MACDILL DESIGN GUIDE

GENERAL DESIGN GUIDELINES FOR FACILITY CONSTRUCTION AND RENOVATION

FINAL COPY
APPROVED FOR PUBLIC RELEASE

FOREWORD

The MacDill Air Force Base General Design Guidelines, reference herein as MacDill Design Guide (MDG), provides information regarding facility and infrastructure planning, design, and construction at MacDill Air Force Base (MAFB). It is not intended to be all encompassing. This is a living document and will be periodically reviewed, updated, and made available. There are additional documents that determine project specific final design and construction requirements. This document does, however, provide guidance for frequently asked questions as well as basic design elements and concepts that have evolved at MAFB. Brand names, or the basis of design (BOD) products, are often used to establish a minimum acceptable level of quality, finish, size, thickness, durability, testing agency compliance, and code compliance. Equally qualified, alternate products will be considered if the products meet or exceed all the salient characteristic attributes of the BOD. Salient characteristics shall be defined as those characteristics that specifically describe the essential physical and functional features of the material or service required. They are features that are identified in the construction documents as a mandatory requirement that a proposed "equal" product or material must possess for the bid to be considered responsive. Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors. UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide web site https://www.wbdg.org/dod/ufc.

Refer to UFC 1-200-01, *DoD Building Code*, for implementation of new issuances on projects.

NOTICE TO DESIGNERS: The designer shall be aware that any information (including information marked as as-built or record drawings) provided to the contractor or the contractor's engineer will require independent verification. The government cannot confirm that all documentation has been completed. All information provided will require independent field verification to include field surveys, soft-dig investigation, ground penetrating radar (GPR) or other means. Further, in the older developed area of the base it is highly recommended that the engineer executes a GPR survey to detect abandoned foundations that have been terminated below grade, the location of abandoned utilities or even verify the location of existing utilities. The references are not to be an inclusive list, and burden of proof remains on the Design-Build Contractor and the engineers of record (EoR).

The MDG is applicable unless otherwise noted (UON) in the specific project's documents and drawings.

This MDG supersedes MDG, dated February 2025.

MACDILL AIR FORCE BASE GENERAL DESIGN GUIDELINES

REVISION SUMMARY SHEET

Document: MacDill Air Force Base General Design Guidelines, Dated May 2025

Superseding: MacDill Air Force Base General Design Guidelines, Dated February 2025

Description: This document is an update to include Air Force and code updates to 2025 guidelines, to continue to maintain uniformity across MacDill Air Force Base and DoD components, and incorporate latest technologies, policies, and references.

Reasons for Document:

Purpose: This document provides minimum unified requirements, and guidance for planning, designing, constructing, renovating, and maintaining structures, roadways, and other components at MacDill Air Force Base.

Application: The MDG is applicable to construction projects located on MacDill Air Force Base, Tampa, Florida.

Need: The MDG is needed to bring uniformity to the construction projects on MacDill Air Force Base.

Reasons for Revision: Required update cycle. Updates are to keep within changing regulations and conditions.

Impact:

Enhanced building and installation performance, maintenance, and sustainability

Promoting sustainable resource and environmental stewardship

Improving cohesive designs

Record of Changes

Change No.	Date	Location
1	30 MAY 2025	16-20.1.1 - Additional paragraph added 16-20.1.2 - Revised Section (3) and added note 16-20.2 - Revised list of soil analysis methods Appendix I - Replaced with new document

NOTE: It will be the guide user's responsibility to carefully review the General Design Guidelines for verification of deleted / or revised information. Hardcopies printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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CHAPTER 1 INTRODUCTION

1-1 PURPOSE AND SCOPE.

MacDill AFB (MAFB) provides the information below as design guidance and serves the minimum requirements. Unless more stringent / restrictive design and construction requirements have been called for in the specific project design package documents provided by MAFB, the references below shall be used to establish a minimum level of performance.

This document, as well as all codes and other references, will change over time. It is incumbent upon the designers to verify they have the current applicable references for the project. Designers must visit the appropriate web sites to verify applicability. UFC are effective upon issuance and are distributed only in electronic media from the following source: Whole Building Design Guide (WBDG) website http://dod.wbdg.org/.

1-2 APPLICABILITY.

This MacDill Design Guide (MDG) applies to planning, design, and construction for new and renovation projects at MAFB. These criteria serve as the minimum standards for projects. This Design Guide applies to all types of construction regardless of funding, including properties listed or eligible for listing on the National Register of Historic Places, as well as National Guard and Reserve projects constructed on military installations or non-military DoD property, unless otherwise noted (UON).

The Building Official/AHJ is a person authorized and directed to enforce the provisions of this Design Guide (APPENDIX B). They have the authority to render interpretations of this Guide and to clarify the application of the provisions. Such interpretations will follow the intent and purpose of this Design Guide and will not have the effect of waiving or exempting requirements specifically provided for in this Design Guide. See APPENDIX A for acronyms used in this document.

1-3 BUILDING CODES FOR DOD FACILITIES.

The Department of Defense (DoD) has established the International Building Code (IBC), 2018, International Existing Building Code (IEBC) 2018, and all associated references as the overall general code. UFC 1-200-01, “DoD Building Code (General Building Requirements)” clarifies air force modifications to the IBC and IEBC for military construction. The architect/engineer designing on military installations must review the modifications/exclusions listed in UFC 1-200-01. See APPENDIX C.

1-3.1 Specialized Facilities

Certain specialized facilities, such as health facilities and childcare centers, carry more stringent requirements. See UFC or other criteria that are applicable to the respective specialized facility that is being designed. The onus is on the engineer of record (EoR) for incorporation of the requirements.

1-4 REFERENCES

The following requirements are listed in order of relevant priority. If there is a conflict, then the requirements will be considered in the order listed below with the highest priority listed first. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. The publication date of the code or standard is not included in this document. Unless otherwise specified, the most recent edition of the referenced publication applies. See UFC 1-200-01, DoD Building Code, UFC Hierarchy, for more information.

1. Unified Facility Criteria (UFC)
2. Facility Criteria (FC)
3. Engineering Technical Letters (ETL)
4. Air Force Instructions (AFI)
5. Unified Facility Guide Specifications (UFGS)
6. Air Force Manuals (AFMAN)
7. Air Force Handbooks (AFH)
8. Air Force Design Guides, Occupancy Specific (AFDG)
9. Other relevant references. Other technical criteria may apply and must be followed as appropriate for each project.

1-4.1 Reference (As-Built) Drawings

Reference, or As-Built, drawings provided in design solicitation packages or provided by CE, are intended only to show the original construction. Drawings are the property of the Government and shall not be used for any purpose other than that intended by the contract. All projects on MacDill are pursuant to contract clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1-5 NOTED REFERENCES

Comply with UFC 1-200-01, *DoD Building Code*. UFC 1-200-01 provides applicability of model building codes and government unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, security, high performance and sustainability requirements, and safety. Use this UFC in addition to UFC 1-200-01 and the UFCs and government criteria referenced therein. The following references will be strictly enforced:

1. UFC 4-010-01 DOD Minimum Antiterrorism Standards for Buildings
2. UFC 4-020-01 DOD Security Engineering Facilities Planning Manual
3. UFC 4-021-01 Design and O & M: Mass Notification Systems
4. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse
5. UFC 4-010-05 Sensitive Compartmented Information Facilities

Planning, Design, and Construction

6. ICS 705-1 Intelligence Community Standard (for SCIFS)
7. IC Tech Spec for ICD/ICS 705 SCIF Construction Specifications
8. MacDill AFB Traffic Control Standards (APPENDIX D)
9. MacDill AFB IFS https://www.wbdg.org/airforce/ifs/macdill-afb-ifs

1-6 ENERGY REQUIREMENTS

For compliance to energy related design guidelines, meet applicable standard requirements in the following order of priority:

1. Energy Policy Act 2005
2. Applicable USAF UFCs and ETLs
3. Florida Building Code, latest version, Chapter 13.
4. MacDill Air Force Base Energy Management Policy
5. UFC 1-200-02, High Performance and Sustainable Building Requirements, including Guiding Principles Compliance (GPC) certification using either the United States Green Building Council (USGBC) or Green Building Initiative (GBI) GPC Certification, when specific criterion and thresholds are met as outlined in UFC 1-200-02. Refer to https://www.wbdg.org/FFC/AF/POLICY/AGram_17-01.pdf for guidance and minimum program requirements.

1-7 MACDILL REGIONAL REQUIREMENTS

MAFB, due to its location and unusually severe climate conditions, requires the design and construction to comply with the following to reduce long term repair and maintenance costs:

1. The latest edition of the Florida Building Code (FBC), Chapter 13, Energy.
2. The latest edition of the FBC, Exterior claddings, attachments, and appurtenances shall meet Miami-Dade Notice of Acceptance (Miami-Dade NOA) requirements. This includes openings such as doors, louvers, and windows.

1-8 RESTRICTED DOCUMENTS

Some documents referenced are marked “Controlled Unclassified Information” (CUI) or the older designation of “For Official Use Only” (FOUO). If restricted documents are needed for the design, please notify the designated point of contact (POC) for assistance.

CHAPTER 2 CIVIL

2-1 GENERAL

2-1.1 Base Civil Engineer (BCE) Work Clearence Request (AF Form 103)

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

All base utilities shall have been marked by the Base Civil Engineer (CE) Shops and Utility Companies. The utility marking shall be protected, and any required remarking may result in additional cost to the requestor of the markings.

2-1.2 Base CE Support Requests

To schedule and properly request Base CE Support for items such as utility outages and support for Base associated equipment use complete the attached request for CE Support Request. The request must be submitted 14 days prior to the action. All outage requests must be accompanied with a Public Service Announcement (PSA) and shall include impacts to the base populace and facilities with any work around in place.

2-1.3 Temporary Airfield Construction Waiver

Projects on the airfield need to obtain / coordinate a Temporary Airfield Construction Waiver through Planning prior to start of the project, preferably at least 60 days prior to construction start.

2-1.4 Federal Aviation Administration Form

Projects utilizing a crane need to have a Federal Aviation Administration (FAA) Form 7460-1 completed prior to crane mobilization. An aeronautical determination by the FAA is mandatory for all cranes and should be coordinated through the Planning Department at 6 CES at least 45 days prior to mobilization.

2-2 SURVEYING STANDARDS AND CLASSIFICATIONS.

This section specifies two categories of existing condition land surveys and the minimum content and standards of care to be executed for each, including the description and intent of possible sub classifications where such exists. These categories are ‘Topographic Surveys’ and ‘Property and Encumbrance Surveys’.

Where a survey work element identifies more than one possible sub classification, this shall intend a single deliverable containing the combination of all identified content.

Multiple deliverables will be explicitly identified within the project scope of work along with their respective content sub classifications.

2-2.1 Topographic Surveys

Standard of care reference is United States Army Corps of Engineers (USACE), Engineering Manual (EM) 1110-1-1005, “Control and Topographic Surveying”, latest date.

The project scope of work may include detailed specifications for survey deliverables, which shall take precedence over any other stipulated minimum requirement or referenced standard. If no detailed specification is provided in the project scope of work, then EM 1110-1-1005 Appendix D-2, “Generic Topographic Survey Specifications for a Task Order (Military Project)” shall govern.

Sub-classification of this survey category, including description of intended content, shall be as specified in EM 1110-1-1005 section I “Types of Surveys”.

Resource website: http://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/

When stipulated, Subsurface Utility Investigation and Exploration (SUIE) surveys shall include physical exposure of each utility at sufficient intervals to determine the full vertical traverse of utility. When observation is complete, every opened pit shall be backfilled with Florida Department of Transportation (FDOT) Flowable Fill to existing grade, or to bottom of existing pavement structure. Where pits occur in existing pavement, the horizontal extent of observation pits shall be minimized to the maximum extent possible. Asphalt concrete pavement shall be filled to grade with either hot-mix or cold patch asphalt concrete. Portland cement concrete (PCC) pavement shall be filled to grade with PCC of f'c 3000 psi minimum.

2-2.2 Property and Encumbrance Surveys

Standard of care reference is American Land Title Association / American Congress on Surveying and Mapping (ALTA/ACSM) “Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys”, latest date.

This survey category contains no sub-classifications. Minimum content shall include elements of work marked on ALTA/ACSM Table A “Optional Survey Responsibilities and Specifications”, which is to be made a part of the project scope of work.

2-2.3 Survey Deliverables

Deliverables shall comply with the Tri-Service Standards (Architect/ Engineer/ Construction (A/E/C) Computer-Aided Design (CAD) Standards, Engineer Research and Development Center (ERDC) / Information Technology Laboratory (ITL) TR-09-2), as well as other minimum drawing requirements contained in the project scope of work.

Resource website: https://cadbimcenter.erdc.dren.mil/

The submission of all deliverables shall include at least one physical copy bearing the original signature and seal of a State of Florida, Licensed Professional Surveyor. The conditions and limitations placed on a deliverable's endorsement shall not diminish the specified standard of care.

2-3 AIRFIELD PAVEMENTS

2-3.1 General

All design, construction, materials, means and methods shall be in accordance with U.S. DoD, WBDG, UFC and UFGS including but not limited to:

a. UFC 3-260-01 Airfield and Heliport Planning and Design
b. UFC 3-260-02 Pavement Design for Airfields

If UFC and/or UFGS do not provide sufficient instruction, then design, construction, materials, means and/or methods shall be in accordance with U.S. Dept. of Transportation, FAA manuals and circulars including but not limited to:

a. AC 150/5300-13 Airport Design
b. AC 150/5320-6 Airport Pavement Design and Evaluation
c. AC 150/5370-10 Standards for Specifying Construction of Airports

2-3.2 Airfield Asphalt Concrete Pavement

Airfield Asphalt Concrete Pavement (ACP) shall be U.S. Dept. of Transportation, FAA, AC 150/5370-10 Standards for Specifying Construction of Airports, Item P-401 Hot Mix Asphalt (HMA) Pavements over Item P-208 Aggregate Base Course.

2-3.3 Airfield Portland Cement Concrete Pavement

Airfield PCC pavement shall be FAA AC 150/5370-10, Item P-501 PCC Pavement over Item P-208 Aggregate Base Course.

2-3.4 Airfield Markings

All marking paint shall be lead free water-borne paint in accordance with Federal Specification TT-P-1952, Type II 'Fast Dry, High Humidity Formula'.

All markings shall be treated with glass beads in accordance with Federal Specification TT-B-1325 'Beads, Retroreflective', use Type I Gradation A for all markings.

2-4 SITE DEVELOPMENT AND OTHER PAVEMENTS

The requirements and instruction of the MacDill AFB Traffic Control Standards made an APPENDIX D MACDILL AFB TRAFFIC CONTROL STANDARDS and MAFB IFS hereto shall take precedence over any other instruction.

2-4.1 Florida Department of Transportation Standards

All design, construction, materials, means and methods shall comply with FDOT standards including but not limited to:

a. Standard Specifications for Road and Bridge Construction
b. Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System
c. Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Greenbook)
d. Construction Project Administration Manual (CPAM)
e. Drainage Design Guide
f. Drainage Manual
g. Traffic Engineering Manual
h. Manual on Uniform Traffic Studies
i. Minimum Specifications for Traffic Control Signals and Devices

2-4.2 Roadways and Parking Lots

All roadway and parking lot traffic control devices, markings and signage shall be in accordance with the Military Surface Deployment and Distribution Command, Transportation Engineering Agency (SDDCTEA), Pamphlet 55-14 Traffic Engineering for Better Signs and Markings. If SDDCTEA Pamphlet 55-14 does not provide sufficient instruction, then same shall be in accordance with U.S. Dept. Of Transportation, Federal Highway Administration (FHWA), Manual on Uniform Traffic Control Devices (MUTCD). Note all marking and signage materials are to be in accordance with FDOT standards.

2-4.3 Traffic Control Signage

All traffic control signage shall be in accordance with the MacDill Traffic Control Signage Policy (See APPENDIX D).

2-4.4 Impervious Surfaces

Work on any new or expanding impervious surface (rooftop, pavement, etc.) shall meet the surface water-quality retention of stormwater runoff rainfall events. Provisions shall be incorporated to infiltrate to ground and/or filter this retained volume in accordance Southwest Florida Water Management District under the provisions of Chapter 373, Florida Statues and the Rules contained in Chapter 62-330, Florida Administrative Code. The Designer shall make all attempts to avoid designing a “wet pond” within MacDill AFB due to potential wildlife impacts on the airfield.

Construction of any new impervious surface (rooftop, pavement, etc.) shall require storm water runoff detention so that the FDOT 5- and 25-year, 24-hour, frequency event post development peak runoff rates do not exceed predevelopment rates.

Construction of any new structure or addition thereto upon completion of lowest floor rough surface shall require the submission of an Elevation Certificate (FEMA Form 086-

0-33) in accordance with the instructions of the U.S. Dept. of Homeland Security, Federal Emergency Management Agency (FEMA). The certificate shall be signed and sealed by a State of Florida Professional Land Surveyor. No further building work may be executed until a completed Elevation Certificate has been submitted to and approved by the Government.

2-4.5 Vibratory Compaction

Vibratory compaction is prohibited within MacDill AFB, all compaction requirements shall be met via oscillating type equipment and/or static rolling.

2-5 ADDITIONAL REQUIREMENTS

2-5.1 Pavements

All pavements shall have a design life of FDOT Standard Specifications Section 334, Traffic Level C.

2-5.2 Curbs and Gutters

New curb work shall be FDOT Type F, A (mountable), or Valley according to location unless work is part of and/or integral to an existing other type, in which case work shall match existing. See APPENDIX D MACDILL AFB TRAFFIC CONTROL STANDARDS and the MacDill IFS.

All roadway gutters and inlets shall be designed for an FDOT 10-year frequency event minimum peak runoff rate.

2-5.3 Cross Culverts, Open Ditch, and Canals

All cross culverts, open ditch and canals shall be designed for an FDOT 10-year frequency event minimum peak runoff rate.

2-5.4 Storm Water

2-5.4.1 Storm Water Networks

All storm water conveyance networks and ponds shall provide one foot freeboard minimum at their design frequency.

All storm water network structures and conduit shall be cement concrete. Structures, frames, grates, and covers shall be capable of supporting American Association of State Highway and Transportation Officials (AASHTO) H-20 loads. Cement concrete pipe with three or more feet of cover shall be FDOT Class III. Cement concrete pipe with less than three feet of cover shall be FDOT Class V.

2-5.4.2 Storm Water Structures

All storm water structure covers shall have the text 'STORM' integrally cast into the top.

All storm water outlet control structures shall be fitted with a skimmer in accordance with Watershed Management District specifications, as well as a four (4) inch thick PCC ground skirt extending the full horizontal limit of skimmer.

2-5.5 Inverted Roadway Crowns

Inverted roadway crowns are prohibited.

2-5.6 Reclaimed Asphalt Pavement

Reclaimed Asphalt Pavement (RAP) content shall be limited to 30 percent.

2-5.7 Utility Coordination

Open cutting of utility pathway through existing roadway pavements is prohibited. Whenever open cutting of an existing pavement (roadway, parking, or other) is specifically permitted, then backfill shall be completed entirely with FDOT Flowable Fill.

2-5.8 Sidewalks

New sidewalks shall be provided with FDOT compliant curb ramps and detectable warnings. Detectable warnings shall be black in color. See APPENDIX D MACDILL AFB TRAFFIC CONTROL STANDARDS and the MacDill IFS.

Partial demolition of existing pavement and sidewalk shall follow existing pavement joints to the maximum extent practical.

2-5.9 Structural Welds

All welds shall be inspected by an independent inspector.

CHAPTER 3 LANDSCAPE ARCHITECTURE

3-1 GENERAL

3-1.1 MacDill Air Force Installation Facility Standards

Refer to the MAFB IFS for landscaping requirements at MAFB. See https://www.wbdg.org/airforce/ifs/macdill-afb-ifs.

3-1.2 Antiterrorism and Force Protection Measures

UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, Standard 2 for unobstructed space: It is assumed that aggressors will not attempt to place explosive devices in areas near buildings where these explosive devices could be visually detected by building occupants observing the area around the building. Therefore, ensure that obstructions within 10 meters (33 feet) of inhabited buildings or portions thereof do not allow for concealment from observation of explosive devices 150 mm (6-inches) or greater in height. This does not preclude the placement of site furnishings or plantings around buildings. It only requires conditions such that any explosive devices placed in that space would be observable by building occupants.

For existing buildings where the standoff distances for parking and roadways have been established at less than 10-meters (33-feet) IAW UFC 4-010-01, the unobstructed space may be reduced to be equivalent to that distance.

Plant growth should not allow for the concealment of explosive devices for up to three years from the planting date. Selected plant growth should be such that quick visual detection of a potential explosive device is possible through the plant growth. Also, remember everything around a facility becomes part of the blast when it occurs.

3-1.3 Mowing Strips

Mowing strips installed around new construction shall be concrete.

3-2 PLANT SELECTION

3-2.1 General Guidance and Regulations

See the list of plants suitable for MAFB compiled as part of the IFS.

The Florida Cooperative Extension Service (University of Florida) publications website (http://edis.ifas.ufl.edu/topic_landscape_plants) is a good source of information for landscaping in Florida. Utilize xeriscape plantings using Florida native plants where possible.

White House memorandum #W50737 (dated 26 April 1994) mandates the use of regionally native plants at federal installations. Exotic species are not authorized.

3-2.2 Climate and Regional Considerations

Plants must be tolerant and capable of withstanding the full range of potential climate conditions located in south, central Florida. Select plants that require little or no maintenance (trimming/shaping). Consider the plant's mature size. Consider the sun and shade conditions where each plant is to live—most plants have very specific sun and shade requirements. Avoid planting vegetation in medians, UON.

3-2.3 Military Family Housing, CDC, and Youth Centers

Poisonous plants and plants with thorns are not authorized in Military Family Housing areas. Plant selections for Child Development Centers (CDC) and youth centers will require additional guidance. Coordinate with CES for project specific information.

3-3 SOIL QUALITY, GROUND COVER, AND MULCHING

3-3.1 Soil Quality

Soil quality is consistent across the base. It is very sandy, which means excellent drainage and little organic content. Remember that shoreline areas have increased soil salinity and saltwater spray.

3-3.2 Ground Cover

3-3.2.1 Grasses

Site areas disturbed because of construction shall be re-sodded with Argentine Bahia sod unless the site has special sod requirements.

Seeding with grass and cover crop seed may be permitted in remote locations if prior approval is obtained from the contracting officer. The contractor shall assure good growth and at least 90% coverage after 3 months. In order to prevent erosion, the contractor shall provide mulch in potential erosion prone areas. Any site erosion within a 3-month period following the installation shall be repaired and the area reseeded (or sodded).

3-3.2.1.1 Argentine Bahia Grass (preferred, UON):

- Excellent drought tolerance
- Requires little or no maintenance after it is established
- Poor salt tolerance

3-3.2.1.2 St. Augustine Grass:

- Requires irrigation
- Highly tolerant to soil salinity

3-3.2.1.3 Seashore Paspalum

- For ditch banks, shoreline, and wet areas

- Excellent salt tolerance

3-3.3 Rock Beds

All rock beds shall be treated with a pre-emergent herbicide and then top-dressed with 10 ml of weed fabric.

3-3.4 Plant Beds

All plant beds and tree rings shall be treated with a pre-emergent herbicide and then top-dressed with 3-inches cypress mulch. All new trees shall have a tree ring with a minimum of 24-inch radius. All new trees and palms shall be staked. All existing trees to remain shall have a 6-foot radius mulch ring at a depth of 3-inches.

Shredded cypress mulch is normally installed in a 3-inch layer in all plant beds, except in certain areas near the flight line because of Foreign Object Debris (FOD). Coordinate with Airfield Operations for landscaping near the airfield perimeter.

Provide an 18-inch-wide mulch area between a building and its foundation planting.

3-4 IRRIGATION

3-4.1 Irrigation Systems

Install only temporary irrigation system to establish sod, tree, and/or flowers initial growth. Only install a permanent irrigation system if required per the project statement of work. All irrigation systems will require a backflow device.

3-4.2 Irrigation Meters

Install water meter on the irrigation systems to measure the amount of potable water used. Meters must meet the same requirements as for potable water services and shall be remote readable from Emergency Management and Control System (EMCS) or automated meter reading program.

CHAPTER 4 INTERIOR ARCHITECTURE

4-1 GENERAL

Government provided project documents are not assembly drawings or instructions. The sample list below outlines the many items a successful design/build or design/bid/build contractor is expected to be able to expertly perform. In addition, the Contractor must adhere to UFC 1-200-01, DoD Building Code, UFC 3-101-01, Architecture, UFC 3-120-10, Interior Design, and Architectural Barriers Act (ABA) Standards.

4-1.1 Minimum Standards for Demolition

All demolition of existing materials for access to concealed or obstructed elements, such as plumbing, will require that the demolished material be replaced with matching or like-kind material (i.e., CMU with CMU or plaster with plaster), UON.

Government has the first right of refusal for equipment, furnishings, etc. After coordination with the Contracting Officer, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor, and shall be removed from Government property.

Prior to any demolition (e.g., saw cutting), a thorough investigation and verification of existing conditions must be performed to avoid damage to concealed elements such as electrical, plumbing, fire sprinklers, and gas lines.

4-1.2 Minimum Standards for Construction and Installation

a. Install all items or elements level, true, plumb, square, true to line without warping, binding, kinking, bends, or twisting.
b. Anchor and adhere items or elements securely.
c. Sealants and weatherproofing must be appropriate for substrates, joints, and specific conditions.
d. Clean and protect items or elements from damage.
e. Equalize margins.
f. Scribe and trim neatly eliminating burrs, snags, and splits.
g. Protect existing elements from damage.
h. Protect new work and ‘existing to remain’ from damage, soiling, or pilfering.
i. Verify that substrates are in appropriate condition prior to installing new materials such as moisture content, cleanliness, primer, and temperature.
j. New material shall be acclimated to jobsite conditions.
k. Verify that room temperature and humidity are correct for intended work.

l. Fill and seal all annular spaces around pipes, ducting, and various penetrations with appropriate materials such as behind plumbing escutcheons, trim, and flanges. Underwriter Laboratories (UL) listed foams/sealants are required where penetrations of rated assemblies occur.

m. Use the correct type and length of fasteners for any application. When a fastener is used to anchors an item located in an area subject to moisture exposure, the hole into which the fastener is installed shall be filled with sealant prior to fastener insertion and the fastener system shall be stainless steel.

n. Install appropriate solid blocking in walls and ceilings to support various attachments.

o. Final cleaning, dusting, polishing, touch up, and adjustments are required.

p. Properly brace tops of walls where door jambs are located to provide solid, vibration-free door operation.

q. Fill, seal, finish all gaps, cracks, and seams with appropriate materials such as filling the gap between the suspended ceiling perimeter angle and the wall, the gap between the water closet and the floor, the gap between the door frame and the wall, and the gap between cabinetry and the wall, perimeter joint at windows, grills, louvers and so forth.

r. All visible surfaces, except concrete walkways, roofs, factory finished items and glazing, shall require, as a minimum, a painted finish (i.e., appropriate prime and preparation with a minimum three brush applied coats of paint).

s. Install transition strips of appropriate material at all floor finish changes. Tile to tile may require an accent tile to accommodate color transitions.

t. Wax, buff, polish, and burnish all vinyl composite tile (VCT) flooring as part of final cleaning and protect until final acceptance.

u. Typically, the distance from a gypsum board wall 90-degree corner to the edge of a door frame/trim should be 2 to 3-inches.

v. All edges of visible elements are expected to be finished and sealed even though that edge may not be readily visible such as tops and bottoms of doors.

w. As appropriate for any given material, finishes shall be of maximum coating thickness, durable, scrubbing tolerant, cleanable, soiling resistant, low maintenance, and mold and mildew resistant.

x. All materials are to be asbestos and lead free.

y. All interior windowsills should be solid surface, UON.

4-1.3 Removal of Existing Slab

Removal of any existing slab on grade requires the treatment of the exposed soil with properly applied Termidor Termiticide, and installation of a minimum 6 mil vapor barrier prior to slab replacement.

4-1.4 New Openings in Existing CMU Walls

New door openings in existing concrete masonry unit (CMU) walls shall require new precast lintels for support of the remaining wall, and the new lintel must be tied into the existing wall with filled cells and #5 rebar continuous vertically minimum. The designer of record shall provide specific requirements.

4-1.5 Plumbing Wet Walls

All plumbing wet walls are to be 6-inches thick to allow room for fixture carriers and piping. This may require demolishing existing walls for renovated spaces to accommodate the 6-inch wall.

4-1.6 Material Country of Origin Requirements

Materials, assemblies, and products shall be American made, and shall comply with all appropriate requirements of the Federal Acquisition Regulation (FAR).

4-2 WOOD & PLASTICS

4-2.1.1 Cabinetry

Custom built cabinetry shall be all plywood construction. Wet location approved particle board may be used for cabinet doors only if laminate selection dictates. Cabinets shall, as a minimum, be constructed as specified, and shall meet the requirements of Architectural Woodworking Institute's Architectural Woodwork Quality Standards (AWI AWS) latest edition for premium grades of interior architectural woodwork, construction, finishes, and other requirements, and shall be test report verifiable.

Wall and base cabinet assemblies shall consist of individual units joined into continuous sections. Fastenings and anchorage shall be accomplished to permit removal and replacement of individual units without affecting the remainder of the installation.

Drawers shall be removable, equipped with extra heavy duty, full extension guides, and shall be equipped with position stops to avoid accidental complete withdrawals. Shelves shall be ¾-inches thick minimum and be fixed or adjustable as indicated. Cabinetry construction is typically flush overlay.

Cabinet door hardware shall be premium grade and allow for multi directional adjustments.

4-2.1.2 Countertops

Solid surface, granite, and/or quartz shall be chosen from manufacturer's full range of colors, UON. Countertops shall have minimum 4-inch-high back splashes.

4-2.1.3 Chair Rails

Conference rooms shall have a wood chair rail at the perimeter of the space. The chair rail is a minimum 5-inches high with a 1 ½ -inch projection. Wood shall be premium grade with a site applied stain. Color will be determined per project basis.

4-3 SOUND ATTENUATION MATERIAL

Gypsum board walls required to be sound attenuated shall be filled with mineral wool batts, 2.0 pcf density, UON. Fiberglass batts are not acceptable due to density deficiencies.

Specific Sound transmission Coefficient (STC) requirements shall dictate exact construction.

4-4 INTERIOR PARTITION CONSTRUCTION

4-4.1.1 General

Typically, interior gypsum board walls shall be floor to deck above, and be constructed of one layer of 5/8-inch, Type X gypsum board on each side of 3-5/8-inch, 24-gauge, galvanized steel studs at 16-inches on center maximum. Attachment must be according to the US Gypsum Association as well as the building code, minimum.

Walls which do not extend to the deck above shall terminate at 12 inches above the highest adjacent wall.

4-4.1.2 Gypsum Board Requirements

Gypsum board wall finish shall be Level 5, UON.

American Society for Testing and Materials (ASTM) requirements must be followed to achieve the specified STC.

Gypsum board shall be installed according to manufacturer specifications and ASTM C 840-99.

4-4.2 Imported Board

Imported board is not allowed.

4-4.2.1 Wet Areas

All wet areas subject to water build up, splashing, condensate, or tile require Dense Shield or cement board. Green board can be allowed when not subject to the preceding conditions.

4-4.2.2 Surface Mounted Conduit

Surface mounted conduit is not permitted for new work, excluding mechanical/electrical rooms, UON. Recess fixtures as permitted by code.

4-5 INTERIOR DOORS, FRAMES, AND HARDWARE

The designer and the user must review all functions and determine master keying requirements. The review cannot occur later than the 65% design review.

The designer must provide a complete door hardware and accessories schedule as well as cut sheets for all items. This information must be carefully reviewed with the user no later than the 65% design stage.

Doors, frames, and hardware maybe required to meet fire door requirements based on all applicable current fire codes, NFPA, and DoD Regulations.

4-5.1 Wood Doors

Typically, interior wood door slabs shall be 1 & ¾-inch thick, solid core, particleboard core, 1LD2, 32 lbs/cu ft, hardwood rails & stiles, birch veneer, white birch, (all sapwood), custom grade, stain grade, and book matched.

4-5.2 Steel Doors

The BOD for interior steel doors shall be as manufactured by Steelcraft. Slabs to be 16 gauge, cold rolled G60 galvannealed steel, seamless with appropriate foamed insulated core to enhance sound control. Doors shall be factory primed / American Nation Standards Institute (ANSI) a224.1.

4-5.3 Steel Frames

The BOD for steel frames shall be as manufactured by Steelcraft, 16 gauge, G60 galvannealed steel, and primed for jobsite finishing. Reinforce at all hardware locations with galvannealed steel: 7 gauge at hinges; 14 gauge at strike. Kerfed frames for gasketed sound and air infiltration control. Poured top cap for outswing doors. Doors must have closer reinforcement.

4-5.4 Hardware

4-5.4.1 Hinges

Hinges must be heavy duty, 5 knuckle, stainless steel base metal and finish with NRP. Best hardware: 45H Series; interchangeable cores; stainless steel base metal lever style 14 (new #15 lever); escutcheon J; compatible strike; 630 satin stainless steel.

4-5.4.2 Lockets and Cores

Hardware must be able to accept the Best cores that are MacDill standard requirements. All proposed hardware schedules must be reviewed by the base

locksmith for compliance as well as keying. The base is to receive three blank keys per lock.

Lock sets and cores shall be purchased by the contractor. The contractor shall install lockable construction cores to be used during the construction phase. After the facility is accepted by the base, the base locksmith will remove the construction cores and install the Best cores, which have been provided under the construction contract. UON, the final cores are to be sent directly to the base locksmith from the manufacturer. For projects with 80 or more doors, the contractor must supply a certified hardware installer under the employ of an Architectural Hardware Consultant (AHC).

4-6 CERAMIC AND PORCELAIN TILE

All tile work shall be performed only by companies that are members of the Tile Council of America and shall comply with the latest Tile Council of North America (TCNA) installation handbook.

Do not install porous surfaces in high traffic areas.

Use lower absorption level tiles to have a greater resistance against stains.

Install larger tiles, 12-inch x 12-inch in high traffic areas to minimize grout lines.

4-6.1 Tile

BOD for public areas shall be Daltile 12-inch x 12-inch. Continental Slate, color Asian Black, UON. The base should typically match the tile and be 4-inches tall.

Restroom floor tile BOD shall be Daltile Mosaics Unglazed Porcelain Keystones, 2-inch x 2- inch top range of cost chart, UON. Exact color TBD.

Restroom wall tile BOD shall be Daltile 4-inch x 4-inch wall tile, semi-gloss, Biscuit K175 with cove base and bullnose tiles. A three-tile accent border/band consisting of three additional, different color tiles installed in checker-board fashion will be required starting at 5 feet above the finished floor, UON.

4-6.2 Grout

All floor tile grout shall be pigmented Laticrete Spectralock Pro Grout (epoxy grout), UON or approved as equal.

4-7 LUXURY VINYL TILE

The wear layer (protective clear layer) and polyurethane coating of 28 mil and above are appropriate for use in heavy-use traffic environments.

The wear layer and polyurethane coating provides resistance to stains, scratches, and scuffing. There is no need for waxing, polishing, and chemicals for cleaning and maintaining.

BOD shall be Shaw Industries Group Luxury Vinyl Tile (LVT)

4-8 CARPET

All work to be performed by contractors/installers who are Certified Floor covering Installers (CFI) from the International Certified Flooring Installer Association or manufacturer approved installer.

All carpeted areas must conform to 16 CFR Part 1630, Standard for the Surface Flammability of Carpets and Rugs (FF 1-70) (pill test) and performance characteristics and 28 CFR 36, Nondiscrimination on The Basis Of Disability By Public Accommodations And In Commercial Facilities.

Federal agencies are required by law, Executive Orders (EO), FAR, Defense Federal Acquisition Regulation (DFAR), and Air Force Policy to consider environmentally preferable products ETL 07-04: Air Force Carpet Standard.

Provide low volatile organic compound (VOC) products for carpet, adhesives, sealants, and carpet cushions.

Install solid-colored carpets only in commanders' suites, chapels, Distinguished Visitor (DV) suites, and family housing units or as borders.

BOD shall be Shaw Connect Tile, Style 59342, color; Harbouring Desire, color 40485, multi- level pattern loop, with SSP monolithic installation. The wall base should typically be Johnsonite 1/8-inch-thick vinyl and be 4-inches high.

Static free Carpet: Computer Room, etc.

Upon completion of the work, provide the user with replacement carpet tiles at the rate of 2 percent of the total installed area. Coordinate delivery of these tiles with the construction inspector.

4-9 INTERIOR PAINT

All surfaces exposed to view must be properly primed and painted. This includes some items which may be factory finished, but not be of the appropriate color. Dark bronzed finishes are specifically excluded as well as any Kawneer exterior doors.

New paints and coatings BOD shall be low VOC as manufactured by Sherwin Williams.

Typically, interior paint colors should be a subtle off white (Sherwin Williams Divinity White) or light grey (Sherwin Williams Bradley Gray) depending on the interior color scheme. Trim colors are Sherwin Williams Harbor Grey, Rodin Grey, Worsted Tan, and Architectural Brown. Exact color must be verified with user via color submittals.

4-9.1 Partial or Spot Painting

Partial or spot painting is not acceptable. If part of a surface requires painting, then the entire surface will have to be painted or repainted to reach a corner or a different material.

4-9.2 Paint Categories

Paint categories are listed below (drawdowns to be submitted for all paints/colors):

P1: Interior gypsum board walls, both new and patched, interior gypsum board soffits, ceilings, except in wet areas, and interior exposed concrete elements. Three coats, brush or roller, minimum over properly prepared and primed substrate with color to be determined by exact location.

Eg-Shel Finish

a. 1st Coat: S-W ProMar 400 Zero VOC Latex Primer, B28W04600 (4.0 mils wet, 1.1 mils dry)

b. 2nd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel, B20-4600 Series

c. 3rd Coat: S-W ProMar 400 Zero VOC Latex Eg-Shel, B20-4600 Series (4.0 mils wet, 1.3 mils dry per coat)

P2: Interior wood trim, wood shelves, wet area gypsum board walls, ceilings, janitor closets, storage rooms, electrical, mechanical, communication, interior steel doors, interior steel door frames, and interior steel window frames. Three coats, brush, minimum over properly prepared and primed substrate with color to be determined by exact location.

Single-Component Acrylic Epoxy System, Semi-Gloss Finish

a. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W2600 (4.0 mils wet, 1.0 mils dry)

b. 2nd Coat: S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150

c. 3rd Coat: S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150 (4.0 mils wet, 1.5 mils dry per coat)

P3: Three coats, brush applied, minimum over properly prepared and primed substrate, color to be determined by exact location. This application includes elements/areas such as exterior sheet metal, flashings, and parapet caps.

Acrylic High-Performance System, Semi-Gloss Finish

a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B28W08111 (5.0-10.0 mils wet, 2.0-4.0 mils dry)

b. 2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss, B66-650 Series

c. 3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss, B66-650 Series (6.0-12.0 mils wet, 2.5-4.0 mils dry per coat)

P4: Cement stucco, exposed concrete, and generally the exterior of the entire building vertical and horizontal appropriate surfaces. Three coats, brush or roller, minimum over properly prepared and primed substrate with color to be determined by exact location.

Acrylic System, Flat Finish

a. 1st Coat: S-W Loxon Concrete & Masonry Primer/Sealer Interior/Exterior Latex, A24W8300 (8.0 mils wet, 3.2 mils dry)

b. 2nd Coat: S-W Resilience Exterior Latex Flat, K42 Series

c. 3rd Coat: S-W Resilience Exterior Latex Flat, K42 Series (4.0 mils wet, 1.56 mils dry per coat)

P5: Exterior steel doors, exterior steel frames, interior & exterior steel railings, exterior steel grills/louvers, downspouts and brackets, and miscellaneous steel. Three coats, brush only, minimum over properly prepared and primed substrate with color to be determined by exact location.

METAL (Steel Doors & Frames, Steel Railings, Steel Grills/Louvers, Downspouts & Brackets, Steel Miscellaneous),

Single-Component Water based Urethane System, Gloss Finish

a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B28W08111 (5.0-10.0 mils wet, 2.0-4.0 mils dry)

b. 2nd Coat: S-W HydroGloss Single Component Water based Urethane, B65W181

c. 3rd Coat: S-W HydroGloss Single Component Water based Urethane, B65W181 (6.0-12.0 mils wet, 2.0-4.0 mils dry per coat)

STEEL (Doors, Frames, Window Frames)

Single-Component Acrylic Epoxy System, Semi-Gloss Finish

a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B28W08111 (5.0-10.0 mils wet, 2.0-4.0 mils dry)

b. 2nd Coat: S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150

c. 3rd Coat:S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150 (4.0 mils wet, 1.5 mils dry per coat)

WOOD (Trim, Shelves)

Single-Component Acrylic Epoxy System, Semi-Gloss Finish

a. 1st Coat: S-W Premium Wall & Wood Latex Primer, B28W08111 (4.0 mils wet, 1.8 mils dry)

b. 2nd Coat: S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150

c. 3rd Coat:S-W Pro Industrial Pre-Catalyzed Water based Epoxy Semi-Gloss, K46-150 (4.0 mils wet, 1.5 mils dry per coat)

4-10 SUSPENDED CEILINGS

Ceiling system shall be installed in strict compliance with the particular manufacturers' specifications as well as ASTM C 636-96, with the following exceptions: lay-in light fixtures and Heating, Ventilation, and Air Conditioning (HVAC) grills will be supported independently of ceiling grid; support wire shall be plumb to within 1-inch horizontal for each 12-inches vertical, 4 degrees (use steel cross members of proper size as needed to achieve this requirement).

Tiles shall be snug to grid, and the grid shall be square and level. Penetrations shall be centered in tiles and the system shall be centered within room.

Install hold down clips as noted.

Ceiling type BOD:

ACT 1 (typical): Armstrong Dune 1774; 24-inch x 24-inch x 5/8-inch; angled tegular; ASTM 1264 classification Type III, Form 2, pattern CE; white on white, Armstrong, Prelude XL, 15/16-inch exposed tee.

ACT 2: Armstrong Cortega 704A; 24-inch x 24-inch x 5/8-inch; angled tegular; ASTM 1264 classification Type III, Form 2, pattern CE; white on white, Armstrong, Prelude XL, 15/16-inch exposed tee.

Upon completion of the work, provide the user with replacement tiles at the rate of 2 percent of the total installed area. Coordinate delivery of these tiles with the construction inspector.

4-11 RESTROOM ACCESSORIES

Restrooms require complete array of accessories, to be coordinated with the user.

All mounting locations shall receive reinforcement as required to ensure secure installation of toilet accessories. Provide corrosion-resistant anchors and fasteners capable of developing a restraining force commensurate with the strength of the accessory to be mounted and suited for use with the supporting construction.

4-11.1 Showers

Showers shall have shower curtain hooks, white, vinyl shower curtains, and shower curtain rod with concealed mounting.

Accessible showers shall have solid-plastic folding seat and grab bars with concealed mounting.

4-11.2 Toilet

Toilet accessories shall be provided and installed by the contractor.

