6. Termite Control

The application of a residual termiticide during construction shall provide years of termite protection to the building and its contents.

31.3.3 Termiticide pre-treatments are required regardless of type of construction. Termite control measures are also needed when building modifications disturb the in-place termiticide barrier or when construction occurs on untreated soil.

31.3.4 Wood treated with a preservative shall be used where soil termiticides cannot be used or where wood shall be in direct contact with the soil.

Part 6: Links and Documents in Attachment to the Facility Standard



List of ATTACHMENTS

“ATTACHMENT A”	Native Landscaping Plant Material Working List	
“ATTACHMENT B”	BASE ELECTRICAL STANDARD Tinker Air Force Base, Oklahoma	<i>[Published Separately]</i>
“ATTACHMENT C”	BASE MECHANICAL STANDARD Tinker Air Force Base, Oklahoma	<i>[Published Separately]</i>
“ATTACHMENT D”	BASE SUSTAINABILITY GUIDELINES Tinker Air Force Base, Oklahoma	
“ATTACHMENT E”	Pavement Trench Detail	
“ATTACHMENT F”	Bird Proofing Facilities at Tinker AFB	

“ATTACHMENT A”

Native Landscaping Plant Material Working List

TINKER AIR FORCE BASE

TREES

<u>Scientific Name</u>	<u>Common Name</u>
Acer saccharum ‘Caddo’ * **	Caddo maple
Betula nigra	River birch
Bumelia lanuginose	Chittamwood
Carya cordiformis **	Bitternut Hickory
Carya illinoensis **	Pecan
Carya texana	Black hickory
Celtis laevigata **	Sugarberry
Celtis occidentalis **	Hackberry
Cercis Canadensis **	Eastern redbud
Cercis canadensis ‘Forest Pansy’ **	Eastern redbud.
Cercis canadensis var. texensis cult. Oklahoma **	Oklahoma redbud
Cotinus obovatus	American smoketree
Crataegus crus-galli	Cockspur hawthorn/Red haw
Diospyros virginiana	Common persimmon
Fraxinus americana ‘Autumn Purple’	White ash
Fraxinus pennsylvanica	Green ash
Fraxinus quadrangulata	Blue ash
Gleditsia triacanthos **	Honeylocust
Gymnocladus dioica **	Kentucky coffeetree

Juglans nigra **	Black Walnut
Juniperus virginiana **	Eastern red cedar
Juniperus virginiana 'Canaert'	Eastern red cedar
Juniperus virginiana 'Taylor'	Eastern red cedar
Liquidambar styraciflua **	Sweetgum
Maclura pomifera 'White Shield' or 'Pawhuska'	Osage orange
Platanus occidentalis **	Sycamore
Populus deltoides (male only) **	Cottonwood
Prunus americana	American plum
Prunus Mexicana	Mexican plum
Prunus serotina **	Black Cherry
Ptelea trifoliata	Wafer ash
Quercus falcata	Southern red oak
Quercus macrocarpa **	Bur oak
Quercus marilandica	Blackjack oak
Quercus muehlenbergi **	Chinquipin oak
Quercus prinoides	Dwarf chinquipin oak
Quercus rubra **	Northern red oak
Quercus shumardii	Shumard's oak
Quercus stellata	Post oak
Quercus velutina **	Black oak
Salix nigra **	Black Willow
Sapindus drummondii	Western soapberry
Sophora affinis	Eve's necklace
Ulmus americana 'New Harmony' **	American elm

Ulmus americana 'Valley Forge' **

American elm

Ulmus crassifolia

Cedar elm

Ulmus rubra **

Slippery elm

SHRUBS

Aesculus glabra var. arguta

Texas buckeye/Horse chestnut

Amorpha canescens

Leadplant

Ceanothus ovatus

Ceanothus

Cephalanthus occidentalis

Buttonbush

Cornus drummondii **

Roughleaf dogwood

Euonymus atropurpureus

Wahoo (Burning bush)