Toilet accessories will include toilet paper dispensers, waste receptacles, napkin disposal receptacles, paper towel dispensers, and soap dispensers. Dispensers must be operated by the universal plastic waffle key. Paper towel holders shall be sized to fit "Big 8" rolls and toilet paper dispensers shall be able to use "Jumbo Roll JRT" with the following considerations:

BOD: Low Profile Surface Mounted Jumbo-Roll Toilet Tissue Dispenser, Model # 0039 as manufactured by American Specialties Inc.

BOD: Surface Mounted Vertical Soap Dispenser, Model # 0347 (add -41 for PC matte black) of American Specialties Inc.

BOD: Surface Mounted End Stall Locked Sanitary Napkin Disposal, Model # 0473-1A as manufactured by American Specialties Inc.

BOD: Surface Mounted Waste Receptacle, Model # 0826 as manufactured by American Specialties, Inc.

BOD: Surfaced Mounted Roll Paper Towel Dispenser, Model # 8522 as manufactured by American Specialties, Inc.

BOD Semi-Recess Mounted Roll Paper Towel Dispenser and Disposal, Model # 046921-6 as manufactured by American Specialties, Inc.

4-11.3 Toilet Partitions

The toilet partitions and urinal screens BOD shall be No-Site Bradmar partitions as manufactured by Bradley Corporation. Install in accordance with (IAW) manufacturer's requirements. Color shall be selected from manufacturer's full range of options.

Partitions shall be floor mounted and overhead braced.

Toilet compartments shall swing outward unless ABA clearances are impeded.

Color to be S406, desert stone (to be verified at time of submittal), UON. Continuous wall brackets and color coordinated accessories are required.

4-12 SIGNAGE

Installed sign location is typically on the strike side of the room door, approximately 3-inches from the steel jamb edge and approximately 44-inches from the floor to the sign top. Signs are typically square edge.

Light Emitting Diode (LED) lighting for exit signs and bulletin boards is required.

UFC 3-120-01, “Design: Sign Standards must be consulted for latest additional requirements.

4-12.1 Interior Signage

Interior signs shall be provided for all interior rooms affected by construction. Signs shall match existing signs, UON.

Identification signage BOD shall be a product of Scott Sign Systems Inc., (www.scottsigns.com).

Interior signs identifying the men’s and women’s restrooms shall be American with Disabilities Act (ADA) compliant, ADA blue, and shall be 8-inch x 6-inch molded plaques (apmena68 and apwoma68).

Interior signs identifying all specifically designated rooms such as janitors’ closets, communication, storage, break room, electrical, conference room (two required, one at each door) shall be interior ADA appliqué, square edge, 6-inches high x 8-inches wide with ‘rm xxx’, ‘janitor closet,’ and braille. Lettering shall be 1-inch Helvetica caps lettering, stacked as needed. Clear non-glare acrylic back painted. Color to be determined (TBD).

Interior signs identifying all offices to be series s2100 with 3-inch header, ‘rm xxx’, 1-inch Helvetica and Braille with four insert slots at 1-inch high for each location. In addition to the partitioned offices, provide these signs for any open office/workstation areas. 1 slot per person/workstation.

4-12.2 Exterior Signage

Exterior signs identifying exterior accessed rooms shall be exterior photopolymer, approximately 8- inches wide x 6-inches high, 1-inch letters, with room name, room number, and Braille. Color TBD.

CHAPTER 5 EXTERIOR ARCHITECTURE

5-1 GENERAL

Government provided project documents are not assembly drawings or instructions. The sample list below outlines some of the many items that the successful design/build or design/bid/build contractor is expected to be able to expertly perform.

5-1.1 Minimum Standards for Demolition

All demolition of existing materials for access to concealed or obstructed elements, such as plumbing, will require that the demolished material be replaced with matching or like-kind material (i.e., CMU with CMU or plaster with plaster), UON.

Prior to any demolition (e.g., saw cutting), a thorough investigation and verification of existing conditions must be performed to avoid damage to concealed elements such as electrical, plumbing, fire sprinklers, structural components, and gas lines.

5-1.2 Minimum Standards for Construction and Installation

a. Install items or elements level, true, plumb, square, true to line without warping, binding, kinking, bends, or twisting.
b. All attachments to building exteriors shall be kept to a minimum (e.g., chases, line set covers, etc.)
c. Anchor and adhere items or elements securely.
d. Sealants and weatherproofing must be appropriate for substrates, joints, and specific conditions.
e. Clean and protect items or elements from damage.
f. Equalize margins.
g. Scribe and trim neatly eliminating burrs, snags, and splits.
h. Protect existing elements from damage.
i. Protect new work and ‘existing to remain’ from damage, soiling, or pilfering.
j. Verify that substrates are in appropriate condition prior to installing new materials such as moisture content, cleanliness, primer, and temperature.
k. New material shall be acclimated to jobsite conditions.
l. Fill and seal all annular spaces around pipes, ducting, and various penetrations with appropriate materials such as behind escutcheons, trim, and flanges. UL listed foams or sealants shall be required where penetrations of rated assemblies occur.
m. Final cleaning, touch up, and adjustments shall be required.
n. Install appropriate type and length of fasteners for any application. All exterior fasteners shall be type 316 stainless steel, except where

specifically noted otherwise; is critically contrary to; or invalidates the warranty of a particular manufactured system or element. When a fastener anchors an item located in an area subject to water exposure, the hole into which the fastener is installed should be filled with sealant prior to fastener insertion.

o. Fill, seal, finish all gaps, cracks, and seams with appropriate materials such as the gap between the window frame and the wall, trims and walls, door frame and the wall, and all thresholds to be set in a full sealant bed.

p. All visible surfaces, except concrete walkways, roofs, and glazing, shall be, as a minimum, a painted finish with appropriate prime/preparation and minimum three coats of paint.

q. Finishes shall be maximum coating thickness, durable, scrubbing tolerant, cleanable, soiling resistant, low maintenance, and mold and mildew resistant, where appropriate, for any given material.

r. All materials shall be asbestos and lead free.

s. If existing openings are to be filled in, the filled opening must match the adjacent building construction materials and finish. Partial painting is not permitted.

t. Existing nonconforming fabric canopies are to be replaced with conforming canopies.

u. Exterior Insulation and Finish System (EIFS) is not permitted unless approved by Base Civil Engineering.

5-1.3 New Openings in Existing CMU Walls

New door openings in existing CMU walls require new precast lintels for support of the remaining wall, and the new lintel must be tied into the existing wall with filled cells and #5 rebar continuous vertically minimum. The designer of record shall provide specific requirements.

5-1.4 Exterior Envelope

The exterior perimeter envelope of the building must be completely sealed and airtight to prevent infiltration of warm humid air or exfiltration of interior air. All new penetrations must comply with this requirement.

The exterior thermal envelope of the building must be continuous and uniform, from floor slab to insulated roof deck. As needed, UL rated foamed insulation with comparable R-value must be installed to fill and seal gaps, cracks, and annular rings. When project work disturbs existing envelopes, the new work must comply with these requirements.

All exterior wall assemblies must place the insulation layer on the interior side of the structure to prevent future moisture and maintenance issues due to the hot-humid, marine climate.

5-1.5 Material Country of Origin Requirements

Materials, assemblies, and products shall be American made, and shall comply with all appropriate requirements of the FAR.

5-2 BASE STANDARD COLORS

Refer to the base Installation Facility Standards (IFS) (https://www.wbdg.org/airforce/ifs/macdill-afb-ifs) color scheme for exterior building colors (i.e., two colors: one base color and one color for roof and trim).

All colors, interior and exterior, must be submitted for Government approval.

5-3 ANTITERRORISM AND FORCE PROTECTION

Buildings will be IAW UFC 4-010-01, “DoD Minimum Antiterrorism Standards for Buildings” and UFC 1-200-01, “General Building Requirements”.

5-4 HISTORIC BUILDING DESIGNATION

Exterior features such as windows, doors, and siding are important features on our historic buildings and any changes or modifications to exterior features of a historic building are a high interest item for the State Historic Preservation Office (SHPO).

Any proposed exterior modifications of historic buildings in Table 5-1 must be coordinated with 6 CES/CEIE and will likely require consultation with the Florida State Historic Preservation Office Historic Buildings. See Table 16-2 Built Resources Inventory Table - Eligible Properties for more detailed information.

Table 5-1 List of Historic Buildings

Building Number	Description	Building Number (Cont.)	Description
11	Storage Facility	45	Fuel Station
12	Maintenance Shop	68	Storage Facility
26	Fire Station	347	Office
27	Community Facility	401	Gen Quarters
29	Maintenance Shop	402	Gen Quarters
30	Engineering Adm	403	Gen Quarters
31	Maintenance Shop	404	Gen Quarters
32	Maintenance Shop	405	Gen Quarters
33	Maintenance Shop	501	USSOCOM HQ
34	CE Storage Shed	Hangar 1	Aircraft Hangar
35	Maintenance Shop	Hangar 2	Aircraft Hangar
37	Water Tower	Hangar 3	Aircraft Hangar
41	Theater	Hangar 4	Aircraft Hangar
42	PMEL Laboratory	Hangar 5	Aircraft Hangar

5-5 EXISTING BUILDING GUIDELINES

5-5.1 Design

Representative examples of period architecture are to be preserved and used.

Rehabilitate and maintain buildings in a manner consistent with the original character. Where possible, eliminate incompatible appendages, such as exterior stairs, awnings, and canopies that were not part of the original structures.

Locate equipment (such as transformers, HVAC apparatus, telephone cabinets, dumpsters) in areas where they will have minimum detrimental effect on the appearance of existing structures. Provide screening where necessary.

Main entrances to facilities shall be designed to be readily discernible.

5-5.1.1 Additions

Limit size of new additions to be in scale with original building.

Avoid alterations that detract from the design integrity of a building or that negatively impact adjacent buildings.

When possible, locate additions to form spaces, develop views, or screen poor views as described under guidelines for new construction.

Locate additions to minimize intrusions on character defining features such as massing, rhythm, setbacks, elevations, rooflines, or primary entrances.

5-5.1.2 HVAC EQUIPMENT

Avoid placement of window air conditioning units on the facades of buildings in the Campus District. Where air conditioning equipment is required, a central system should be installed.

Avoid placing HVAC equipment (e.g., heat pumps and cooling towers) outside of existing structures. Where such equipment must remain, shall be screened from view, but not to restrict air flow. Screen walls must meet IFS requirements and must maintain maintenance clearances.

Hose bib and receptacle are required in screened mechanical yards for future maintenance by base support shops.

5-5.2 Materials

When appropriate, match original materials and construction techniques where structural and decorative elements of the building façade need repair or replacement.

Clean and repair exposed and visible surfaces. Paint only materials that were originally painted, such as fascia, cornices, trims, or doors. Do not paint concrete, copper, brass, glass, brick, stone, and slate, UON.

Remove, where possible, all extraneous elements (such as utility lines, support brackets, pipes, and vents), that detract from the building facades. When this is not possible, paint an appropriate color to minimize visual impact.

5-5.3 Wall Surface Treatment

Clean brick, stone, wood, and metal surfaces by appropriate method. Investigate alternatives and choose the least harmful cleaning method. Never sandblast old brick, stone, or wood surfaces.

Repair walls, where necessary, by removing loose material and patching holes and cracks with new material to match adjoining surfaces.

Repair joints in masonry walls by pointing. Joints should be raked tooled, struck, or otherwise treated to match original joint techniques.

Avoid cosmetic application of new synthetic materials resembling original materials; such materials will not weather and age the same as existing natural materials. When new synthetic materials must be used, avoid combining with existing materials to achieve resemblance with original appearance.

5-5.4 Historic Building Exterior Work

Coordinate exterior work with the SHPO for buildings indicated in Table 5-1List of Historic Buildings and Table 16-2 Built Resources Inventory Table - Eligible Properties.

5-6 NEW CONSTRUCTION GUIDELINES

5-6.1 Design

When appropriate, make new buildings compatible in style, scale, proportion, orientation, and directional emphasis with existing structures in their respective districts.

Avoid intrusions into positive open spaces.

Locate new structures to visually define space, to reinforce spatial enclosure, create vistas, frame views, and guide the eye to landmarks.

Main entrances to facilities shall be designed to be readily discernible.

5-6.1.1 Pre-Engineered Metal Buildings

Basis of design is Butler Manufacturing.

5-6.1.2 HVAC Equipment

Avoid installation of HVAC or other utility equipment such as transformers and telephone cabinets on the exterior of new structures. Install such equipment in a mechanical room.

Where required on facades, mechanical rooms should be simple in design and finished to match adjoining surfaces.

5-6.2 Materials

Exteriors of new buildings shall be split-faced CMU, stucco, or a combination of the two. Thought must be given to match surrounding areas. When appropriate, select material, finishes and details to be consistent and compatible with existing materials, finishes, and details in their respective districts.

5-6.3 Wall Surface Treatment

Use split face CMU or stucco as a unifying material in all districts, if suitable as exterior cladding for a particular new structure. Match colors in the tan or buff range.

Match new surfaces with existing ones in size, texture, color, and use the same bonding patterns.

5-7 ROOFING AND ACCESSORIES

Roofing shall follow UFC 3-110-03, “Roofing” in conjunction with National Roofing Contractors Association (NRCA) Roofing Manuals (MRCA Manual) and the NRCA technical bulletins and the Metal Building Manufacturers Association (MBMA) Metal Roofing Systems Design Manual (MBMA Roofing Manual) to provide specific design guidance for Military roofing projects.

The EoR shall determine wind uplift pressures and dimensions of the corners, perimeter, and field of the roof IAW ASCE-7, Minimum Design Loads for Buildings and other Structures. Delineate calculated values in the roof specification or drawings. Products shall bear Miami-Dade Notice of Acceptance. All new and existing penetrations must be accounted in the design and calculations.

All new roofs or reroof designs have pressure diagrams, load calculations, and other related components at the 65% design review stage in the design drawings. The Contractor’s EoR must visit the site to evaluate the roof prior to creation of the design drawings. All calculations and drawings must be signed by a structural engineer registered in the state of Florida.

5-7.1 Base Standard Roof

Generally, new roofs and replacements will be standing seam metal roof. Metal roof roofing shall be mechanically seamed with 16-inch exposure and a 2-inch-high seam. Material must be either sheet aluminum or Galvalume coated sheet steel. Color shall be Berridge, Terra Cotta or approved similar color. This may mean a custom color.

5-7.2 Roof Top Elements

All roof top elements on sloped standing seam metal roofs, which can be viewed, shall be coated to match the roof color.

5-7.3 Solar Roof Reflectance Index

New roofs and major roof replacements shall meet or exceed the following Solar Roof Reflectance Index (SRI) for a minimum of 75% of the roof surface.

SRI > 78 for low slope roofs (<2:12)

SRI > 29 for high slope roofs (>2:12)

5-7.4 Roof Hatch

IAW UFC 3-110-03 section 1-8.6, all buildings over two stories shall have a roof hatch with an interior ladder or a building-attached exterior ladder for roof access. Roof hatch shall be wind rated for MAFB.

5-7.5 Soffits

Soffits will be perforated aluminum panels pre-finished with a rust resistant paint finish, UON.

5-7.6 Gutters and Downspouts

Prepare calculations to determine the minimum drainage requirement using the calculation method as specified in the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) Architectural Sheet Metal Manual (current edition).

All gutters and downspouts must be aluminum. All gutters must be pitched toward the downspout for the associated run of gutter. The pitch should be approximately 1/8-inch per foot.

Downspouts are to be painted to match the background color against which they are viewed. This often results in the downspout being painted more than a single color.

5-7.6.1 Internal Gutters

Installation of new internal gutters are not permitted on MAFB, UON.

5-7.7 Fall Protection Control Measures

IAW with UFC 3-110-03, Roofing, all roofs with a slope greater than 3:12 shall have permanently installed fall protection. The preferred order of control measures or the hierarchy of controls is to eliminate the need to work at heights (design out fall hazards), followed by prevention (installing guards) and protection and control of fall hazards by identifying, designing and installing anchorages (hard points) for safe use of fall arrest equipment and systems.

5-7.8 Roof Warranty Requirements

IAW UFC 3-110-03 section 1-8.11, all roofs installed at MAFB must carry a warranty that covers the following:

i. Covers full system watertightness
ii. Is from the single source manufacturer
iii. Has a minimum duration of 20 years

5-7.9 Roof-Mounted HVAC

IAW 3-110-03, “Roofing, large and heavy roof-mounted HVAC equipment is not recommended on metal roof systems. If the HVAC equipment is not to be at ground level, provide a platform with access within the roof system and that uses a single-ply roof system with good watertight details.

5-8 EXTERIOR DOORS, FRAMES, AND HARDWARE

Primary entrance doors are typically aluminum and glass, dark bronze anodized frames.

All exterior doors shall be protected from the direct effects of weather to the extent reasonable. The main entrance(s) shall generally include a building canopy that is part of the building architecture for new facilities and major renovations.

Typically, exterior steel doors and frames BOD shall be as manufactured by Steelcraft. Slabs to be 16 gauge, cold rolled G60 galvannealed steel, seamless with appropriate foamed (polystyrene) insulated core. Doors shall be factory primed/ANSI a224.1. The steel frames BOD shall be as manufactured by Steelcraft, 16 gauge, G60 galvannealed steel, primed for jobsite finishing. Reinforced at all hardware locations with galvannealed steel: 7 gauge at hinges; 14 gauge at strike. Kerfed frames for gasketed sound and air infiltration control. Hinges must be heavy duty, 5 knuckle, stainless steel, base metal and finish with NRP. Best hardware: 45H Series; interchangeable cores; stainless steel base metal lever style 14 (now #15 lever); escutcheon J; compatible strike; 630 satin stainless steel.

Typically, the aluminum and glass exterior door BOD shall be the Kawneer 350IR, blast tested to 5.8 psi, wet glazed, insulated, bronzed, 3-inch x 1/2-inch cross rail., thermally broken frames.

Hardware must be able to accept the Best cores that are MacDill standard requirements. All proposed hardware schedules must be reviewed by the base locksmith for compliance as well as keying. The base is to receive two finished keys and three blank keys per lock. The user must review all functions and determine master keying requirements. The review cannot occur later than the 65% design review.

5-8.1 Locksets and Cores

The designer must provide a complete door hardware and accessories schedule as well as cut sheets for all items. This information must be carefully reviewed with the Government / user no later than the 65% design stage.

Locksets and cores shall be purchased by the contractor.

The contractor shall install lockable construction cores to be used during the construction phase. After the facility is accepted by the base, the base locksmith will remove the construction cores and install the Best cores, which have been provided under the construction contract. The final cores are to be sent directly to the base locksmith from the manufacturer.

Clearly indicate Building Number/Facility Number ID and project specific NVZR number on shipping label and packing slip.

Provide proof of delivery identifying the part numbers and quantity provided to the construction inspector.

For projects of 30 or more doors, the contractor must supply a certified hardware installer under the employ of an AHC.

At ‘existing-to-remain’ exterior doors, all weather stripping and sealants shall be replaced.

5-8.2 Antiterrorism and Force Protection

All exterior doors must comply with Antiterrorism/Force Protection (ATFP) requirements. See UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings.

5-8.3 Miami-Dade Notice of Acceptance

All exterior doors are expected to also comply with Miami-Dade NOA and pass large and small projectile testing. ATFP requirements may override NOA requirements where no other options exist.

5-9 EXTERIOR WINDOWS

Generally, dark bronze Class I anodized, tinted, insulated, single hung windows, with thermally broken frames (exterior glazed mullions and screens to be determined where operable windows are utilized).

All windows shall be double paned with tinting.

New window installation shall require shop drawings that are engineered, signed, and sealed by a Florida registered structural engineer. The drawings should show anchors, anchor holes in frames, hardware, operators, and other components as appropriate if not included in manufacturer's standard data.

5-9.1 Minimum Performance Standards

Minimum performance requirements for aluminum windows, terminology, and standards of performance, fabrication, and workmanship are those specified and recommended in American Architectural Manufacturers Association (AAMA) / National Wood, Window, and Door Association (NWWDA) 101/i.s.2 - 97 and applicable general recommendations published by AAMA. Conform to more stringent requirements as indicated in specific project documents.

Fenestration must meet code, Miami-Dade NOA, and UFC 4-010-01, “Anti-terrorism Force Protection” (ATFP) requirements per UFC 3-110-01, “Architecture”, UON.

5-9.2 Historic Windows

Historic windows shall be coordinated with CE and SHPO.

5-9.3 Blast Resistance

Windows must adhere to ASTM F1642-04: Standard test method for glazing and glazing systems subject to air blast loadings: Minimal hazard response at a 4 psi pressure, 30 psi-msec impulse, blast load, US General Services Administration (GSA) test protocol GSA-TS01-2003: Standard test method for glazing and window systems subject to dynamic overpressure loadings: Level 2 protection at a 4 psi pressure, 30 psi-msec impulse, blast load, and DOD ATFP construction standards, UFC 4-010-01: Medium level of protection at a 4 psi pressure, 30 psi-msec impulse, blast load, UON.

5-10 SPLIT-FACE CONCRETE MASONRY UNIT

Split-face CMU BOD is Coastal Architectural Products Split Face Concrete Masonry Units. Base unit color will be “Macadamia”. Accent unit color will be “Pebble”. Integrally colored architectural CMU are made to order, include oxide pigments, and integral water repellant. CMU must conform to ASTM C 90-09 specification. The face shell and web thickness of the CMU conform to Class-D units which are classified as two (2) hour retardant under the UL standard.

5-11 GUARD AND HANDRAILS

Adhere to FBC, Occupational Safety and Health Administration Standards (OSHA), and ABA standards. If the Contractor is unclear the location designation, it is on the Contractor to request this information prior to award.

5-11.1 Non-Industrial locations

Non-industrial locations are defined as locations such as office buildings, child development centers, etc. Anodized aluminum pre-finished with dark bronze coating suitable for salt-air environments.

5-11.2 Industrial Locations

Industrial locations are defined as locations such as loading docks, loading platforms, etc. Steel tube guardrails with powder-coated finish suitable for a salt-air environment can be used in industrial locations. They must meet OSHA standards.

5-12 BOLLARDS

Bollards surrounding equipment such as transformers, HVAC, etc. shall be painted/factory-finished in Manor House Brown, UON. Bollards around trash enclosures shall be painted Brazil Nut, UON. Bollards surround Federal Government Utility Authority (FGUA) equipment shall be coordinated with FGUA.

5-13 EXTERIOR SIGNAGE

Signage must adhere to UFC 3-120-01, “Design: Sign Standards”. All new buildings/facilities must have building number identification. Building Identification signs shall adhere to the following Base Standard:

a. Overall Dimensions 10 inches high, width will vary on building number
b. Font: Helvetica Neue LT Std 85 Heavy
c. Text Height: 6 inches. ¾ inch spacing between numbers
d. Mounting Height: Field coordinate location
e. Color: Park Service Brown with reflective white vinyl lettering.
f. Backer: Aluminum, Factory Pre-Finished Park Service Brown
g. Mounting: Tapcon to exterior wall surface

5-13.1 Existing Signs

If exterior work requires removal of exterior-mounted signage, the Contractor shall reinstall exterior signage, UON.

5-14 COLOR BINDER

Exterior finish material color binders displaying actual samples of all proposed finishes are required during the design of the project. The creation of the color binder will require a pre-design meeting scheduled by the contractor prior to the 65% design meeting. The purpose of the meeting is to approve all color selections prior to the color binder submission.

The Contractor’s Architect is responsible for selection and coordination of all final exterior finish and color selections using installation architectural guidelines, after obtaining input from the using activity and the Government’s architectural reviewer. Indicate these selections on a comprehensive schedule located on the contract drawings.

For all designs, the design/build team must prepare complete finish/color/material schedules as well as presentation binder. They must review with the Government / user at the 65% design stage, at the latest.

The word "color", as used in this document, include surface color and pattern. When color is not designated for items, propose a color for approval in the Color Binder. Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. All colors selections are from the manufacturer's full range. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers.

5-14.1 Color Binder Submittal Requirements

IAW UFC 3-120-10, Interior Design, interior and exterior finish color binders must display actual samples of proposed finishes required in the design of a project. Submit SID information and samples in separate three ring binders with pockets on the inside of the covers. When samples are numerous or thick, use more than one binder. Large D-ring binders are preferred to O-ring binders. Fold out items must have a maximum spread of 25 1/2". Finish Color boards must be in 8 1/2" x 11" format and sturdy enough to support samples. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Label finish samples with the material codes used in the contract documents. Samples that are difficult to attach, or large samples, such as ceiling tiles or flooring samples can be provided separately in a loose sleeve. Samples must be labeled with the finish code so they can be identified independently if removed from the binder. Material and finish samples must indicate true pattern, color and texture. Photographs or colored photocopies of materials or fabrics to show large overall patterns are required in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical. For example, if the specified carpet has a large pattern, provide a color photograph showing the overall pattern in addition to the carpet sample with representative colors.

The Contractor's EOR certifies, by submission, that the color samples have been reviewed in detail, and that the color samples are IAW contract drawings and specifications, except as may be otherwise explicitly stated. Submittal of color samples does not relieve the Contractor of the responsibility to submit samples required elsewhere herein.

Each binder must be labeled on the outside spine and front cover with the following information: Phase %, Date, A-E firm, Project Title and Number, Location and Volume number. Include the Color Schedule or the Room Finish Schedule and Finish Color Schedule from the drawings. The contractor must coordinate the binder format with the installation design guides where applicable.

5-14.2 Material or Finish Changes

Any color selection changes after approval of the color binder must be resubmitted. Individual pages may be submitted for substitution in the binder. Substituted pages must be clearly marked with the revision date, phase %, and project title and number.

CHAPTER 6 FIRE SUPPRESSION

6-1 GENERAL

All buildings shall be designed per National Fire Protection Association (NFPA), and UFC 3-600-01, “Fire Protection Engineering for Facilities”. Designs shall adhere to the latest edition of AFI 32-10141 regarding Planning and Programing Fire Safety Deficiency Correction Projects. Compliance with this publication is mandatory. Avoid the use of fire pumps for wet-pipe sprinkler systems and apply larger distribution piping.

Existing conditions, such as as-built drawings or existing design drawings shall be reviewed and integrated into the new design drawings, calculations, and specifications as necessary to show all components of the existing suppression system.

6-2 FIRE FLOW TESTING

Fire flow testing for the water supply shall be performed IAW NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants. Coordinate the operation of any fire hydrants with the utility privatization authority (Florida Governmental Utility Authority (FGUA)). The contractor’s fire protection engineer of record shall verify with FGUA the existing utility water flow for buildings requiring hydraulic calculations of fire sprinkler systems.

6-3 FLEXIBLE FIRE SPRINKLER HEAD

Flexible fire sprinkler head hose lines or flexible braded piping is not permitted.

6-4 POINT OF DEMARCATION

Coordinate with FGUA the point of demarcation (POD) and use a post indicator valve for underground piping or a gate valve for above ground piping to establish this boundary between FGUA and Government maintenance requirements and responsibilities.

6-5 FIRE SUPPRESSION SYSTEM DELIVERABLES

Specifications for fire suppression systems shall include a statement requiring the design of the sprinkler system to be under the direct supervision of a Qualified Fire Protection Engineer (QFPE) experienced in the design of this type of work and licensed in the State of Florida. Shop drawings for fire suppression systems shall be required and shall bear the seal of the engineer of record.

CHAPTER 7 PLUMBING

7-1 GENERAL

Furnish minimum plumbing fixtures as indicated in the International Plumbing Code (IPC).

7-1.1 Piping

Use only Type Chlorinated polyvinyl chloride (CPVC) for water piping inside facilities.

Dielectric unions shall be used where dissimilar metals are in contact.

Provide pipe saddles at pipe hangars.

7-1.2 Pipe Labels

Label all piping carrying fluids and gases with fluid carried and flow direction per ANSI/ASME A13.1.

7-1.2.1 Minimum Sanitary Service Connections

Minimum Sanitary service connections from building shall be 4-inch minimum, with not less than a 2.5 FPS hydraulic velocity flow.

Verify that exterior sanitary service connections meet or exceed a 2.5 FPS hydraulic velocity flow when tied into existing sanitary site piping.

Provide a two-way ground cleanout (GCO) on all sewer -soil or waste lines which enter the building. This GCO shall be identified as the POD between FGUA and Government maintenance requirements and responsibilities.

7-1.3 Valves

Do not use automatic flow control balancing valves. Do not use triple-duty (multifunction) valves on pumps per UFC 3-410-01, “Heating, Ventilating, and Air Conditioning Systems”, section 3-7.14.2. Furnish a check valve, circuit setter, and isolation valve for each pump.

7-1.4 Pumps

Provide a laser alignment on all pumps that are not close coupled. Submit a laser alignment report for each pump.

7-1.5 Wall Hung Fixtures

Provide wall carriers for all wall-hung fixtures. Blocking is not an acceptable method for mounting wall-hung fixtures.

7-1.6 Fittings

Do not use back-to-back wye fittings on back-to-back fixtures. Use staggered wye fittings to permit effective stacking.

7-1.7 Branch Isolation Valves

Provide branch isolation valves for branch piping serving multiple fixtures.

Provide branch isolation valves on cold, hot and hot water recirculation lines serving groups of bathroom fixtures.

All shut off and isolation valves must be accessible from a maximum 6-foot ladder.

7-1.8 Plumbing Wet Walls

All plumbing wet walls are to be 6-inches thick to allow room for fixture carriers and piping. See 4-4 INTERIOR PARTITION CONSTRUCTION.

7-1.9 Waterless Urinals

MAFB does not allow the use of waterless urinals.

7-2 PLUMBING FIXTURE TYPES

7-2.1 Water Closets

Flushometer Valve as specified below, siphon jet, elongated bowl, top supply spud, floor or wall mounted. Seat: plastic, elongated, open front. Flushometers shall be specified as Sloan flush flushometers, or approved equal, to match the base standard.

7-2.2 Accessible Water Closets

Top rim of bowl shall be 18 inches above the floor. All other characteristics shall be the same as above.

7-2.3 Lavatories

Enameled cast iron or vitreous China

7-2.4 Accessible Lavatories

Vitreous China, 20 inches by 27 inches deep.

7-2.5 Urinal

Wall hung. Siphon-jet or washout. Flushometers as specified above.

7-3 SINKS

7-3.1 Kitchen Sinks

Single or double bowl, ledge back with holes for faucet and spout, stainless steel.

7-3.2 Service Sinks

Enameled cast iron. 3-inch minimum Trap standard, wall mounted or floor mounted. Provide wall protection at all service sinks,

7-3.2.1 Food Service

Stainless steel with drain board. Faucet: As required.

7-3.3 Water Coolers

Self-contained. Exposed surfaces shall be stainless steel. Wall mounted surface. Wall mounted semi-recessed. Wall mounted recessed. Accessible. Free standing. Provide bottle fillers for all water coolers (where possible). Provide stainless steel wall protection at all water coolers.

7-3.4 Showers

Wall mounted for stall or bathtub.

7-3.5 Bathtubs

Straight front recessed. Enameled cast iron, porcelain enameled. Formed steel, plastic without wall, plastic with high wall.

7-3.6 Venting

Vent all fixtures to the exterior IAW the International Plumbing Code.

Studor vents or air admittance valves are not permitted.

CHAPTER 8 MECHANICAL (HVAC)

8-1 GENERAL

Fully coordinate mechanical, electrical, plumbing (MEP) and fire protection systems with each other and with the building structure, enclosure, thermal envelope, and interior design. All exterior equipment shall be concealed behind curtain walls to improve facility aesthetics while still providing good airflow and ease of access for maintenance and repair.

A-E shall thoroughly coordinate mechanical and electrical design between plan sheets for motor sizing and electrical loads. Verify that size and connection methods are compatible with existing systems.

The primary method of space conditioning will be ducted HVAC systems using a building-wide chilled water loop for cooling and a building-wide hot water loop or electric heat for heating. Individual split systems, window units, fan coil units, are not preferred.

8-1.1 Ductwork

All ductwork must be sheet metal, no fibrous duct board is allowed. Verify that existing space is sufficient to properly route ductwork (i.e., ceiling plenums and chases) and piping. Coordinate with other disciplines.

Contractor shall coordinate electrical or other ceiling mounted fixtures with the height of the duct work or ceiling to be installed.

To meet SMACNA recommendations the designer should indicate the operating pressure in the various elements of the duct system on the plans.

The duct aspect ratio shall be a maximum of 4:1.

Flexible ducts shall be limited to 10 linear feet.

The duct aspect ratio should be kept as low as possible to reduce duct cost.

Install enough volume dampers to allow an air system to be balanced as required. All outlets require a volume damper.

Seal all ductwork to Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) Seal Class B. Transverse joints and longitudinal seams shall be sealed. Pressure sensitive tape shall not be used as the primary sealant.

Test all ductwork to SMACNA Leakage Class 12 for rectangular metal duct and Leakage Class 6 for round metal duct. Leak test ductwork per SMACNA HVAC Air Duct Leakage Test Manual. All DALT (Duct Air Leakage Testing) equipment must be calibrated within one year of use.

DALT shall be performed by an Independent Party not associated with the EoR or mechanical contractor.

8-1.2 Energy Management Control System

Refer to Energy Management Control System (EMCS) Controls section 9 below.

For demolition, the Contractor shall remove the following EMCS, Direct Digital Control (DDC), or Building Management System (BMS) components and deliver them to the MAFB HVAC shop: (1) Building level front-end components such as Java Application Control Engine (JACE) Controllers, Universal Network Controllers (UNC), and Building Control Units (BCU); (2) Unit level control components such as Trane MP580/581 Programmable Controllers.

8-1.3 Fire Alarm Coordination

HVAC units must have connections to the Fire Alarm system. Ensure that space is available for alarm panel connections.

8-1.4 Roof-Top Mounted Equipment

Do not install HVAC units and any other mechanical live load equipment on top of roofs, unless otherwise noted. Minimize all penetrations through roofs due to problems with roof leaks, accessibility, and maintainability requirements. If an exception to use a rooftop equipment is approved, use existing roof warranty holder to perform the work, as applicable.

Packaged rooftop units with strip heat may be used under limited conditions, (such as replacement of existing units).

8-1.5 Maintenance Accessibility

All HVAC equipment, such as air handler units, Variable Air Volume (VAV) boxes, and air terminals, shall be accessible for maintenance via removable ceiling tiles or access panels. Ensure direct exterior access is provided (for CE) to main mechanical and electrical rooms. The design shall allow for access points large enough to allow for filter replacement and maintenance of the equipment.

Place all utilities underground, if possible, especially laterals to buildings. All exposed piping, insulation, and supports must be painted to match the structure. Protective sleeves must be used if pipe or insulation must be run above ground.

Air handlers should be cleanable and accessible for proper maintenance. All ductwork, supply, and return shall be insulated and constructed of material that is cleanable.

Provide full access to all interior surfaces of kitchen exhaust hoods and ductwork for the cleaning. Install roof mounted exhaust fans with hinges for access to the interior of grease-laden ductwork.

8-1.6 Piping & Valves

Provide pipe saddles at all pipe hangars.

8-1.6.1 Condensate Piping

All condensate piping shall have individual dedicated drains to exterior drywells or sanitary systems via dedicated mechanical room floor drains. Do not gang condensate drains together. Do NOT combine condensate drains with other plumbing fixtures such as sinks, showers, toilets and or vent stacks.

8-1.6.2 Piping Labels

Label all piping carrying fluids with fluid carried and flow direction per ANSI/ASME A13.1.

8-1.6.3 Valves

Install isolation valves for all equipment and provide proper air venting for all piping systems as required. Isolation valves should be located at all branches serving two or more components. All shut off and isolation valves must be accessible from a maximum 6-foot ladder.

Do not use automatic flow control balancing valves. Do not use triple-duty (multifunction) valves on pumps per UFC 3-410-01 section 3-7.14.2. Furnish a check valve, circuit setter and isolation valve for each pump.

8-1.7 Positive Air Pressure

Observe American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1, latest edition. Ensure buildings always maintain a positive air pressure. Building pressurization of at least 8% greater outside airflow than the exhaust flow is required to offset infiltration.

8-1.8 Testing and Balancing

Testing, Adjusting, and Balancing (TAB) specifications must call for a plus 10%/minus 0 (zero)% on the outdoor air supply and a plus 0 (zero)%/minus 10% on the exhaust systems to prevent inadvertent building negative pressure after TAB per UFC 3-410-01, “Heating, Ventilating, and Air Conditioning Systems”.

All test and balance equipment must be calibrated within one year of use.

8-1.9 HVAC System Design

The selection of HVAC chiller manufacturers is limited to Carrier. Only a manufacturer trained and authorized technician shall be allowed to perform the equipment start-up. Provide a 5-year parts and materials warranty that includes the replacement cost of all parts and materials within the equipment at the time when the failure is discovered. There shall be no cost to MacDill AFB due to depreciation or wear of the failed parts and materials and no ancillary cost such as shipping.

Air-side HVAC system design will incorporate a dedicated outdoor air system (DOAS) using dedicated outdoor air handling units (AHU) on systems with design outdoor air flow rates above 300 CFM to pre-condition outdoor air ducted to the return side of the AHUs.

Do not introduce untreated outside air into the building through fan coils.

The DOAS must continuously dehumidify the outdoor air before it is introduced into the building. Where cost effective, the dedicated outdoor air handler will be equipped with an energy recovery ventilator utilizing a flat plate heat exchanger or energy recovery wheel to transfer load between exhaust air and outdoor air. Do not use energy recovery for shower areas.

Units that do not provide enough air to require a DOAS must provide dehumidification in the form of a digital or inverter rated compressor or a Rawal device to provide part loading. If none of these options are available provide hot gas reheat for humidity control. It is preferable to dehumidify the air through the cooling coil before the air is introduced into the facility.

Provide factory-applied coating to all outdoor air unit coils to prevent premature corrosion of outdoor air system coils. Use double wall, insulated air handling units and fan coils. Provide either copper or aluminum fin and copper tube condensers with factory applied coating to prevent corrosion of outdoor air-cooled air conditioning equipment. However, condenser coils on all air-cooled chillers shall be composed of copper tubes, manifolds, and fins only.

All split-systems equipment shall be of the same manufacturer and have Air conditioning, heating, and refrigeration Institute (AHRI) certification.

Provide a laser alignment on all pumps that are not close coupled. Submit a laser alignment report for each pump.

Verify that the air separator and expansion tank are on the suction side of circulation pumps.

8-1.10 Four-Pipe Chilled Water System

Use four pipe chilled water systems where possible. Avoid the use of heat recovery condensers (Desuperheaters, Heat recovery, etc.) for pre-heating hot water unless hot water use and chiller operations occur at the same time and approach temperatures that make this configuration cost effective. Perform life cycle cost analysis during design.

Where economically or mission justified, single chiller chilled water pumping systems will be “variable primary” systems (using one chilled water loop) with one set of pumping systems. Variable primary pumping will be applied to pumping systems greater than 10 hp and will be controlled by a VFD with the use of two-way valves at air handling units. Pressure transducers will be installed at AHU farthest away from the pumping system and will control pump VFD. The chilled water bypass valve shall modulate based on system pressure as determined by the engineer of record.

Where the design calls for multiple chillers to run in parallel to meet the load, use constant primary/variable secondary primary-to-secondary pumping systems. Each chiller is to have a motor operated isolation valve controlled by the associated chiller controller to isolate the chiller when not in use to prevent mixing cooled chilled water with warm return water.

Chilled water delta T (difference between the supply and return chilled water temperature) will be designed to be 15 °F or the maximum allowable per the chiller manufacturer’s specifications.

Chilled water supply temperature will be designed to 44 °F at all times.

Chilled water shall be used for server room cooling if feasible. Provide 100 percent redundant cooling of server rooms using Direct Expansion (DX) systems wherever possible. Where multiple DX systems are used as backup cooling, each unit shall have independent control of startup and shutdown sequencing. Each DX system will have its own thermostat.

All air handlers and fan coils that are connected to a four (4) pipe system shall have the heating coils located downstream of the cooling coil to be capable of re-heat for humidity control.

Use double-walled, pre-insulated pipe for buried chilled water piping between the mechanical room and the chiller.

8-1.10.1 Building Cooling Loads Exceeding 60 Tons

Building cooling loads over 60 tons (but less than 400 tons) must have air cooled chillers. Chilled water systems over 400 tons must be water cooled chillers using a cooling tower designed at a return water temperature of 87 degrees F. If an existing water-cooled chilled water system already exists at the facility, a load analysis will be completed to investigate the potential of adding load to the existing condenser water system.

8-1.10.2 Humidity Range

Maintain space humidity at 50% +/- 10% unless humidity control is stated otherwise by building user.

8-1.10.3 Air Filtration

Provide no less than minimum efficiency reporting value (MERV 18) air filters to ensure indoor air quality requirements are met.

8-1.11 Vibration Isolation

Include vibration isolation on all supply and exhaust fans, energy recovery units, and when needed elsewhere.

All air-cooled chillers will be isolated with spring isolators. Rubber or synthetic isolation pads are not a substitute for spring isolators.

8-1.12 Toilet Room Ventilation

Toilet room areas shall be properly ventilated according to the International Mechanical Code (IMC), or ASHRAE, whichever is greatest. All toilet room ventilation systems shall be controlled by lighting occupancy sensors and interlocked with the air handling unit introducing outside air into that area of the building. Toilet rooms that are part of an energy recovery system are an exception.

8-1.13 Antiterrorism and Force Protection

UFC 4-010-01, “DOD Minimum Antiterrorism Standards for Buildings” requires emergency air intake shutoffs and that building air intake be located 10-feet or greater above the adjacent ground surface.

8-1.13.1 Shelter-in-Place Shutoff Switch

See UFC 4-01-01, section B-4.3 Standard 18. Emergency Air Distribution Shutoff. "The switch must be capable of shutting down all required systems and closing all required dampers, even if the local hand/off/auto switch is in the hand position, within 30 seconds of switch activation". The contractor shall set the shutoff process with the similar control system PRIORITY as that of the fire alarm smoke control shutdown of HVAC systems. The “unoccupied” mode of HVAC shutdown is typically not fast enough to meet the aforementioned UFC. Control system “cycle time” cannot be used as reason for not meeting the 30 second shutoff requirement. See the CHAPTER 9 ENERGY MANAGEMENT CONTROL SYSTEM.

Locate the shutoff switch (or switches) to be easily accessible by building occupants by locating them similarly to mass notification system (MNS) local operating consoles. Verify the shutoff switch location with the project inspector prior to final installation. The switch box cannot protrude into the path of egress to be an obstruction.

Provide pilot lights, one red, one green on the Emergency Air Distribution Shutoff switch and provide a non-locking plastic cover, flush-mounted.

8-1.14 Demand Controlled Ventilation

Demand controlled ventilation (DCV) using CO2 sensors for ventilation control is prohibited unless approved by AHJ per UFC 3-410-01. Demand control ventilation

using occupancy sensors is permitted for intermittent occupancy facilities such as reserve centers, chapels, auditoriums, and theatres that are occupied at irregular or infrequent intervals.

8-1.15 Commissioning

All control systems shall be commissioned using Associated Air Balance Council (AABC) ACG Commissioning Guideline as a guide and UFGS 01 91 00.15 as an aid for developing the commissioning plan. The commissioning agent needs to be different from the firm employing the Engineer of Record (EoR) and also different from the Testing, Adjusting, and Balancing company.

8-1.16 Refrigerants

Do not use refrigerants that are based on R-22 which have Chlorodifluoromethane, difluoromonochloromethane or hydrochlorofluorocarbon chemistry. These are ozone depleting agents that cannot be used at MacDill AFB.

All refrigerant containing equipment is to have ALL refrigerants properly recovered, reclaimed then recycled by Certified Refrigerant Reclamation service provider. The refrigerant recovery shall occur at MacDill AFB at the equipment's location prior to disconnecting or removing the unit for recycling/scrap. Refrigerant recovery must be witnessed by a 6 CES Construction Management Inspector. MacDill AFB shall only accept refrigerant certified 100% pure. The refrigerants are to be returned to MAFB HVAC shop in new disposable cylinders (not to exceed 30LB of refrigerant in each cylinder). Per EPA regulations, the refrigerant recovery contractor is to provide a detailed recovery report for EACH piece of equipment as well as refrigerant reclamation documentation for all recovered refrigerants.

Notify Construction Inspector prior to refrigerant recovery. Refrigerant recovery must be performed on-site and must be witnessed by the Construction Inspector.

Refrigerant ownership cannot be sold or transferred outside of the DOD. The Air Force has a Refrigerant Management Handbook that governs the use of refrigerants, and all work shall conform to this policy.

8-1.17 Boilers

Obtain permits for air pollution emissions for boiler installations. IBC or FBC states rooms containing boilers, central heating plant, or hot water supply boilers shall have a one hour rated separation, except where the largest piece of fuel equipment does not exceed 400,000 Btu/hr.

8-1.18 Equipment Start-Up

Do not start up HVAC equipment without operating controls. This may require repeated visits by the controls contractor to accomplish.

8-1.19 Communication Closets

Provide a mini-split system for all communication closets with house air as backup cooling.

8-2 REQUIRED TRAINING

Provide training and start up for all new and renovated chilled water and direct expansion systems and airside systems/components to include chiller operation and programing, controls sequence of operations and programing for all unit controllers. See the training portion of the Energy Savings section. All training shall be video recorded and submitted with final closeout documents.

8-3 ENERGY CONSERVATION

Designs shall comply with ASHRAE 90.1 as Energy Standard for equipment efficiency. Specify maximum chiller and condensing unit efficiencies consistent with equipment that is at or near the top of industry standards. Select units that operate at maximum efficiency at Integrated Part Load Value (IPLV) rating load condition.

i. For energy conservation projects with building cooling loads over 60 tons (but less than 400 tons), the air-cooled chiller shall utilize magnetic bearing compressors, if warranted.

ii. For energy conservation projects with building cooling loads over 400 tons using water cooled chillers, at least one chiller shall be used where the IPLV load conditions of the building justify the use of magnetic bearing compressors or equally IPLV efficient compressors types.

iii. Consideration of compressor types other than magnetic bearing must be validated using the same input data when calculating IPLV ratings types. The IPLV ratings of other proposed compressor types shall be equal or better than magnetic bearing compressor (water cooled chiller) IPLV when justifying the use of other proposed compressor types.

iv. Exemptions from the use of magnetic bearing compressors in chillers (either air cooled or water cooled) can only be approved by the Base Civil Engineer for energy conservation projects. All replacement parts and software programing for chillers shall be deliverable to MacDill AFB within 24 hours.

v. Training shall be provided by the contractor to MacDill AFB HVAC maintenance staff for all new installations and repairs of existing chillers. A video recording shall be made by the contractor of said training. This video shall clearly describe the step-by-step maintenance and operation of the equipment and software and shall be delivered to MacDill AFB HVAC maintenance staff leadership upon completion of this work.

Use chiller waste heat recovery where applicable particularly where air side reheat for dehumidification is required.

Energy performance must meet or exceed the requirement of UFC 1-200-02, High Performance and Sustainable Building Requirements. Additionally, energy performance must meet the Energy Policy Act of 2005 (Life Cycle Cost Analysis (LCCA) exceed ASHRAE 90.1 by 30%).

Use premium efficiency rating for all motors.

Use variable speed or VFD to power fans and pumps for motors over 3 HP unless another alternative provides a lower life-cycle cost or if a special system constraint requires constant speed equipment. Pump VFDs will respond to downstream system pressure and Fan VFD will respond to downstream duct static pressure.

All motors with variable speed or VFD drives for fans and pumps shall have the same Available Interrupting Current (AIC) or Short Circuit Current Rating (SCCR) rating. The AIC rating for each motor shall be equal to the AIC rating for its associated drive.

CHAPTER 9 ENERGY MANAGEMENT CONTROL SYSTEM

9-1 GENERAL

The base Civil Engineering Energy Management Control System (EMCS) section controls all HVAC and integrated lighting controls systems.

Civil engineering will be notified if any work will require an electric, water or gas meter to be out of service, disconnected, or temporarily removed. Readings from before the meter is out of service will be taken and provided to the construction inspector. If the meter is to be permanently removed, then a new meter complying with the base's meter policy will be installed and the cost will be incorporated in the cost of the project. If the meter will not be replaced, then the existing meter will be reinstalled and programmed correctly.

All projects, renovation or construction exceeding the amount of $200,000 per facility will be required to install a new electric, water, and gas meter compliant with the bases approved meter installation.

Contractor will provide civil engineering with information from all newly installed and replaced meters:

a. Building number served
b. Location in/on building
c. Manufacturer
d. Model Number
e. Multiplier (if applicable)

New electric meters will be programmed with the correct current transformer (CT) and/or potential transformer (PT) so that display readings will accurately show the utility usage. New meters (electric, water or gas) will be zeroed out or the initial meter reading at the time of installation reported.

Electric, gas and water meters will be fully commissioned onto the base Utility Management Control System (UMCS) via the wireless metering communications system. Electric meters will collect pulse signal outputs from the gas and water meters located at the facility so that this information will be collected by the Base UMCS.

See Electric, Water and Gas sections for specific information on meter type and installation requirements.

9-2 FRONT END

All building automation controls are to be DDC type. Pneumatic controls shall not be used. If not controlled by the EMCS, programmable thermostats should be installed to reduce space temperatures to requirements listed in the Energy Management Policy Manual. Zone air sensors will have the capability to monitor temperature and humidity.

All new construction or any renovated DDC system must be fully compatible with the unified MacDill EMCS Server (Trane Tracer Enclave Server). Any modifications to this front-end server must be fully compatible with UFC 3-410-02 and is intended to be used with UFGS 23 09 00, UFGS 23 09 23.01, UFGS 23 09 23.02 or often referenced as UFGS 23 09 23.XX.

HVAC mechanical rooms for EMCS controls shall have a network drop connection for communications. Applicable HVAC units shall be connected to the CE COINEv2 network. Communication between the Building Front End controller (BCU, JACE, UNC or equivalent) and the MacDill EMCS Server shall be via a CE COINEv2 connection.

Provide a minimum GSA approved 17” laptop with 16 GB memory and a minimum 2.6 GHz quad core processor with all new DDC systems. A fully configure laptop with all necessary controls and contractor software is required with a preferred lifetime license (or annually, if only available) and provide technician control programming and operational training of the new system.

All new construction or major renovation projects must be fully integrated into this front-end system with new comparable graphic packages installed graphics on the MacDill EMCS Server.

9-3 COMMUNICATION

A CAT6 line shall be installed from the EMCS Front End controller to the closest COMM room for communication to the MacDill EMCS Server. The building automation system shall be open source non-proprietary such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original Contractor. This includes, but is not limited to the following:

a. Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.

b. Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, direct connection peripherals, and any other required software shall be licensed to and otherwise remain with the Government.

   NOTE - Once the new DDC system is installed on the CE COINEv2 network, ALL PERMISSABLE ACCESS will be performed using a government-furnished laptop service tool with applicable software installed. No contractor-supplied hardware will be permitted to be used on the COINEv2 network WITHOUT PRIOR AUTHORITY.

c. At MAFB the following systems are prohibited for new installation:

   i. Proprietary DDC Systems

   ii. Pneumatic systems or combination DDC/Pneumatic systems

d. Gateways may be used for the following:

i. A single major component (chiller, boiler, etc.)

ii. Legacy or existing equipment in a building that is to remain

9-4 DDC HARDWARE (CONTROLLER) REQUIREMENTS

9-4.1 Replacement and New Work

For control systems or projects where the controls are to be replaced, only the following manufacturers will be used, UON:

a. Distech

b. Trane

9-4.2 Existing Systems

For work on existing DDC systems the new equipment must be the same manufacturer and type as the existing system. Alternatively, the existing system may be entirely replaced with a new system of acceptable type. All points that are monitored and controlled by the existing system shall be present on the new system. The contractor shall remove the following EMCS, DDC, or BMS components and deliver them to the MAFB HVAC Shop:

a. Building level front-end components such as JACE controllers, UNC, and BCU.

b. Unit level control components such as Trace MP580/581 Programmable Controllers, Carrier CCN6400 Comfort Controllers, and TAC MicroNet 800 series I/A Controllers.

9-4.3 DDC Hardware Requirements

All field level controllers are to comply with UFC 3-410-02 and are intended to be used with UFGS 23 09 00, UFGS 23 09 23.01, UFGS 23 09 23.02, or often referenced as UFGS 23 09 23.XX.

All equipment controls must be provided by Trane or Distech and all factory controllers must be branded and supported by a current MacDill controls vendor (i.e., Trane or Distech).

All HVAC control points must be writable to the controls vendor so the controls vendor will have access to all points.

9-4.4 Application Specific Controllers

Application Specific Controllers (ASC) have a fixed factory-installed application program (i.e. Program identification) with configurable settings and do not have the ability to be

programmed for custom applications. In addition to the requirements for all DDC Hardware ASCs shall:

a. Be LonMark Certified or BACNET Certified or otherwise approved.

b. Be configurable via an LNS plug-in unless otherwise approved.

9-4.5 Application Generic Controllers

Application Generic Controllers (AGC) have a fixed application program which includes the ability to be programmed for custom applications. In addition to the requirements for all DDC Hardware AGCs shall:

a. Have a fixed Program ID and fixed XIF file.

b. Be fully programmable and configurable for the application through one or more LNS plug-in unless otherwise approved.

c. General Purpose Programmable Controllers (GPPC) are not installed with a fixed factory- installed application program and must be programmed for the application.

d. At MAFB, Local Display Panels (LDP) shall be installed at a minimum in each mechanical room where an AHU exists and programmed as per the Point Schedules.

9-5 GRAPHICS

Provide dynamic graphic displays for use on the MacDill EMCS Server. Maintain consistent graphical displays with already established programming.

a. Provide a main graphic for the overall building that displays thermostat locations, static pressure sensors, Shelter-in-Place (SIP) shutoff switch, outside air temperature/humidity, Time/Date stamp, and other general information. The main graphic shall also contain links to other graphic screens for individual systems. Include room numbers if possible.

b. Provide a dynamic point for each system component (e.g., air handling units, chiller plants, boilers, and utility meters). All inputs and outputs for each component shall be displayed on the graphic. Each graphic shall contain links to the main graphic and other related graphics. Each graphic shall represent the type of equipment displayed with sensors, relays, status, controlling set points, and alarms.

c. For variable speed AHUs, provide VAV index page separate to include space temperature, active space temperature, airflow set points, actual airflows and discharge temperatures. Graphics shall represent the type of equipment displayed.

9-6 ACCESSIBILITY

Control specifications must contain a statement that requires that all DDC field panels, subpanels, and microcontrollers to be completely programmable through the MacDill EMCS Server in Building 347 via the CE COINEv2 network. Control specifications must also contain statement that requires that the MacDill EMCS Server in Building 347 has override capabilities on all analog and digital outputs.

There shall be no devices that contain features that can only be accessed in the field with special equipment or connectors.

9-7 POINTS TO MONITOR OR CONTROL

See Table 9-1 for general points to consider for monitoring.

Provide override capabilities of all end devices (i.e., actuators and Start/Stop relays). Provide Occupancy Override capability on thermostats. Set override period to 2 hours (adjustable). User adjustable set points shall be on equipment page (e.g., airflow, temperature, static pressures). Additional points may be needed for each specific project such as a system with an emergency generator may have certain chillers interlocked for load shedding.

Prior to DDC system installation the following should be submitted for Government Approval:

a. Points Schedules: Submit Points Schedules using the Points Schedule template located at https://eko.usace.army mil/fa/bas/ for each piece of DDC Hardware. Points Schedules shall be submitted in hard copy (11”x17”) and electronic format. Electronic submission shall be in [AutoCAD] [Microstation] [Excel] format and submitted on CD or DVD.

b. Control System Schematic diagram and Sequence of Operation for each HVAC system.

c. Deliverables: Upon completion of project the following should be delivered to the Government for acceptance:

d. Final (as-built) commissioned DDC database of complete DDC system submitted on CD/DVD disc. Turbo LONWORKS® Network Services (LNS®) database with Lon Credits transferred to the Government or the BACNET equivalent.

e. External Information Files (XIF), Resource files and Plug-ins for the completed system.

f. Point Schedules: Final (as-built) Points Schedules

g. Control System Schematic diagram and Sequence of Operation for each HVAC system.

h. Programming Software: All software, including licensing information and user manuals, necessary to program GPPCs installed under this contract. Software will be installed and operational on contractor furnished laptop service tool. Laptop specifications must be verified prior to installation due to changing cybersecurity and security parameters.

i. GPPC and AGC Application Source Code: Copies of the installed application programs (all software that is not common to every controller of the same manufacturer and model) as source code compatible with the supplied programming software.

j. Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.

k. Quality Control (QC) checklist completed by the Contractor's Chief QC Representative

Table 9-1 EMCS Monitoring Points

Description		Comments
Chiller/Condensing Units		
Entering water temperature	AI	
Leaving water temperature	AI	
Motor amps	AI	
Unit watts	AI	Chillers greater than 50 tons
Refrigerant suction pressure	AI	Chillers greater than 50 tons
Refrigerant discharge pressure	AI	Chillers greater than 50 tons
Water GPM	AI	Chillers greater than 50 tons
Alarm Status	DI	
Control output	DO	
Boilers		
Entering water temperature	AI	
Leaving water temperature	AI	
Unit status	DI/AI	Relay in parallel with gas valve or flue stack temperature
Water GPM	AI	Boilers greater than 500,000 Btu
Control output	DO	

Description		Comments
Air Handlers		
Entering water temperature	AI	Air handlers greater than 50 tons
Leaving water temperature	AI	Air handlers greater than 50 tons
Cold deck temperature	AI	
Hot deck temperature	AI	
Outside air temperature	AI	
Return air Temperature	AI	
Mixed air temperature	AI	
Return air humidity	AI	
Outside air humidity	AI	
Motor amps	AI	
Unit watts	AI	Variable volume units only
Water GPM	AI	Air handlers greater than 50 tons
Alarm Status	DI	
Outside air flow	AI	
Supply air CFM	AI	Variable volume units only
VFD Speed	AI	Variable volume units only
Space temperature	AI	
Control output	DO	
Multi zones		
Control output	AO	
Actuator position	AI	Use actuator with feedback potentiometer unless a temperature sensor is installed downstream of damper/valve
Space temperature	AI	
Discharge air temperature	AI	
Heater output	AO/DO	AO for hot water valve or SCR, DO for banks of heaters
VAV		
Damper output	AO	
Supply air CFM	AI	
Space temperature	AI	
Heater percent output	AO/DO	AO for hot water valve or SCR, DO for banks of heaters
Discharge Air Temperature	AI	

Description		Comments
Fan Terminal Units		
Heater output	AO/DO	AO for hot water valve or SCR, DO for banks of heaters
Chilled Water Valve Position	AI	
Space temperature	AI	
Discharge air temperature	AI	
Pumps		
Motor amps	AI	
Unit watts	AI	Variable speed units
Pump output	AO/DO	DO for constant speed/two position, AO for variable speed/modulating
Valves/Dampers		
Valve output	AO	DO for constant speed/two position, AO for variable speed/modulating
Lights, interior		
Control output	DO	
Occupancy sensor	DI	
Photocell	DI	
Irrigation		
Control output	DO	
Rain sensor switch	DI	

CHAPTER 10 UTILITY PRIVITIZATION

10-1 GENERAL

The Water and Wastewater systems at MAFB are owned and operated by the Florida Governmental Utility Authority (FGUA). See APPENDIX F, FGUA UTILITY PRIVITIZATION AGREEMENT and APPENDIX G, SAMPLE FGUA FORMS, for sample forms and for more information. FGUA follows the Hillsborough County (HC) standards for water and waste utilities and its own FGUA Supplemental Standards for MAFB.

The Natural Gas System at MAFB are owned and operated by TECO Peoples Gas (PGS). Contact PGS for the latest Construction Standards Manual and Operations and Maintenance Procedures for more information.

All drawings and specifications must clearly identify Point of Demarcations using the information provided in APPENDIX F.

Contractor must answer all comments received from FGUA or PGS on AF ARW HQ Form 137 Review Comment Sheets within 5 days of receipt.

10-2 WATER AND WASTEWATER

On 21 June 2010, the MAFB utilities privatization (UP) contract for water and wastewater was awarded to FGUA by DLA Energy (formerly DESC). On March 1, 2011, the water chlorination and distribution system, and the wastewater collection, treatment, and reuse systems (excluding golf course irrigation lines) at MAFB were transferred to FGUA by means of a Utility System Bill of Sale. Water and wastewater services are provided to MacDill by means of the UP contract. Therefore, FGUA is the sole provider of these utility services to the installation. In addition, FGUA must meet legally enforceable regulatory operation permit requirements for the wastewater system and Federal/State Safe Drinking Water Act requirements as regulated by the Public Water System.

The Government has entered a fifty-year contract with FGUA for utility services provided via their water and wastewater systems. Over the course of the fifty-year contract, FGUA is responsible for provision of utility services, to include operation, maintenance, repair, renewals, and replacements for the systems. This includes all exterior and underground pipes, manholes, water towers, pump and lift stations, valves, backflow preventer devices, and other related conveyance infrastructure. Each facility will have points of demarcation (POD) for FGUA owned infrastructure.

FGUA Contact information:

Florida Governmental Utility Authority
Michael (Mike) Harrison, Utility Manager, MacDill AFB
Michael.harrison@fgua.com
9109 Bayshore Boulevard, B84
Tampa, Florida 33621
(407) 628-6757 office

10-2.1 Planning

FGUA is required to submit annually an Annual System Deficiency Corrections/ Upgrades/ Connections and Renewals and Replacements Plan. The 6 CES Contracting Officer Representative (COR), with input from 6 CES/CEP, is responsible for providing information to FGUA on MacDill's planned programs, such as Military Construction (MILCON). The purpose is to define projects which could alter demands placed on the water and wastewater systems, or which could modify or relocate existing infrastructure.

10-2.2 Design

10-2.2.1 Project Design for Utility Construction

All agencies that design projects for construction on MAFB must coordinate with FGUA on all proposed actions that might impact the utility systems. Projects that cause impact include temporary connections, such as connecting to a fire hydrant for water; disconnections due to demolition; new connections due to facility construction; replacing existing lines and components; any project that involves work on utilities past the POD, which identifies the transition from Government to FGUA ownership. 6 CES is the primary agency designing projects, accomplishing work through 6 CONS via the Multiple Award Construction Contract (MACC) contract. Also, the USACE designs and oversees MILCON projects. Because FGUA owns the utility systems, these project designs must be reviewed and approved by FGUA. Coordination is also necessary because FGUA must ensure the utility systems provide adequate system capacity as the water and wastewater systems are repaired and/or replaced, utility systems are not compromised or damaged, and the planned modifications or new construction meets the FGUA's requirements. Initial coordination must occur during the planning and conceptual phase of the project so that the FGUA can identify connection points, utility layout and siting, design requirements, and construction requirements. Formal review of the conceptual design aspects and specifications will typically occur during the 30 percent design phase. The pre-design coordination and 30 percent design review requests must be forwarded to FGUA via the COR, who will have set up parallel notification processes. FGUA shall have a minimum of two weeks to review the project and provide comments. FGUA comments are to be incorporated to the extent that FGUA will accept the utility components after construction is complete.

Please note that the latest DAFI 32-1020 Incorporating Change 1, 19 January 2022 para 2.9.6 requires that any modification or construction to the utility system shall be performed or provided by the System Owner (SO) unless a waiver to do otherwise is obtained from AFCEC/CI. Please see Figure 10-1 Utility Connection Process Flowchart.

10-2.2.2 Design Standards

Designs that install, alter, modify, disconnect or connect (temporary or permanently), or cause adverse impacts to the systems must incorporate FGUA's design standards. For water and wastewater systems FGUA follows Hillsborough County, Florida Technical Specifications and FGUA Supplemental Specifications.

10-2.3 Project Review

Please note that FGUA requires a minimum of 14 calendar day review time. Comments from FGUA will be transmitted to the COR and other appropriate individuals.

The design must meet FGUA's approval to the extent that FGUA will accept the utility components after construction is complete.

10-2.4 Fees

The FGUA may provide Utility Services, such as utility locates, temporary water meter connections, and hydrant flow testing, upon request. Fees for such services are updated annually and can be identified by contacting the FGUA's MAFB Utility Operations Center at 813-828-3982. A copy of the 2024 Utility Service Requests and Fees is provided in APPENDIX G, SAMPLE FGUA FORMS.

Due to new requirements published in the latest DAFI 32-1020 Incorporating Change 1, 19 January 2022, FGUA will charge construction inspection fees only if a waiver is approved by AFCEC/CI allowing, with FGUA concurrence, the 3rd party contractor to connect a utility connection, disconnection, modification, or extension.

The Per the UP contract, FGUA has the right to reasonably inspect third party construction projects ($150/hour for Contract Operator and $120/hour for Systems Manager). FGUA will prepare a Water & Sewer Utility Construction Fees Letter specific for the project, if a waiver is approved by AFCEC/CI. This letter will list the construction and inspection fee lump sum, and the temporary construction water meter cost. This letter will be used in developing the government cost estimate and third-party construction solicitation. FGUA costs will be identified in the solicitation. Also, FGUA required forms will be identified in the solicitation. The third-party construction contractor shall pay FGUA these costs and submit completed forms to FGUA prior to any utility construction activity.

10-2.5 Meters

Please note that per Air Force Civil Engineer Center (AFCEC) policy meters on privatized water and wastewater systems shall not be AMR-type that can be connected to the Air Force network.

10-2.6 Construction

Only FGUA can connect/disconnect into FGUA owned utilities. No third-party contractor can connect/disconnect to a FGUA owned utility unless authorized by FGUA.

Per latest DAFI 32-1020 Incorporating Change 1, 19 January 2022 para 2.6 for any project that requires alteration or modification of, connections to, or disconnections from, a privatized utility system, the BCE shall ensure the AF Form 332 or DD Form 1391 includes a lump sum connection charge amount for the privatized system owner to construct the new utility infrastructure. Please Figure 10-1, Utility Connection Process Flowchart and Figure 10-2, Utility Privatization Playbook SO Construction Scenario 1

Utility construction accomplished through the UP contract using the connection contract clauses is initiated by, with contracting assistance for the DLA Energy, who submits a Request for Proposal to the FGUA and following acceptance of the FGUA's construction cost arranges for a Military Interdepartmental Purchase Request (MIPR) to be sent to Defense Logistics Agency (DLA).

Water and sewer utility construction by the FGUA will be identified in a scope of work that becomes part of a Contract Modification between the FGUA and DLA Energy. The Scope of Work will state exactly what work FGUA will perform, including site preparation and finish work. This will enable the Construction Contractor and the FGUA to properly phase the construction so that both parties work as a team. Upon completion of the construction, the FGUA will own and be responsible for maintaining infrastructure.

10-2.6.1 Third Party Construction

The latest DAFI 32-1020 Incorporating Change 1, 19 January 2022 para 2.6 for any project that requires alteration or modification of, connections to, or disconnections from, a privatized utility system, the BCE shall ensure the AF Form 332 or DD Form 1391 includes a lump sum connection charge amount for the privatized system owner to construct the new utility infrastructure. Also, per para 2.9.6 this work, including extension of service, shall be performed, or provided by the System Owner (SO) unless a waiver to do otherwise is obtained from AFCEC/CI. (T-1). If a waiver is obtained, the BCE shall provide access to the worksite for the SO to inspect all aspects of the work including materials and construction practices. Please see Figure 10-1, Utility Connection Process Flowchart and Figure 10-2, Utility Privatization Playbook SO Construction Scenario 1.

If a waiver is approved by AFCEC/CI, 6CES or 3rd party contractor will be responsible for the connection, disconnection, modification, or extension of the utility components. The third-party construction contractor must coordinate with FGUA prior to the start of utility work. This coordination involves payment of inspection fees and submission of the following forms: FGUA Form 427, FGUA Form 11, and FGUA Form 301. The construction contractor is expected to notify FGUA at the appropriate times for inspection during the project. Please note that if new sewer and water infrastructure is constructed by a third-party contractor, the new infrastructure belongs to the Government (6 CES) until the new infrastructure can be officially conveyed to FGUA via Amended Bill of Sale and the UP contract modified.

FGUA has the right not to accept infrastructure that is installed by others if the construction does not meet FGUA standards. In the meantime, the Government will own and provide for the operation and maintenance of the new infrastructure until it can be brought up to acceptable standards. The COR is responsible for initiating the process to transfer the new infrastructure to FGUA.

Figure 10-1 Utility Connection Process Flowchart

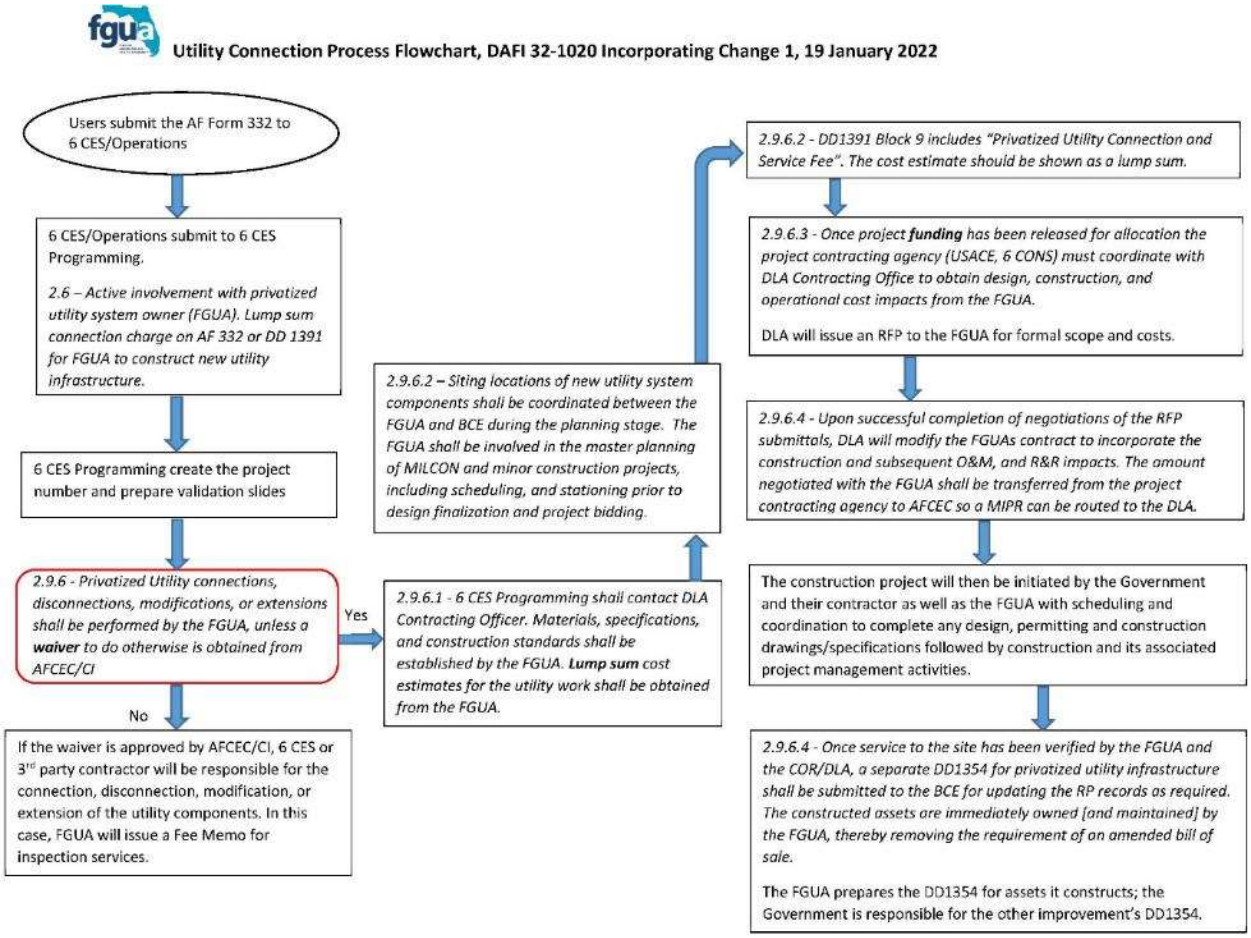


Figure 10-2 Utility Privatization Playbook SO Construction Scenario 1

Scenario 1: SO performs connection through UP Contract (preferred scenario)
This scenario is the preferred option for the following reasons:

- DLA Energy facilitates the process to request proposal, evaluate, negotiate, and execute a modification for award to perform the connection.
- Decreases likelihood of "surprises" where connection fees are agreed upon outside the UP Contract which can affect future USC pricing.
- Avoids requirement to amend BoS.

Step 3.6.1.1 – SO to perform connection through UP Contract
Role: SO
Under this scenario, whether it is military construction (MILCON), O&M, etc., the SO performs the work and owns the infrastructure once complete. Funds are provided to DLA Energy. DLA Energy CO executes the modification and the project is invoiced against UP Contract for payment. DLA Energy CO and SO negotiate impact to USC. If the project is MILCON, it is required that DD Form 1391, FYXX Military Construction Project Data, includes a line item for the connection fee.

Step 3.6.1.2 – Installation provides funds to AF/DLA Energy for SO to perform connection
Role: Installation
A contract modification cannot be finalized until funds are obtained.
Proceed to predefined process 3.2 Post-award Management (modify contract).
Predefined Process 3.2 – Post-award Management (modify UP Contract)
Roles: DLA Energy CO/Installation CO, SO
The process to modify the UP contract is outlined under predefined process *3.2 Post-award Management*.
Note:
Deliverable **–** UP Contract Modification

Step 3.6.1.3 – SO performs connection(s)
Role: SO

Step 3.6.1.4 – No requirement for ABoS
Role: Not applicable (N/A)
The SO owns the infrastructure after completing the connection. No ABoS is required. The additional utility infrastructure must be reported to the RPO where installation real property records are updated to reflect the non-equity assets (Z-Code).

Step 3.6.1.5 – DLA Energy CO/Installation CO modifies UP Contract based on negotiated USC with SO
Roles: DLA Energy CO/Installation CO, SO
The SO requests modification to the UP Contract for an update to USC.
Note:
Deliverable **–** UP Contract Modification

10-3 NATURAL GAS

The Natural Gas System at MAFB are owned and operated by TECO PGS. Contact PGS for their Construction Standards Manual Operations and Maintenance Procedures for more information.

On 26 March 2012 the MAFB UP contract for natural gas was awarded to TECO PGS by DLA Energy (formerly DESC). On 23 September 2012 the natural gas system at MAFB will be transferred to PGS by means of a Utility System Bill of Sale. Natural gas services will be provided to MacDill by means of the UP contract. PGS also provides the commodity. Therefore, PGS is the sole provider of these utility services to the installation. The Government has entered a fifty-year contract with PGS for utility services provided via their natural gas system. Over the course of the fifty-year contract, PGS is responsible for provision of utility services, to include operation, maintenance, repair, renewals, and replacements for the system. This includes all

exterior and underground pipes, meters, valves, and other related conveyance infrastructure. Each facility will have POD for PGS owned infrastructure.

TECO Peoples Gass Contact Information:

EMERGENCY CALL: 877-832-6747
NON-EMERGENCY administrative contact: 813-275-3799
Dustin D. Danahoo
8416 Palm River Road
Tampa, FL 33619
DDDonahoo@tecoenergy.com

10-3.1 Planning

PGS is required to submit annually an Annual System Deficiency Corrections/ Upgrades/ Connections and Renewals and Replacements Plan. The 6 CES COR, with input from 6 CES/CEP, is responsible for providing information to PGS on MacDill's planned programs, such as MILCON. The purpose is to define projects which could alter demands placed on the natural gas system, or which could modify or relocate e 4.

10-3.2 Design

10-3.2.1 Project Design for Third Party Construction

All agencies that design projects for construction on MAFB must coordinate with PGS on all proposed actions that might impact the utility system. Projects that cause impact include temporary connections; disconnections due to demolition; new connections due to facility construction; replacing existing lines and components; any project that involves work past the POD, which demarcate Government ownership. 6 CES is the primary agency designing projects, accomplishing work through 6 CONS via the MACC contract. Also, the US Army Corps of Engineers designs and oversees MILCON projects. Because PGS owns the utility system, these project designs must be coordinated with PGS. Coordination is also necessary because PGS must ensure the utility system provides adequate capacity as lines are repaired and/or replaced. PGS must also ensure the utility system is not compromised or damaged. Requests for design coordination will typically have a set of 30 percent design plans. These requests must be forwarded to PSG via the COR, who will have set up parallel notification processes. PGS shall have a minimum of two weeks to review the project and provide comments. PGS comments are to be incorporated to the extent that PGS will accept the utility components after construction is complete.

10-3.2.2 Design Standards

Designs that install, alter, disconnect, or connect (temporary of permanently), or cause adverse impacts to the natural gas system must incorporate PGS's design standards, and are subject to PGS inspection during construction. PGS design standards are provided as an attachment to this design guide.

Please note that PGS requires a minimum of two weeks review time. Comments from PGS will be transmitted to the COR and other appropriate individuals. The design must meet PGS's approval to the extent that PGS will accept the utility components after construction is complete existing infrastructure.

10-3.3 METERS

Please note that per AFCEC policy meters on privatized natural gas systems shall not be AMR type that can be connected to the Air Force network.

10-3.4 Construction:

Only PGS can connect/disconnect into PGS owned natural gas lines. No 3rd party contractor can connect/disconnect to a PGS owned line unless authorized by PGS.

10-3.4.1 Third Party Construction

The third-party construction contractor must coordinate with PGS prior to the start of utility work. This coordination involves payment of fees and submission of PGS forms. The construction contractor is expected to notify PGS at the appropriate times for inspection during the project. Please note that if new natural gas infrastructure is constructed by a third-party contractor, the new infrastructure belongs to the Government (6 CES) until the new infrastructure can be officially conveyed to PGS and the UP contract modified. PGS has the right not to accept infrastructure that is installed by others if the construction does not meet PGS standards. In the meantime, the Government will own and provide for the operation and maintenance of the new infrastructure until it can be brought up to acceptable standards. The COR is responsible for initiating the process to transfer the new infrastructure to PGS. Construction categories are listed below.

10-3.4.2 New Connection with Meter and Equipment that Uses Natural Gas

If the project meets the MACC provisions, the letter from PGS will state the fee is zero, and PGS will construct the new utility line to the POD. The letter will state exactly what work PGS will perform, including site preparation and finish work. This will enable the third-party construction contractor to properly phase the construction so that both parties work as a team. The third-party construction contractor is responsible for utility construction from the POD on. PGS will own the new utility line to the POD.

10-3.4.3 New Connection with Meter and Equipment that Uses Natural Gas

If the project does not meet the MACC provisions, PGS will prepare a letter that describes two scenarios. The first scenario will state the fee PGS will charge to construct the new line to the POD and will detail exactly what work is included. The first party construction contractor will pay the fee to PGS. PGS will own the new line to the POD. The second scenario addresses the case where the third-party construction contractor builds the new line. The letter will state the fee PGS will charge for making the final connection of the new line to the PGS owned natural gas main. The third-party

construction contractor will pay the fee to PGS. The government will own this new line until it can be transferred to PGS.

10-3.4.4 Temporary Connections/Disconnections

For any project requiring temporary natural gas connections and eventual disconnections, the PGS letter will state the fee to make the temporary connection and eventual disconnection. The letter will state exactly what work PGS will perform, including site work. An example of this would be connecting a thermal oxidizing unit- which may operate for several years- to a PGS owned main. The third-party construction contractor will pay the fee to PGS.

10-3.4.5 Permanent Disconnections, including Removing/Abandoning Natural Gas Lines

PGS will prepare a letter that describes two scenarios. The first scenario will state the fee PGS will charge to disconnect from the main and remove/abandon the line up to the POD. The letter will detail exactly what work is included. In this case it is very important that the third-party contractor understands his scope regarding clearing obstructions out of the way for PGS, such as removing pavement. The third-party construction contractor will pay the fee to PGS. The second scenario addresses the case where the third-party construction contractor removes /abandons the line after PGS has disconnected it from the main. The letter will detail exactly what work is included. The third-party construction contractor will pay the fee to PGS.

10-3.4.6 Altering Existing Natural Gas Lines (such as location, size, and material)

PGS will prepare a letter that describes two scenarios. The first scenario will state the fee PGS will charge to construct the alteration up to the POD. The letter will detail exactly what work is included. In this case it is very important that the third-party contractor understands his scope regarding clearing obstructions out of the way for PGS, such as removing pavement. The third-party construction contractor will pay the fee to PGS. PGS will own the new line to the POD. The second scenario addresses the case where the third-party construction contractor constructs the alteration, keeping in mind that only PGS can connect/disconnect to PGS owned lines. The letter will detail exactly what work is included. The third-party construction contractor will pay the fee to PGS. The government will own this new line until it can be transferred to PGS.

CHAPTER 11 ELECTRICAL

11-1 GENERAL

All specifications and design criteria listed within this document are required to be met as a minimum standard on all projects, UON. All equipment and wiring shall be Underwriter's Laboratories (UL) Listed. All equipment must be utilized, installed, and operated IAW UL Listing.

All design and installation shall be prepared and executed IAW the most current edition of the following:

NFPA 70	National Electric Code (NEC), 2017
NESC	National Electrical Safety Code, 2017
IBC	International Building Code, 2018
NFPA 70E	Standard for Electrical Safety, Latest Edition
NFPA 101	Life Safety Code
IESNA	Illumination Engineering Society of North America

All design and installation shall be prepared and executed IAW the most current edition of the following:

UFC 3-520-01	Interior Electrical Systems
UFC 3-501-01	Electrical Engineering
UFC 3-550-01	Exterior Electrical Power Distribution
UFC 3-530-01	Interior and Exterior Lighting Systems and Controls
UFC 3-575-01	Lightning and Static Electricity Protection Systems
	UFCs with specific construction requirements for facility or system

11-1.1 Electrical Equipment Identification Tags and Schematics

All electrical distribution components and units shall be designated and numbered (i.e., power distribution panels "PP-4" or transformer "XR- 12") and labeled with an etched plastic laminate identification tag reflecting abbreviated designation. A framed one-line schematic drawing of the electrical system, measuring no less than 11" x 17", shall be mounted in the electrical room.

11-1.2 Medium Voltage Overhead and Underground Lines

For medium voltage overhead and underground lines, reference TECO, Duke Energy, and Next Era Energy's Construction Specifications and UFC 3-550-01 Design Criteria for Underground Electrical Distribution. No paved areas will be cut and trenched to install electrical or communication lines, UON.

11-1.3 Available Fault Currents

Fault current available at the MacDill Ave substation (East or West 13.8kV bus) is as follows:

Three Phase	8500 A
Single Phase-Ground	8900 A

11-2 POWER ANALYSIS AND REQUIRED CALCULATIONS

The EOR will determine which existing electrical panels will require metering to be performed during the design phase and it will up to the general contractor to coordinate the efforts with the inspector.

All calculations shall be provided on the electrical plans and shall be accurate to the facility. The calculations and power analysis shall be performed with Easy Power V. 10.4.1 or equal software which is fully compatible with Easy Power 10.4.1.

The contractor shall provide the calculations and incorporate the findings from the analysis within the 95% design submittal. All calculations shall be performed utilizing the selected equipment to be installed for both primary (13,800V) and secondary voltage distribution systems and equipment associated with the project. If actual equipment installed differs from the BOD, the contractor shall be required to submit new calculations for approval. When additional equipment or load is being added to a primary conductor/circuit associated with a project, the analysis shall be performed to the furthest most upstream device, in most cases, this would be to the substation Relay/Breaker.

11-2.1 Load Analysis

All load analysis and calculation requirements listed within shall be performed IAW UFC 3-501-01 Chapter 3-2.2. The load analysis shall be provided for all projects and for the entire electrical distribution system associated with the facility and provided with the 95% design submitted for approval by the contractor, UON.

Providing analyses and calculations that are described fully, written clearly, and lead the reviewer through the design by stating all assumptions and design inputs.

11-2.1.1 Electrical Panel Metering

Electrical panel metering may be required to identify the existing load within the facility to ensure proper calculations per NEC Chapter 2 Article 220.

11-2.1.2 New and Existing Equipment

The contractor is responsible for changing/updating all settings on both new and existing equipment. A list of the required calculations are as follows:

- Primary and/or Secondary Load Analysis (including panel schedules, load and service demand calculations, the Easypower model report and model shall be submitted separately as a binder and on compact disc (CD)(electronically)).
- Short circuit analysis, including protective device interrupting rating
- Detailed riser diagrams
- Primary and/or Secondary voltage Protective device time-current coordination study
- Arc Flash Analysis
- Voltage drop calculations
- Motor starting/flicker analysis
- Underground structure design
- Cable pulling tension calculations
- Directional boring installation details
- Sag, tension, and guying analysis
- Cathodic protection calculation
- Lightning protection analysis
- Cable Television (CATV) network loss calculations
- Wind load calculations compliant with current adopted edition of the FBC.

11-3 UNDERGROUND ELECTRICAL DISTRIBUTION

All three-phase underground medium to high-voltage shielded cable shall be 15 kV, 133% Ethylene Propylene Rubber (EPR) insulation level, 1/3 concentric neutral, MV-105, All single-phase underground medium to high-voltage shielded cable shall be 15 kV, 133% EPR insulation level, Full concentric neutral, MV-105, copper. All electrical medium voltage lines shall be in a minimum schedule 40 Polyvinyl chloride (PVC), UON, conduit and encased in red-dyed concrete.

All new cables shall be installed with fault indicators. BOD: Raychem.

Cable/conductor field testing shall be performed IAW the current edition of Institute of Electronic and Electrical Engineers (IEEE) Standard 400.2. Raceway routed under pavement shall be capable of withstanding compression loads for applicable vehicle traffic.

11-4 PRELIMINARY TERMINATION/SPLICES

Use cold shrink or heat shrink type splices and pole-top terminations. Neither "T' nor "Y" splices are allowed on any underground medium to high voltage feeders. Pre-molded elbow-type or bolt-together terminations (200 or 600 A) for underground cables are not acceptable (UFC 3-550-01). Only 600 A Bolt-T and 200 Load break terminals are allowed within above grade transformers, sectionalizing cabinets and switchgear, UON. Terminations and splices shall not limit the ampacity of the cable. All conductors shall be INDIVIDUALLY fire wrapped IAW UFC 3-550-01.

BOD: 3M Scotch 77 Fire and Electric Arc Proofing Tape.

11-5 OVERHEAD ELECTRICAL DISTRIBUTION

All new power distribution construction shall be below grade, no new overhead power lines will be constructed, UON.

All new poles shall be concrete (A-type construction unless otherwise directed by the base).

All down guys shall be covered at ground level with tamper proof guy guards.

Pole grounds shall be externally mounted. Do not ground any pole mounted devices unless required by the manufacturer.