Hypericum spathulatum

Shrubby St. John's-wort

Ilex decidua 'Warren'

Deciduous holly

Juniperus virginiana 'Grey Owl'

Eastern red cedar

Prunus angustifolia

Chickasaw plum

Rhamnus caroliniana

Buckthorn

Rhus aromatica

Fragrant sumac

Rhus aromatica 'Gro-low'

Fragrant sumac

Rhus copallina

Shining or Winged sumac

Rhus glabra

Smooth sumac

Rhus glabra lanciniata

Cutleaf smooth sumac

Ribes odoratum

Clove current

Symphoricarpos orbiculatus

Coralberry

Viburnum rufidulum

Rusty blackhaw

Xanthocephalum sarothrae

Broom snakeweed

Yucca glauca

Soapweed yucca/Great Plains yucca

VINES

Campsis radicans

Trumpet vine

Celastrus scandens

American bittersweet

Cocculus carolinus

Snailseed/Moonseed

Parthenocissus quinquefolia

Virginia creeper

Passiflora incarnata

Passion flower

PERENNIAL FLOWERS

Achillea millefolium

Western yarrow

Asclepias tuberosa

Butterflyweed

Allium stellatum

Fall glade onion

Artemisia ludoviciana

White sage

Artemisia ludoviciana 'Silver King'

Silver King white sage

Aster oblongifolius

Aromatic aster

Baptisia australis

Blue wild indigo

Baptisia lactea

White false indigo

Callirhoe involucrata

Purple Poppy Mallow (Winecup)

Petalostemon purpureum

Purple prairie clover (Dalea purpurea 'Stephanie')

Echinacea angustifolia

Narrow-leaved purple coneflower

Echinacea pallida

Pale purple coneflower

Echinacea paradoxa

Yellow coneflower

Helianthus maximiliani

Maxmillian sunflower

Helianthus maximiliani 'Santa Fe'

Maxmillian sunflower

Hymenoxys odorata

Limonillo

Hymenoxys scaposa	Bitterweed/Plains yellow daisy
<i>Liatrix mucronata</i>	Gayfeather
<i>Liatrix punctata</i>	Dotted gayfeather
<i>Liatrix pycnostachya</i>	Prairie blazing star
Linum perene 'Blue Sapphire'	Flax
<i>Oenothera serrulata</i> (<i>Carylophus serrulatus</i>)	Half shrub sundrops
Oenothera speciosa	Showy primrose
<i>Penstemon tubaeiflorus</i>	Tube flower penstemon
Physostegia virginiana	Obedient plant
Rudbeckia fulgida	Orange coneflower
Rudbeckia fulgida 'Goldsturm'	Black-eyed Susan
Rudbeckia fulgida var. deamii	Black-eyed Susan
Solanum eleagnifolium	Silver-leafed nightshade
Solidago canadensis	Canada goldenrod
Solidago canadensis 'Golden Baby'	Canada goldenrod
Solidago missouriensis	Missouri goldenrod
Solidago rigida	Rigid goldenrod
Salvia pitcheri 'Grandiflora'	Azure blue sage
Scutellaria resinosa	Resindot skullcap/Wright's skullcap
Talinum calycinum	Rockpink Flameflower
Tradescantia bracteata	Spiderwort
Verbena canadensis	Rose verbena
Verbena canadensis 'Homestead Purple'	Homestead Purple
verbena Vernonia fasciculata	Ironweed

Zinnia grandiflora

Plains zinnia

CACTI

Coryphantha vivipara

Pin cushion cactus

Opuntia macrorhiza (compressa)

Prickly pear cactus

GRASSES

Andropogon gerardii

Big bluestem

Andropogon glomeratus

Bushy bluestem

Andropogon virginicus

Broomsedge bluestem

Buchloe dactyloides

Buffalo grass 'Cody' or 'Legacy', et al.