For Triplex type overhead secondary lines, aluminum may be used.

All pole mounted devices shall be constructed of anon-metallic material, such as, fiberglass.

Use non-metallic cutouts and 10 kV (8.4 MCOY) heavy duty distribution type lightning arrestors and external ground wire.

High voltage insulators shall be clamp type-rated at 25 kV.

11-6 VAULT TYPE PAD-MOUNTED DISTRIBUTION SWITCHES

All pad mounted switches shall be insulated with either FR3 Biodegradable oil or SF6 gas, constructed of all 304L or 316; stainless steel components and 316 stainless steel enclosure, with dead- front construction only.

Each switched way shall have all three phase, three position (Open, Closed, Grounded), single-handle gang operated with switch position viewing window. The operating handles shall be located on the opposite side of the tank from the cable entrance bushings such that switch operating personnel will not be exposed to the switch cable entrance bushings, terminations and cable during switching.

All switch gear ways shall be lockable by penta bolt and provided with a Best 7 pin format padlock keyed to the base standard transformer key.

All switched ways shall be protected with an electronic trip controller with multiple trip options, e.g., Vacuum Fault Interrupter (VFI). The VFI controller shall be re-programmable in the field without additional equipment required and shall include all necessary software and interface cables if applicable.

All switchgear shall be factory powder coated, manor house brown.

Do not install any switchgear below grade. Switchgear shall be installed on a vault type pad with a rectangular spring loaded lockable galvanized, 2-piece access lid. Switchgear pads are to be set at 6- inches above grade.

All unused Load Break and dead break bushings shall be protected with a load break protective cap with drain wire, BOD will be Cooper.

All unused load break and dead break bushing wells shall be protected with an insulated bushing well plug, BOD will be Cooper.

11-7 VAULT TYPE PAD MOUNTED SECTIONALIZING CABINETS

Sectionalizing cabinets shall be constructed of 316 stainless steel enclosure with dead front construction only.

All gear shall be lockable by penta bolt and provided with a Best 7 pin format padlock keyed to the base standard key.

Equipment shall be factory painted manor house brown and shall meet corrosion resistant specifications.

Sectionalizing cabinet shall be installed on a vault type pad 4 feet deep minimum and shall extend a minimum of 6 inches beyond each side of the gear and shall be set at 6 inches above grade.

All unused load break and dead break bushings and bushing wells shall be protected with either a protective cap with drain wire or insulated bushing well plug, BOD Cooper.

11-8 ELECTRICAL DISTRIBUTION MANHOLES

Round entry rings and lids are not allowed. Manhole access lids shall be bonded to ground via a ground strap tied to the manhole grounding system.

All manholes will be grounded and will have an appropriately sized ground cable around the inside of the manhole. Ground rod shall be installed outside the manhole, with the grounding conductor penetration no lower than 18-inches below the top of the manhole.

Access lids will be clearly marked “Electric” in a permanent method. All manholes will be supplied with high strength plastic (non-metallic) cable racks and rails. All manholes will have a sump pit with removable cover similar to communications manholes.

Electric Power Cables and Conductors installed through Manholes shall have a service (slack) loop equal to the one and half times (x1.5) the perimeter of Manhole.

11-8.1 Electrical Primary Distribution

Electrical Primary distribution manholes shall be octagonal precast concrete set at grade (8’ x 8’ x 6’ minimum, UON) with a traffic grade rectangular, two-piece galvanized spring-loaded lockable access lid.

11-8.2 Electrical Secondary Distribution

Electrical Secondary distribution manholes shall be sized to accommodate cable bending radiuses and have a traffic grade rectangular, two-piece galvanized spring-loaded lockable access lid.

11-9 SERVICE ENTRANCES

New service entrances shall be underground in conduit. Conductors rated 600 volts and below may be in direct buried conduit. All concrete encased duct banks shall be dyed red. Caution tape shall be provided 12-inches above conduit.

All existing and new services modified and/or installed a placard shall be provided indicating the new calculated available AIC Rating permanently affixed to the outside of the equipment.

All new and existing services/equipment associated with a project shall be provided with the current UFC 3-501-01 Arc Flash Warning labeling.

11-10 METERS

Advanced meters are required at all facilities that meet the feasibility criteria of the current AF Facility Metering Policy, latest version and the DOD 4170.11 criteria, and must meet the UFGS 26 27 13.10 30 requirements of being MV-90 compatible. Meter location shall be coordinated with the Base.

11-10.1 Up to and Including 400 Amp Building Service

All CT cabling shall be installed below grade when installed within the secondary or primary compartment of a transformer.

11-10.1.1 Meter BOD

Square D PM 5560 - shall be of the microprocessor based intelligent type, with communications capabilities including Ethernet gateway, radio frequency, and fiber optic modem. Ethernet/RF accessory or an equivalent poly-phase electricity meters suitable for billing, allocation of cost, and recording of data for energy management and control applications.

11-10.1.2 Meter Enclosure

If noted to be mounted on the exterior, all devices shall be enclosed in a National Electrical Manufacturers Association (NEMA) 4X, 316 stainless steel box with hinged door. Provide meter bypass switch. Provide split core type current transformers for the service, sized for the service amps or larger.

11-10.1.3 Wireless Antennae and Enclosure

316 Stainless Steel NEMA 4X (if mounted on exterior) Air Guard Radio 2.4 & 5.8 GZ secure wireless Ethernet radio with FIPS140-2 compliant and dual power supply. 10DBI Omni antenna with lightning arrester included. The antenna is to be mounted on side of meter enclosure by the Contractor. Where remote antenna mount is indicated additional cable is to be provided.

11-10.1.4 Other Enclosures

If the Meter/Antennae enclosures are to be mounted either near the transformer or free standing the meter shall be concrete post mounted and supported by stainless steel unistrut. The meter/antennae enclosures and associated equipment shall be powder coated to the manor house brown standard; the conduit shall be painted. If mounted to exterior of the facility, the meter/antennae enclosures, all associated equipment, and conduit color shall match the surrounding area.

11-10.2 Above 400 Amp Building Service

CT cabling shall be installed below grade when installed within the secondary or primary compartment of a transformer.

11-10.2.1 Meter BOD

ION 8650 Advanced Revenue Socket Meter with Federal Information Processing Standard (FIPS) Approved Wireless Radio with factory assembled enclosure. The meter needs to meet additional specifications below and shall meet EPA 2005 criteria. (Part Number #9788E860CRADIO).

11-10.2.2 Enclosure (Total)

316 Stainless Steel NEMA 4X rated (if mounted on exterior), total dual compartment dimensions: 38” x 12” x 53”.

11-10.2.3 Enclosure top compartment

ION S8650C0C0E6E0B0K, Form 9S, 3 element, 4 wire, 60Hz system frequency, with 32MB onboard memory, 4 data recorders 64 channels), sag/swell detection, Ethernet, RS-232/485, MV-90, Infrared Optical Port, 4 Form C Digital Outputs, 3 Form A Digital Inputs, Password protected. Input disconnects for meter voltage connection, CT shorting block for current transformers, CTs shall be provided, and the ratios shall be properly programmed.

11-10.2.4 Enclosure bottom compartment

Air Guard Radio 2.4 & 5.8 GHZ secure wireless Ethernet radio with FIPS 140-2 compliant and dual power supply. 10 DBI Omni antenna with lightning arrester included. The antenna is to be mounted on side of meter enclosure by the Contractor. Where remote antenna mount is indicated additional cable is to be provided.

11-10.2.5 Other Enclosures

If the Meter/Antennae enclosures are to be mounted either near the transformer or free standing the meter shall be concrete post mounted and supported by stainless steel unistrut. The meter/antennae enclosures and associated equipment shall be powder coated to the manor house brown standard; the conduit shall be painted. If mounted to exterior of the facility, the meter/antennae enclosures, all associated equipment, and conduit color shall match the surrounding area.

11-10.3 Temporary Electric Meters

Temporary electric meters shall be installed at each construction site (for monitoring purposes only). Civil engineer squadron shall be notified when a temporary meter is installed at a construction site.

11-10.4 Commissioning and Line of Sight Surveying

Commissioning and Line of Sight (LOS) surveying shall be completed for all newly installed wireless meters and antennas to ensure a fully operational system. The meter shall properly report to building 347 head end wireless network prior to acceptance. The LOS survey shall be done prior to the 95% design submittal and the results provided with the 95% design submittal. The antennae shall be properly installed at the location indicated by the LOS survey results.

11-11 PRIMARY TRANSFORMERS

Primary transformers shall be Delta primary, Wye secondary, 200 A dead front feed through type with 10 kV Heavy duty lightning arrestor elbows on the feed through side. Adapters shall be supplied as necessary to accommodate surge arrestors when feed through side is being utilized. All transformers shall be filled with biodegradable oil, i.e., FR3. All new single phase pad mounted transformers shall be connected as 7,620 Volt primary connection, Wye secondary with fully rated concentric neutral. No rebuilt or re-manufactured transformers are allowed.

All transformers shall come equipped with 3 – load-break on-off internal liquid immersed switches to allow for all switch options: A, B, A and B, and C.

All transformers shall have a five position no load tap changer, with normal tap plus two each 2.5% taps above and below, a pressure relief and a drain valve within.

All transformers shall be internally fused and include bay-o-net fusing. If the transformers are fed from an overhead line, 200A rated fused cutouts (minimum) and 10KV distribution class, heavy duty lightning arrestors shall be provided so that fuses and arrestors can be standardized.

11-11.1 Pad-Mounted Transformers

All new service transformers shall be mounted on a 10-inch pad (5 inches above finished grade and 5- inches below). All pad mounted transformer shall be lockable by Penta bolt and provided with a Best 7 pin format padlock keyed to the base standard transformer key. All pad mounted transformers shall be a NEMA 3R, 100% 304L stainless steel (Tank, Tank base, Cabinet, Fins) construction, and factory painted manor house brown color.

11-12 LOW VOLTAGE TRANSFORMERS

Facilities with computer loads shall have 220 degrees F, UL listed transformers with a K-factor of not less than 4.0 according to ANSI/EEE C57.1986 or 220 degrees F or UL listed harmonic mitigating transformer according to ANSI/IEEE standards, including C57.12.91, C57.96, C57.110 with secondary neutral rated 200% of phase or Environment Potential harmonic mitigating and surge suppression device BOD: 2800 Series. No rebuilt or re-manufactured transformers are allowed.

11-13 MOTORS/EQUIPMENT

11-13.1 Disconnect Switches

Provide Heavy Duty type safety switches on systems rated for greater than 240V and General Duty for those rated below 240V. Use NEMA 4X stainless steel switch enclosures for switches located outside or on building exteriors. All disconnects shall be lockable and shall be capable of positive visual verification of disconnect status (hinged door).

Disconnects Switches shall be fusible when needed for Equipment Overcurrent Protection measures.

11-13.2 Motor Control Circuits (MCC) (Starters)

Provide motor starters when required by the manufacturer or where specifically required. Provide manual control capability for all installations having automatic control that operates the motor directly. Use a double-throw, three-position switch or other suitable device (marked MANUAL-OFF-AUTOMATIC) for the manual control of motors. All motors shall have premium efficiency ratings per the Energy Policy Act of 2005.

11-13.3 Voltage/Wiring

Use three-phase motors if more than 5 horsepower rating when such service is available. If three-phase service is not available, operate motors 5 horsepower and larger at phase-to- phase voltage rather than phase-to-neutral voltage. Motors smaller than 5 horsepower should be single phase, with phase-to-phase voltage preferred over phase-to-neutral voltage. Do not use 230V motors on 208V.

11-13.4 VFD/ VSD, Direct Current

All new VFD equipment shall comply with the current UFGS 26 29 23 – Variable Frequency Drive systems under 600V at a minimum. The E.O.R. shall select the industry standard options including the system voltage, SCCR rating, and horsepower ratings. The VFD shall come equipped with an electronic break option. All VFD equipment shall have the ability to perform a restart of the motor/pump it is associated with once the motor stops or if the VFD has properly synchronized with the motor. DC and AC low voltage control wiring shall be run in separate conduits. All newly installed VFD equipment shall additionally be provided with a line reactor installed ahead of the VFD equipment.

The motor should be located as close to the VFD as possible (100 feet or less). For applications where the motor is to be located more than 100 feet away from the VFD, a load reactor or dV/dt filter (500 feet or greater) must be installed and VFD shielded cabling (B.O.D. – Belden MCM VFD cable) within conduit from motor to drive shall be used. All VFD driven motors 20hp and larger shall be supplied with exterior mounted shaft grounding brush kit, BOD – AEGIS bearing protection rings.

11-14 GROUNDING

All grounding shall follow AFI 32-1065.

All below grade connections shall be exothermically welded.

Equipment ground conductors shall be an insulated conductor sized according to the NEC. Secondary distribution grounding system resistance shall be no more than 5 ohms.

11-14.1 Lightning Protection Grounding Systems

All lightning protection and static ground systems shall be designed and installed IAW UFC 3-575-01, AFI 32-1065, and NFPA 780.

11-14.2 Other Grounding Systems

Switchgear, sectionalizing, recloser, capacitor bank and transformer grounds shall be a 4-rod grid, 2 feet from the pad.

11-14.3 Test Wells

Test Wells shall be installed at ground level points to access ground grid. All ground rods shall be provided with a 10” x 18” deep test wells. The test well shall be filled with 8” of gravel and the ground rod shall be installed 6 inches below the test well lid. The lid shall be permanently marked with the word “Ground”. The conductors shall exothermically welded to the ground rod, however, since periodic testing is required by DoD, there shall be a bolted connection between the ground rod and the down conductor.

11-15 SECONDARY LIGHTNING/SURGE PROTECTION

Provide UL 1449, 3rd Edition listed lightning/surge protection for all phase and neutral conductors at service entrance and branch panels for the appropriate category as defined in ANSI C62.1, and C62.45 and tested as defined in ANSI/IEEE C62.41. Selected device shall meet or exceed with the requirements of UFC 3-520-01, “Interior Electrical Systems” Section 3-4.

Provide UL 1449 3rd edition listed devices for all communications, fire alarm, security, and/or fire control panel feeders exiting the facility as required by NFPA 780 and UFC 3-575-01, “Lightning and Static Electricity Protection Systems”. Lightning Protection System (LPS) installation shall be compliant with NFPA 780, Standard for the Installation of Lightning Protection Systems.

11-16 CONDUIT

Conduit selection and usage shall be IAW UFC 3-520-01, “Interior Electrical Systems”. Whenever possible, all exterior mounted conduit/conductors shall be placed below grade.

Underground primary conduit shall be no less than 4-inches schedule 40 PVC concrete encased in red- dyed concrete.

UL listed Schedule 80 HDPE with tape and wall thickness of .432” shall be used for all directional boring, which shall be installed and only utilized IAW ETL 07-1.

Minimum conduit size for any electrical power conductors is ¾-inch.

11-16.1 Galvanized Rigid Steel

All primary below grade schedule 40 PVC conduit shall be installed with Galvanized Rigid Steel (GRS) 90-degree elbows, UON. All conduits shall be painted to match surrounding area. Additionally, all exposed conduits to free standing electrical equipment shall be painted to match equipment. GRS conduit shall be specified when installed within masonry or concrete walls and slabs, wherever exposed to weather, and whenever exposed to physical damage.

For transitions from underground to above ground, the 90-degree elbow and beyond shall be GRS conduit.

11-16.2 Electrical Metallic Tubing

Electrical Metallic Tubing (EMT) shall be specified for branch circuits and feeders above suspended ceilings or exposed where not subject to physical damage within the interior of the building. Do not use EMT underground, encased in concrete, mortar or grout, hazardous locations, outdoors nor in pump rooms. Use die-cast compression connectors and couplings.

11-16.3 PVC

PVC shall be specified as Schedule 40 PVC for service entrance conduits from the service utility to the substation to the service entrance or underground below floor slabs. Do not use PVC above the ground level slab of buildings.

11-16.4 Surface Metal Raceways

Surface Metal Raceways (not PVC Raceway) shall only be used for building improvements or renovations where surface mounting interior conduits is a must. Surface Metal Raceways shall be two- piece painted steel, totally enclosed with snap-cover.

Multi-outlet assemblies are only allowed for applications where a variety of cord and plug connect equipment will be utilized in a limited space, such as in certain areas of medical facilities, shops, and laboratories.

11-16.5 Flexible Metallic Conduit

Flexible Metallic Conduit (FMC) shall only be used for recessed and semi-recessed lighting fixtures or equipment subject to vibration and as a whip connection to motors. The maximum length for a single run of FMC is 6 linear feet.

11-16.6 Electrical Non-Metallic Tubing

Electrical Non-Metallic tubing (ENT) and Flexible Non-Metallic Conduit (FNC) and associated fittings are prohibited to be installed in any base installation.

11-16.7 Metal-Clad Cable

Metal-Clad Cable (MC) shall only be used as a whip from a junction box to a light fixture or a wiring device. The maximum length for a single run of MC is 6 linear feet.

Conduits shall be ¾-inch minimum.

11-17 SECONDARY CONDUCTORS

Copper (no aluminum) with THHN/THWN insulation, UNO. The minimum wire size shall be #12. All circuits shall have dedicated, full sized neutral wire. All secondary below grade termination/splices shall be listed for use in wet locations and shall comply with 310.8C of the NEC. Romex style conductors are not permitted.

11-18 DISTRBUTION SWITCHBOARDS

11-18.1 1200 Amp-Rated and Larger Main Distribution Switchboards

If there will be three or more 400A or larger breakers installed due to large equipment demand requirements then the main switchboard shall be of the Power-Style QED-6 type, or equal. If there will be less than three 400A or larger breakers installed due to large equipment demand requirements then the main switchboard shall be of the QED-2 type, or equal. The equipment and breakers shall be accurately rated and sized for the

building demand per NEC requirements. Main switchboard breakers shall be PowerPact with Micrologic molded case circuit breakers, or equal. Breaker options and style shall be determined and set in compliance with the EasyPower study provided by the engineer of record. All buses shall be copper.

11-18.2 Up To 1200 Amp Main Distribution Switchboards

Shall be Power-Style QED-2 or equal, and accurately rated and sized for the building demand per NEC requirements. Main switchboard breakers shall be PowerPact with Micrologic molded case circuit breakers, or equal. Breaker options and style shall be determined and set in compliance with the EasyPower study provided by the engineer of record. 25% spare breaker spaces shall be provided when deciding the number of available circuit breakers. All buses shall be copper.

11-19 BRANCH/SUB ELECTRICAL PANELS

- Bolt-on breakers with trip indicators shall be specified.
- Hinged Door.
- Provide 25% minimum spare breakers and 25% spaces for electrical distribution panels.
- Provide at least two spare 1-inch stubbed-out conduits to above ceiling at panel location.
- Use only copper or tin-plated copper buses, neutral bars, grounding bars, etc.
- Provide 200% neutral bus for all computer loads.

11-20 LIGHTING

All design and installation shall be prepared and executed in accordance with the most current edition of the following: UFC 3-530-01, Interior, Exterior Lighting and Controls. The Target Illuminance is specified for different occupancies in UFC 3-530-01. A calculation and subsequent installation are permitted to be out of UFC tolerance (+/- 10%) of Target Illuminance by exception only. Exceptions shall be requested by Contractor or EOR at the 65% design phase with provided Photometric Calculations.

Contractor shall perform both normal and egress photometric calculations during the 65% design phase and submit as part of the 65% submittal drawings, UON. Photometric foot candle levels shall be IAW UFC 3-530-01. The target illuminance for each room must be included on the calculated photometric values table on the photometric plan demonstrating levels are met.

All installed lamps, fixtures, ballast, and lighting control equipment must comply with UFC 3-530-01 and the IESNA Handbook.

11-20.1 Color Temperature

Color temperature must be consistent throughout a room. For most applications, interior lighting color temperature must be rated to 4000K, UON. Exterior lighting color temperature must be rated to 4100K, UON.

11-20.2 Color Rendering Index

Color Rendering Index (CRI) shall be a minimum of 85.

11-20.3 Incandescent Lighting

Incandescent lighting is prohibited unless given authorization by 6 CES.

11-20.4 Low- or High-Pressure Sodium Fixtures

Low- or high-pressure sodium fixtures are prohibited.

11-20.5 Fluorescent Lighting

Fluorescent lighting is not permitted.

11-20.6 LED Requirements

LED fixtures shall comply with ETL 3-530-01. If the contractor attempts to utilize an "alternative" or an "or equal" LED fixture then what has been approved per UFC 3-530-01, then the contractor is responsible for providing a signed letter of acceptance and agreement that the lighting manufacturer used (whether BOD or not) is supplying LED technology the meets the specifications as required in the MacDill Guidelines.

- Must be rated to operate +40 degrees C or above.
- Must be rated to a minimum of 60 lumens per watt driven at 350 mA
- Must be rated to a minimum of 50 lumens per watt driven at 525 mA
- Fixtures, lamps, and drivers must be purchased with a warranty of at least 10 years.

11-20.7 Lighting Controls

11-20.7.1 Control Schemes

Light Control Schemes shall be limited to ON / OFF / Dimming. Occupancy sensors shall not be used in any area where Mission Tasks, Work Tasks, Office Activities, Meetings, Learning, Seminars, Server Room, Dining, Maintenance, or Storage/Warehousing takes place. Light Harvesting technology is not to be employed or specified. Lighting Automation shall not be employed or specified. Any Lighting Automation that is cumbersome, prone to nuisance, or difficult to operate shall be prohibited. Any lighting automation must be requested in advance of specification, design, or installation.

Banks of two or more single switches (with or without dimming capability) may be grouped together to achieve Scene Control within a space.

Three-way switching may be included in a floorplan for operability.

11-20.7.2 Timer Switches

Provide and install push button timer switches in exterior task lighting. Time switches must have a Hand-On Override. Switches shall be set to the option to have lights flash 5 minutes prior to off. BOD: Wattstopper – TS-400.

11-20.7.3 Mechanical and Electrical Rooms

Mechanical and Electrical rooms shall have toggle light switches.

11-20.8 Specific Lighting Requirements:

11-20.8.1 Airfield Lighting Requirements

Use UFC 3-535-01, Visual Air Navigation Facilities. LED products are only allowed/required IAW ETL 11-29, Use of Light-Emitting Diode (LED) Fixtures in Airfield Lighting Systems on Air Force Installations.

11-20.8.2 Street lighting Requirements

Fixtures must be full cut off and must be LED. Use cobra head fixture, UON. Fixture color must be dark bronze.

Post Top shall be LED and the fixture color must be dark bronze. Lamp posts are anodized aluminum, Dark Bronze color. Refer to the IFS for design style. Pole and base shall be 296 style, 16-ft, with Hubbell Helix Screw type base T1120566 with poured in place 24”x16” round pad, UON.

11-20.8.3 Parking lot Requirements

Fixtures must be full cut off and shall be shoe box style fixture. Fixtures shall be LED and shall have Bi-Level option, controlled by motion detection. Fixture color must be dark bronze. Lighting on-off must be controlled by Photocell (at a minimum). Other control options in addition to photocell may include Hand-ON, Hand-OFF, Push-to-Test-ON, Timeclock, etc. If multiple control schemes in addition to Photocell are utilized, a switch (accessible at 42” to user must be installed).

11-20.8.4 Wall pack Requirements

Fixtures must be full cut off and shall be LED. Fixture shall have emergency backup battery when required and bi-Level option, controlled by motion detection. For fixtures over 25 watts, utilize motion detectors, detection pattern shall cover all lighted area.

11-20.8.5 Landscape Lighting

Shall be LED.

11-20.8.6 Emergency Lighting

Emergency lighting test buttons shall be accessible from 6-foot maximum ladder height or remote test buttons must be provided.

11-21 EMERGENCY GENERATORS

Installation of an Emergency Generator shall include the completion of a Generator Authorization Form from AFCEC.

Generators shall follow UFC 3-540-01, “Engine-Driven Generator Systems for Prime and Standby Power Applications”, AFI 32-1062, “Electrical Systems, Power Plants and Generators”, and ETL13-4, “Standby Generator Design, Maintenance, and Testing Criteria”.

Diesel only generators with fuel on site to operate a minimum of 72 hours at full load. Use caution during design to ensure that generator fueling access is included. Base refueling vehicles have a limited hose length, limited type hose connection, and adequate fueling access (within 50 feet of the tank) is critical. Dual fuel generators are not permitted, diesel fuel only generators shall be provided.

Auto transfer switches shall be 4-pole only (switched neutral), with maintenance bypass isolation. No exercise timer. Exterior mounted in NEMA 4X stainless steel enclosure. The Contractor shall utilize UFGS 26 36 00.00 10 standard and the EOR shall finalize the specification to the specific installation.

Manufacturer BOD for generators: Cummins, Caterpillar, or Kohler. Manufacturer BOD for Automatic Transfer Switches with bypass isolation: Cummins, ASCO or Russelectric.

The Contractor shall provide a complete set of manufactures Operation, Maintenance and Parts manuals (IPB with part numbers).

The generator shall be provided with an engineered work platform whenever the generator assembly exceeds the height elevation of four feet above finished grade.

11-21.1 Permitting Requirements

All generators shall be added to the MAFB Air Permit prior to installation by the contractor. The contractor is typically responsible for preparation of the application to modify the Air Permit. Permit applications shall be submitted to 6 CES/CEIE for review.

All equipment and fuel for required commissioning will be supplied by the contractor.

Refer to permitting requirements in Section 16-3 STORAGE TANKS PERMITTING for fuel above ground storage tanks greater than 550 gallons and air quality permitting requirements in section 16-12 AIR QUALITY.

11-21.2 Temporary Generators

The contractor must maintain a usage log for all portable/temporary generator use to implement task associated with this specification.

11-22 HANGARS

Existing electric distribution voltages vary within every hangar. Contractor shall verify equipment voltage requirements with available voltages. Contractor shall provide all additional equipment necessary for proper operation, i.e., 240/416 volt and/or 277/480 volt.

11-23 ENERGY CONSERVATION

Energy performance must meet or exceed the requirement of ETL 94-4, Energy Usage Criteria for Facilities in the Military Construction Program & Energy Policy Act of 2005, as well as, UFC 3-400-01, Energy Conservation, with Change 4. Use premium efficiency on all motors. Use variable speed fans and pumps unless other alternatives provide a lower life-cycle-cost or special system constraints require constant speed equipment.

11-23.1.1 Exit Signs

Use LED type. Contractor must perform 60-minute requirement for Self-Testing IAW UFC 3-601-02.

11-23.1.2 Plug Loads

Flat screen monitors will be LED and energy star approved. Appliances will not be installed in individual offices for personal use only. Data center and server room temperatures will be designed for 75 degrees F. Wet areas under water fountains must have a GFCI (Ground fault circuit interrupter) protected receptacle.

Time controlled general use receptacle switching shall not be designed or installed in any project.

11-24 FIRE DETECTION/MASS NOTIFICATION SYSTEMS:

All design and installation shall be prepared and executed IAW the most current edition of the following:

NFPA 72	National Fire Alarm and Signaling Code
UFC 3-600-01	Fire Protection Engineering for Facilities – Chapter 5
UFC 3-601-02	Operation and Maintenance: Inspection Testing, And Maintenance of Fire Protection Systems
UFC 4-021-01	Mass Notification Systems

All fully renovated systems (more than 50% of fire detection system value) shall be converted to fire alarm/mass notification combination systems.

All new and modified fire alarm/fire suppression/mass notification system designs shall be signed and sealed by a Qualified Fire Protection Engineer (QFPE) who meets or exceeds the required standards of UFC 3- 600-01 section 1-5.

Systems must report to central alarm center via FM radio transceiver/receiver operating on 165.1375 MHz and must be completely compatible with Monaco BT-XM Radio Fire Alarm Reporting Transceiver/receiver and controller.

Contractor to provide all commissioning and any additional equipment necessary to properly report to the fire station network, including by not limited to, transceiver/receiver, surge suppression, omni- directional antenna, and cable.

11-24.1 Alert Messages

All new systems shall be fire alarm/mass notification combination systems. The following messages alerts shall be installed at time of commissioning:

Message 1: Alternate Exit

Message 2: Bomb Threat

Message 3: Chemical Attack

Message 4: Shelter-In-Place

Message 5: Severe Weather

Message 6: Active Shooter

Message 7: All Clear

Message 8: Test

11-24.2 Minimum Requirements

The contractor provided fire alarm/mass notification equipment panels shall meet the following requirements:

a. Devices shall be addressable.

b. Devices shall be interchangeable.

c. Devices shall require no FACP Programming Software.

d. Intelligent/addressable devices

e. Interchangeable devices that require no additional panel programming software

f. 80-90% front end maintenance capable without additional programming devices/software

g. Non-Proprietary. Fire Alarm Control Panel Software shall be turned over to Operations / 6CES no later than 3 days after at the completion of the Fire Alarm commissioning (Including system programming, settings, operating files and any software files required to interface with FACP hardware).

h. Auto program capability

11-24.3 Project Deliverables

The following items are required to be provided by the contractor to the MAFB construction representative prior to acceptance of the project:

a. A copy of the system software with current license and/or keys

b. A hard copy of a complete device listing indicating the device type, device IP address, device location, and device alarm notification (this shall remain within the fire alarm control panel cabinet)

c. All maintenance manuals and guides

d. A hard copy of the final as-builts

e. A USB thumb drive with the final system .data file used in programming the fire alarm system (this shall remain within the fire alarm control panel cabinet).

CHAPTER 12 COMMUNICATIONS

12-1 GENERAL

Designs shall adhere to the following references:

ETL 02-12: Communications and Information System Criteria for Air Force Facilities.

ETL 02-12 MAFB Supplement: Communications and Information System Criteria for Air Force Facilities (APPENDIX H).

UFC 3-580-01: Communications Building Cabling Systems Planning and Design.

12-2 CABLING

All cabling shall be properly labeled per ETL 2-12 and Energy Information Association (EIA) / Telecommunication Industry Association (TIA) - 606-B standards and neatly formed, racked, supported, and secured in place within the hand hole/manhole.

12-2.1 CABLE TAGS

All tags shall be permanently labeled, easily visible and corrosion resistant.

Cable tags shall be installed in all maintenance hole/hand hole and Fiber Optic Distribution Panel (FODP) locations. When cables pass through maintenance holes/hand holes, put a tag on the cable, approximately 2 feet from each duct entrance and at each splice location.

Information on the cable tag shall identify cable by size, type, cable number and count. The same information shall appear on the Contractor’s completed as-built-drawings.

12-2.2 CONDUIT INSTALLATION

12-2.2.1 Underground Installation

Installation of underground conduits/ducts shall be IAW RUS Bulletin 1751F-643 and RUS Bulletin 1753F-151.

12-2.2.2 Across Paved Areas Installation

Ducts across roads, sidewalks, parking areas, or areas to be paved, etc. shall be installed a minimum of 36" below grade.

In maintenance holes with knockouts, ducts shall start at the bottom knockout, allowing for upward expansion in the maintenance holes.

All ducts not installed across roads, sidewalks, parking areas, or areas to be paved, etc. shall have a minimum of 36 inches ground cover.

The Contractor shall provide other protective measures, concrete cap, etc., in those areas where the minimum ground cover cannot be achieved. Grading of ducts shall be accomplished IAW RUS Bulletin 1751F-643.

12-3 FIBER OPTIC CABLE TYPE

The Contractor shall install outside plant (all-dielectric, loose buffer tube, single mode, water blocked) optical fiber cable suitable for underground applications. The cable shall meet RUS 7 CFR 1755.900 criteria; shall comply with industry standards regarding manufacturers' cable marking, jacket, rip cords, water blocking, fiber color coding, jacketing materials, etc. All fibers shall comply with industry standards regarding mode field diameter, core cladding concentricity, attenuation, and dispersion characteristics at 1310 nm and 1550nm.

12-4 GENERAL TESTING REQURIEMENTS

The Contractor shall furnish all test equipment and personnel required to conduct testing.

The Contractor shall record all inspections and tests as they are accomplished and make all test sheets/results available for 6 CS/SCXP representative as tests are completed.

Contractor is required to locate/repair any testing irregularities if caused by the installation. Any splicer's errors detected shall be corrected in the splice in which they were made. It is assumed that the cable is delivered fault free from the manufacturer. No cable faults or splicer's errors are allowed in the new cable. Contractor is required to locate and repair cable faults or splicer's errors if caused by the installation.

12-4.1 Testing Schedule

The Contractor shall notify the 6 CS/SCXP at least 5 calendar days prior to any testing. All testing will be IAW accepted telecommunications industry standards for the type of test being conducted.

The Contractor shall provide test reports to the government within 10 calendar days of completing the testing.

12-4.2 FIBER OPTIC CABLE TESTING

These tests shall also be performed prior to any modifications so that the integrity all existing fiber strands affected by this scope, is verified prior to modifications.

All strands of all fiber optic cables shall be tested IAW TIA 526-7 Measurement of Optical Power Loss of Installed Single-mode Fiber Cable Plant, or equivalent. As a minimum, the following tests shall be performed.

a. Both Optical Time Domain Reflectometer (OTDR) and Optical Power Meter tests will be used for all end-to-end circuits.

b. Between Fiber Optic Distribution Point (FODP), bi-directional testing at 1310 nm and 1550 nm is required.

c. For incomplete circuits that end in manholes, only 1-way OTDR testing is required.

12-5 COPPER TELEPHONE CABLING

The contractor shall provide gel filled base cable, IAW the Rural Electrical Association (REA) standard PE-39 from main communications panel to the nearest communications connection point with sufficient vacant pairs to provide each facility with required cable pairs.

All copper cable splicing shall be completed using singular splicing connectors.

All copper cables shall be tested for the following: continuity, shorts, opens, grounds, and crosses. In addition, all level Cat-6 cables shall be tested to ensure compliance with TIA/EIA 568A standards. Test results shall be provided to base communications squadron project manager.

All contractor cable installations shall be inspected and tested; all defects discovered shall be repaired at no cost to the government.

12-6 SERVICE OUTAGES

The Contractor shall be responsible for preventing any unscheduled (i.e., cutting or disabling any in- service cables or equipment.), Contractor-caused, interruptions of communications capabilities or other utilities that are properly identified.

The Contractor shall coordinate planned outages/interruptions existing circuits with the 6 CS/SCXP project manager (PM) at least 14 calendar days in advance of the outage if the implementation necessitates disruption of service, (e.g., communications, electrical, or other utilities).

CHAPTER 13 SECURITY FORCES

13-1 GENERAL

Work that Security Forces (SF) are generally concerned with:

a. Any work being conducted in Restricted or Controlled areas requires coordinated with CE and SF.

b. All Commercial Vehicles will utilize Tanker way Gate for deliveries. All Concrete or Asphalt deliveries AFTER HOURS and on weekends will be pre coordinated with Security Forces and should be discussed in the planning phase.

c. Personnel are vetted and authorized to come on the installation with NO qualifying convictions.

d. All flight line projects, regardless of location or degree of work, require airfield escorts. Escort requirements will be identified in the statement of work. Escorts will need to be trained and provided by the construction contractor and or the unit responsible for the project. CE will brief requirements if questions arise contact Security Forces. Submit requested documentation for access 30-45 days prior i.e., Free Zone Letters.

e. Special purpose construction: armories, munitions, fund storage areas; drug vault or storage areas; secure rooms or vaults for classified storage.

f. Facilities requesting or requiring alarms.

g. Special purpose fencing.

h. The effect a project will have on traffic flow or road closures.

13-2 ADDITIONAL INFORMATION REQUESTS

Business Telephone Numbers and Locations:

Security Forces	828-3323	Bldg. 203 (MacDill AFB)

CHAPTER 14 SAFETY

14-1 GENERAL

The safety guide outline is provided for use by 6 ARW Safety, 6 CES Fire Department, and 6th Medical Group Bioenvironmental Engineering. Additional compliance shall be adherence to Safety and Health Requirements Manual, US Army Corps of Engineers EM 385-1-1 latest revision. The guide provides a general overview of safety items or issues for the A-E to consider when developing a project as well as specific, supplemental information to serve as a quick reference, only, when used at the job site. The guide includes the following:

Contractors shall comply with the safety requirements as stipulated in the applicable contract and requirements applicable to the environment and the work being performed. Applicable standards and regulations are available at Civil Engineering and the above agencies.

14-1.1 Site Visits

Wing Safety and Fire Department personnel may periodically visit the work site. If a discrepancy of a minor nature is discovered, it will be brought to the attention of the government representative who has been assigned to monitor the project. The inspector will advise the contractor of the problem in need of corrective action. Contractors shall comply with this request as soon as possible. In the event of a serious discrepancy and safety hazard found on the job, the Safety Office/Fire Department Inspector will notify the government representative (Contracting Officer) for immediate corrective action.

14-1.2 Occupational Safety and Health Agency

The Occupational Safety and Health Agency (OSHA), which administers the Williams-Steiger Occupational Safety and Health Act of 1970, has a regional office in Tampa, Florida. Contractors shall abide by all federal regulations, especially, Public Law 91-596, Sect. (5)(a)(1); 29 CFR 1910; and 29 CFR 1926. Contractors are additionally open for a safety inspection by OSHA representatives.

14-1.3 Emergency Telephone Numbers

Operation	Number
Fire	911
Police	911
Medical	911

14-1.4 Business Telephone Numbers and Locations

Operation	Number	Location

6 ARW Safety	828-3383	Bldg 299 (MacDill AFB)
Bioenvironmental	827-9570	Bldg 1078 (MacDill AFB)
Fire Department	828-4236	Bldg. 26 (MacDill AFB)
Security Forces	828-3323	Bldg. 203 (MacDill AFB)

14-2 GENERAL SAFETY REQUIREMENTS

Study the job from a safety angle: Think before starting work.Look around and search for hazards, then take precautions to prevent accidents from happening. Be sure all necessary protective equipment is obtained before the start to work. If there is doubt about hazards or the proper protective clothing or equipment, consult project's foreman.

Practice good housekeeping in the work area: Pick up tools. Do not leave materials and scrap where they will be hazardous to other personnel (e.g., tripping hazards or sharp objects). The handling of explosives is extremely dangerous. On all work of this nature, consult the project's foreman.

Obey all warning signs such as "KEEP OUT," "NO SMOKING," "EYE PROTECTION REQUIRED," "AUTHORIZED PERSONNEL ONLY," and "RESTRICTED AREA."

14-2.1 Personal Protective Equipment

Ensure that all personal protective equipment that is needed is provided and used by the contractor's employees.

14-2.2 Reporting Unsafe Conditions

Report any unsafe conditions or acts to the project's foreman immediately. Contact the 6 ARW Safety Office at 828-3383 if assistance is required. Fighting or horseplay is not tolerated. Never jump from any elevated surface.

Ensure that all personnel performing work are advised of the heavy traffic at MAFB. Contractor and contractor's personnel shall be briefed on abiding by the posted speed limits, respect "NO PARKING" signs, yield to emergency vehicles, and obey other appropriate road signs which govern traffic flow. Failure to obey will result in a driving citation issued by the MacDill Security Forces Squadron on a United States District Court Violation Notice.

14-2.3 Confined Space Entry Permits

Permits in which contractors and Air Force personnel will both enter the space must be coordinated, approved, and signed by the 6 ARW Safety Office, 6 CES Fire Department, and the 6 Medical Group Bioenvironmental Engineering Office prior to entry. All other contractor confined space work shall follow OSHA and coordinated with the originating organization IAW AFMAN 91-203. Also, the Contractor must provide atmospheric monitoring capability as needed. 6 ARW will not provide this service.

CHAPTER 15 BIOENVIRONMENTAL

15-1 GENERAL

The contractor shall be responsible for OSHA compliance at the job site. Sometimes the contractor's activities may pose a health risk to Air Force Personnel in the area. If such a potential health threat should occur, the Bioenvironmental Engineering Office will work through the contractor monitor to help resolve the problem.

15-2 HAZARDOUS NOISE AREAS

Many areas on MacDill have been designated as Hazardous Noise Areas. DOD personnel are required to wear hearing protection in these areas. The Air Force noise standard is more conservative than OSHA's (29 CFR 1910.95). Please contact the Bioenvironmental Engineering Office for noise level information.

15-3 SAFETY DATA SHEETS

Contractors must send in a chemical inventory and a safety data sheet (SDS) for all chemicals that will be brought onto the installation. This inventory must be coordinated through the 6 CES/CEIE (828-0462). In the same manner, if the contractor has any concerns of Air Force chemical use in the construction area, that information can be obtained through the Bioenvironmental Engineering Office (813-827-9570) or Environmental Flight (6 CES/CEIE).

15-4 RADIATION SAFETY

If the contractor is going to bring any radioactive material, or ionizing radiation producing equipment, the contractor must coordinate with the base Radiation Safety Officer (at the Bioenvironmental Engineering Office, 813-827-9570) at least 45 days ahead of intended use. Also, compliance with all Nuclear Regulatory Commission (NRC) regulations is the contractor's responsibility.

15-5 POTABLE WATER LINES TO CDC FACILITIES

All repairs and construction that affect potable water lines or fixtures in childcare facilities must be tested to ensure all requirements of the most recent Environmental Protection Agency Lead and Copper Rule, all revisions, are met. Contact Bioenvironmental Engineering (813-827-9570) if any construction affects potable water lines or fixtures in childcare or youth facilities: 381, 382, 307, 384, 395.

CHAPTER 16 BASE ENVIRONMENTAL/ENVIRONMENTAL RESTORATION

16-1 COMPLIANCE

CEIE prepared a guidance document that includes additional and detailed information for regulatory requirements and project planning during project design and execution. This document is incorporated as part of this design guide document in APPENDIX J ENVIRONMENTAL.

16-2 ENVIRONMENTAL AWARENESS QUICK LOOK LIST

Please be aware that this list may not be all-inclusive and other project types not described below may also require environmental coordination. If in doubt, please refer to the contacts in Table 16-1.