Bouteloua curtipendula

Sideoats grama

Bouteloua gracilis

Blue grama

Bothriochloa lageroides (saccharoides)

Silver bluestem (beardgrass)

Bothriochloa barbinodis var. perforatus

Pinhole bluestem or Cane

bluestem *Chasmanthium latifolium*

Broadleaf uniola

Chloris cuculata

Hooded windmill grass (sandy

soils) *Elymus canadensis* var. canadensis

Canada wildrye

Eragrostis spectabilis

Purple lovegrass

Eragrostis trichoides 'Mason Sandhill'

Sand lovegrass (sandy

soils) *Erianthus contortus*

Bentawn plumegrass

Panicum virgatum

Switchgrass

Panicum virgatum 'Heavy Metal'

Switchgrass

Panicum virgatum 'Prairie Sky'

Switchgrass

Schizachyrium scoparium var. frequens

Little bluestem

Schizachyrium scoparium 'The Blues'

Little bluestem

Sorghastrum nutans 'Bluebird'

Indiangrass

Sporobolus heterolepis

Prairie dropseed

Note: Tinker Air Force Base lies in Central Oklahoma/Texas Plains and Central Great Plains ecoregions. This list identifies select plants that are considered native to these ecoregions. The list is not exhaustive, but is working list of native plants that possess actual or potential ornamental merit. (Updated Jul 07)

- * Plants in **red** are suitable for use in the 10 M AT/FP setback zone
- ** Preferred trees for carbon sequestration

“ATTACHMENT B”

BASE ELECTRICAL STANDARD

TINKER AIR FORCE BASE

Note: *Document is incorporated by reference herein, but is published separately. Please contact your project POC such as the contracting officer or Air Force Project Manager as appropriate.*

“ATTACHMENT C”

BASE MECHANICAL STANDARD

TINKER AIR FORCE BASE

Note: *Document is incorporated by reference herein, but is published separately. Please contact your project POC such as the contracting officer or Air Force Project Manager as appropriate.*

“ATTACHMENT D”

Sustainability Guidelines

TINKER AIR FORCE BASE

PART 1 –GENERAL

Background:

The Energy Policy Act of 2005, Energy and Independence Security Act of 2007 and Executive Order (EO) 13693 mandate Federal agencies to lead by example, promoting sustainable Federal buildings through sound environmental and economic fiscal design, construction and operating decisions. The Federal requirements collectively are referred to as the “Guiding Principles” and are detailed in “Guiding Principles for Sustainable Federal Buildings and Associated Instructions”, February 2016. UFC 2-100-02 integrates DOD requirements with High Performance and Sustainable Building (HPSB) Guiding Principles and industry standards for high performance and sustainable buildings.

- **TAFB Requirements:**

1.1 UFC 1-200-02, dated 01-Dec-2016, applies to all planning, design and construction, renovation, repair, operations and maintenance, and affixed equipment installation in new and existing buildings, regardless of funding source, that result in DOD real property assets.

- 1.1.1** New design and construction and assessments of existing buildings larger than 5,000 SF shall comply with the UFC listed above.
- 1.1.2** For renovation, maintenance and restoration work in existing buildings, the goal is to improve the performance of the building with every investment.
- 1.1.3** Integrated design is the most important requirement in achieving a high performance building. A design team must have strong, consistent representation from all stakeholders throughout the project phases to improve building performance.
- 1.1.4** Employ collaborative, integrated planning by a design team composed of user, government support staff and appropriate professionals to establish performance goals for siting, energy, water, materials and other comprehensive design goals.

- **Tinker AFB Policy:** Every project shall address the most economic and sustainable building practice to the fullest extent possible. Sustainable practices include those elements of planning, design and construction that promote the efficient use of energy and material resources, the conservation of water and the protection of land and water environments.

- **Primary Principles:**

1.2 Design for energy efficiency – Meet the requirements of ASHRAE 90.1 for commercial buildings. Meet the requirements of International Energy Conservation Code for low-rise residential buildings.