Table 16-1 Environmental Point of Contacts

Project Activity	Regulatory Concern	Environmental Flight POC
Digging/Excavation	NEPA Process, Soil or Ground Water Contamination/IRP	Chris Sutton, 828-0458 Kristy Snyder, 828-0776
Building Demolition	NEPA Process Historic/Cultural Resources/SHPO Asbestos/Lead Based Paints (LBP) Solid Waste/Recycling	Chris Sutton, 828-0458 Chris Sutton, 828-0458 Rob Ritch, 828-3393 Chris Sutton, 828-0458
Structural Modifications to Building	NEPA Process Historic/Cultural Resources/SHPO Lead Based Paint (LBP) Asbestos Water or Sewer line modification	Chris Sutton, 828-0458 Chris Sutton, 828-0458 Robert Ritch, 828-3393 Chris Sutton, 828-0458
New Building/Facility/ Parking Lot Construction	NEPA Process, Storm Water Permitting (SWFWMD, NPDES)	Chris Sutton, 828-0458 Chris Sutton, 828-0458

Project Activity	Regulatory Concern	Environmental Flight POC
	EPA CPG and Green Procurement compliance Water or Sewer line installation	Chris Sutton, 828-0458 Chris Sutton, 828-0458
Roof Replacement/Repair	Historic/Cultural Resources/SHPO Asbestos	Chris Sutton, 828-0458 Robert Ritch, 828-3393
Pressure Washing	Storm Water Pollution LBP	Chris Sutton, 828-0458 Robert Ritch, 828-3393
Painting	LBP	Robert Ritch, 828-3393
Mechanical Room Repair/Demolition	LBP, Asbestos	Robert Ritch, 828-3393
Interior Repair/Demolition	LBP, Asbestos	Robert Ritch, 828-3393
Water Line Work/ Replacements/ Extensions	Safe Drinking Water Act (SDWA) Construction Standards and Florida Administrative Code (FAC), Permitting Asbestos Piping Cutting/Removal	Chris Sutton, 828-0458 Robert Ritch, 828-3393
Sewer Line Repair/Extension	Permitting, FAC, 10 State Standards	Chris Sutton, 828-0458
Lift Station Modification/Addition	Permit Requirements, FAC, 10 State Standards	Chris Sutton, 828-0458
Septic Tank/Drain Field Installation	Permitting, FAC, Department of Health Construction Standards	Chris Sutton, 828-0458
Natural Gas-Fired Boiler/Hot Water	Air Permit Requirements/Notifications	Chris Mair, 828-0462

Project Activity	Regulatory Concern	Environmental Flight POC
Heater/Heat Pump/ HVAC Installation		
Paint Booth/Bead Blast Installation	Air Construction Permit	Chris Mair, 828-0462
Emergency Generator Modifications & Installations	Air Construction/Operating Permit Fuel Tank Registration/Permitting	Chris Mair, 828-0462 Chris Sutton, 828-0458
UST/AST Installation	Fuel Tank Registration/Permitting, Air Permit Requirements/ Notification	Chris Sutton, 828-0458 Chris Mair, 828-0462
Hazardous Material Purchases, Contractor HazMat Usage Uninterruptable Power Supplies (UPS)	Hazardous Materials Management Review Process, EPCRA Compliance	Chris Mair, 828-0462

16-2.2 Environmental Impact Analysis

Actions that trigger detailed Environmental Impact Analysis Process documentation:

- Construction of a new permanent facility or temporary facility
- Substantial renovation of an existing facility, particularly if it includes demolition.
- Increasing impervious surfaces by 5,000 SF (parking lots, roads, storage areas or facilities, sidewalks, etc.
- Projects being completed on undeveloped lands (forest, open field, etc.)
- Projects being completed over or immediately adjacent to water bodies (bay, pond, canal, etc.)
- Project being completed on or immediately adjacent to Environmental Restoration Program site (soil or groundwater contamination)
- Renovation of any “historic” building (see Table 16-21 below)

- Substantial infrastructure repair, particularly if it involves earth moving, trenching or excavation.

16-2.3 Environmental Permitting

Actions that may trigger Environmental permitting requirements:

- Construction over or adjacent to a water body (bay, pond, canal, etc.)
- Construction in a low-lying area, within standing water, an open field with tall grass like vegetation or a drainage swale
- Construction on a site with animal burrows, i.e., “holes in the ground”

16-2.4 State Historic Preservation Office (SHPO)

If a SHPO is listed in the permitting section, the Contractor shall adjust their construction schedule to include SHPO consultation and/or letter.

Actions that may trigger consultation with the State Historic Preservation Office:

a. Renovation or demolition of any of the buildings listed in Table 16-2; or

b. New construction within the Historic Districts shown in Figure 16-1 below.

Figure 16-1 Historic Districts on MacDill Air Force Base

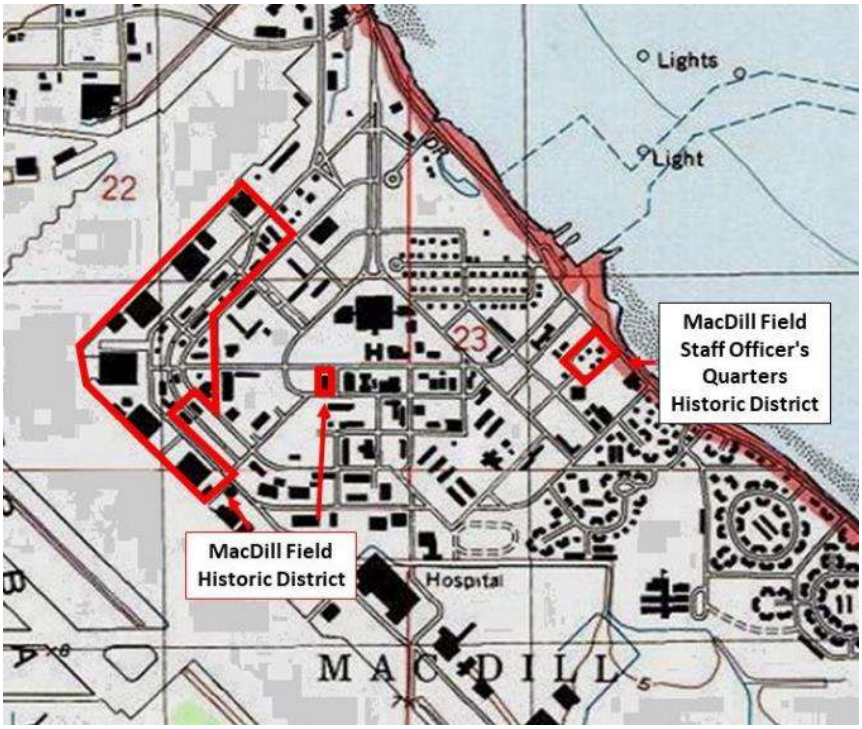


Table 16-2 Built Resources Inventory Table - Eligible Properties

Tally	Bldg No.	Building Name/ Organization	Year Built	NRHP Eligibility		HABS Level	Study
				Indiv	District		
1	1	Hangar	1941	Yes	MacDill Field	I	E-S 1993
2	2	Hangar	1941	Yes	MacDill Field	I	E-S 1993
3	3	Hangar	1941	Yes	MacDill Field	III	E-S 1993
4	4	Hangar	1941	Yes	MacDill Field	III	E-S 1993
5	5	Hangar	1941	Yes	MacDill Field	III	E-S 1993
6	11	Maintenance Shop	1941	No	MacDill Field	III	Hardlines 1994
7	12	Maintenance Shop	1941	No	MacDill Field	III	Hardlines 1994
8	26	Fire Station	1941	Yes	MacDill Field	I	Hardlines 1994
9	27	Community Facility	1941	No	MacDill Field	II	Hardlines 1994
10	29	Maintenance Shop	1941	No	MacDill Field	II	Hardlines 1994
11	30	Engineer Admin.	1941	Yes	MacDill Field	I	Hardlines 1994
12	31	Maintenance Shop	1941	No	MacDill Field	III	Hardlines 1994
13	32	Maintenance Shop	1941	No	MacDill Field	III	Hardlines 1994
14	33	Maintenance Shop	1941	No	MacDill Field	III	Hardlines 1994
15	34	CE Storage Shed	1941	No	MacDill Field	III	Hardlines 1994
16	35	Maintenance Shop	1941	No	MacDill Field	II	Hardlines 1994
17	37	Water Tower	1941	No	MacDill Field	IV	Hardlines 1994
18	41	Theater	1941	Yes	MacDill Field	I	Hardlines 1994
19	42	PME Laboratory	1942	No	MacDill Field	II	Hardlines 1994
20	45	Fuel Station	1941	No	MacDill Field	III	Hardlines 1994
21	68	Storage Facility	1941	No	MacDill Field	III	Hardlines 1994
22	347	Engineer Admin.	1944	No	MacDill Field	III	Hardlines 1994

Tally	Bldg No.	Building Name/ Organization	Year Built	NRHP Eligibility		HABS Level	Study
				Indiv	District		
23	401	Housing (Loop)	1941	Yes	SOQ	I	Hardlines 1994
24	402	Housing (Loop)	1941	Yes	SOQ	I	Hardlines 1994
25	403	Housing (Loop)	1941	No	SOQ	I	Hardlines 1994
26	404	Housing (Loop)	1941	Yes	SOQ	I	Hardlines 1994
27	405	Housing (Loop)	1941	Yes	SOQ	I	Hardlines 1994
28	501	USSOCOM Headquarters	1968	Yes	No	None	Brockington 2016

16-3 STORAGE TANKS PERMITTING

MacDill AFB is required by the State of Florida to obtain permits for the installation of any regulated underground or above ground storage tank systems. If you have any questions, please contact Mr. Chris Sutton at 828-0458.

16-3.1 Permit Requirements

The following lists identify our permit requirements. Note that permit or no permit required, any type of storage tank system must be designed in accordance with good engineering practices which insure protection of the environment. Any tank larger than 55 gallons requires secondary containment.

16-3.1.1 Permit Needed

- Installation of Underground Storage Tank greater than 110 gallons for storage of:
  - Vehicular Fuel
  - Pollutants or Hazardous Substances
  - Regulated Substances in Unmaintained Storage Tanks
- Installation of Aboveground Storage Tank greater than 550 gallons for storage of the above listed materials

16-3.1.2 Permit Not Needed

- Storage tank for Heating Oil less than 30,000 gallons in size
- Storage tanks storing solid or gaseous materials, such as LP gas.
- Storage tanks for Wastewater Treatment Systems or Septic systems
- Storage tanks for Emergency Spill Containment

- Storage tanks for equipment or machinery, such as hydraulic systems
- Mobile storage tanks

16-3.2 Required Submittals/Notifications

Required submittals/notifications to the Storage Tank Compliance Department of the Environmental Protection Commission of Hillsborough County (EPC/HC) include the following:

- *Submittal of an Application for the Installation or Upgrade of Pollutant Storage Tank Systems* at least 45 days prior to initiation of the installation/upgrade of a storage tank system. MacDill AFB is the 'owner/operator' for storage tank systems on base. Storage tank application permits shall be signed by 6 CES Director. Contractor shall provide the permit application fee along with the permit application.
- Notify the EPC/HC at least 10 days prior to the EPC/HC inspection of a newly installed or closed storage tank system.
- Submittal of a Storage Tank Registration form no more than 30 days after the installation, upgrade, or closure of a storage tank system.
- Prior to permit closeout the following tests must be accomplished and provide to CEIE: Operability test results, Leak Detection test results, Overfill Protection test result, and Integrity test results. The construction contractor is typically required to accomplish the tank testing.
- A closure integrity evaluation must be conducted no more than 45 days prior to closure of double-walled ASTs/USTs, double-bottomed field erected ASTs, double-walled integral piping, piping sumps, dispenser sumps, hydrant sumps, and spill containment systems that are in contact with the soil to determine whether closure sampling is required. In all cases, when closing these components, a Closure Report or Limited Closure Report, dependent on the situation, must be submitted within 60 days.

16-4 ENVIRONMENTAL MANAGEMENT SYSTEM

MAFB has implemented an Environmental Management System (EMS), which is based on International Organization for Standardization (ISO)-14001, as their primary management approach in conducting operations and managing their environmental programs including avoiding or minimizing environmental impacts. Work performed by all contractors and subcontractors, shall be consistent with the MacDill EMS policy (see APPENDIX J, J-1.2 MacDill AFB Commitment Statement).

The installation expects its suppliers and contractors to provide, at the same quality and price, products and services that have the least environmental consequences out of all available options.

The installation considers any potential environmental impacts from suppliers and contractors and ensures statements of need and/or statements of work specify products that mitigate, minimize, or otherwise control potential environmental impacts.

The Contractor is required to do the following:

- Obtain permits from local regulators and to pay associated fees.
- Conduct all required tests prior to inspection and close out.
- To register the tank systems with the state.

16-5 STORM WATER & WATER UTILITY PERMITS

16-5.1 Storm Water Permits

The regulatory authority for storm water permits is SWFWMD. Storm water permits are required anytime a project includes construction of impervious surfaces (e.g., parking lots, buildings) or the construction, demolition or alteration of permitted storm water management systems.

16-5.1.1 SWFWMD Storm water Management System Permitting Information

The SWFWMD requires Environmental Resource permits (ERPs) for construction of impervious surface (e.g., pavements, buildings), storm water management systems (retention ponds, swales, storm water pipes/culverts), or work in wetlands. The ERPs must include design drawings and a drainage report that meets their Basis of Review requirements before construction begins. For more information, please refer to http://www.swfwmd.state.fl.us/permits/erp/. Contractor is required to submit and obtain ERPs.

Contractor is required to submit as-builts certification to SWFWMD prior to completion of the project.

To prevent project delays, 60-90 days should be allowed for the permitting process, although more time may be required if SWFWMD requests additional information. MacDill AFB is the permittee for all projects on base. Storm Water management system application forms will be signed by 6 CES Director. Applications for work in wetlands are typically signed by the Installation Commander. CEIE can provide the most recent version of application forms. It is imperative that CEIE be included in the permit application process and receives copies of all submittals and communications. Contractors/consultants may not engage SWFWMD without prior CEIE approval. Current application fee information can be found in the attached excerpt from Chapter 40D of the Florida Administrative Code.

6 CES is responsible for the operation and maintenance of all constructed and permitted storm water management systems. If you have any questions, please contact Mr. Chris Sutton at 828-0458.

The following O&M instructions should be included in SWFWMD applications:

16-5.1.1.1 WET POND

The system, as designed, will require minimal maintenance, however, the following is noted:

- Remove all construction sand and silt from detention pond prior to finalizing the construction.
- Remove sand and silt from around the outfall piping into the pond as may be required. (Frequency will depend upon how roadway and grassed areas of contributing drainage areas are maintained). Care is to be exercised so that sand & silt is removed before it infringes on the littoral shelf.
- Check orifice or weir at the control structure at least yearly to assure that it is free of debris, which may have an effect on hydraulic functions.
- Do not use herbicides or other chemicals in the pond, which will damage or kill vegetation on the littoral shelf.
- Monitor the littoral shelf including submittal of brief report to SWFWMD every three months for the first year and every six months for the following two years. The report submitted is to be brief and is to include a photograph along with a status report on the shelf condition. At the end of the 3-year reporting period the planted littoral shelf species shall show an 85% survival rate. Modifications to the shelf shall be made if it is found that this survival rate cannot be met.

16-5.1.1.2 Dry Pond

- The system, as designed, will require minimal maintenance, however, the following is noted:
- Remove all construction sand and silt from treatment / detention pond prior to finalizing the construction.
- Remove sand and silt from around the outfall piping into the pond as may be required (frequency will depend upon how roadway/parking lot and grassed areas of contributing drainage areas are maintained). Care is to be exercised so that sand & silt is removed before it interferes with the control structure operation and pond treatment volume.
- Inspect the operation of the underdrains. if treatment volume is not restored within 72 hours following a storm event the underdrain may require maintenance.
- Check the skimmer and weir at the control structure at least yearly to assure that it is free of debris, which may influence hydraulic functions.

16-5.2 Storm Water Runoff from Construction Sites Permits

The regulatory authority for permitting storm water discharge from construction sites is the Florida Department of Environmental Protection (FDEP). A permit Notice of Intent

and Storm Water Pollution Prevention Plan shall be obtained for any construction project that disturbs one acre or more of land.

16-5.3 Sanitary Sewer and Wastewater Permits

The regulatory authority for wastewater permits is the Environmental Protection Commission of Hillsborough County (EPC-HC). In general, wastewater permits shall be required anytime a project constructs a force main, constructs a lift station, or involves any type of expansion of the sanitary sewer system beyond the installation of a single service lateral (i.e., construction of a collection system serving more than one facility).

16-5.3.1 Sanitary Sewer Permitting Information

The Environmental Protection Commission of Hillsborough County is our regulatory authority in regard to permitting for sanitary sewer components. If you have any questions, please contact Mr. Chris Sutton at 828-0458. The following lists identify our permit requirements:

16-5.3.1.1 Permit Needed

- Any new domestic sewage lift station or force main.
- New domestic sanitary sewer collection systems (e.g., gravity or force mains, manholes) that serve multiple buildings.
- Modification of any existing domestic sewage lift station (e.g., pump size increase, additional connections, increase wet well capacity)
- Move or relocate any domestic sewage lift station.

16-5.3.1.2 Permit Not Needed

- Construction of any sewage service lateral to a single building
- Any industrial sewage system
- In-kind replacement of sanitary sewer facilities
- Existing equipment repair or maintenance
- Interior plumbing

16-5.4 Potable Water Permits

The regulatory authority for potable water is the Hillsborough County Health Department (DOH). A drinking water permit shall be obtained for construction of any water main. Building service line permitting is evaluated on a case-by-case basis.

16-5.4.1 Drinking Water Permitting Information

MacDill AFB, as a regulated Public Water System is required by the State of Florida/Department of Health to obtain permits for the construction of various water system components. Permit or no permit required, any type of drinking water work still

requires design in accordance with good engineering practices/industry standards and disinfection in accordance with AWWA C651. If you have any questions, please contact Mr. Chris Sutton at 828-0458. The following lists identify our permit requirements:

16-5.4.1.1 Permit Needed

- New water mains/distribution lines
- Service lines to multiple buildings
- New service lines not located in “typical right-of-way” that could potentially be used as a distribution main for future water line tie-ins.
- Extensions to existing water mains/distribution lines
- Construction of drinking water storage facilities
- Installation of new drinking water booster pump stations
- Installation of drinking water treatment systems (chlorination, corrosion control, filtration)
- Any water service connection to a childcare facility, school, hospital, health care facility

16-5.4.1.2 Permit Not Needed

- Construction of a new or replacement of a service line (see exception above)
- In-kind replacement of water mains/distribution lines
- Existing water meter, valve, hydrant, booster pump, or backflow prevention device repair or replacement
- Point of use water treatment units (water softeners) - although there are other environmental/permit issues with these units such as backwash/brine disposal.
- Interior plumbing

16-5.4.2 Permit Forms

Two different permit forms are available: long and short. The short form does not allow DOH to ask for additional info via letter; they are only allowed to approve or flatly deny the permit within 30 days (and can result in paying an additional fee to resubmit). With the short form, the permittee is only able to request clearance approval after all the water system construction work is completed. The long form provides an administrative procedure for comments and responses as well as multiple clearance approvals as the construction work progress.

16-5.5 On-Site Septic System Permits

It is 6 CES/CEIE policy to connect all domestic wastewater discharges to the existing wastewater collection system and base wastewater treatment plant. However, the

WWTP service area does not completely encompass the entire base and, therefore, MacDill AFB occasionally needs to use on-site septic systems for wastewater treatment and disposal. The information below will help for personnel that will design new, repair/upgrade, or maintain existing on-site septic systems.

The regulatory agency responsible for on-site septic systems is the Florida Department of Health (including the local Hillsborough County office) with information and permitting forms posted at http://www.doh.state.fl.us/Environment/ostds/index.html.

Permits are required for the following activities:

- Drainfield Replacement
- Tank resize/upgrade
- New tank and drainfield

Most State-licensed on-site septic system contractors will obtain the required (the recommended approach) permit with the required site and facility information and can obtain the permit the same day it is applied for. There is a permit fee of about $120. As-builts and a final inspection by DOH are requirements of the permit (typically contractor accomplished).

If you have any questions, please contact Mr. Chris Sutton at 828-0458.

16-6 PERMIT APPLICATIONS

16-6.1 Deliverables

The A-E shall sign and seal the permit application prior to 6 ARW/CC or 6 CES/CL signatures. The permit shall include the agency required number of copies of permit application, 65% design plans, specifications, and required calculations.

Ensure the 6 ARW/CC or 6 CES/CL name is current and spelled correctly. Also confirm the correct address for 6 ARW/CC or 6 CES/CL is included on the permit application (contact 6 CES/CEIE for examples of correct permit applications)

Include all permit application fees in the design (A-E) cost.

For Base Civil Engineer Squadron contracts, the final permits shall be submitted to 6 CES/CEIE as part of the 95% design submittal. A construction Notice to Proceed will not be issued until the final permit has been received.

16-6.2 Permit Processing Time

It takes an average of one week to get the permit application signed by 6 CES/CL, and then the regulators have 30 days to “respond”, not “approve”, the application. Another 1-2 weeks is needed for permits requiring coordination through FGUA. This whole process takes 2 ½ months to get a permit in-hand for the contractor once the permit application package has been received by 6 CES/CEIE from the A-E. In most instances,

there are questions from the regulators that must be addressed before a permit is issued, further delaying the approval process. (Note: every time the regulators have questions, the processing clock resets.)

16-6.2.1 Storm Water Permits

The A-E shall bear full responsibility to accurately conceive and design the water quality treatment system based on acceptable practices for design as endorsed by SWFWMD and the Florida Department of Environmental Protection. The water quality treatment system shall incorporate design guidelines set forth in the SWFWMD Environmental Resource Permitting Basis of Review Manual (most current edition). Modeling of existing and proposed conditions shall be accomplished using a locally accepted storm water modeling program. See APPENDIX L.

16-6.2.2 Sanitary Sewer and Drinking Water Permits

The A-E shall bear full responsibility to accurately conceive and design the proposed utility system and/or modifications to the existing system(s) based on acceptable practices for design as required by EPC-HC, Department of Health and FDEP. A-E shall bear full responsibility for providing timely and accurate responses to requests from EPC-HC, DOH and FDEP upon receipt of permit application. By law the A-E has 30 days to respond to the requests, after which time the permit may be denied if a response has not been received by EPC-HC, DOH and FDEP.

16-7 UTILITY SYSTEM CERTIFICATION OF COMPLETION INFORMATION

All contractors that install wastewater, storm water, or drinking water utility systems at MacDill AFB shall ensure that the following procedures are followed. The purpose of these procedures is to maintain 100 percent compliance with Florida Administrative Codes, including all related construction permits issued to the base under these codes.

All contractors shall complete the installation of the utility systems only in accordance with approved project specifications and design drawings issued for construction. When complete (including all manholes, electrical connections, sediment removal, cleaning, bacteriological analysis, or pressure testing), the contractor shall have the work inspected by the designated project construction manager. The construction manager shall determine if the work is complete, and the system can operate in accordance with the engineering design.

After the construction manager accepts the utility system as complete and operational, the engineer of record for the project shall immediately complete the Certification of Completion of Construction form. Two copies of the form (including all supporting documentation) and as-built drawings shall be submitted to the base Environmental Element (6 CES/CEIE) for signature by the base authorities (6 ARW/CC and 6 CES/CL) and submission to the appropriate regulatory agency prior to placing the system into operation. The engineer of record shall ensure that any substantial deviations from the approved plans and specifications are noted in the appropriate section and the forms and drawings are signed and sealed.

The construction manager also shall notify 6 CES/CEIE that the utility system is ready for regulatory inspection. 6 CES/CEIE will contact the appropriate regulatory agency and schedule an inspection. This step can occur before the entire construction project is complete if the utility system is accepted as ready for operation. The contractor shall ensure that all required regulatory inspections are completed and the systems approved for use before the utility systems are placed into operation.

These actions shall not exceed 30 days from the date the system was inspected by the project construction manager and deemed complete and operational.

Please contact Mr. Chris Sutton of the base Environmental Flight at 828-0458 if you have any questions regarding these procedures.

16-8 NON-ERP SITE COORDINATION

Certain requirements apply to the discharge of produced groundwater from sites that are not subject to Environmental Restoration Program (ERP) regulations, i.e. not in a contaminated area. Please see section 16-9. for information on dewatering in restoration/contaminated sites. Produced groundwater from non- contaminated sites may not be discharged to the storm sewer system or surface water without coverage under the Generic Permit for the Discharge of Produced Groundwater from any Non-Contaminated Site Activity. Produced groundwater may be allowed to infiltrate back into the soil in proximity to the withdrawal location with an approved Dewater Plan. To discharge produced groundwater to the storm sewer or surface water, the water must meet the coastal waters screening values outlined in the Table 1 of the permit found here https://www.flrules.org/gateway/reference.asp?No=Ref-04262 . The water must be sampled before commencement of discharge and again within thirty days after commencement, and then once every six months for the duration of the project. All discharges must be free from floating solids, visible foam, turbidity, or visible oil.

16-9 ASBESTOS AND LEAD-BASED PAINT ABATEMENT

All asbestos and lead-based paint abatement, contact, disturbance, and demolition must be done in agreement with all applicable Federal, State, and Local regulations and guidelines. All contract workers must be trained in the proper handling of asbestos and lead based paint if the workers are performing this type of work. If, during the completion of the contract, workers come across a material that has not been identified as non-asbestos, and it cannot be assumed that the material is not asbestos containing (e.g., wood or glass), the contract monitor must be notified prior to disturbance.

16-10 ASBESTOS

Design firms designing projects that involve constructing new buildings or other structures, or potentially modifying existing buildings or other structures (demolition and/or renovation) at MAFB shall comply with EPA- National Emission Standards for Hazardous Air Pollutants (NESHAP), OSHA, and Hillsborough County EPC regulations regarding asbestos containing materials. See APPENDIX K.

New projects plans and specifications shall stipulate that no Asbestos Containing Materials (ACM) will be used in any construction at MAFB.

The design phase of projects for modifying existing structures located at MAFB shall include a complete or partial asbestos survey of the facility to determine if ACM is present in any part of the structure that will be modified or disturbed.

The construction phase of projects for modifying existing structures located at MAFB shall include abatement, encapsulation, enclosure, or repair of ACM as necessary.

All design projects that involve asbestos at MAFB shall be coordinated with the Civil Engineer Squadron Environmental Element, 6 CES/CEIE.

16-10.1.1 Common Locations of Asbestos Containing Materials

Most products made today do not contain asbestos. Those few products made which still contain asbestos that could be inhaled are required to be labeled as such. However, until the 1970s, many types of building products and insulation materials used in construction contained asbestos. Common products that might have contained asbestos in the past and conditions which may release fibers include:

- Steam pipes, boilers and furnace ducts insulated with an asbestos blanket or asbestos paper tape. These materials mat release asbestos fibers if damaged, repaired or removed improperly.
- Resilient floor tiles (vinyl asbestos, asphalt, and rubber), the backing on vinyl sheet flooring and adhesives used for installing floor tile. Sanding, scraping, or grinding can release asbestos fibers.
- Cement sheet, millboard and paper used as insulation around furnaces and wood burning stoves. Repairing or removing appliances may release asbestos fibers. So may cutting, tearing, sanding, drilling, or sawing.
- Door gaskets in furnaces, wood stoves and coal stoves. Worn seals can release asbestos fibers during use.
- Soundproofing or decorative materials sprayed on walls and ceilings. Loose, crumbling or water damaged materials may release asbestos fibers. Sanding, drilling, or scraping will also result in the release of asbestos fibers.
- Patching and joint compounds for walls and ceilings and some textured paints. Sanding, scraping, or drilling these surfaces may release asbestos fibers.
- Asbestos cement roofing, shingles, and siding. These products are not likely to release asbestos fibers unless sawed, drilled, or cut.
- Artificial ashes and embers sold for use in gas-fired fireplaces. Also, other older household products such as fireproof gloves, stove-top pads, ironing board covers and certain hairdryers.

- Automotive brake pads and linings, clutch faces, and gaskets.

16-11 LEAD-BASED PAINT

Contracts/Contractors engaged in demolition, construction, renovation, or any other services involving lead-based paint (LBP) surfaces shall comply with Air Force Standards, applicable Federal, State and Local codes, and regulations.

The design phase of projects for modifying existing structures located at MAFB shall include a complete or partial lead-based survey of the facility to determine if LBP is present in any part of the structure that will be modified or disturbed.

The construction phase of projects for modifying existing structures located at MAFB shall include abatement, encapsulation, enclosure, or repair of LBP as necessary.

The contractor shall ensure workers are informed of and protected with the necessary protective equipment, IAW OSHA regulations 29 CFR1926.62, 1910.1025 and 1910.134.

All work shall be accomplished by personnel trained and certified in LBP operations.

All contractor work plans shall address abatement/encapsulation requirements, paint removal, material storage, containing and controlling lead dust and debris, daily and final cleanup, worker and occupant protection, inspecting and testing requirements, waste storage and disposal requirements, and recordkeeping and notification requirements.

Coordination with 6 CES/CEIE is mandatory prior to initiating any contract involving lead-based paint.

16-12 AIR QUALITY

Air pollution sources include, but are not limited to, external combustion sources (boilers), internal combustion sources (gas, diesel, propane, natural gas – fired generators and other internal combustion driven types of equipment), kitchen appliances and boilers (natural gas external combustion sources) woodworking shops, paint spray booths, fuel storage and dispensing operations, welding operations, abrasive cleaning, degreasers, users or emitters of ozone depleting substances and/or Hazardous Air Pollutants (HAPS).

Design firms working on projects that involve the creation or changing, in any way, of an air pollution source located at MAFB shall coordinate with the EPC-HC through 6 CES/CEIE to modify the existing air operating permit or, for a new air source, apply for a construction permit. The cost of any fees and permit application involved shall be included in the design firm's proposal with MAFB for the project.

No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds,

or organic solvents without applying known and existing vapor emission control devices or systems.

16-12.1 General Visible Emissions Standard

No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, including fugitive dirt and dust, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20 percent opacity). Contractor shall take reasonable precautions to prevent such emissions. Contact 6 CES/CEIE for a list of “reasonable precautions” as defined in our current Air Operations Permit.

16-12.2 Internal Combustion Engines

Requirements for Internal Combustion Engines (ICE): Any project that involves the installation or modification of an ICE requires an Air Construction Permit IAW Florida Administrative Code (FAC) 62-210, Stationary Sources – General Requirements. The regulatory authority for air permits is the EPC-HC. The A-E shall complete the permit application. The A-E shall sign and seal the permit application prior to 6 ARW/CC or 6 CES/CL signatures. The permit shall include the agency required number of copies of permit application, 65% design plans, specifications, data sheets, and required calculations. Ensure the 6 ARW/CC or 6 CES/CL name is current and spelled correctly. Also confirm the correct address for 6 ARW/CC or 6 CES/CL is included on the permit application (contact 6 CES/CEIE for examples of correct permit applications). Include the cost for permit application fees in the design (A-E) cost. The A-E shall comply with the requirements of the issued permit by the EPC-HC.

16-12.3 Natural Gas-Fired Heating Units or Other External Combustion Units

Requirements for Natural Gas-Fired Heating Units or other External Combustion Units: Any project that involves the installation or modification of an external combustion unit shall coordinate with 6 CES/CEIE to determine if permitting is required. This may require review of the 65% design plans and manufacturer’s specifications (including emission factors/calculations associated with the proposed equipment) and discussion with the EPC-HC. The designer/contractor shall include the cost of these activities as part of its planned activities.

16-12.4 Refrigerants/Ozone Depleting Substances

Requirements for Refrigerants/Ozone Depleting Substance: The use of any Class I Ozone Depleting Substance (ODS) on MAFB is prohibited. The use of any Class II ODS for any new HVAC unit on MAFB is prohibited. Any project that involves performing any service, maintenance, repair and/or disposal of any appliance containing a refrigerant shall comply with the requirements identified in the projects Scope of Work. The recovery and reclamation of refrigerant must be strictly documented in accordance with Air Force requirements.

16-13 GREEN PROCUREMENT

All Contracts/contractors providing goods or services to MAFB shall be reviewed for EPA Comprehensive Procurement Guideline items, United States Department of Agriculture (USDA) Bio-Preferred Program, Department of Energy Federal Energy Program (Energy Star, standby power, water efficiency), EPA Significant New Alternatives Program (SNAP), and EPA Priority Chemicals (PROACT) regarding building materials, supplies, products, and specify percentages of recycled-content being used/supplied to the government. See APPENDIX M.

The contractor shall complete and submit a Green Procurement Determination Form to identify products that are subject to these purchasing requirements and/or claim an exemption from the requirements if appropriate.

Service contract managers shall also review all contract specifications that apply to EPA Guideline Items IAW the Air Force Affirmative Procurement Program, Executive Order 12873, Section 6002 of Resource Conservation and Recovery Act, and the FAR prior to the implementation of the contract.

16-14 HAZARDOUS MATERIALS MANAGEMENT

The base shall complete its review of the contractor's proposed non-exempt HAZMAT list and respond within five business days (APPENDIX N Contractor hazmat list). If the base fails to respond within five business days from receipt of the submittal, the contractor shall assume the list of non-exempt HAZMAT items is approved.

If the contractor determines he/she will need additional HAZMAT materials after project initiation, he/she shall send an email with the requested item(s) to the CEN and CEIE representative. The CEIE representative shall expedite base coordination with the goal of responding within one (1) business day.

The contractor shall not use supplemental non-exempt HAZMAT items on the project until they are reviewed. Costs for delays caused by the contractor requiring review after contract start for non-exempt items not identified in their HAZMAT items submittal, shall be the responsibility of the contractor.

The contractor shall maintain a copy of the original and supplemental item list and associated Safety Data Sheets (SDS) at the work site IAW 29 CFR 1910.1200.

CEN shall make periodic checks of the contractor's HAZMAT records and materials on hand to ensure he/she is staying within the reviewed list and quantities.

At completion of his/her work, the contractor shall remove all unused HAZMAT from the worksite and dispose of it off base IAW all environmental laws and regulations.

16-14.1 Federal Standard 313, Safety Data Sheets (SDS)

For each DO issued against a contract, the Contractor must identify and report hazardous material usage to the contracting officer or designated field representative using the Contractor HAZMAT List.

Contractors are required to maintain copies of SDSs for all hazardous materials used on MAFB at the job site. Installation of new or replacement of existing UPS requires completion of the UPS data sheet to the contracting officer or designated field representative. The contractor shall remove all unused hazardous materials from MAFB, IAW applicable laws, regulations, and standards, upon completion of work.

16-14.2 Definition of Hazardous Materials

Refer to hazardous and toxic materials/substances included in Subparts H and Z of 29 CFR 1910 as well as Federal Standard. 313.

16-14.3 Hazardous Materials Inventory Report

Contractors shall complete and submit Contractor Hazardous Materials Usage Form and Safety Data Sheets in accordance with the instructions included in the Project's Scope of Work. The use of any "Extremely Hazardous Substances" (EHS) listed in 40 CFR, Part 355, Appendix A or any Class I Ozone Depleting Substances (ODS Class I) listed in 40 CRF Part 82 on MacDill AFB is prohibited.

If the base deems a contractor's proposed material line item inappropriate because of safety or environmental concerns, CEN shall advise the contractor that he/she must refrain from using that material on the project. The contractor shall be required to provide an alternative material or process that meets the contract requirements.

16-15 HAZARDOUS WASTE

Contractors are responsible for the identification, characterization, storage, and disposal of any waste that may be regulated under the Resource Conservation and Recovery Act (RCRA), hazardous waste regulations, 40 CFR 260-279.

6 CES/CEIE must be coordinated with prior to the generation of any hazardous waste. Any shipments of hazardous waste will be coordinated and approved through 6 CES/CEIE prior to shipment off-base for disposal.

All manifests/land disposal restrictions must be signed by 6 CES/CEIE prior to shipment off-base.

16-16 UNDERGROUND AND ABOVEGROUND STORAGE TANKS

Underground and Aboveground Storage Tanks (USTs and ASTs) shall comply with all requirements for new systems as stated in FAC 62-761, UST Systems and 62-762, AST Systems. All tanks, piping, and associated equipment shall be FDEP approved. USTs shall not be installed, unless approved by 6 CES/CEIE. ASTs shall be double walled.

Installation of above ground storage tanks greater than 550 gallons requires a permit from the EPC-HC and registration with the State of Florida. Contractor is responsible for preparing the permit application package, including all necessary supporting data and the permit application fee. Permit package shall be provided to 6 CEIE for review prior to submittal to the EPC-HC. Final tests and results need to be submitted to the EPC-

HC prior to final installation inspection. All required tests are the Contractor's responsibility and at their expense.

16-17 SOLID WASTE / RECYCLING

All construction contractors shall use appropriately sized dumpsters. Construction and demolition waste comprises approximately 20% to 30% of all the solid waste generated at MAFB. A large part of this waste stream is recyclable such as the metal, dry wall, wood and the concrete.

All demolition debris that can be salvaged and resold shall be included in the construction contract specifications. The proceeds from the sales shall go to reducing the cost of the construction contract. The total tonnage recycled from the project shall be reported to CEIE through the submittals process.

Construction and demolition contractors shall provide the base with their proposal a recycling plan to properly depose of this valuable material.

16-17.1 Construction and Demolition Disposal Deliverable

The contractor shall submit Construction and Demolition (C&D) disposal tonnages and cost data using the MAFB Construction & Demolition Debris Disposal Form at 50% and 100% construction completion.

16-18 NATURAL CULTURAL RESOURCES

The contractor shall follow the National Environmental Policy Act.

MAFB aims to protect the resources under their care, which usually involves building preservation, cultural, historic, and archeological site protection, protection of endangered species, protection of wetlands, protection of flood plains. CEIE can assist the contractor with developing a work approach that ensure the protection of natural and cultural resources and compliance with Air Force, local, state, federal regulations and how these items must be considered and dealt with. The requirements will vary dependent upon the project location and scope. Construction within wetlands shall be avoided.

Generally, all new construction should require the completion of section I of an AF Form 813 by the proponent (user/requester).

16-18.1 State Historic Preservation Office Coordination

Any project involving the demolition or substantial alteration of a building constructed before 1989 shall require coordination with the State Historic Preservation Office (SHPO). Likewise, any project involving the renovation of a building shown in Table 16-2 Built Resources Inventory Table - Eligible Properties shall require coordination with SHPO. Before 6 CES/CEIE can coordinate with the SHPO, they will require a detailed description of the proposed interior and exterior modifications from 6 CES/CEN. Proposed exterior modifications to buildings shown in Table 16-2 Built Resources

Inventory Table - Eligible Properties will replicate the historic appearance of the building to the maximum extent. If the historic appearance cannot be replicated, 6 CES/CEN shall provide justification for economic, materials availability, energy efficiency or similar reasons to support the consultation process with the SHPO.

If artifacts, concentrations of shell, or unique soil conditions are discovered during earth work, all construction activity in the vicinity of the discovery shall cease until the MacDill Cultural Resources Manager has assessed the situation and given approval for work to continue.

16-19 FLOODPLAIN MANAGEMENT

MAFB is a 5,695-acre military base in Hillsborough County, Florida, approximately eight miles south of downtown Tampa, Florida. Greater than 90 percent of the landmass at MAFB is in the 100-year floodplain. The rest of MAFB is in the 500-year floodplain. The base is in the Special Flood Hazard Zone on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). Based on the FIRM, all of MAFB is located either within Zone VE (Elevation 13, NAVD 88) along the shoreline, Zone AE (Elevation 12, NAVD 88) near the shoreline, Zone AE (Elevation 11, NAVD 88) within a majority of the developed portion of the base and a portion of the airfield, Zone AE (Elevation 9, NAVD 88) within the airfield portion of the base, or Zone X (the 500-year floodplain) in the north central portion of the base.

MAFB is required to design and construct IAW UFC 1-200-01, which requires the use of IBC 2018 as modified by this UFC. Section 2-16 of UFC 1-200-01 requires the use of IBC Chapter 16, Structural Design, as modified by UFC 3-301-01, Structural Engineering. Section 1612 of IBC 2018 Chapter 16 addresses flood loads. It specifies that the design and construction of buildings and structures shall be IAW Chapter 5 of ASCE 7-10, Minimum Design Loads for Buildings and Other Structures, and ASCE 24-05, Flood Resistant Design and Construction. Chapter 3 of UFC 3-301-01 makes several modifications to American Society of Civil Engineers (ASCE) 7- ASCE 24-05 is not modified. The use of these codes and criteria will provide assurance that MAFB will design and construct flood resistant buildings that meet the intent of NFIP regulations as required by EO 11988.

16-20 ENVIRONMENTAL RESTORATION

16-20.1 Known and Suspected Contaminated Sites

If construction is planned for an area that is located within the boundary of (a) known or suspected contaminated site(s), the Contractor shall be provided with a Site Summary document that includes information on the nature of the contaminant(s) at the site(s), as well as the media affected (groundwater, soil, or sediment); however, even if the project area is NOT within (a) known or suspected contaminated site(s), the groundwater and soil may be contaminated with per- and polyfluoroalkyl substances (PFAS), a group of emerging contaminants currently being investigated on MacDill AFB. Current information is showing potential PFAS in all groundwater and soil at MacDill AFB above screening levels, therefore all waste generated from construction projects must be

sampled, regardless of location on the installation until the current investigation is complete. Due to the dynamic regulatory environment (concerning PFAS) please contact the Environmental Restoration Program office (AFCEC 6 CES/CZOE) for the most current PFAS guidance.

16-20.1.1 Soil/Sediment Contamination

When excavating on (a) site(s) known or suspected to have soil/sediment contamination, any material excavated as a result of construction activity must be backfilled to the exact location from which it was removed unless constructing on a landfill site. On the following Landfill sites, all soil removed must be disposed of off base, as landfill waste materials are expected to be present: LF002, LF003, LF010, LF011, LF009, LF012, LF005, LF006, LF007, LF008, LF077. If there is not enough space in the excavation area to replace all the removed material, the soil/sediment must be stockpiled in a manner as not to spread contamination, i.e., staging in a roll off container or piling on a layer of polyethylene plastic sheeting (if this method is used, soil must also be covered with plastic to prevent rain from spreading contamination). Prior to removal from the site(s), the staged material must be analyzed, at the Contractor's expense, by a certified laboratory. The site-specific Site Summary document (when applicable) lists the contaminant information for the site and should be provided to the lab when arranging for analysis. Additionally, all soil/sediment to be removed from the installation during construction is to be analyzed for PFAS. The analysis should be performed by a laboratory that is able to achieve a detection level below the current US EPA regional screening level (RSL) for soil of 0.13 parts per million (ppm). Please contact AFCEC 6 CES/CZOE ERP for a list of accredited laboratories. The Contractor shall provide the results of lab analysis to AFCEC 6 CES/CZOE ERP for interpretation prior to any action. The soil/sediment resulting from construction activity on a contaminated site may never be placed on another area of the site or used for backfilling anywhere else on the installation. Upon notice from AFCEC 6 CES/CZOE ERP, the Contractor will be required to remove the stockpiled material from the site and arrange for transport to an appropriate disposal facility.

- If test results are below Florida Department of Environmental Protection (DEP) Soil Cleanup Target Levels (SCTLs) and the US EPA RSLs for soil, the soil/sediment must be hauled off-site and transported, at the Contractor's expense, to a landfill/facility that accepts Class III wastes, IAW FAC 62-701, Solid Waste Management Facilities.
- If soil/sediment is found to exceed Florida DEP SCTLs or the US EPA RSL for soil, the soil/sediment must be hauled off-site and transported, at the Contractor's expense, to a landfill/facility that accepts Class I waste, IAW FAC 62-701, Solid Waste Management Facilities. In addition, the Contractor must coordinate with AFCEC 6 CES/CZOE ERP for signatures on the nonhazardous waste profiles/manifests that are required for transport.

Total and TCLP samples for analysis that must be taken to determine contamination and proper disposal requirements. unless AFCEC 6 CES/CZOE ERP has historical

sampling data. Please coordinate with AFCEC 6 CES/CZOE for historical data. If no historical data is known, then the following complete list will need to be analyzed for:

- Total Volatile Organic Compounds (VOCs) by EPA Method 8260
- Total Semi-Volatile Organics by EPA Method 8270
- Total Pesticides/Herbicides by EPA Method 8081B/8151A
- Total PCBs by EPA Method 8082
- Total RCRA Metals by EPA Method 6010 and EPA Method 7471
- TPH-DRO and TPH-GRO by EPA Method 3510C and 8270D
- Petroleum Residual Organics by FL-PRO
- PFAS Chemicals by Draft EPA Method 1633
- TCLP RCRA metals and mercury via USEPA Methods 1311, 3010A, 6010C/D, 6020C, and 7470A/7471A
- TCLP VOCs via USEPA Methods 1311, 5030C, and 8260C
- TCLP SVOC via USEPA Methods 1311, 3510C, and 7270D
- TCLP pesticides via USEPA Methods 1311, 3510C, and 8081B
- TCLP herbicides via USEPA Methods 1311, 3510C, and 8151A
- pH/corrosivity (USEPA Method 9040C/9045C)
- Flash point (USEPA 1010A)
- Reactivity (sulfide and cyanide; USEPA 335.4).

16-20.1.2 Groundwater Contamination

When excavating on (a) site(s) known or suspected to have groundwater contamination, there are three (3) options to dealing with groundwater/dewater:

1) Groundwater extracted as a result of excavation must be contained and analyzed, at the Contractor's expense, by a certified laboratory. The site-specific Site Summary document (when applicable) lists the contaminant information for the site and should be provided to the lab when arranging for analysis. Additionally, all groundwater generated from dewatering activities shall be analyzed for PFAS. The analysis will be performed by a laboratory able to achieve a detection level below the current US EPA regional screening levels (RSL) of 4 parts per trillion (ppt). Please contact AFCEC 6 CES/CZOE ERP for a list of accredited laboratories. The Contractor shall provide the results of lab analysis to AFCEC 6 CES/CZOE for interpretation prior to any action. Upon notice from AFCEC 6 CES/CZOE, the Contractor will be required to dispose of dewater product in one of the following ways:

- If the test results are below Florida DEP Groundwater Cleanup Target Levels (GCTLs), and below the US EPA RSLs for groundwater the Contractor may discharge the groundwater back to the ground or storm

water pond, allowing the water to infiltrate back into the groundwater table, at a rate which does not allow the water to runoff into any nearby storm water systems; or they may discharge groundwater to the sanitary sewer system to allow water to enter the base wastewater treatment plant, be processed and land applied, upon approval from the Florida Government Utility Authority (FGUA).

- If the test results are above Florida DEP GCTLs or the US EPA RSL for groundwater the contaminated groundwater must be transported off- site for disposal/treatment at the Contractor's expense; or on-site treatment is an option with coordination with AFCEC 6 CES/CZOE IAW federal regulations, or infiltration conducted with an approved Dewatering Plan. The Dewatering Plan shall be approved by AFCEC 6 CES/CZOE ERP and 6 CES/CEIE. In addition, the Contractor must coordinate with 6 CES for signatures on the non-hazardous waste profiles/manifests that are required for transport.

2) For large quantities of PFAS liquid concentrations, on-site groundwater treatment can be used which includes Granular Activated Carbon (GAC) or other approved treatment technology to bring chemical concentrations below the US EPA RSL for groundwater. For more details concerning on-site treatment systems, contact AFCEC 6 CES/CZOE.

3) A Dewatering Plan shall be submitted to 6 CES and AFCEC 6 CES/CZOE that shows where the dewater will be placed, how the contractor will keep it within the ERP site area, and how the contractor will ensure that the dewater will not enter any storm drains/stormwater system in violation of the base’s NPDES permit, and will not cause any standing water. Submission of a Dewatering Plan does not ensure that this method of handling dewater will be approved, especially for large amounts of dewater.

NOTE: If dewatering is chosen the dewatering plan must be submitted prior to submission of the 103 Form or attached to the 103 Form. If the dewater is to be treated, please submit treatment design and NPDES permit with 103 Form. If disposal of dewater/soil, please submit disposal facility to the 103 Form for approval. Prior to disposal the analytical results and waste profile will need to be submitted to AFCEC 6 CES/CZOE ERP.

16-20.1.3 Soil and other Media Waste

The Contractor shall drum any drill cuttings or slurries generated from excavation activities within a known or suspected contaminated site and dispose of waste IAW federal regulations. In addition, the Contractor must coordinate with 6 CES/ for signatures on waste profiles/manifests that are required for transport.

16-20.2 Backfill/Source Fill Material

The Contractor will ensure that any material brought onto MacDill AFB, including but not limited to clean backfill or soil fill material, does not contain any Chemicals of Concern exceeding **ANY** of the Florida Department of Environmental Protection (DEP) Soil

Cleanup Target Levels (SCTLs) and the US EPA regional screening levels (RSLs) for soil.

Soil backfill and source fill material must be provided from a source of native soil from an area that was previously undisturbed (other than the operation of the borrow pit facility) and should be in an area which has not previously been used for commercial or industrial activities. Records and verification of the soil backfill, and source fill material must be submitted to AFCEC 6 CES/CZOE for approval.

Grab samples must be collected, analytical results submitted and approved by AFCEC 6 CES/CZOE from the fill source (borrow pit) *prior* to loading for delivery to MacDill AFB. The number and frequency should be one sample per 500 cubic yards. For projects that will need a large quantity of backfill to be brought onto MacDill AFB, direct correspondence to AFCEC 6 CES/CZOE for further instruction.

Samples shall be collected in a timely manner that allows for the proper analytical review and exclusive approval by AFCEC 6 CES/CZOE before material from the fill source is delivered to MacDill AFB.

Soil samples will be analyzed for the following:

- Total Volatile Organic Compounds (VOCs) by EPA Method 8260
- Total Semi-Volatile Organics by EPA Method 8270
- Total Pesticides/Herbicides by EPA Method 8081B/8151A
- Total PCBs by EPA Method 8082
- Total RCRA Metals by EPA Method 6010 and EPA Method 7471
- TPH-DRO and TPH-GRO by EPA Method 3510C and 8270D
- Petroleum Residual Organics by FL-PRO
- PFAS Chemicals by Draft EPA Method 1633

Other analytes may be added on a case-specific basis.

Soil will only be accepted for use as clean backfill and/or source fill material if the results of laboratory analysis show that there are no exceedances of ANY Florida DEP SCTLs or the US EPA RSLs for soil for any of the analytes measured.

For additional information on clean soil backfill and source fill material, please contact the POC for AFCEC 6CES/CZOE, Kristy Snyder at 813-828-0776/813-716-4293, kristy.snyder.2@us.af.mil.

16-20.3 Groundwater Monitoring Wells

Groundwater monitoring wells may be located within the project area. Approximate well locations are provided upon project design; however, more wells may exist in the project area than are shown. The Contractor shall survey the site prior to start of work for exact

locations of all wells. Great care must be taken to protect all the wells found in the project area as such wells must be identified and clearly marked.

16-20.3.1 Damaged Wells

If any of these wells are damaged during this project, the Contractor shall either repair or abandon and reinstall the well at the Contractor's expense, IAW FL DEP Monitoring Well Design and Construction Guidance Manual located in APPENDIX I ENVIRONMENTAL RESTORATION of this document. The determination as to whether the well can be repaired or must be properly abandoned and a new well installed will be made by AFCEC 6 CES/CZOE.

16-20.3.2 Abandoning/Reinstalling Wells

If the work is such that damage to a well is unavoidable, the well must be properly abandoned prior to construction activities and a new well installed at the Contractor's expense upon completion of construction activities IAW FL DEP Monitoring Well Design and Construction Guidance Manual located in APPENDIX I ENVIRONMENTAL RESTORATION of this document. The Contractor shall coordinate the well abandonment and reinstallation activities with AFCEC 6 CES/CZOE to ensure that well locations are acceptable to regulators before construction activities take place.

Wells must be abandoned/reinstalled by a Florida licensed driller and surveyed by a Registered Land Surveyor in the State of Florida. Well locations are to be surveyed to within 1 foot accuracy using Florida State plane, West Zone, North American Datum, 1983 (NAD 83). Ground surface elevations and top of concrete pad elevations will be surveyed to within 0.1 ft accuracy; and top of casing elevations will be surveyed to within 0.01 ft accuracy. Elevations will be referenced to the National Geodetic Vertical Datum of 1929 (NGVD-29).

All field logs, permits and survey forms must be provided to AFCEC 6 CES/CZOE at the completion of well abandonment/installation. The Contractor must coordinate with AFCEC 6 CES/CZOE to obtain well tag specifications and ordering information.

16-20.4 Additional Information Requests

For additional information on contaminated sites, please contact the POC for AFCEC 6 CES/CZOE, Kristy Snyder at 813-828-0776/813-716-4293, kristy.snyder.2@us.af.mil .

See APPENDIX I ENVIRONMENTAL RESTORATION of this document for more information.

16-20.5 ERP Drum Storage Yard Standard Operating Procedure (SOP)

To place drums into the ERP non-hazardous waste drum storage yard, the following process needs to be followed:

1. Process and Documentation

- Prior to the drums being placed in the storage yard the following information needs to be sent to the ERP group (Kristy Snyder, kristy.snyder.2@us.af.mil; Karen Campbell-Fraze, karen.campbell-fraze@us.af.mil; and Isis Marley, isis.marley.ctr@us.af.mil).

  Date drums are placed in the yard

  Project/site location drums are from

  Number of drums and/or containers and sizes

  What drums contain, (ie soil, groundwater, drill cuttings)

  AF/CE POC name and phone number for project/drums

  Contractors POC name and phone number for project/drums

2. Coordinate with ERP to gain access to the drum storage yard to store drums. ERP are the only personnel with keys to get into the drum storage yard. Ensure that all containers are properly labeled for storage (see following examples).

   - HOW TO LABEL DRUMS

     <u>Pending Analysis Label</u>

     If the drum contents do not have any analytical data associated with the contents a Pending Analysis label needs to be placed on EACH container. Please follow the instructions below on the information that needs to be included on the labels.

     If the drum contents do not have any analytical data associated with the contents a Pending Analysis label needs to be placed on EACH container. Please follow the instructions below on the information that needs to be included on the labels.

     1) Contents: State contents such as soil, groundwater, sediment, drill cuttings, etc. Also list which laboratory analysis is pending.

        • Example: Soil pending PFAS analysis

     2) Origin of Materials: State location of where the waste came from.

        • Example: KC-46 Hangar 4

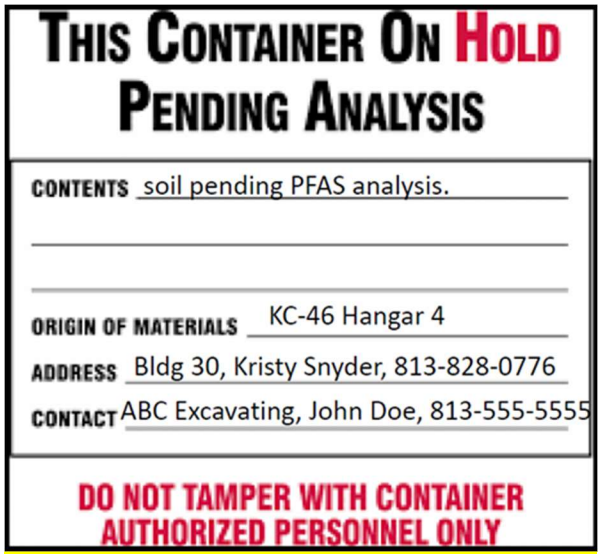
     3) Address: Building location of contractor's Air Force Point of Contract (POC), name and phone number of POC

        • Example: Bldg 30, Kristy Snyder, 813-828-0776

     4) Contact: Contractor's POC information

• Example: ABC Excavating, John Doe, 813-555-5555

Figure 16-2 Pending Analysis Label



Non-Hazardous Waste

Once the drum contents have analytical data and show that the contents have been determined to be a non-hazardous waste then a Non-Hazardous Waste label placed on EACH container. Please follow the instructions below on the information that needs to be included on the labels.

1) Shipper: Contractor's Air Force Point of Contract (POC), name and phone number of POC. • Example: Bldg 30, Kristy Snyder, 813-828-0776

2) Address: State location of where the waste came from. • Example: KC-46 Hangar 4

3) City, State, Zip: Use MAFB information • Example: MAFB, FL

4) Contents: Contents and contractor's POC information, including company, POC name, phone number

• Example: Soil with PFAS

ABC Excavating, John Doe, 813-555-5555

Figure 16-3 Non-Hazardous Waste Label

Hazardous Waste

Once the drum contents have analytical data and show that the contents have been determined to be a hazardous waste you need to contact Rob Ritch at 813-828-3393, and have the drums moved to the 90-day storage location.

3. All analytical results and an UNSIGNED waste profile from the disposal facility needs to be submitted to Robert Ritch, (robert.ritch.ctr@us.af.mil), Kristy Snyder (kristy.snyder.2@us.af.mil), or Karen Campbell-Fraze (karen.campbell-fraze@us.af.mil) for approval and signature. Only approved MacDill AFB personnel are authorized to sign waste profiles and manifests for any waste generated at MacDill AFB.
4. At least a week prior to disposal of the drums, Rob Ritch and/or Kristy Snyder/Karen Campbell-Fraze need to be notified and coordinated with to ensure access for the drums to be removed and the manifests are completed appropriately for signature.
5. Within 60 days that the contractor receives analytical data, a waste profile needs to be submitted to 6 CES/CEIC for approval and all non-hazardous waste drums need to be removed from the drum storage area.

16-21 INTEGRATED PEST MANAGEMENT

16-21.1 General

Reference: AFI 32-1053, Integrated Pest Management Program, 20 November 2014

16-21.2 Pest Management Service Request

Contractors requesting Pest Management Services to apply pesticides for contracted services must follow the guidance in AFI32-1053, Civil Engineering Integrated Pest

Management Program, and Paragraph 4.7 Contracting for Pest Management Services. Requestor shall:

a. Prepare a Performance Work Statement (PWS) for the type of Pest Management Service required to the Installation Pest Management Coordinator (IPMC) for review and coordination. The PWS shall: identify the pest to be controlled; include a map identifying the location where the pesticides are to be applied, indicate number of acres of application, identify the pesticide that will be applied, and provide a copy of the MSDS or SDS.
b. Pesticides must be approved by the Headquarters (HQ) ARW Command Entomologist prior to application.
c. Contractor's Pesticide Applicators must have current State Pesticide Applicator Certifications for the types of operations specified in the contract PWS prior to starting work.

The contractor shall establish an AF Integrated Pest Management Information System (IPMIS) account at https://web.ipmis-helpdesk.org/ to enter and document state pesticide applicator certification categories and expiration dates.

The contractor will provide pesticide use data to the IPMC daily for input into the IPMIS pesticide management database.

Forward the PWS to the IPMC for coordination and approval.

IPMC will forward PWS to the MAJCOM Pest Management Consultant (PMC) AFCEC/COSC.

The MAJCOM PMC will review and approve the PWS. Installation personnel must receive MAJCOM PMC approval before a request for contracts, subcontracts, or other support service contracts that utilize pesticides is made for procuring commercial pest management services.

Approved PWS will be forwarded to the contractor for execution.

The Civil Engineering Environmental Flight office will work with the installation contracting office to ensure all prospective contractors send proof that all their personnel have current state pesticide applicator certifications for the types of operations specified in the contract PWS prior to starting work.

16-21.2.1 Pesticide Mixing, Storage and Disposal

All pesticides shall be stored off-base. All unused pesticides, empty pesticide containers and residue shall be disposed of properly at an approved off-base disposal area. Chemical mixing for immediate application may be accomplished at the site of application/treatment and only state certified applicators may mix or apply pesticides. Contractor shall provide a spill container at mixing areas to ensure that no chemicals impact an area that is not being treated. The contractor shall have an operational

emergency eyewash kit available at each mixing location. In the event the contractor spills or releases any hazardous substances (example, substances listed in 40 CFR 302), the contractor shall immediately notify the Contracting Office Representative, Project Manager, or Installation Pest Management Coordinator.

16-21.3 Safety

The contractor shall comply with all applicable parts of Title 29, CFR, Occupational Safety and Health Standards, Part 1910; Title 29, CFR, Safety and Health Standards for Federal Service Contracts, Part 1925; Title 40, CFR, Parts 150-189, and Title 49, CFR, Hazardous Materials Regulations, Part 171, while on an Air Force installation, to ensure safe working conditions for contract personnel and a safe environment for the occupants of Air Force facilities.

The contractor must operate in compliance with all state and local regulations. All pest management contractors must also comply with sections of DoDI 4150.07 and Air Force Instruction 32-1053 that apply to contract pest management operations. Only state-certified contract pesticide applicators may mix or apply pesticides on MAFB.

16-21.4 Additional Information Requests

POC for this checklist is Mr. Cesar Medina, Installation Pest Management Coordinator, (813) 828- 0841, cesar.medina@us.af mil.

CHAPTER 17 GIS AND CADD

17-1 GENERAL

The following are specifications to add to contracts to ensure the organization receives products that will seamlessly integrate with existing Geographic Information System (GIS) and Computer-Aided Design and Drafting (CADD) data models. The MAFB Civil Engineer squadron may define specific data model as it applies to the contract.

17-2 GOVERNMENT FURNISHED REFERENCE MATERIALS

The Government shall provide the contractor with data and information concerning all necessary and pertinent functions and principal features of the identified project. These items will include:

- The installation's latest geo-referenced digital planimetric data and/or base map in ESRI Arc/Info 10.x format or best format available, with associated data files.
- The installation’s latest orthorectified imagery and specified geospatial parameters (coordinate system, datum, projection, distance units).
- Any pertinent and necessary prototype, template, or seed files.
- Any other data or schematics deemed necessary for project completion, pending approval from the Government.

17-3 CONTRACT SERVICES

These deliverables include, but are not limited to:

1. Site plans
2. As-built drawings
3. Engineering designs, plans, or surveys
4. Topographic surveys or studies
5. Boundary or cadastral surveys
6. Master plan drawings
7. Utility (e.g., water, sewer, power, storm) designs, plans, surveys, and studies
8. Pavement, grading, or excavation plans

17-4 MINIMUM DRAWING REQUIREMENTS

At a minimum 100% Design CADD drawings shall be submitted.

17-4.1 Borders, Sheets, and Symbols

Use the MAFB cover sheet, haul route, and general notes / symbols sheets as part of the drawing set (e.g., G-001, G-002, G-003, and when required G-004), including sheet borders. The Contractor/Engineer is permitted to add their company name to the cover sheet and other plan sheets. All plans shall have a graphic scale and north arrow (where necessary). All drawings shall have the project number (NVZR xx-xxxx), approved project title and Facility Number.

17-4.2 Font Legibility

See Text Legibility & Fonts 17-6.6.

17-4.2.1 Civil Project Sheets

For clarity all civil projects shall contain as a minimum demolition plan, site plan, grading/drainage plan and utility plan sheets.

17-4.3 Projects with Multiple Facilities

For projects that involve multiple facilities, As-Builts shall be submitted as each facility or milestone is completed. For example, building renovation, demolition, and new construction.

17-4.4 As-Builts

All As-Built drawings (each sheet) shall be clearly marked as “As-Built” with date, and PDFs shall be generated from their respective CADD drawing file. As-Built PDF Size shall be 11” x 17”. Also see Sections 17-5.1.6 and 17-6.10.

17-4.5 BIM/Revit Files

BIM and Revit files will need to be submitted when used on projects. All disciplines must accompany main Revit project file. If the Project is in a Workset the elements need to be relinquished (save and relinquish their elements from federated/work model).

17-4.6 Contractor Redlines

Contractor Field-Redlines marked-up plan set (each sheet) shall be clearly marked as “Redlines” or “Contractor Redlines” with date and submitted in PDF format. Redlines PDF size shall be 11” x 17”. A complete drawing set will be submitted even if there are not marked-up changes.

17-5 GIS DATA

17-5.1 Geospatial Data Deliverables

The contractor shall provide GIS deliverables in the following format:

All locational (point, line, and polygon feature(s)) data collected shall be delivered in ESRI 10.x format along with the original source files. Current version used by 6 CES is ArcGIS 10.8.1.

Geospatial data files:

- Geodatabase format shall be maintained in schema and coordinate system as furnished.
- Shape file format (when necessary) shall have an external spatial reference (.prj) file attached specifying the parameters of the coordinate system used (as provided by the government).

All topologically correct geospatial data shall overlay on the installations latest orthorectified imagery provided by the government.

All accuracy errors shall be reported to the contract program manager.

All graphic and non-graphic data will be collected in the format defined by the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) Release 4.0.3 AF Adaption, except where modified by the Government. This standard can be found at: http://www.sdsfieonline.org/.

17-5.1.2 Quality Control Report

The contractor shall provide a Quality Control (QC) report that must state whether all inconsistencies in the data generated were corrected, or it must detail the remaining errors by case. The contractor shall utilize a topology build and clean routine to assure that there are no overshoots or undershoots in the line work, slivers, or dangles in polygons, and that there is complete closure of polygons with a maximum fuzzy tolerance value of 10-9. The quality report must identify the software (name and version) and satisfy these conditions:

- The edges of all digitized vector data or raster imagery must exactly match digitally with those of all adjacent maps.
- The digital representation of the common boundaries for all graphic features must be the same, regardless of feature layer. Each feature within a theme must be represented by a single graphic element (e.g., polygon, line, or line string).
- Lines and line strings which represent the same graphic element must be continuous (i.e., not broken or segmented), unless that segmentation reflects a specific visual line type. Lines or line strings representing the same type of data must not cross except at intersections.
- Polygons must be closed (i.e., the first x- and y-coordinates must exactly match the last x- and y- coordinates). Each polygon must have a single unique centroid to which attributes (i.e., an attribute table) can be attached. Polygons of the same coverage must not overlap and must cover the area of interest completely (i.e., have no gaps in coverage).

- All graphic elements that connect must exactly connect digitally, without overlaps or gaps.
- Straight lines must be represented by only the beginning and ending x- and y-coordinate points. Line strings must not cross back on themselves or be of zero length.

17-5.1.3 Feature Attributes

The contractor shall identify the classification, type, size, location, identification number, and any other necessary attributes (specified by the Government) for all surveyed, mapped, designed, or proposed features.

17-5.1.4 Floor Plan Data

Facility floor plan data to include the room perimeter and building lines. Information shall include only the area of the facility affected by the project. For new facilities the data shall also include the interior building footprint.

- Room, space, and hallway areas in a polygon layer.
- Building floor plan in a polyline layer, to include exterior and interior walls, door swings, stairs, openings, columns, and floor level changes.
- Interior building footprint in a polygon layer (where required).

17-5.1.5 Spatial Data Standards for Symbols, Fonts, and Text

All symbol libraries, font libraries, text size, text format, and text placement shall be prepared IAW and conform to the SDSFIE Version 4.0.3 AF Adaption.

The contractor shall not develop new libraries without prior written approval from the Government.

17-5.1.6 As-Built/Post-Construction Surveys

As-Built information, or post-construction survey, shall be used to depict actual feature locations, materials, dimensions, and sizes.

17-5.2 Applicability

Where applicable, GIS feature quantities will be used for Real Property (RP) form DD 1354.

17-6 CADD DATA, MINIMUM REQUIREMENTS

17-6.1 Electronic Format

All data deliverables shall be in a digital (electronic information) format and shall be delivered in AutoCAD 2013 (or higher). Current version used by 6 CES is AutoCAD 2020. Drawings shall be delivered in .DWG file format. Electronic files shall be delivered in their original format. No converted files will be accepted.

17-6.2 CAD Standards

The contractor shall use the A/E/C CAD Standard 6.1 (or latest version) and A/E/C Graphics Standard Release 2.1 (or latest version) when creating or revising any CADD data deliverables. The A/E/C CAD Standards will be used for Design and Sheet model file assembly, layer convention, plotting, and fonts. Each file shall comply with the current CAD Standard for Design and Sheet Model assembly (this assembly shall contain no more than one sheet layout per electronic file). These standards can be found or reviewed at: https://cadbimcenter.erdc.dren.mil/aeccadstandard and will be included with the Solicitation CAD files.

17-6.3 Naming Conventions

The Industry Standard and MAFB model file and sheet naming conventions, consisting of a Discipline Designator, Model File/Sheet Type Designator, and Sheet Sequence Number shall be used for all submissions - diagrams of this naming convention can be found in the A/E/C CAD Standard, and acceptable model file naming can be found in the document Model Filenames.pdf that will be included with the Solicitation CAD files.

17-6.4 Coordinate System

The coordinate system used for CAD files shall be State Plane Coordinates North American Datum 1983 (NAD83) Projection, Florida West 0902 Feet.

17-6.5 Graphics

Graphics depicted in all submitted plan drawings shall occupy their actual geographic coordinates. Acceptable orientation of plans on the sheet files ranges from North appearing straight up (preferable) regarding the top of the sheet or within 90 degrees to the left or right (9 o'clock to 3 o'clock).

17-6.6 Text Legibility & Fonts

Text on all files shall be depicted straight up regarding the top of the sheet or generally within 90 degrees to the left (9 o'clock) and be to the minimum text height according to the A/E/C CADD Standard 6.1. Arial is the only allowed True Type Font. Drawing fonts shall be legible at a reduced print size of 11" X 17". Minimum text height is 1/8" for ANSI D Sheet Size (34" x 22") and 1/16" for ANSI B Sheet Size (11" x 17").

17-6.7 Documentation of Nonstandard Items

All submittals should include any standards sheets (abbreviations, symbols, fonts, etc.) necessary for a complete project, and document any nonstandard fonts, tables, symbols, etc. that are used.

17-6.8 Acceptable Units of Measure

All drawing files will use units of feet and inches, UON.

17-6.9 Drawing Scales

Acceptable drawing scales depend on the type of drawing and the size of area the drawing encompasses. A detailed description of which drawing scale to select can be found in the A/E/C CAD Standard Release 6.1 (or latest version). Similar drawing layouts shall be produced using the same standard scale.

17-6.10 As-Built Drawings

As-Built drawings shall reflect post-construction feature locations, materials, dimensions, and sizes.

17-7 DELIVERABLE FORMAT

Deviations from the Government's established standards will not be permitted unless prior written approval of such deviation has been issued by the Government.

All linkages of non-graphical data with graphic elements, relationships between data objects and attributes, and report formats shall be maintained.

All data deliverables (i.e., plans, surveys, studies, imagery, and designs) shall be in a digital (electronic information) format and shall be delivered in a format that is directly compatible with the SDSFIE Version 4.0.3 AF Adaption. Digital submittal shall be provided on CD/DVD ROM. No flash drives, thumb drives, etc., will be accepted.

The following procedures must be performed before a file is placed on the delivery media:

- Include all files, both graphic and non-graphic, required for the project. Make sure all files are in the same directory, and that references to those files do not include device or directory specifications.
- Ensure all required reference (external reference) files are attached and without device or directory specifications, and unnecessary reference (external reference) files are detached.
- Remove all extraneous graphics/text outside the project border area and set the active parameters to a standard setting (or the setting contained in the seed or prototype file).
- Include any standard sheets (e.g., abbreviations, symbols, etc.) and files (e.g., symbol libraries, font libraries, color tables, pen tables, plot configuration files, and user command files) necessary for a complete project.
- Digital Media must have an external label with project NVZR number, a short description of contents, and a sequence number if there are multiple volumes.

- A transmittal sheet must accompany the media containing the information included on the external labels, total number of volumes being delivered, and a list of file names and file descriptions on each volume.

APPENDIX A GLOSSARY

A-1 ACRONYMS.

6 CES	6th Engineer Squadron
6 CONS	6th Contracting Squadron
6 CS	6th Communication Squadron
A	Ampere
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABA	Architectural Barriers Act
ACM	Asbestos Containing Materials
ACP	Airfield Asphalt Concrete Pavement
ACSM	American Congress on Surveying and Mapping
ADA	American with Disability Act
A-E	Architectural - Engineering
AF	Air Force
AF FORM 103	Air Force Form 103, Work Clearance Request
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFDG	Air Force Design Guides
AFH	Air Force Handbook
AFI	Air Force Instruction
AFMAN	Air Force Manual
AGC	Application Generic Controllers

AHC	Architectural Hardware Consultant
AHU	Air Handling Unit
AHRI	Air Conditioning, Heating & Refrigeration Institute
AIC	Available Interrupting Current
ALTA	American Land Title Association
AMP	Amperes
ANSI	American Nation Standards Institute
ARW	Air Refueling Wing
ASC	Application Specific Controllers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
AST	Above-Ground Storage Tank
ASTM	American Society for Testing and Materials
ATFP	Antiterrorism/Force Protection
AWI	Architectural Woodworking Institute
AWS	Architectural Woodwork Standards
BCU	Building Control Units
BLCC	Building Life Cycle Cost
BMS	Building Management System
BOD	Basis of Design
C&D	Construction and Demolition
CADD	Computer-Aided Design and Drafting
CATV	Cable Television
CD	Compact Disc
CDC	Child Development Center

CE	Civil Engineer
CEN	Civil Engineer Environmental
CES	Civil Engineer Squadron
CFI	Certified Floor Installer
CFM	Cubic Feet per Minute
CFR	Code of Federal Regulations
CMU	Concrete Masonry Unit
CO2	Carbon Dioxide
COR	Contracting Office Representative
CPAM	Construction Project Administration Manual
CPVC	Chlorinated polyvinyl chloride
CRI	Color Rendering Index
CT	Current Transformer
CUI	Controlled Unclassified Information
CU FT	Cubic Feet
DBI	Decibel
DCI	Director of Central Intelligence
DDC	Direct Digital Control
DFAR	Defense Federal Acquisition Regulation
DLA	Defense Logistics Agency
DOAS	Dedicated Outdoor Air System
DoD	Department of Defense
DOH	Hillsborough County Health Department
DV	Distinguished Visitor
DVC	Demand Controlled Ventilation

DX	Direct Expansion
EHS	Extremely Hazardous Substance
EIA	United States Energy Information Administration
EIA	Energy Information Association
EM	Engineering Manual
EMCS	Emergency Management and Control System
EMS	Environmental Management System
EMT	Electrical Metallic Tubing
ENT	Electrical Non-Metallic tubing
EO	Executive Order
EoR	Engineer of Record
EPA	Energy Policy Act
EPA	Environmental Protection Agency
EPCHC	Environmental Protection Commission of Hillsborough County
EPR	Ethylene Propylene Rubber
ERDC	US Army Engineer Research and Development Center
ERP	Environmental Restoration Personnel
ESS	Energy Saving Scheme
ETL	Engineering Technical Letter
F	Fahrenheit
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FAR	Federal Acquisition Regulation
FBC	Florida Building Code

FC	Facility Criteria
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FGUA	Florida Governmental Utility Authority
FHWA	Federal Highway Administration
FIPS	Federal Information Processing Standard
FIRM	Flood Insurance Rate Map
FMC	Flexible Metallic Conduit
FNC	Flexible Non-Metallic Conduit
FOD	Foreign Object Debris
FODP	Fiber Optic Distribution Panel
FODP	Fiber Optic Distribution Point
FOUO	For Official Use Only
FPS	Feet Per Second
ft	Feet
FTU	Fan Terminal Units
GBI	Green Building Initiative
GCO	Ground Cleanout
GCTL	Groundwater Cleanup Target Levels
GFCI	Ground Fault Circuit Interrupter
GIS	Geographic Information System
GPC	Guiding Principle Compliance
GPPC	General Purpose Programmable Controllers
GPR	Ground Penetrating Radar

GRS	Galvanized Rigid Steel
GSA	General Services Administration
Gz	Gigahertz
HACR	Heating, Air Conditioning, and Refrigeration
HAPS	Hazardous Air Pollutants
HAZMAT	Hazardous Materials
HDPE	High Density Polyethylene
HMA	Hot Mix Asphalt
HP	Horsepower
HQ	Headquarters
HVAC	Heating, Ventilation, and Air Conditioning
IAW	In accordance with
IBC	International Building Code
ICE	Internal Combustion Engines
IDW	Investigation Derived Waste
IEBC	International Existing Building Code
IEEE	Institute of Electronic and Electrical Engineers
IESNA	Illumination Engineering Society of North America
IFS	Installation Facility Standards
IMC	International Mechanical Code
IPC	International Plumbing Code
IPLV	Integrated Part Load Value
IPMC	Installation Pest Management Coordinator
IPMIS	Integrated Pest Management Information System
ISO	International Organization for Standardization

ITL	Information Technology Laboratory
JACE	Java Application Control Engine
K	Kelvin
KV	Kilovolt
LAN	Local Area Network
LB	Pounds per Cubic Foot
LBP	Lead-Based Paint
LCCA	Life Cycle Cost Analysis
LCCA	Lead Contamination Control Act
LDP	Local Display Panels
LED	Light Emitting Diode
LPS	Lightning Protection System
LOS	Line of Sight
LVT	Luxury Vinyl Tile, or planks
MACC	Multiple Award Construction Contract
MAFB	MacDill Air Force Base
MBMA	Metal Building Manufacturers Association
MC	Metal-Clad Cable
MCC	Motor Control Circuits
MDG	MacDill Design Guide
MEP	Mechanical, Electrical, and Plumbing
MHZ	Megahertz
MILCON	Military Construction
MIPR	Military Interdepartmental Purchase Request
MNS	Mass Notification System

MRCA	Metal Roofing Contractors Association
MUTCD	Manual on Uniform Traffic Control Devices
NCI	Network Configuration Inputs
NEC	National Electric Code
NESC	National Electrical Safety Code
NEMA	National Electrical Manufacturers Association
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NOA	Notice of Acceptance
NRC	Nuclear Regulatory Commission
NRCA	National Roofing Contractors Association
NWWDA	National Wood, Window, and Door Association
O&M	Operations and Maintenance
ODS	Ozone Depleting Substance
OSHA	Occupational Safety and Health Agency
OTDR	Optical Time Domain Reflectometer
PCC	Portland Cement Concrete
PCF	Pounds per Cubic Foot
PGS	Peoples Gas
PM	Project Manager
PMC	Pest Management Consultant
POC	Point of Contact
POD	Points of Demarcation
PROACT	EPA Priority Chemicals

PSA	Public Service Announcement
PSI	Pounds per Square Inch
PT	Potential Transformer
PVC	Polyvinyl chloride
PWS	Performance Work Statement
QFPE	Qualified Fire Protection Engineer
QC	Quality Control
RAP	Reclaimed Asphalt Pavement
RCRA	Resource Conservation and Recovery Act
REA	Rural Electrical Association
RP	Real Property
SCCR	Short Circuit Current Rating
SCIF	Sensitive Compartmented Information Facilities
SCS	Soil Conservation Service
SCTL	Soil Cleanup Target Levels
SDDCTEA	Surface Deployment and Distribution Command, Transportation Engineering Agency
SDS	Safety Data Sheets
SDSFIE	Spatial Data Standards for Facilities, Infrastructure and Environment
SHPO	State Historic Preservation Office
SIP	Shelter-in-Place
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SNAP	EPA Significant New Alternatives Program
SNVT	Standard Network Variable Type
SOP	Standard Operating Procedure

SRI	Solar Roof Reflectance Index
STC	Sound Transmission Coefficient
SUIE	Subsurface Utility Investigation and Exploration
SWFWMD	Southwest Florida Water Management District
TAB	Test and Balance, similar T&B
TBD	To Be Determined
TCNA	Tile Council of North America
TECO	Tampa Electric Company
THD	Total Harmonic Distortion
TIA	Telecommunication Industry Association
UCPT	User-Defined Configuration Parameter Types
UFP/QAPP	MAFB Uniform Federal Policy Quality Assurance Plan Geology Supplement to the Scope of Services
UFC	Unified Facility Criteria
UFGS	Unified Facility Guide Specifications
UL	Underwriter Laboratories
UMCS	Utility Management Control System
UNC	Universal Network Controllers
UNO	Unless Noted Otherwise, similar to UON.
UP	Utilities Privatization
UPS	Uninterruptible Power Supplies
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USB	Universal Serial Bus
USDA	United States Department of Agriculture
USGBC	United States Green Building Council

UST	Underground Storage Tank
V	Volt
VAV	Variable Air Volume
VCT	Vinyl Composite Tile
VFD	Variable-Frequency Drive
VFI	Variable Fault Interrupter
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

APPENDIX B

B-1 DEFINITION OF TERMS.

Authority Having Jurisdiction (AHJ): A person authorized and directed to enforce the provisions of this Design Guide.

APPENDIX C REFERENCES

The list below is not inclusive all codes or regulations that may be applied. The contractor bears the burden of verifying project conditions and scope.

A/E/C CAD STANDARD

https://cadbimcenter.erdc.dren.mil/aeccadstandard

AIR CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

https://www.ahrinet.org/

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

https://www.transportation.org/

AMERICAN NATIONAL STANDARDS INSTITUTE

https://ansi.org/

AMERICAN SOCIETY OF CIVIL ENGINEERINGS

https://www.asce.org/

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS

http://www.ashrae.org

ANSI/ASHRAE/IES Standard 90.1 2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*

ANSI/ASHRAE Standards 62.1, *Ventilation for Acceptable Indoor Air Quality*

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

http://www.asme.org

ANSI/ASME A13.1, Pipe Markers

ARCHITECTURAL WOODWORK INSTITUTE

https://www.awinet.org/

ASSOCIATED AIR BALANCE COUNCIL

https://www.aabc.com/

ASTM INTERNATIONAL

https://www.astm.org/

CODE OF FEDERAL REGULATIONS

https://www.ecfr.gov/

7 CFR 1755.900, *RUS Specification for Filled Fiber Optic Cables*

16 CFR 1360, *Standard for the Surface Flammability of Carpets and Rugs (FF 1-70)*

28 CFR 36, *Nondiscrimination on The Basis Of Disability By Public Accommodations And In Commercial Facilities*

29 CFR 1910, *Occupational Safety and Health Standards*

29 CFR 1926, *Occupational Safety and Health Administration (OSHA)*

29 CFR 1630, *Regulations to Implement the Equal Employment Provision of the Americans with Disabilities Act*

40 CFR, *Protection of Environment*

40 CFR Part 82, Protection *of Stratospheric Ozone, Subpart F – Recycling and Emissions Reduction*

40 CFR 260-279, *Chapter 1 Environmental Protection Agency, Subchapter 1 Solid Wastes, Parts 260-279*

40 CFR 302, *Designation, Reportable Quantities, And Notification*

40 CFR 355, *Emergency Planning and Notification*

40 CFR 370, *Hazardous Chemical Reporting: Community Right-To-Know*

40 CFR 372, *Toxic Chemical Release Reporting: Community Right-To-Know*

FEDERAL ACQUISITION REGULATIONS SYSTEM

https://www.acquisition.gov/browse/index/far

FEDERAL AVIATION ADMINISTRATION

https://www.faa.gov/

FEDERAL HIGHWAY ADMINISTRATION

https://highways.dot.gov/

FLORIDA DEPARTMENT OF TRANSPORTATION

https://www.fdot.gov/

FEMA

https://www.fema.gov/

ILLUMINATING ENGINEERING SOCIETY

https://www.ies.org/

INTERNATIONAL CERTIFIED FLOORING INSTALLATERS ASSOCIATION

https://cfiinstallers.org/

INTERNATIONAL CODE COUNCIL

http://www.iccsafe.org

IBC, International Building Code

IEBC, International Existing Building Code

IECC, International Energy Conservation Code

IMC, International Mechanical Code

IPC, International Plumbing Code

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

https://www.iso.org/

ISO 14000, *Environmental Management*

INSTITUTE OF ELECTRICAL AND ELECTONICS ENGINEERS

https://www.ieee.org/

METAL BUILDING MANUFACTURERS ASSOCIATION

https://www.mbma.com/

NATIONAL FIRE PROTECTION ASSOCIATION

http://www.nfpa.org

NFPA 1, *Fire Code*

NFPA 13, *Standard for the Installation of Fire Sprinklers*

NFPA 54 (ANSI Z223.1), *National Fuel Gas Code*

NFPA 58, *Liquefied Petroleum Code*

NFPA 70, *National Electric Code (NEC), 2017*

NFPA 70E, *Standard for Electrical Safety, Latest Edition*

NFPA 72, *National Fire Alarm and Signaling Code*

NFPA 101, *Life Safety Code*

NFPA 291, *Recommended Practice for Fire Flow Testing and Marking of Hydrants*

NFPA 780, *Standard for the Installation of Lightning Protection Systems*

NATIONAL ROOFING CONTRACTORS ASSOCIATION

https://www.nrca.net/

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION

https://www.smacna.org/

SURFACE DEPLOYMENT AND DISTRISBUTION COMMAND, TRANSPORTATION, ENGINEERING AGENCY

https://www.sddc.army.mil/

TELECOMMUNICATION INDUSTRY ASSOCIATION

https://tiaonline.org/

TILE COUNCIL OF NORTH AMERICA

https://www.tcnatile.com/

UNIFIED FACILITIES CRITERIA

http://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc

UFC 1-200-01, *DoD Building Code*

UFC 1-200-02, *High Performance and Sustainable Building Requirements*

UFC 3-101-01, *Architecture*

UFC 3-110-03, *Roofing*

UFC 3-120-01, *Design: Sign Standards*

UFC 3-260-01, *Airfield and Heliport Planning and Design*

UFC 3-260-02, *Pavement Design for Airfields*

UFC 3-301-01, *Structural Engineering*

UFC 3-400-01, *Energy Conservation*

UFC 3-410-01, *Heating, Ventilating, and Air Conditioning*

UFC 3-501-01, *Electrical Engineering*

UFC 3-520-01, *Interior Electrical Systems*

UFC 3-530-01, *Interior and Exterior Lighting Systems and Controls*

UFC 3-540-01, *Engine-Driven Generator Systems For Prime And Standby Power Applications*

UFC 3-550-01, *Exterior Electrical Power Distribution*

UFC 3-575-01, *Lightning and Static Electricity Protection Systems*

UFC 3-600-01, *Fire Protection Engineering for Facilities*

UFC 3-601-02, *Operations And Maintenance: Inspection, Testing, And Maintenance Of Fire Protection Systems; Download And Print Warning Sign*

UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*

UFC 4-010-05, *Sensitive Compartmented Information Facilities Planning, Design, and Construction*

UFC 4-020-01, *DoD Security Engineering Facilities Planning Manual*

UFC 4-021-01, *Design And O&M: Mass Notification Systems*

UFC 4-023-03, *Design of Buildings to Resist Progressive Collapse*

UFC 3-580-01, *Telecommunications Interior Infrastructure Planning And Design*

UNITED STATES ACCESS BOARD

http://www.access-board.gov/attachments/article/1029/ABAstandards.pdf

ABA Standards

UNITED STATES DEPARTMENT OF AGRICULTURE

https://www.usda.gov/

https://www.biopreferred.gov/

UNITED STATES DEPARMENT OF ENERGY

https://www.energy.gov/

UNITED STATES ENERGY INFORMATION ADMINISTRATION

https://www.eia.gov/

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

https://www.epa.gov/

https://www.epa.gov/snap

UNITED STATES ARMY CORPS OF ENGINEERS

USACE Control and Topographic Surveying

https://www.publications.usace.army.mil/portals/76/publications/engineermanuals/em_1110-1-1005.pdf

UNITED STATES AIR FORCE

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

AFMAN

AFMAN 91-203, Air Force Occupational Safety, Fire and Health Standards

AFMAN 32-7089, Refrigerant Management Program

UNITED STATES DEPARTMENT OF DEFENSE

DoD 4170.11, *Installation Energy Management*
https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/417011p.pdf

DoD 4150.07, *Dod Pest Management Program Elements And Implementation: Structure And Operation*
https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/415007_vol1.pdf?ver=2020-01-22-132922-467

UNITED STATES DEPARTMENT OF DEFENSE, UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

http://dod.wbdg.org

https://www.wbdg.org/ffc/af-afcec/installation-facilities-standards-ifs

APPENDIX D MACDILL AFB TRAFFIC CONTROL STANDARDS

D-1 CROSSWALKS

There are two standard types of crosswalks currently in use at MacDill Air Force Base: Type 1 and Type 2.