1.3 Enhance indoor environmental quality – Meet the requirements of ASHRAE 55 and 62.1 (62.2 for low-rise residential.)

1.3.1 Specify materials and products with low or no pollutant emissions (VOCs).

1.3.2 Protect indoor air quality during construction – For new construction and renovation of unoccupied existing buildings, comply with ASHRAE 189.1 Section 10.3.1.4 with maximum outdoor air while

keeping relative humidity no greater than 60%. For renovation of occupied existing buildings, comply with ANSI/SMACNA 008-2008, 2nd Edition, *SMACNA IAQ Guidelines for Occupied Buildings Under Construction*.

- 1.3.3 Smoking is not allowed within fifty feet of building entrances, operable windows and building ventilation intakes.
- 1.4 Protect and conserve water – Meet the requirements of ASHRAE 189.1 Sections 6.3.2 and 6.4.2.
- 1.5 Employ environmentally preferable products – Use RCRA 6002 compliant products that meet or exceed EPA's recycled content recommendations, per Comprehensive Procurement Guideline at <http://www.epa.gov/>.
 - 1.5.1 Use biologically-based products whenever possible.
 - 1.5.2 Do not use ozone depleting substances or high Global Warming Potential (GWP) chemicals where other environmentally preferable products are available – Re: www.epa.gov/snap
- 1.6 In building demolition, work to divert nonhazardous waste materials from landfills through recycling.
- 1.7 Sustainability resources available online include:
 - 1.7.1 <http://www.wbdg.org/resources/sustainability-building-envelope>
 - 1.7.2 <http://www.wbdg.org/resources/sustainable-historic-preservation>
 - 1.7.3 A new (3/2017) Air Force Sustainability Requirements Scoresheet can be downloaded: <http://www.wbdg.org/ffc/af-afcec/policies-and-guidance-af-design-and-construction/AF-Sust-Scoresheet-GP-vFeb2017>
- 1.8 **Contracting Officer Primer on Green Procurement**, as issued by SAF-AQC dated 28- Apr-2011, as follows:
 - 1.8.1 **FAR 23.203**, entitled Energy-Efficient Products, states:
 - 1.8.1.1 When acquiring energy-consuming products listed in the ENERGY STAR ® Program or Federal Energy Management Program (FEMP) –
 - (i) Agencies shall purchase ENERGY STAR ® or FEMP- designated products; and
 - (ii) For products that consume power in a standby mode and are listed on FEMP's Low Standby Power Devices product listing, agencies shall –
 - (A) Purchase items which meet FEMP's standby power wattage recommendation or document the reason for not purchasing such items; or
 - (B) If FEMP has listed a product without a corresponding wattage recommendation, purchase items which use no more than one watt in their standby power consuming mode. When it is impracticable to meet the one watt requirement, agencies shall purchase items with the lowest standby wattage practicable.
 - 1.8.1.2 When contracting for services that will include the provision of energy-consuming products, agencies shall specify products that comply with the applicable requirements in paragraph (1.8.1.1) of this section.

Information is available via the Internet about -

 - (1) ENERGY STAR ® at <http://www.energystar.gov/>; and
 - (2) FEMP at http://www1.eere.energy.gov/femp/procurement/eeep_requirements.html