D-1.1 Type 1 Crosswalk

This crosswalk is used exclusively in high visibility areas. It consists of an 8-foot-wide red brick crosswalk with 12-inches wide concrete strips on either side. The brick color will be a Hollandale Red/Tan or equivalent laid in a basket weave pattern.

The foundation material for this crosswalk will be a 1-inch-thick sand base 6-inches of Portland cement concrete. The individual bricks will have sand filler between the brick. The concrete border strips (10-inches thick by 12-inches wide) will be constructed on a crushed concrete base. Adjustments in the base thickness or border strip thickness may be required to adjust for traffic volume.

Figure D-1 **Type 1 Crosswalk Examples**



D-1.2 Type 2 Crosswalks

This is a standard crosswalk to be used throughout the base. This crosswalk will be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), Part 3b-18.

Crosswalks will consist of 12-inch-wide bars spaced 48-inches apart from outside edge to outside edge. Side bars will be 12-inches wide and spaced 6-feet apart from outside edge to outside edge. Crosswalks will be made of white reflective thermoplastic material.

Figure D-1 **Type 2 Crosswalk Examples**


D-2 CURBS

There are four standard types of curbs used at MacDill AFB. See MacDill AFB IFS for profiles.

Specifications for curbing will be according to the current FDOT standards plans and specifications.

D-3 SIGNS

D-3.1 Regulatory Information and Street Signs

Regulatory signs will be mounted to a uniform height of 7-feet to the bottom of the sign, per MUTCD. Information signs will be mounted below regulatory signs, as shown in Figure D-1.

Figure D-1 **Example of Regulatory Sign Placement**

D-3.2 Signposts

Signposts will be Qwik-punch 2-inch square steel posts with rain cap. Posts will be hot-dip galvanized, with an architectural brown anodized baked enamel finish as shown in Figure D-1 and Figure D-2 (UNISTRUT PART NO. 20 DIZP-10-QP). Signs will be installed using 36-inch break-away with 12-gauge anchor sleeve. All signposts will be installed in concrete footings. Sign fronts will be aluminum panes with baked enamel finish. Sign backs will be black vinyl as shown at left. Sign backings will be pre-coated pressure sensitive adhesive or tack-free heat activated adhesive.

Figure D-1 **Example of Signposts**

Figure D-2 **Example of Sign Backs**

D-3.3 Street Signs

Street signs will be mounted at 7-feet to the bottom of sign unless mounted on top of a regulatory sign as shown at the left. All new signs shall be made with a decal made of Engineer Grade reflective sheeting to prevent peeling. Decals will be in color as shown in Figure D-1. Signs will be aluminum panes with baked enamel finish front. Signposts and backs will be identical to regulatory signs.

Figure D-1 **Example of Street Sign**

D-4 ROADWAY MARKINGS

D-4.1 Stop Lines

Stop lines will be utilized at intersections in addition to stop signs as shown in Figure D-1. Stop lines will extend from the center of either the single or double yellow line to the roadway edge and will be located on the intersection side of the stop sign. Stop lines

will be fabricated using white thermoplastic paint and be 24-inches wide and located in accordance with the MUTCD.

Figure D-1 **Example of Stop Lines**

D-4.2 Roadway Centerlines

Roadway centerlines will be yellow thermoplastic as shown at the left, unless approval is granted for an alternate type of marking by the Pavements Engineer. In “No Passing” zones, double solid yellow lines are required.

Roadway edge lines will be solid white 6-inches wide reflective painted lines.

Lines dividing two lanes of traffic in the same direction will be white thermoplastic dotted lines in accordance with the MUTCD.

Shown at the left are examples of directional arrows used to control traffic entering intersections. Directional arrows must be white reflective thermoplastic and in accordance with MUTCD standards.

Figure D-1 **Examples of Roadway Centerlines**

D-5 PARKING LOTS

Parking area designs will be reviewed by the Pavements Engineer to ensure they meet the established standards for these facilities. The Pavements Engineer will review the design for: Type and strength of materials; Functionality and Traffic Flow; Fire Department Vehicle access, Accessibility; and Appearance as related to base standards, environmental permit approvals, and safety.

Markings in parking lots will be white. Spaces will be delineated with 5-inches wide lines. Arrows and stop bars will be applied to the pavement using reflective white

thermoplastic and will be used where appropriate. Painted, non-reflective lines will be used in parking lots except for arrows and stop bars.

Parking lots will include lighting if used during hours of darkness. Lighting shall be both functional and architecturally compatible with the surrounding area. Lighting and light poles will be approved by the Base Electrical Engineer and by the Base Architect.

Figure D-1 **Example of Parking Lots**

Parking lots will normally include sidewalks to provide all weather access to the parking. Lots will be accessible and will have reserved spaces for accessible spaces.

Parking areas will normally be curbed to control drainage and to provide a positive stop for vehicle wheels. The use of wheel stops in parking lots is not preferred. Exceptions shall be proposed to the Pavements Engineer for approval. All environmental permit requirements must be satisfied prior to initiating construction on new parking areas.

Parking on MAFB will be constructed to blend with surrounding areas. A conscious effort will be made to avoid a "sea of asphalt" effect.

Figure D-2 **Example of Curbed and Blended Parking Lot Design**

Landscaping plants will be compatible with other plantings on MacDill AFB. Automatic sprinkler systems must be provided in areas where grass or plants require regular watering.

For MAFB, the normal lane width in parking lots is 24-feet for 90-degree parking spaces. The normal dimensions of the individual parking spaces are 19-feet x 9-feet. Consult ARCHITECTURAL GRAPHICS STANDARDS, Chapter 1, “Automobiles, Roads and Parking” for other acceptable lane widths and parking stall dimensions for specific lot configurations.

Parking areas will use landscaping and green spaces within the parking area to “screen” vehicles from view. Sidewalk access will be provided where parking areas are detached from facilities.

Figure D-3 **Example of Parking Lot Landscaping and Green Spaces**

D-5.2 Accessible Spaces

Accessible spaces will be identified by painted markings on the pavement as shown. Parking spaces will have a double 5-inch-wide non-reflective white line on either side of the parking area. The “Chair” symbol will not be used, nor will any blue markings be used. The accessible sign will have a brown background with white letters. It will be mounted on the Vinyl coated Unistrut 2”x2” pole approved for MAFB. Signs backs will be black vinyl.

Figure D-1 **Example of Accessible Parking Spaces**

D-5.3 Accessible Ramps

Accessible ramps must comply with the ADA guide requirements as well as FDOT Roadway and Traffic Design Standards. These ramps are required whenever newly constructed sidewalks intersect roads or driveways. Ramps shall include surface applied black detectable warning mats from the FDOT approved product list. Accessible ramps as shown in Figure D-1 help to provide better traction for pedestrians and disabled persons alike.

Figure D-1 **Examples of Accessible Ramps**



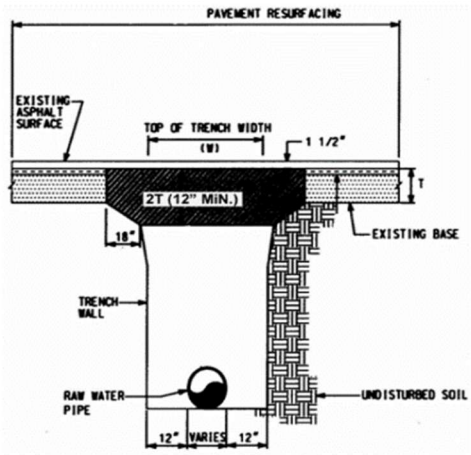
D-6 ROAD CUTS

Road cuts are to be used as a “last resort” and will be avoided whenever possible. Unless unusual circumstances dictate otherwise, horizontal boring will be used to cross roadways without damaging the roadway and marring its surface. Prior to any work of this sort, coordination will be made with the Pavements Engineer. The Pavements Engineer will generally approve all requests for horizontal boring but will require the user to "show cause" why a road cut is necessary.

If a road cut is unavoidable, the Pavements Engineer will specify the repair materials, material densities and thicknesses to be employed in the repair.

Specifications for both road cuts and horizontal boring are in the Army Corps of Engineers Guide Specifications. An example is shown in Figure D-1.

Figure D-1 **Schematic Detail of MacDill Approved Road Cut Repair**



D-7 SIDEWALKS

Sidewalks will be employed where pedestrian traffic is likely. Sidewalks will provide accessible access where appropriate. Normally sidewalks are 4-feet wide and 4-inches thick. They may use wire mesh reinforced; fiber mesh reinforced or unreinforced concrete. Sidewalks which receive a high volume of pedestrian traffic may be 6-feet wide. Sidewalks that are likely to receive vehicular traffic will be at least 6-inches thick to prevent breakage. Design mix for concrete will be approved by the Project Engineer.

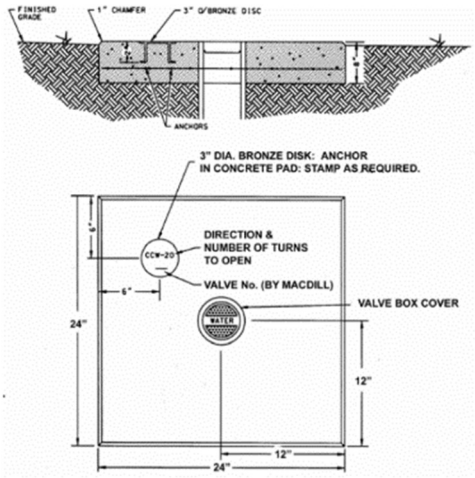
Figure D-1 **Example of Sidewalks**

D-8 MISCELLANEOUS

D-8.1 Water and Gas Valves

Water and Gas valves on MAFB will be marked using a brass disk, which is depicted in Figure D-1. Valves, which lie in grassed areas, shall have a concrete pad around the valve box constructed to the dimensions shown. Valves, which lie in paved areas, are to have the disk placed in an adjacent curb. Disks mounted in existing curbs are to be fixed in place with epoxy.

Figure D-1 **Valve Box with Disk**

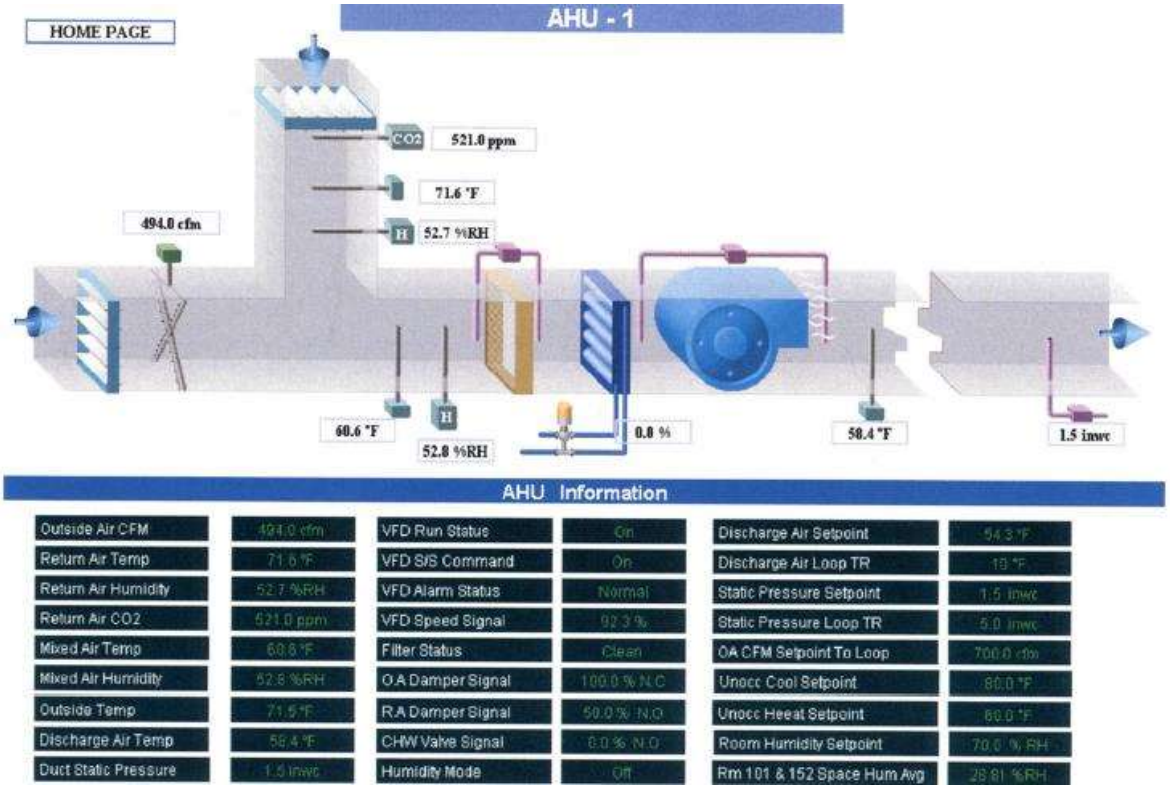


Disks are to be 3-inches in diameter brass. The top line of printing will indicate whether the valve turns clockwise (CW) or Counterclockwise (CCW) and how many turns. The second line will provide the valve number, which can be obtained from the project engineer. The stamped lettering will be at least ¼-inches high block letters.

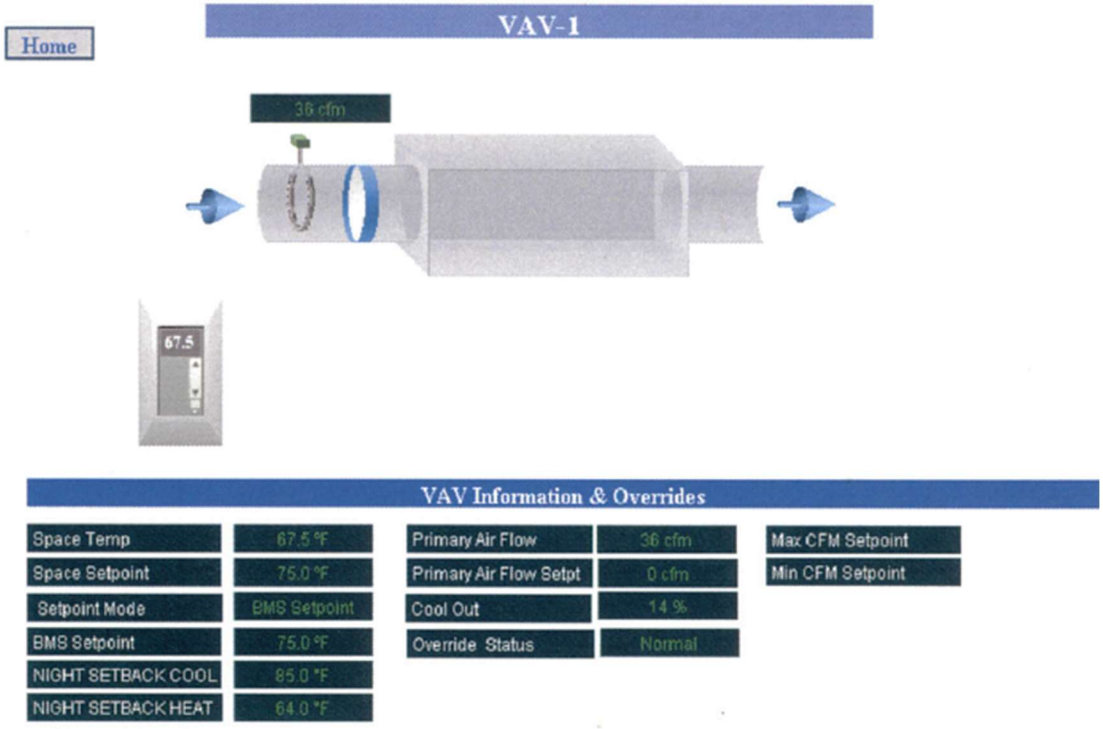
Figure D-2 **Example of Disks Set in Curb/Sidewalk**

APPENDIX E EMCS DIAGRAMS

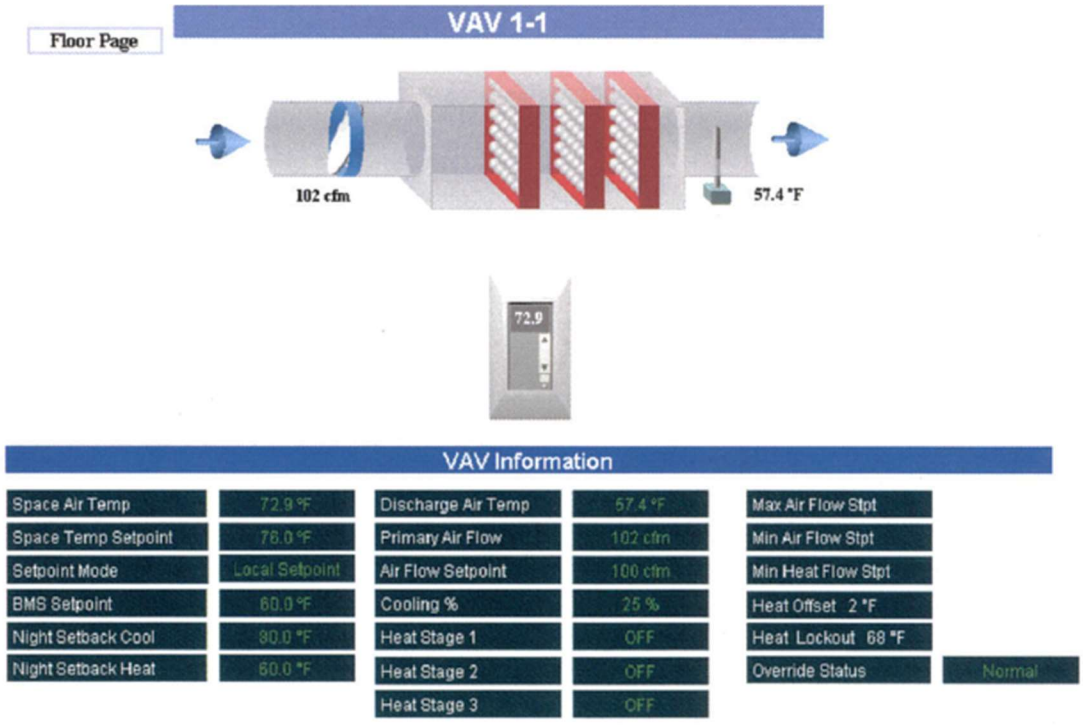
E-1 TYPICAL AIR HANDLER



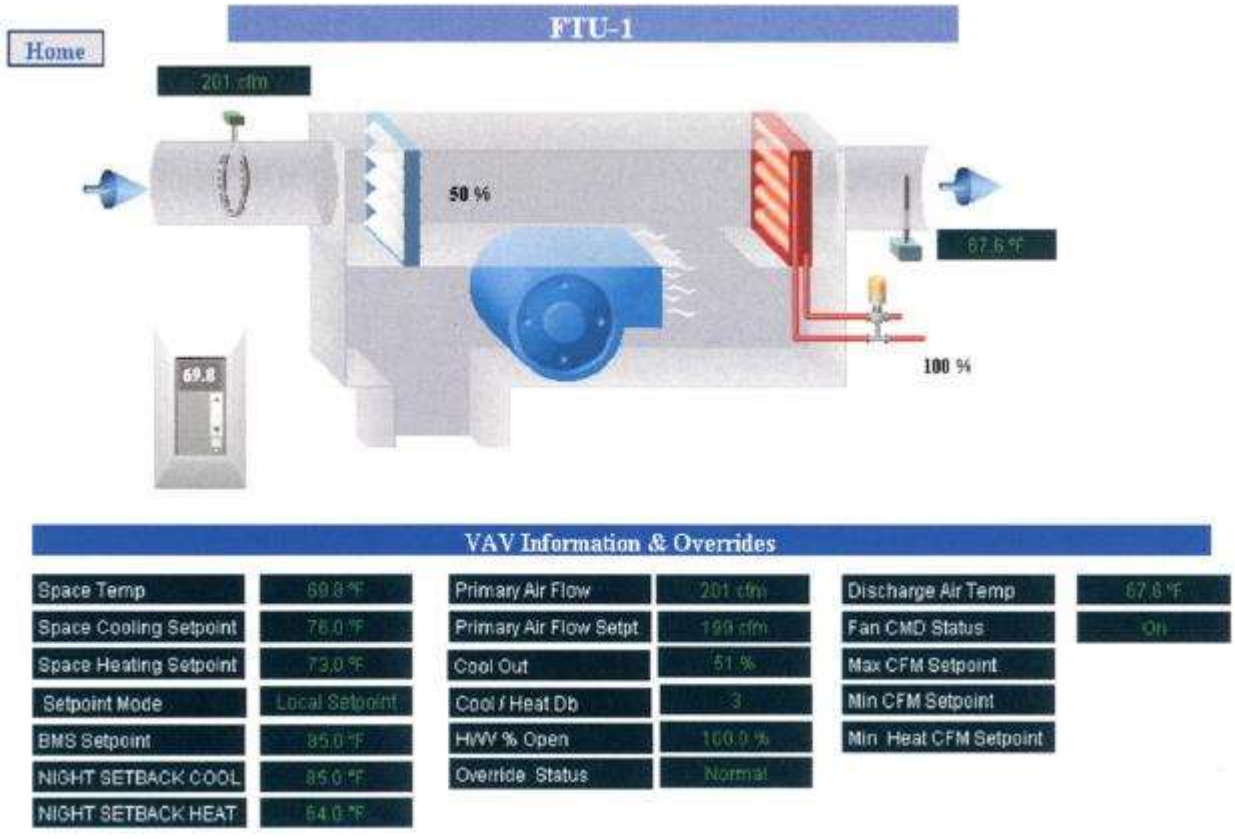
E-2 VAV COOLING ONLY



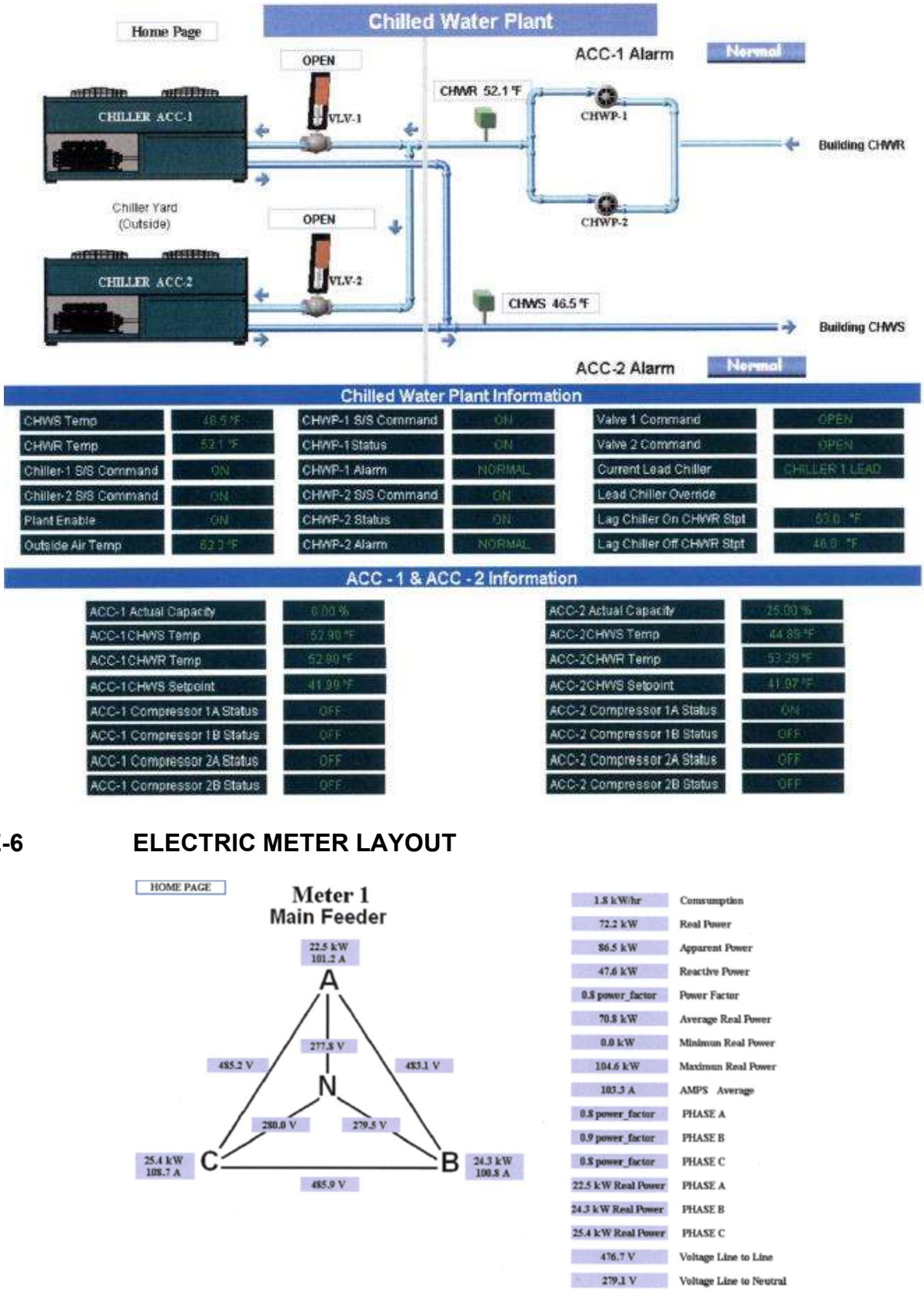
E-3 VAV WITH ELECTRIC HEAT



E-4 VAV WITH HOT WATER REHEAT AND FAN

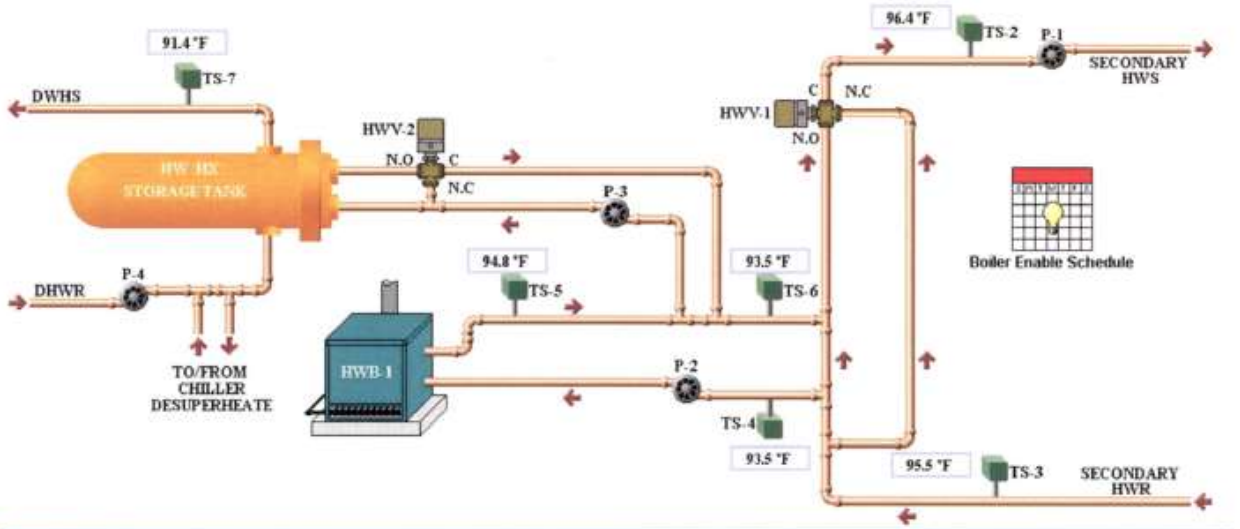


E-5 CHILLER PLANT LAYOUT



E-6 ELECTRIC METER LAYOUT

E-7 BOILER PLANT LAYOUT



Hot Water System Information

Outside Air Temp TS-1	75.8 °F	P-1 Cmd	On	P-3 Cmd	On	Water Meter	0.0 gal/min
Sec HWS Temp TS-2	96.4 °F	P-1 Cmd Status	On	P-3 Cmd Status	On	Gas Meter	0.0 cu ft
Sec HWR Temp TS-3	95.5 °F	P-1 Status	On	P-3 Status	On	Boiler Alarm St	Normal
Pri HWR Temp TS-4	93.5 °F	P-2 Cmd	On	P-4 Cmd	On	INSET ON HWS Setpoint	60 °F
Pri HWS Temp TS-5	94.8 °F	P-2 Cmd Status	On	P-4 Cmd Status	On	INSET HWS Loop Db	10 °F
Dom HWS Temp TS-7	91.4 °F	P-2 Status	On	P-4 Status	On	DOM HWS Setpoint	120 °F
		Boiler Cmd	On	HWVLV - 1 Signal	67 % Closed	DOM HWS Loop Db	10 °F
				HWVLV - 2 Signal	100 % Open		

APPENDIX F FGUA UTILITY PRIVITIZATION AGREEMENT

F-1 UTILITY PRIVATIZATION: POTABLE WATER INFORMATION

Exhibit B—Description of Premises

B.1. General Description of the Utility System:

B.1.1 Utility System Description:

The utility system may be composed of, without limitation, wells (do not exist), well pumps (do not exist), supporting emergency generator sets, water treatment equipment, valves, fire hydrants, water distribution mains, meters, booster station pumps, storage tanks, reservoirs, all related electrical controls, and computer hardware and software used to operate and control the production and delivery of water to end users on the Installation.

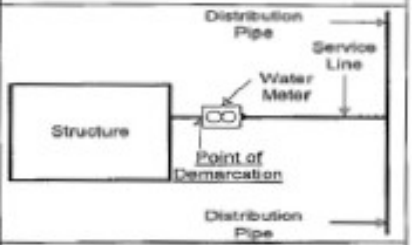
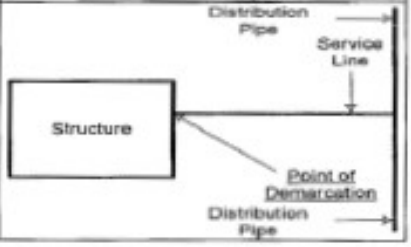
B.1.2 Lateral Extent of Utility System Right-Of-Access:

For pipe sizes of 24 inches in diameter or less, 26-feet-wide, extending 13 feet on each side of the utility system, as installed.

For pipe sizes greater than 24 inches in diameter, 50-feet-wide, extending 25 feet on each side of the utility system, as installed.

B.1.3 Utility System Points of Demarcation:

The point of demarcation is defined as the point on the utility system where ownership changes from the utility system owner to the facility owner. The table below identifies the type and general location of the point of demarcation with respect to the facility for each scenario.

Point of Demarcation (POD)	Applicable Scenario	Sketch
POD is on the downstream side of the water meter, backflow device, or valve (closest apparatus to the exterior of the structure).	Water meter, backflow device, or valve is located on the service line entering the structure within 25 feet of the exterior of the structure.	
POD is where the service line enters the structure.	No water meter, backflow device, or valve exists on the service line within 25 feet of the structure. Note: If a water meter, backflow device, or valve is installed within 25 feet of the structure at any time, the down stream side of the service valve will become the new point of demarcation.	

Point of Demarcation (POD)	Applicable Scenario	Sketch
If the fire suppression system has a storage tank, then the POD is located on the inlet side of the isolation valve or backflow prevention device closest to the storage tank. If no storage tank is present, the POD is located on the inlet side of the PIV or isolation valve closest to the fire suppression pumps.	Fire suppression system is provided flow and/or pressure by the potable water distribution system.	None
POD for irrigation system is the inlet side of the backflow prevention device or isolation valve closest to the irrigation system.	Irrigation system is fed directly from potable water distribution system.	None
POD is the inlet side of the water fountain or hose bib assembly's connection to the service lateral. Note: If a service valve is installed within 25 feet of the hose bib or water fountain, the outlet side of the service valve becomes the new POD.	Water fountains and hose bibs connected to the water distribution system (typically found at ballfields and outdoor recreation areas). No valve is located on the lateral providing water service to the drinking fountain or hose bib within 25 feet of these connections.	None
POD is the outlet side of the service valve.	Water fountains and hose bibs connected to the water distribution system (typically found at ball fields and outdoor recreation areas). Service valve is located on the lateral providing water service to the drinking fountain or hose bib within 25 feet of these water use devices.	None
POD is at the overhead service line's connection to the service entrance mast. Note: If an electric meter is present, or is installed, the owner of the electric distribution system on the installation is the owner and maintainer of the electric meter and can. The POD is on the load side of the meter.	Electric power is provided to a water facility via an overhead service drop. This configuration could be found at facilities dedicated to the water utility such as a water well, pump station, or water tower.	None

Point of Demarcation (POD)	Applicable Scenario	Sketch
POD is at the transformer secondary terminal spade. Note: If an electric meter is present, or is installed, the owner of the electric distribution system on the installation is the owner and maintainer of the electric meter. The POD is on the load side of the meter.	Electric power is provided to a water facility via an underground service connection. This configuration could be found at facilities dedicated to the water utility such as a water well, pump station, or water tower.	None

F-2 UNIQUE POINTS OF DEMARCATION

The following table lists anomalous points of demarcation that do not fit any of the above scenarios.

Table F-1 FGUA Points of Demarcation

Building Number or POD Identifier	Point of Demarcation (POD) Description
Base Entry Point	Downstream side of meter prior to backflow device at Dale Mabry Gate.
Base Entry Point	Downstream side of meter prior to backflow device at Himes Ave.
Base Entry Point	Downstream side of meter prior to backflow device at MacDill Gate.
DLA Fuel Storage Area	Downstream side of valves V1012 and V0401.
Housing Chevron Park	
100 ft southeast of Bldg 496	Downstream of V062019 and 4 in valve (valves are connected to a tee).
150 ft northwest of Bldg 366	Downstream of V062024.
Housing Staff Circle	
300 ft northwest of Bldg 382, west of Bayshore Blvd	Downstream side of V0692A.
200 ft northwest of V0692A	Downstream side of V0689.
Line supplying former pool 300 ft southwest of V0689	Point of connection of line into 6 in CI line running southwest from V0689
Housing Wherry	
Intersection of Tampa Point Blvd and Hangar Loop Dr	Downstream side of V082053.
550 ft northeast of V082053, 50 ft southwest of Hangar Loop Dr	Downstream side of V062240.
100 ft southeast from the intersection of Hangar Loop Dr and Bayshore Blvd	2 in plug valve located on the west side of 8 in PVC line.

Building Number or POD Identifier	Point of Demarcation (POD) Description
150 ft southeast of 2 in plug valve	1¼ in plug valve located on the west side of 8 in PVC line.
100 ft southeast of 1 ¼ in plug valve	¾ in plug valve located on the west side of 8 in PVC line
150 ft southeast of ¾ in plug valve	Downstream side of V062204.
Bldg 767 250 ft southwest of V062204	Point of connection of 1 ½ in service line from Bldg 767 into 6 in CI line
Intersection of Phantom Dr and Bayshore Blvd	Downstream side of valve located west of 8 in PVC line.
Intersection of Tampa Point Blvd and Bayshore Blvd	Downstream side of valve located west of 8 in PVC line.
Tinker school East of building	Downstream side of valve connecting new PVC line to existing backflow device located on concrete slab
Housing McClelland	
400 ft north of the intersection of Fortress Dr and McClelland Ave	Downstream side of new valve connected to existing 10 in PVC water main.
Housing Heritage Cove	
North of Bldg 957 (address 1909)	Downstream side of V062103
150 ft east of V062103	Downstream side of V06141
75 ft east of V06141	Downstream side of V062124
150 ft northwest of Bldg 713 (water tower)	Downstream side of V06142
Housing Liberty Cove	
1400 ft west of Bayshore Blvd along McClelland Ave, 75 ft south	Downstream side of 4 in valve
1400 ft west of Bayshore Blvd along McClelland Ave, 100 ft south	Downstream side of 4 in valve
600 ft west of Bayshore Blvd along McClelland Ave, 200 ft south	Downstream side of 6 in tee

Building Number or POD Identifier	Point of Demarcation (POD) Description
250 ft west of Bayshore Blvd along McClelland Ave, 150 ft south	Downstream side of V062211

Exhibit B—Description of Premises

B.1. General Description of the Utility System:

B.1.1 Utility System Description:

The utility system may be composed of, without limitation, collection piping, manholes, final discharge meters, lift stations, treatment plants, supporting emergency generator sets (if any), and electrical controls associated with the lift stations and emergency generator sets on the Installation.

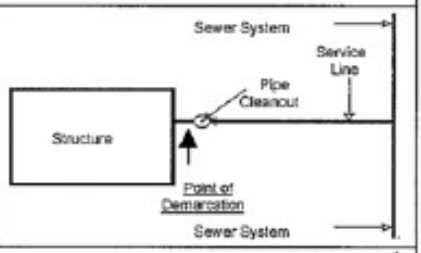
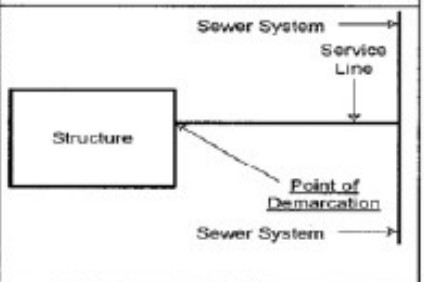
B.1.2 Lateral Extent of Utility System Right-Of-Access:

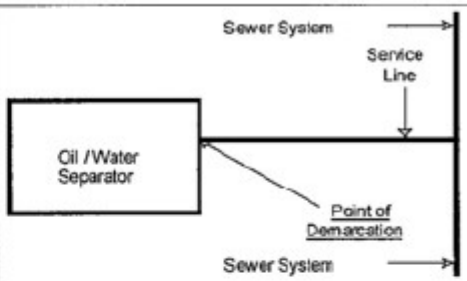
For pipe sizes of 24 inches in diameter and less, 26-feet-wide, extending 13 feet on each side of the utility system, as installed.

For pipe sizes of greater than 24 inches in diameter, 50-feet-wide, extending 25 feet on each side of the utility system, as installed.

B.1.3 Utility System Points of Demarcation:

The point of demarcation is defined as the point on the utility system where ownership changes from the utility system owner to the facility owner. The table below identifies the type and general location of the point of demarcation with respect to the facility for each scenario.

Point of Demarcation (POD)	Applicable Scenario	Sketch
POD is the upstream side of the cleanout device	No flow meter exists and a sewer system cleanout does exist.	
POD is where the service line enters the structure. Note: A new cleanout device should be installed within 10 feet of the building during any stoppage or maintenance action. The upstream side of this device will then become the new POD.	No flow meter or cleanout exists on the service line entering the structure.	

Point of Demarcation (POD)	Applicable Scenario	Sketch
POD is the outfall of the oil/water separator.	Any oil/water separator on the service line.	
POD is the outlet side of the Grease Trap or Pretreatment System.	Grease Trap or Pretreatment System connected to the wastewater collection system.	None
POD is at the overhead service line's connection to the service entrance mast. Note: If an electric meter is present, or is installed, the owner of the electric distribution system on the installation is the owner and maintainer of the electric meter and the can. The POD for the electric meter is at the load side of the meter	Electric power is provided to a wastewater facility via an overhead service drop. This configuration could be found at facilities dedicated to the wastewater utility such as a lift station or wastewater treatment plant.	None
POD is at the transformer secondary terminal spade. Note: If an electric meter is present, or is installed, the new POD is on the load side of the meter.	Electric power is provided to a wastewater facility via an underground service connection. This configuration could be found at facilities dedicated to the wastewater utility such as a lift station or wastewater treatment plant.	None

F-4 UNIQUE POINTS OF DEMARCATION

The following table lists anomalous points of demarcation that do not fit any of the above scenarios.

Table F-1 FGUA Points of Demarcation

Building Number or POD Identifier	Point of Demarcation (POD) Description
Housing Chevron Park	
East of Bayshore Blvd, 250 ft northwest of intersection of Bayshore Blvd and Florida Keys Ave	Upstream side of 3 in gate valve on 3 in force main
Housing Staff Circle	
100 ft southwest of Bldg 405	Point of connection of 6 in line into manhole C100
100 ft southwest of Bldg 401	Point of connection of 6 in line into manhole C101
Housing Wherry	
Intersection of Tampa Point Blvd and Hangar Loop Dr	Point of connection of 6 in line flowing north into manhole C1
Intersection of Tampa Point Blvd and Hangar Loop Dr	Point of connection of line flowing northwest into manhole C1
50 ft northeast of intersection of Tampa Point Blvd and Hangar Loop Dr	Point of connection of 10 in line flowing southwest into manhole C76
Bldg 767 300 ft southwest of intersection of Bayshore Blvd and Phantom Dr	Point of connection of line from Bldg 767 into manhole C88
Tinker School 700 ft east of the intersection of Tampa Point Blvd and Hangar Loop Dr	Point of connection of force main into manhole C87
Intersection of Tampa Point Blvd and Bayshore Blvd	Upstream side of valve from new housing 4 in force main
Housing McClelland	
600 ft northwest of intersection of McClelland Ave and Bayshore Blvd	Point of connection of force main from new lift station into manhole B4
Housing Heritage Cove	

Building Number or POD Identifier	Point of Demarcation (POD) Description
250 ft north of the intersection of McClelland Ave and Bayshore Blvd	Upstream side of valve from existing 4 in force main
Housing Liberty Cove	
50 ft south of McClelland Ave and Bayshore Blvd	Upstream side of valve from existing 4 in force main
Below are NEW Unique Points of Demarcation removing the Golf Course Irrigation system from Wastewater Utility Privatization Contract	
North Golf Course	Discharge side of wastewater effluent valve located approximately 180 feet northwest from the Bldg 726 (Golf Course Clubhouse) and approximately 650 feet west of Bayshore Blvd.
South Golf Course	Discharge side of wastewater effluent value located approximately 200 feet east of Lake 18 (South Golf Course Containment Pond). Inflow side of wastewater effluent valve located approximately 40 feet east of Bldg 63I (wet well/pumping station).
North Golf Course Pump Station Area	Wastewater effluent pipe flange exiting east side of Bldg 63I approximately six (6) inches from Bldg 63I. POD is feed side of flange (where the feed side and discharge side of flange meet). Flange gasket and flange bolts are owned by SO. Top of the concrete slab over the northeast portion of Bldg 63I (therefore the building enclosure, North Golf Course pumps, piping, electrical equipment are not part of the privatization). Load side of Electric Circuit Breaker to North Golf Course pumps located in 63I. Circuit breaker is located in generator building. (Overhead service line electrical connection to generator building is included in privatization.)

APPENDIX G SAMPLE FGUA FORMS

G-1 2024 UTILITY SERVICE REQUESTS AND FEES

FGUA MacDill AFB
Utility Operations Office
Building 84
9109 Bayshore Blvd.
MacDill AFB, FL 33621
(813) 828-3984 Tel

2024 UTILITY SERVICE REQUESTS AND FEES

Updated 1 Feb 2024

Utility Service	Request Form	Fee
Water and Sanitary Sewer Locate	FGUA 301	No Charge
Remark Unmaintained Marks		$300.00
Temporary Construction Hydrant Meter	FGUA 11	
Backflow/Meter Assembly Setup and Rental		$995.00
Backflow/Meter Assembly Deposit		$500.00 (refundable)
Backflow/Meter Assembly Damage/Repair		Cost+18% markup
Water Use		No FGUA charge
Flow Testing	FGUA 427	
Fire Hydrant Flow Capacity Test		No/Charge
Hydrant Operation - Contractor Tests		No Charge
Temporary Sanitary Sewer Connection	FGUA 427	To be determined
New Utility Construction	FGUA 383	To be determined

G-2 SAMPLE WATER & SEWER UTILITY CONSTRUCTION FEE

FGUA Operations Office

Government Services Group, Inc.
280 Wekiva Springs Rd., Ste 2070
Longwood, FL 32779-6026

(877) 552-3482 Toll Free
(407) 629-6900 Tel
(407) 629-6963 Fax

WATER & SEWER UTILITY CONSTRUCTION FEES

TO: Jeff Curry, Utilities Privatization, GS-12 USAF AMC 6 CES/CEO

FROM: Wally Wittaniemi, FGUA Utility Manager

DATE: Click to enter a date.