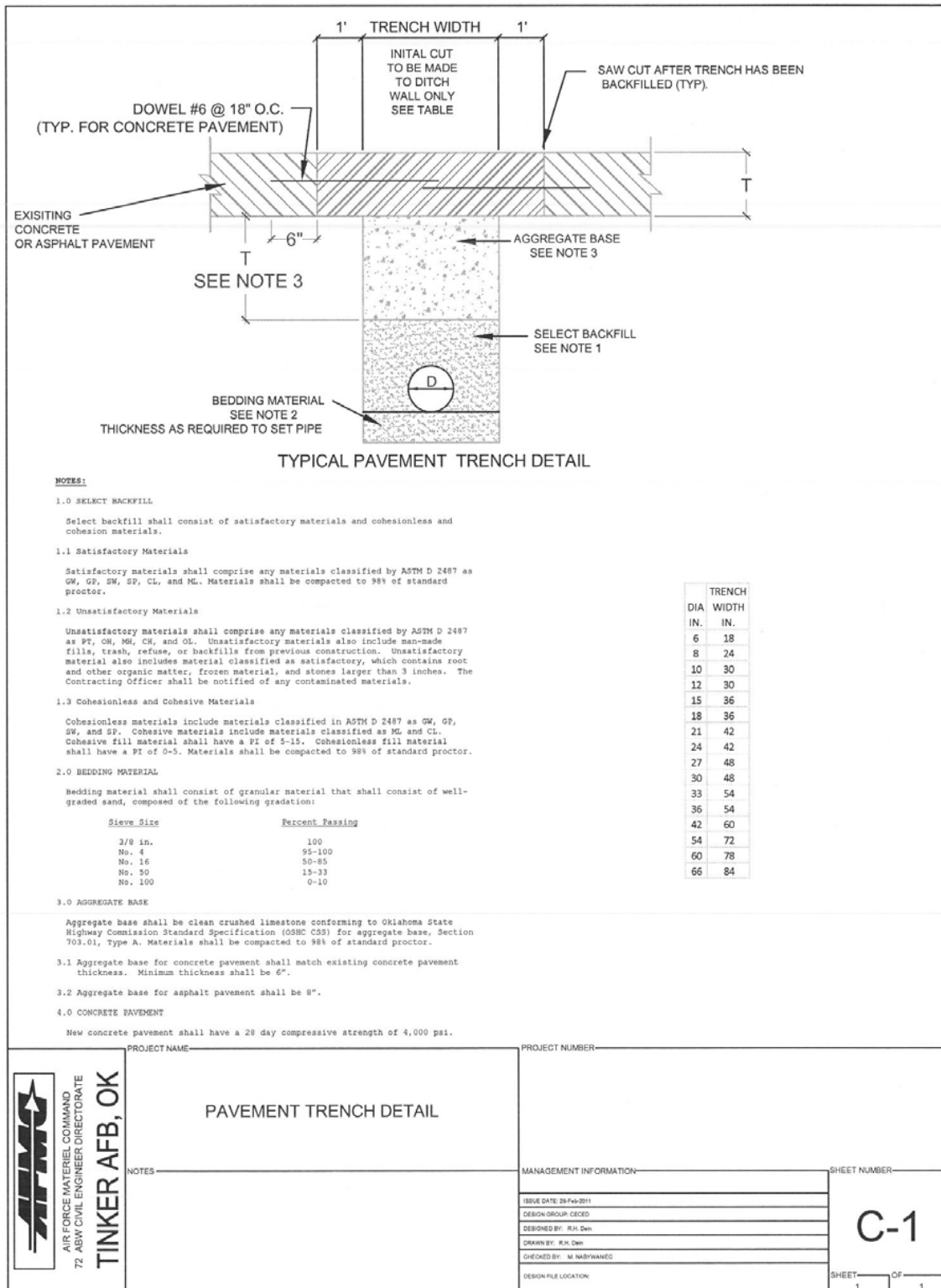
PART 2 - Definitions:

Sustainability:	Sustainable building projects integrate building materials and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. Sustainable building merges sound, environmentally responsible practices into one discipline that looks at the environmental, economic and social effects of a building or built project as a whole. Sustainable design encompasses the following broad topics: efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, reinforcement of natural systems, and integrating the design approach.
Agrifiber Products:	Composite panel products derived from agricultural fiber.
Bio-based Product:	As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials.
Bio-based Content:	The weight of the bio-based material divided by the total weight of the product and expressed as a percentage by weight.
Composite Wood:	A product consisting of wood fiber or other plant particles bonded together by a resin or binder.
Construction and Demolition Waste:	Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, and repair and demolition operations.
Major Renovation:	Construction work that is extensive enough such that normal building operations cannot be performed while the work is in progress and/or a new certificate of occupancy is required.
Recycled Content Materials:	Products that contain pre-consumer or post-consumer materials as all or part of their feedstock.
Post-Consumer Recycled Content:	The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use.
Pre-Consumer Recycled Content:	Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste stream as per Section 5 of the FTC Act, Part 260 "Guidelines for the Use of Environmental Marketing Claims":

Sealant:	Any material that fills and seals gaps between other materials.
Volatile Organic Compounds (VOCs):	Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.
Sustainable Practices:	Those elements of planning, design and construction that promote the efficient use of energy and material resources.

"ATTACHMENT E"

Pavement Trench Detail



“ATTACHMENT F”

Bird Proofing Facilities at Tinker AFB

Bird/wildlife-proofing should be accomplished on all new construction including buildings, hangars, outbuildings, lean-tos, utility poles, large drainage culverts, etc.

As a general rule, the following are not effective as longterm bird-proofing for buildings or are not preferred due to high cost and/or maintenance requirements:

- Scare devices (inflatable balloons/eyes/owls, reflective foil)
- Sonic and ultra-sonic devices
- Bird-misting
- Falconer
- Electric track repellers
- Bird gel
- Large scale netting (such as in a hangar)

The following bird/wildlife-proofing techniques should be incorporated into facility designs on TAFB:

1. Bird-proofing should focus on exclusion of birds. Permanently cover all holes, gaps, penetrations, or other openings on the outside of the building. On new construction, filling holes with rigid foam, spray foam or similar products is not considered permanent. These products often deteriorate in time or birds peck out the brittle material and gain access to the building. Covering holes should include screening vents, louvers, exhausts, intakes and similar openings.

Special attention should be given to covering openings around hangar doors and their tracks. Bird access is particularly problematic at these locations. A couple of hangars on Tinker AFB (Building 2283 and MROTC hangars) were constructed within the past 10 years, and these facilities have not experienced door-related bird access problems. From a bird-proofing standpoint, these door types are preferred. Designers should consider how these were built as they could provide insights to effective bird-proofing. Also, some hanger doors have been equipped with durable broomlike bristles to ensure that holes that must remain are inaccessible to birds when the doors are closed. Alternatively, provide removable panels which can be removed and replaced with normal means of access to and tools used by maintenance and support personnel.

2. Eliminate all ledges and other potential perching surfaces on the exterior of the building to discourage roosting and nesting. This can be done by sloping surfaces or eliminating them altogether. Bird-proofing was included in the design and construction of Building 6612 (Tinker Gate). It has not experienced bird access or roosting problems and therefore could provide bird-proofing insights to designers.

Also, eliminate or reduce interior ledges (e.g., C channels, purlins, girts on walls and roofs) to the maximum extent practical. Particular attention should be given to the upper 1/3 of the interior of the

facility. For areas where ledges cannot be eliminated, install stainless steel (not plastic or polycarbonate in whole or in part) bird spikes. These should only be used in targeted locations where bird problems have been identified post construction.

3. Netting may be an appropriate means of bird-proofing in certain instances, but this should be used with discretion and only on smaller scale areas. Netting should not be used on a large scale (e.g., to cover the entire ceiling space in a hangar). An example of a successful net installation is in the exterior “U” of Building 1 on Tinker AFB.
4. Install vinyl strip curtains on doorways or similar openings as appropriate. For these to be effective, facility users must not tie the strips to the side or shorten the strips.



Vinyl curtains installed on culvert opening to discourage entrance and nesting by swallows (effective)



Bird excreta on inflatable eyes (ineffective)



Birds nesting on inflatable owl (ineffective)