SUBJECT: NVZR Enter Project # – Enter Project Name

The FGUA has reviewed the Click to Select OR Enter Text provided on Click to enter a date. for the above-referenced project and provides this memo regarding estimated utility outage and construction inspection fees for modifications to the FGUA utility system related to this project.

Inspection Requirements - All Inspections require72 Hour Notification

Three stages of coordination between the construction contractor (Contractor) and FGUA are required: Pre-construction Meeting, Construction Inspections, and Final Inspection. The purpose of the FGUA inspections is to determine if the WORK meets Hillsborough County Technical Specifications and provide notification to the Government if deviations are observed that will affect FGUA ownership of the completed WORK. Final acceptance of the WORK remains the responsibility of your (Contractor's) work to meet standards. It is the Contractor's responsibility to notify the FGUA if water or sewer connection/construction activity is anticipated and to schedule these meetings. Please provide at least one-week notice of any scheduled meeting. During the Pre-Construction meeting, the FGUA will provide specific project inspection requirements, and procedures for contacting and scheduling inspections with the FGUA. FGUA point of contact is Jim Gorry 727-809-0914.

Prior to commencing any site work, the Contractor shall complete and submit AF Form 103 and FGUA Form 427 with appropriate fees to the FGUA Utility Operations Center located at 9109 Bayshore Boulevard, Bldg. 84 (on-base WWTP). All plan and shop drawing submittal review will remain the responsibility of the Government Agency contracting the WORK. Please refer also to the MacDill Design Guide for information regarding service termination, service outage, service connection, temporary construction water meter, etc. All fees are paid in advance to the FGUA prior to any Utility Work commencement.

Construction & Inspection Fees

Fees are based upon review of the Click to Select OR Enter Text provided on Click to enter a date.. Fees are subject to modification upon receipt of additional documentation. As a courtesy to the Government, the FGUA reviews early versions of the WORK and provides estimated fees, however we cannot guarantee that the Inspection Fees quoted will be complete without the benefit of final documents or 100% plans.

The following items are covered under the cost shown below:
Water and/or sewer service outages and termination(s) by the FGUA – water outage
All FGUA inspections (water & wastewater utilities only) – included for construction work impacting FGUA facilities
*One Temporary Construction Water Meter with BFPD - installed and removed by FGUA

We appreciate the opportunity to be of service to MacDill AFB, and its construction contractors and look forward to assisting in the successful completion of your project.

Service Outages & Inspection Fees, Project NVZR Enter Project # – (Enter Project Name): **$0.00**
*Temporary Construction Water Meter: **$1,495.00 (includes $500 refundable deposit)**

G-3 FGUA FORM 11

FGUA Form 11, Temporary Water Meter Application

FGUA Utility Operations Center:
9109 Bayshore Boulevard, Building 84
Phone 813-828-3984 - Fax 813-828-3212
Mailing Address:
P.O. Box 6704
Tampa, FL 33608

Full Name of Applicant: _____

Contractor/Business Name: _____

Local Business Address: _____

Business Phone #: _____

Business Fax #: _____ Email: _____

Name of Project Representative that will be Coordinating Work: _____

Mobile Phone #: _____ Email: _____

MacDill AFB Project Name: _____

MacDill AFB Project Number: _____ Date of Commencement: _____

MacDill Project Manager Name: _____ Office Number #: _____

Email: _____

Intended Purpose of the Meter: _____

Estimated Time of Use: _____ Date Meter is Required: _____

Location of Hydrant _____ HYDRANT NUMBER: For Office USE ONLY

This agreement serves the need for Temporary Water Service for construction activities from a designated source. Applicants must submit the completed application, a copy of the Water & Sewer Contruction Fees letter provided by the FGUA, and pay all fees at the FGUA Utility Operations Center listed at the top of this form. All Payments shall be made to the Florida Governmental Utility Authority (FGUA) by CHECK (cash not accepted).

Approved applications are subject to the following conditions:

- *Only FGUA authorized personnel are permitted to install, move or remove portable meters from Fire Hydrants. It is against the Law for anyone other than authorized personnel to tamper with or obtain unmetered water from a MacDill AFB Fire Hydrant.*
- *No Private Meters may be installed on Base Hydrants, trucks or equipment. Violations will be reported to 6CES and Security Forces.*
- *FGUA is not responsible for accident or injury caused by unauthorized placement of a portable meter and/or appurtenance.*
- *The Applicant is liable for any damages to FGUA property and equipment during the contract.*
- *Safety and Security of the meters assigned to the customer are the responsibility of the Customer.*
- *All requests for installation, relocation and removal of potable water meters must be made in writing at least 3 days in advance and hand delivered or mailed to the FGUA Utility Operations Center listed at the top of this form.The FGUA Utility Operations Center is open during normal business hours are 8:00 to 4:00 Monday through Friday. (preceding text matches Form 427). Applications received will be scheduled within 3 business days of the date received. When Removal is required the customer must file a written request, in person, and pay outstanding fees (if any). A Confirmation Number will be issued to the Customer at this time, please retain this confirmation number. Upon account reconciliation a Refund of Deposit will be mailed to the address provided above.*

I _____ (Applicant/ Customer) have reviewed and accept the provisions within this agreement.

_____

Signature ***Date***

This Section is Reserved for Office Use Only

USW Job Number: _____

Meter Number Assigned: _____ Date of Most Recent of Backflow Certification: _____

Date Installed: _____ Technician: _____

Meter Reading Out: _____

Removal Request RCVD: _____

Date Removed: _____ Technician: _____

Meter Reading In: _____

Confirmation Number: _____ Deposit Returned: _____

Rev. (mjh) 102711 ***Florida Governmental Utility Authority - Form 11***

G-4 FGUA FORM 427

MacDill Air Force Base - FGUA Form 427

☐ Termination of Utility Service
☐ Utility Outage Request
☐ Inspection of Work
☐ Other _____

FGUA Utility Operations Center:
9109 Bayshore Boulevard, Building 84
Phone 813-828-3984 - Fax 813-304-2694
Mailing Address:
P.O. Box 6704
Tampa, FL 33608

Name and Phone # of Applicant: _____
Company Name: _____
Local Company Address and Phone #: _____
Name and Phone # of Company Representative on-site during work: _____
Name and Phone # of 6 CES/Government Representative that will be inspecting work: _____
Description of Work: _____
Government Project Number and Name: _____
Tentative/Requested Date of Service: _____ Facilities/Bldgs. Impacted: _____

Complete this Block for Water/Sewer Outages that Impact Customers

Gov't Representative: _____ **Government Approved Date and Duration:** _____
Phone and Email: _____
_____
Signature of Authorization (Gov't Rep) *Date*

This Request for Work must be submitted by all parties anticipating the need to perform work on or adjacent to existing Water or Sewer utilities, where assistance from the FGUA is required. This application ensures that proper construction techniques, utility terminations and physical line disconnections from FGUA-owned Water and Sanitary Sewer systems are followed. Without exception, FGUA personnel must be present at all times during work of this type. For each work request, applicants must submit a completed form 427 along with the proper fees made by check (cash not accepted) and payable to the FGUA.

The following Terms and Conditions apply to all work performed on or around water and sewer utilities

- *Only FGUA personnel are authorized to operate system valves and sanitary sewer lift station equipment.*
- *Temporary Utility Outage - Upon proper notification and at a mutually agreed day and time, FGUA operations personnel will arrive onsite to perform a temporary shutdown of the service. After the work is completed, FGUA personnel will return to the site to restore the service. The maximum amount of time allowed for a service outage is determined by MacDill AFB authorities. Unless indicated during application, FGUA personnel are not required to be present during the time after Suspension and before Restoration of Service*
- *Applicant is responsible for chlorination and bacteriological testing of all water mains and service connections in accordance with AWWA C651. It is anticipated that all bacteriological tests, pressure tests, and record drawings will accompany the Certificate of Construction Completion Forms for signature by the FGUA. If, during the testing of the water mains or as part of a service restoration, it is found that proper disinfection and testing has not been performed, the contractor will be required to perform proper disinfection and flushing of the system until passing tests are received. Contractor is liable for the cost of additional testing and services.*
- *Utility Terminations - All Utility Terminations are performed by the FGUA. Prior to FGUA personnel arrival, the Contractor is required to excavate and expose all water or sanitary sewer piping at the point of termination. The excavation shall be deep enough to provide a minimum of one foot open space below the pipe invert and broad enough to complete the work. For wet soils or when the work will require draining of a water main, the contractor shall place a 12-inch layer of rock in the excavation to stabalize wet soils and provide a pump capable of removing drained water. The contractor is responsible for any groundwater dewatering, if needed. All excavations must be properly stabilized and/or shored as required by OSHA regulations and standard industry practices. Upon completion, contractor will complete the pipe abandonment and/or properly restrain any remaining piping, as required by either Government Inspectors or in accordance with the Hillsborough County Design Standards.*
- *Applicants are liable for any damages caused by the Applicant during work on or around FGUA-owned utilities located and accepted under the terms of Air Force Form 103 and FGUA Form 301.*
- ***All requests must be received at least 2-weeks prior to the earliest day needed at the FGUA Utility Operations Center listed at the top of this form.** The FGUA Utility Operations Center normal business hours are 8:00 to 4:00 Monday through Friday. An FGUA Representative will contact you upon application approval.*

I _____ **(Applicant) have reviewed, understand, and will comply with the provisions of this agreement.**

_____
Signature of Applicant *Date*

This Section is Reserved for FGUA Office Use Only

USW Job Number: _____ Payment Received _____
Work Scheduled for _____ Day/Time Work Completed _____ Date/Time
FGUA Technician Assigned _____ BACTI TESTING _____ Pass / Fail
FGUA Personnel On-Site _____
Utility Damage Observed: _____ Boil Water Advisory Issued: _____ Date/ Time
Est. Additional Costs: _____ Boil Water Advisory Rescinded: _____ Date/ Time

Rev. FGUA 10-29-15 *Florida Governmental Utility Authority - Form 427*

G-5 CONTRACTOR UTILITY LOCATE ACCEPTANCE

Contractor Utility Locate Acceptance

9109 Bayshore Boulevard, Building 84
Tampa Florida 33621
Phone (813) 828 -3984 Fax (813) 828 -3212

Date: _____

Full Name of Applicant: _____ Job Site Phone #: _____

Contractor Name: _____ Contractor License #: _____

Job Trailer Located On-Site (Y / N) _____ Job Site Location (Bldg./Intersection):

Contractor Supervisor: _____

Supervisor Phone #: _____

MacDill Construction Manager: _____ Affiliation (6 CES, USACE): _____

Construction Manager Phone #: _____ Email: _____

Project Name: _____

Project Number: _____

AF Form 103 (dated): _____ Description of Work:

Planned Work Start Date: _____

Locate Ticket #: _____

Date and Time of Utility Locate: _____

General Terms and Conditions of Acceptance:

- *Utility locates are valid for a period of 90 days from the date of acceptance, after which the Requestor is required to contact the FGUA for a new Utility Locate. A current copy of the Air Force Form 103 and project drawings shall be available at the Job Site.*
- *Location and Acceptance pertains to **Water & Sewer Utilities Only** and does not consider any other utilities.*
- *The Contractor is responsible for obtaining all other utility locates from other base utility owners/operators.*
- *Contractor is responsible for maintaining and protecting all utility locate marks during the 90 day period.*
- *Contractors must report Any/All damage to Water or Sewer Utilities **immediately** to the FGUA.*
- *Contractor will be responsible for all costs associated with the repair to utilities damaged as a result of Contractors Work.*

	Marked (X)	*Service Technician*	*Conflicts / Comments*	*(Initials) Acceptance*
Pressurized Water Main				
Water Service Lines				
Reclaimed Water Main				
Gravity Sewer				
Sewage Forcemain				

I _____, have reviewed and accept the provisions stated within this agreement and understand them in their entirety wherein by signing this agreement I affirm that, to my knowledge, all Water and Sewer utilities have been properly identified.

_____

Signature ***Date***

This Section is Reserved for FGUA Office Use Only

Office Tracking Log Completed: _____ Date: _____
Relocate #1: _____ Date: _____
Relocate #2: _____ Date: _____
Relocate #3: _____ Date: _____
Utility Damage: _____ Date: _____
Cost Recovery: _____ Date: _____

Rev. (dbs) 042511 ***Florida Governmental Utility Authority - Form 301***

APPENDIX H 6 TH COMMUNICATIONS SQUADRON SUPPLEMENT TO ETL 02-12

6th Communications Squadron Supplement

to

Engineering Technical Letter (ETL) 02-12: Communications and Information System Criteria for Air Force Facilities, dated 27 June 2002

Communication Systems

Current as of 25 April 2018

OPR: 6 CS/SCXP

Table of Contents

SECTION 1. PURPOSE:

1.01. This supplement clarifies communications requirements for MacDill AFB facilities not covered in ETL 02-12. This supplement shall be used in conjunction with ETL 02-12. The 6th Communications Squadron Communications System Officer (CSO) or designee is the only one who can authorize deviation from this supplement.

SECTION 2. SCOPE.

2.01. This specification shall be used to plan, design, review and evaluate telecommunications cabling and distribution systems for service connections, pre-wiring of new and renovated facilities to support communications – computer systems (C-CS). This specification addresses C-CS as they relate to interior wiring, exterior duct bank and communications cable to the appropriate service connection point(s).

SECTION 3. REFERENCED PUBLICATIONS.

- ANSI/ICEA S-80-576 Standard (Std) for Telecomm Wire and Cable for Wiring of Premises
- TIA/EIA-569-A Commercial Building Std for Telecommunications Pathways and Spaces
- TIA/ EIA 590 Std for Physical Location & Protection of Below-Ground F.O. Plant
- ANSI/TIA/EIA TSB-75 Additional Horizontal Cabling Practices for Open Offices
- Unified Facilities Criteria 4-021-01 Design and O & M: Mass Notification Systems

SECTION 4. BULLETINS.

- REA 1753F-601 (PE-90)	Fiber Cable, Outside
- REA 1753F-205 (PE-39)	Copper Cable, Outside
- REA 1753F-208 (PE-89)	Copper Cable, Outside
- RUS 1751F-640	Design of Buried Plant – Physical Considerations
- RUS 1751F-642	Construction Route Planning of Buried Plant
- RUS 1751F-644	Underground Plant Construction

SECTION 5. GENERAL REQUIREMENTS-INTENT

5.1. Whenever new construction or renovation takes place, the design, installation, and all related costs necessary to complete interior wiring and extend the conduit, ductwork and manhole system to the new or renovated location shall be included in the project cost.

5.1.1. Renovation shall include removal of old/unused telecommunications cabling from interior of facilities. 6th Communication Squadron (CS) will identify old/unused cabling.

5.1.2. Prior to demolition of any facility, 6th CS personnel shall remove the outside plant communications cables (copper and fiber) serving the facility, if applicable. These cables shall be removed back to the splice point and capped. The 6th Civil Engineering Squadron (project manager) shall notify the 6th Communications Squadron (Plans Office) at least 45 days prior to facilitate scheduling of work.

5.1.3. Prior to demolition or renovation of any facility, all network devices, LMR equipment and antennas serving the facility, which shall be impacted by the construction, shall be removed/relocated.

The 6th Civil Engineering Squadron (project manager) shall notify the 6th Communications Squadron (Plans Office) at least 30 days prior to facilitate scheduling of work. Submit the removal/relocation request using automated Form 3215. The 6th Communications Squadron shall remove the antennas.

5.1.4. Communications design criteria is grouped into three areas: inside wire & cable; communications equipment room & distribution frame; and exterior work. The design requirements may vary depending on the size and type of facility being built or renovated.

5.1.5. The facility design shall provide for concealment of wiring/cabling systems, adequate space for installation, maintenance of C-CS equipment and wiring, and proper separation for specialized systems, if required.

5.1.6. The building communications infrastructure shall provide 50% spare capacity for future expansion of the user's voice, network, security and video requirements.

5.1.7. The most practical cable/wire distribution system shall be selected, consistent with facility size/function and current/projected C-CS requirements.

5.1.8. To minimize the long-term cost of the infrastructure, local standards are established as follows and shall only be changed when approved in writing by the base CSO or their designee. These standards are intended to reduce cost associated with post construction C-CS requirements, to promote common skills among maintenance personnel and to minimize the necessity for excessive on-hand spare parts and equipment.

SECTION 6. CABLE MANAGEMENT PLAN.

6.1. Cable management is the planning, designing and accounting of cables routed throughout the building. Placement of any cable system in the building shall follow a well organized and well designed cable management plan. By keeping a record of cable pair counts and assignments and the routing of riser, tie, and distribution cables, future rearrangements or alterations to the wiring system shall be easier. The overall cable management shall be implemented in accordance with TIA/EIA-606 (Administration Standard for the Telecommunications Infrastructure of Commercial Buildings).

6.2. The 6th Communications Squadron project manager shall review and approve the proposed cable management plan prior to construction

SECTION 7. DESIGNER-INSTALLER QUALIFICATIONS.

7.1. All furnished and installed equipment and all work accomplished under this section shall be performed by a certified telecommunications contractor, with the exception of furnishing and installing conduit, electrical boxes and pull wires. The contractor shall have the following qualifications in telecommunication systems installations:

7.2. The contractor shall have a minimum of 3 years experience in the application, installation, splicing and testing of the specified telecommunications systems and equipment.

7.3. All craftsmen installing fiber optic and level Cat-6 cables and their associated hardware shall have certification that they are qualified to install and test the provided equipment and materials. General electrical trade staff (electricians) shall not be used for the installation of the premises distribution system cables and associated hardware. Electricians shall be used for installation of the raceway systems.

7.4. All installers assigned to the installation of this system or any of its components shall have a minimum of 3 years experience in the installation of telecommunications system components.

SECTION 8. INSIDE WIRE AND CABLING

8.1 INSIDE FIBER OPTIC CABLE

8.1.1. Fiber cable type shall depend on the user/base requirements. 6th Communications Squadron (Plans Office) shall make final decision (ex: 8.3/125 microns for single mode and 62.5/125 microns for multi-mode).

8.1.2. All fiber cables shall be run in inner duct, with an individual inner duct for every fiber cable. Secure the inner duct along the route with cable ties or U-shaped mounting brackets. Protective bushing(s) shall be used where the fiber enters and exits the interduct. All plastic cable ties shall be trimmed with a flush-cut tool to ensure that no sharp edges result.

8.1.3. Fiber cable installed inside conduit/ducts shall have no less than ¼ inch air gap existing around the outside perimeter of the cable.

8.1.4. Fiber optic cable shall be installed from the facility demarcation back to the nearest service connection point(s) (Information Transfer Node - ITN). The cable shall be connected/terminated to existing infrastructure. This may require the installation of a new/addition to the manhole/ductbank system. The contractor shall complete the connection/termination.

8.1.5. The fiber optic patch panel shall provide a location for maintenance and cross-connecting of fiber optic cables. Patch panel shall have connectors that interface the inside plant cable with the outside plant cable. Panels shall have engraved laminated plastic nameplates above each connector. The nameplates shall indicate panel designation.

8.2. INSIDE COPPER CABLE

8.2.1. Copper cable shall be CAT-6 cable. The CAT-6 cable used for voice shall be gray and the CAT-6 cable used for data shall be blue

8.2.2. Maintain manufacturer's recommended minimum bend radius of the cables at all times. Do not stretch, stress, tightly coil, bend or crimp the workstation cables when leaving them out of the way of other trades during the staging of the work. All severely stressed cables shall be replaced by the contractor at the contractor's expense.

8.2.3. This system shall support voice, local area network (LAN) and cable TV (CATV) connectivity for the facility. Work includes all wiring, cables, jacks, conduits and mounting devices necessary for a complete and usable system. The cabling shall extend from the distribution panel at the service entrance (comm equipment room) to all parts of the building.

8.2.4. Whenever exposed in environmental air spaces, only plenum-rated cable shall be used. Plenum rated innerduct can not be a substitute for the plenum-rated cable requirement.

8.2.5. Provide a dedicated cable for each outlet.

8.2.6. No communications system shall be removed without notifying the 6th Communications Squadron (Plans Office). This notification shall minimize possible communications failure for base users.

8.2.7. The cable termination configuration shall be 568A for network (LAN) and 568B for telephones.

8.2.8. Each cable shall be numbered corresponding to the outlet.

8.2.9. Each voice and data cable shall terminate on 110 punch-downs on back of patch panels (or on 110-type patch panels) at the distribution frame. All 110 type patch panels shall be mounted in a standard communications rack (19 inches wide).

8.2.10. All cables shall be the proper type for installation in the particular environment they are to be used. (i.e., have the proper fire rating in accordance with the current NEC/NFPA 70, usually plenum rated cable).

8.2.11. Cables shall not be supported by suspended ceilings or any of its components.

8.2.12. An additional one foot of cable shall be left on or near the network patch panel for future cable re-termination. An additional 6 inches to 8 inches of each cable shall be left at or near each outlet box/jack for future cable re-termination. No micro bends shall be permitted less than 2 inch bend radius for the entire cable run. Cable runs shall be continuous full length. No splices are allowed between contacts on patch panel and workstation jacks.

8.2.13. All telephone cables shall be bundled separately from LAN cables.

8.2.14. All indoor cable and wiring shall be supported every 36 inches (910 mm) or less utilizing industry recognized and approved hardware such as cable straps, hangers, steel messenger cables, D-rings, racks, etc. Cable and wiring support shall be self supporting and not rely on or be supported by other pipes, cables, or conduits. The cable shall be neatly bundled and tied with tie wraps into groups of 50 or less.

8.2.15. Cables entering and leaving a conduit or duct shall be supported in a manner in which the cable is not stressed at the edge or rim of the conduit. Indoor conduits shall be firmly anchored and supported, and installed IAW the NEC. Protective bushing(s) shall be used where the cable(s) enters and exits the interduct.

8.2.16. Ends of conduits shall be deburred to prevent cable damage during installation.

8.3. HOUSE BACKBONE CABLE. (Used to connect communications equipment rooms (CERs) to satellite telephone closets (TCs))

8.3.1. The house backbone cable shall consist of riser and horizontal cables. The riser cables provide connection between the telephone patch panels in the TCs and the telephone patch panels or main distribution frame in the CER. The horizontal cables connect individual subscriber telephones and LAN outlets to their respective 110-type patch panels in the TCs.

8.3.2. The riser and horizontal cables shall have an appropriate fire rating for the environment where they are to be installed.

8.3.3. The house backbone cable shall be designed to interconnect patch panels in each TCs to its service entrance in the CER with dedicated pair counts (i.e., no multiple counts). This configuration shall ensure all pairs appear at the building service entrance.

8.3.4. Where patch panels in various TCs require interconnectivity, those connections shall be made at the main distribution patch panel located in the CER. The patch panels, in various TCs, shall not be connected directly from TC (frame) to TC (frame).

8.3.5. All patch panels in different TCs shall be connected to the main distribution patch panel in the CER. The patch panels in one TC shall not be directly connected to patch panels in another TC.

8.3.6. Riser cables (copper) shall be provided in multiples of 25 pairs and shall be UL type 24 AWG CMR rated. The riser cable (copper) shall be sized with an additional 50% spare pairs over and above the number of pairs needed to terminate all station outlets.

8.3.7. Riser cables (fiber) shall be provided in multiples of 12 strands, single mode. The minimum quantity is 12 strands between rooms/closets.

8.3.8. All pairs/strands shall be terminated at each end of every cable. All cables shall be labeled at each end with its respective pair/strand counts.

8.3.9. Telecommunications cables running parallel to electrical cables shall be separated by a minimum of 12 inches. If minimum separation is not possible, telecommunications cables shall be separated from the electrical cables with ferrous metal barrier (i.e., metal conduit).

8.3.10. Telecommunications cables and electrical cables/conduits shall cross at 90 degree angles.

8.4. TELECOMMUNICATIONS OUTLETS.

8.4.1. Telecommunications outlets shall be quadplex (double gang box, with quadplex faceplate) unless otherwise specified by the customer and approved by the communications squadron.

8.4.2. Outlets shall be provided in the following configuration:

8.4.2.1. All four outlets shall be wired using the Cat-6 RJ-45 connectors, ran back to the assigned communications patch panel in the communications room. One of the jacks shall be wired for LAN and the other shall be wired for phone. The remaining faceplate slots shall be covered with a faceplate cap.

8.4.2.2. For administrative office areas, there shall be one outlet every eight linear feet of useable perimeter wall space or one outlet for every 48 square feet of office space, whichever provides a higher outlet density. For areas other than offices, the outlet density shall be determined by the 6th Communications Squadron (Plans Office) and the user/occupant of the facility.

8.4.2.3. Each jack shall be an 8-position, 8-wire modular jack. Both flush and surface mount outlets shall be provided as appropriate. Flush mounted types shall be suitable for mounting in standard electrical outlet boxes (preferred method).

8.4.2.4. Surface mounted types shall be suitable for mounting on walls and baseboards. Where modular furniture is to be used, outlets suitable for mounting in modular raceways shall be provided.

8.4.2.5. Each outlet shall be labeled to show its relationship with the cables terminated on it, and each jack shall be labeled to indicate its use, i.e., voice and network. If an outdoor outlet is necessary it shall be corrosion resistant, weatherproof and designed to mate with a standard 4-wire modular plug.

8.4.2.6. Telecommunications outlets shall be mounted at 18 inches above the floor, to the centerline of the cover plate, unless noted otherwise (except wall mounted phones, para 8.5.1).

8.4.2.7. If the facility is to be furnished with modular office furniture, the outlet locations shall be matched to the furniture design. The multi-user Telecommunications Outlet Assembly can be used for a zone distribution system to support the area with modular furniture.
(ref: ANSI/TIA/EIA TSB 75).

8.4.2.8. Some rooms, such as conference rooms, may require floor mounted communications outlets. These outlets shall be installed flush with the floor. The location shall be determined by the building occupants (users) and coordinated with 6th Communications Squadron personnel. The quantity and type of outlets shall be determined by 6th Communications Squadron personnel based on user requirements.

8.5. MISCELLANEOUS TYPE PHONES and PUBLIC ADDRESS SYSTEMS (when applicable).

8.5.1. Wall-mounted Telephone Instrument. The wall-mounted instrument shall mount to a standard modular wall plate jack (type 630), without the need for a telephone line cord. Instruments not designed to mount on a wall plate jack shall be connected to wall jack with a line cord. The handset shall be securely held on the handset rest to prevent an accidental off-hook condition. The phone shall be mounted 60 inches above the finished floor.

8.5.2. Outdoor Telephone. This instrument shall be a sealed outdoor weatherproof telephone designed to terminate a single switched or nonswitched line. This phone shall be equipped with a handset, six foot double jacketed retractile coiled handset cord (or armored handset cord), and base unit. The faceplate, handset, and other exterior hardware shall be corrosion resistant. These telephones shall be capable of being housed inside the outdoor enclosure.

8.5.3. Outdoor Telephone Enclosure. The weatherproof enclosure shall be designed for outdoor applications capable of wall or pole mounting. The enclosure shall provide a water-tight, dust-tight, and corrosion resistant housing for a telephone. A sealed hinged door shall be provided, equipped with a return spring to ensure automatic door closure. The enclosure shall be externally labeled and provided with a mechanical door lock.

8.5.4. Hazardous Area/Explosion Proof Telephone. This instrument shall be an explosion-proof phone enclosed in a sealed metal housing containing all electrical components except for the handset and cord. The housing shall provide protection against an internal spark or flame from reaching the surrounding atmosphere. This telephone shall be designed for both indoor and outdoor hazardous areas, and shall operate in hazardous locations Class I (Groups A, B, C, D), Class II (Groups E, G), and Class III for both Divisions I and II as defined in the ANSI C2 National Electric Safety Code (NESC), article 500. This phone shall be capable of being housed inside the outdoor enclosure.

8.5.5. Radio and Public Address (Mass Notification) Systems. Radio and public address systems shall be provided in inhabited buildings, primary gathering buildings (ex: dining and activity areas of service clubs, hospitals, training facilities, etc), billeting facilities and elsewhere as required to provide real-time

mass voice notification communications to all building occupants a regular basis. The design guidance for the mass notification system is contained in the Unified Facilities Criteria (UFC) 4-021-01, most current version.

8.5.5.1. Radio systems shall provide for both AM and FM signal reception. Antenna installations shall conform to base standards.

8.5.6. LMR Antenna, Video Camera conduits and CATV.

8.5.6.1. Install two conduits (one for electric from the electrical room and one for video from the communications room) to each projected video camera location. These conduits shall prevent holes from being drilled in walls after construction completion. As a minimum, the conduit shall be 3/4 inches in diameter, with 1/4 inch nylon pull cords. Install caps on the ends of conduits that are on the exterior of the building.

8.5.6.2. Install one conduit from the communications room (near copper cable demarc point) to each projected antenna location. This conduit shall prevent holes from being drilled in walls after construction completion. As a minimum, the conduit shall be 3/4 inches in diameter, with 1/4 inch nylon pull cords. Install a cap on the end of conduit that is on the exterior of the building.

8.6.3. Cable TV. The facility owner/occupant shall identify requirements and CATV outlet locations. The CATV specifications and service connection point shall be obtained from the base contracting office, in coordination with 6th Communications Squadron and the local cable company representatives.

8.6. SECURE INTERNET PROTOCOL NETWORK (SIPRNET)

8.6.1 All SIPRNET cabling shall be fiber optic unless otherwise specified by the 6th Communications Squadron.

8.6.2 Fiber optic cable shall be Orange 62.5 micron Duplex Multi-Mode cable. Fiber optic connectors (outlets) in the user's work area shall be LC type connectors. This includes all open storage areas, sensitive compartmentalize information facility (SCIF) and Protected Distribution System's (PDS)

8.6.3 For all non Open Storage, SCIF, and PDS areas a NIPR drop will be used to gain SIPRNET connectivity through the use of a TACLANE.

8.6.4. SIPRNET Data Outlets shall be located to meet customer's needs. If the facility shall be classified as open storage or sensitive compartmentalize information facility (SCIF), drops shall be every 10 feet or 100 square feet of office space.

8.6.5. Security requirements for processing classified information may vary and facility design shall be handled on a case-by-case basis. The facility owner/occupant shall identify all requirements and coordinate with the appropriate agencies.

SECTION 9. COMMUNICATIONS EQUIPMENT ROOM AND DISTRIBUTION FRAME

*Note – All facilities shall contain at least one communication equipment room or telecommunications closet.

9.1. Communications Equipment Room.

9.1.1. Communications Equipment Room (CER). The CER is normally the entrance point in the facility for all incoming communications ducts and cables. It is the primary location for C-CS equipment such as local area network (LAN) switches, routers, servers and patch panels.

9.1.2. The CER's doors shall open out and be keyed (MacDill's 14-2 key) to allow 6th Communications Squadron personnel 24/7 access. CER's shall not be used as storage.

9.1.3. Special purpose facilities that have unusually heavy telecommunications requirements as well as those facilities that have very limited telecommunications requirements shall be designed to meet the users requirements in a cost-effective manner.

9.1.4. Whenever feasible, CERs shall be centrally located in the facility, along an exterior wall.

9.1.5. Installation contractor shall be responsible for installation of copper riser cable and fiber optic cable connections and terminations between communications rooms. See Section on House Backbone Cable, para 8.3 for additional information.

9.1.6. Two (or more) 19-inch equipment racks (telephone and network equipment) shall be installed and securely fastened to the floor, with a 3 foot clearance on all sides for maintenance of C-CS equipment.

9.1.7. The comm. room shall have a minimum of one quadplex, 20 amp, dedicated electrical circuit, with isolated ground on each wall. An additional duplex convenience outlet shall be located away from the telecommunications outlets to provide power to operate service and maintenance equipment.

9.1.8. The comm. room shall have adequate lighting. It shall be free of any electromagnetic fields and shall not be susceptible to water damage from water pipes or HVAC systems.

9.1.9. As a minimum the room shall be kept between 68 to 78 degrees F, with a positive air pressure (to provide a dust free environment.

9.1.10. Fire Protection, if required, shall be provided as per applicable code.

9.1.11. If sprinklers are required within the equipment area, the heads shall be provided with wire cages to prevent accidental operation. Water pipes shall not be routed over the equipment locations. Drainage troughs shall be placed under the sprinkler pipes to prevent leakage onto the equipment within the room

in accordance with (IAW) TIA/EIA-569A.

9.1.12. A minimum of three 4-inch (102mm) floor sleeves shall be installed between stacked telecomm closets. A floor sleeve is a four-inch nominal inside diameter conduit section installed through the floor to allow passage of cables between floors. Protective bushings shall be used at both ends of the conduit (metallic and nonmetallic) to avoid damaging cable jackets during installation. The sleeve shall extend three inches (75mm) up from the floor to prevent water flow from floor to floor. The comm closets shall be vertically aligned to the maximum extent possible. Provide fire stop in accordance with the fire codes where conduits penetrate fire rated ceilings walls or floors.

9.2. TELECOMMUNICATIONS CLOSET.

9.2.1. Telecommunications closets (TC) are the facilities for housing telecommunications equipment, cable terminations, and cross-connect wiring. The closet is the transition point between the riser/backbone cable and horizontal/subscriber cables (homeruns to outlets). Closet sizes shall vary depending on the floor space that they serve.

9.2.2. The TC's doors shall open out and be keyed to allow 6th Communications Squadron personnel 24/7 access. TC's shall not be used for storage.

9.2.3. The closets shall be centrally located within the floor space that they serve so that no copper cable run is longer than 293 feet (90 meters) from the closet to the workstation outlet, including vertical distances to wall telecommunications outlets.

9.2.4. The telecommunications closet shall not serve an area in excess of 10,000 square feet. If either maximum requirement (cable run length or square footage) is exceeded, additional telecommunications closets shall be added.

9.2.5. Where multiple TCs are required, attention shall be given to their strategic placement to support interconnection via three 4-inch conduits between each room as well as the primary telecommunications room in which the cable head/fiber connections are to be located. Four 1-inch innerducts shall be provided inside the one of the 4-inch conduits or conduit raceways, with pull cord, as a dedicated, direct path between each TC and the primary telecommunications rooms.

9.2.6. All LAN runs shall be continuous (homerun) from wall outlet to network patch panel equipment located in TCs or communications equipment rooms.

SECTION 10. EXTERIOR WORK

10.1. Communications Cables To and Between Buildings.

10.1.1 For Base Fiber Optic Backbone Connections to Information Transfer Nodes (ITNs):

- Gigabit Ethernet Connections - 36 Strand Single Mode (SM) Fiber 8.3/125 micron

10.1.2 For Base Fiber Optic Satellite Connections (to building):

- Switched Ethernet Connections - 12 Strand SM Fiber 8.3/125 micron

10.1.3 Minimum of 25 pair copper cable to each new facility for new installations

10.2. OUTSIDE COPPER CABLE

10.2.1. All copper conductors for cables less than 2,100 pair shall be not less than 24 AWG. All copper cable conductors for cables more than 2,100 shall be 24 AWG. However, if cable shall not fit inside a 4" duct, than copper conductors may be 26 AWG. All splices shall be spliced with singular splice connectors and shall be sealed in a stainless steel type closure.

10.2.2. All outdoor metallic Twisted Pair (TP) Cable shall be filled core type.

10.2.3. Copper cable shall be installed from the facility demarcation back to the nearest service connection point(s). The cable shall be connected/terminated to existing infrastructure. The contractor shall complete the connection/termination.

10.3. OUTSIDE FIBER OPTIC CABLE.

10.3.1. The filled fiber optic cable portion of the outside plant shall comply with industry standards. The fiber optic cable used indoors shall comply with industry standards.

10.3.2. Fiber cable type shall depend on the user/base requirements. 6th Communications Squadron (Plans Office) shall make final decision (ex: 8.3/125 microns for single mode and 62.5/125 microns for multi-mode).

10.3.3. Fiber cable installed:

10.3.3.1. In manholes, handholes or cable vaults shall be neatly formed, racked, supported and secured in place.

10.3.3.2. Through manholes, handholes or cable vaults shall be labeled / tagged (ref: EIA/TIA-606, Administration Standards for Telecommunications Infrastructure of Commercial Buildings).

10.4. OUTSIDE PLANT CABLE ENTRANCE.

10.4.1. Provide a minimum of four 4-inch (102 mm) entrance ducts (copper, fiber, CATV and spare) into the telecommunications room. One of the ducts shall contain four 1" inner ducts; this duct shall be used for fiber optic cable. The copper, fiber and spare ducts shall extend into a communications manhole with available service connection point/s. The CATV duct shall not enter the communications manhole. The CATV duct shall extend 5-feet, straight out, from the building foundation and be capped.

10.4.2. The ducts shall stub up 3 inches (75 mm) above the floor in the telecommunications room. Provide 1/4 inch nylon pull rope in all ducts and innerducts.

10.4.3. Facilities with large telecommunications requirements may require the installation of more ducts. These ducts shall be run underground from the building to the nearest communication connection point where adequate service is available. One of the ducts shall contain four 1" inner ducts; this duct shall be used for fiber optic cable.

10.4.4. Conduits shall be PVC schedule 40 pipe, as a minimum.

10.4.5. Ends of PVC conduits shall be deburred to prevent cable damage during installation.

10.4.6. The telephone cable pair size required from the nearest communications connection point to the comm room shall be dictated by the 6th Communications Squadron.

10.4.7. The fiber optic cable and copper cable shall be terminated within 50 feet of the cable stub-up, if the cable is not riser rated (*Recommended copper cable protector: Circa, C3B1E, Surge Protection Module, 3-element gas, 5-pin, 3-electrode or equivalent protector).* If the cable can not be terminated within 50 feet of the stub-up, the cable shall be placed in a metal conduit that is grounded.

10.4.8. The contractor shall provide gel filled base cable, IAW the Rural Electrical Association (REA) standard PE-39 or PE-89 from main communications panel to the nearest communications connection point with sufficient vacant pairs to provide each facility with required cable pairs.

10.4.9. All pedestals and outdoor housings shall be permanently labeled using not less than 1/4 inch stamped or painted lettering and shall include the terminal number, cable number and pair count. Where there are cable load points, identify the load point number for the cable.

10.4.10. Underground plant construction shall be completed IAW RUS Bulletin 1751F-644.

10.5. CONDUITS AND DUCT BANK.

10.5.1. Where PVC conduits are installed, a metallic tracer wire shall be installed within the conduit or 6 inches above the duct bank to assist in future location efforts, with bonding to occur inside each manhole and at CER grounding frame.

10.5.2. Conduit Protection *(info in this para was obtained from RUS Bulletin 1751F-643)*

10.5.3. Top protection (concrete cap or concrete slurry encasement) shall be provided where conduits are to be installed under roads, parking lots, paved areas and areas which may be paved at a later date.

10.5.4. Concrete bases shall be used whenever the ground is spongy or yielding, such as swamps or marshlands, or where bases are desirable as leveling mediums under conditions where sand base trenches are subjected to washing out.

10.5.5. Communications cable duct banks that cross under railroads, runways, and aircraft parking ramps, shall be concrete encased or directional bore and use High-Density Polyethylene (HDPE) pipe at sufficient depth to prevent damage to the ducts or cables. Use the method that is more economical.

10.5.6. When determined necessary to simplify installations, conduit shall be curved to provide gentle sweeps, with a minimum radius of 25 feet, for a total bending radius not to exceed 180 degrees between manholes.

10.5.7. All conduits shall be sloped toward each opposing manhole at a slope of 3 inches per 100 feet of run to promote drainage of any accumulated liquids.

10.5.8. The ducts shall be buried a minimum of 36 inches and have a minimum bending radius of 36 inches (910 mm).

10.5.9. There shall not be more than the equivalent of two (2) 90-degree bends (180-degrees total) between pull points, including offsets and kicks.

10.6. Conduit Rodding and Cleaning.

10.6.1. Before installation of underground cables, conduits shall be rodded to determine if conduits are free of foreign obstructions which may prevent placement of cables in conduits. Rodding consists of pulling a test mandrel through the conduits to remove the obstruction. The diameter of the test mandrel shall be 0.25 inches (6mm) smaller in diameter than the inside diameter of conduit.

10.6.2. Conduits suspected or found to contain particles of earth, sand, gravel, etc. shall be cleaned by pulling a stiff bristled brush through the conduits.

10.6.3. Conduits suspected or found to be obstructed with foreign materials which can not be removed by rodding and/or cleaning shall be immediately reported to the base communications squadron project manager. The comm squadron project manager shall coordinate with appropriate agencies to determine a corrective action.

10.7. Innerduct Installation.

10.7.1. Innerducts installed:

10.7.1.1. Shall be used for each fiber optic cable installed.

10.7.1.2. Shall not have an inside diameter less than one inch.

10.7.1.3. Shall be sized for each fiber optic cable such that no less than ¼" air gap exists between the inside perimeter of the innerducts and the outside perimeter of the cable. In addition, shall be sized such that an air gap exists between the innerduct(s) and the conduit/ducts.

10.7.1.4. In a conduit shall be provided up to the capacity of the conduit.

10.7.1.5. Shall be capped, plugged or sealed, if unused.

10.7.1.6. Through each manhole or cable vault shall be labeled/tagged with cable ID number for the fiber optic cable installed within the innerduct or the word "VACANT". Contact the 6th Communications Squadron project manager for proper cable, manhole, numbers, etc.

10.7.1.7. Shall be provided with a waterproof corrosion-resistant pull rope for future cable installations.

10.7.2. Exterior duct and communications cable systems to support all valid requirements shall be installed from the facility's CER to the closest service connection point(s). This includes entrance ducts (including spares), conduits, duct and manhole systems to the closest base service connection point(s), and necessary provisions for crossing roads and other paved areas.

10.8. Manholes (MH).

10.8.1. Manholes shall be installed for all connections to the existing cable plant as required to maintain a maximum manhole spacing of 475 feet. Additional manholes may be required to provide adequate control of connection and distribution of the cable plant. The manhole covers shall be flush with the ground. The ground shall slope down from the top of the manhole.

10.8.2. All manholes shall be designed and constructed to provide a clear floor space of 8 feet x 10 feet measured inside the manhole. An alternate size of 6 feet x 8 feet may be approved only when no primary backbone cable passes through the manhole (lateral or dead end service only). All manholes shall provide a clear height of not less than 7 feet. Mandatory appurtenances include grounding bus bar and grounding rod and related conductors and wiring, a ladder or steps, cable rack supports, a 12-inch diameter sump with a polymer cover, pull in irons, frame and a manhole cover cast with the word "COMMUNICATIONS" exposed to the surface. Conduits shall enter the manholes 4 to 5 feet from floor on the end and be perpendicular to the wall. The conduit entry point shall be sealed.

10.8.3. Handholes, when specified, shall be nominally 4 feet x 4 feet x 4 feet inner dimensions and are provided with a grounding rod, cable rack supports sump drain and pulling irons. The design and construction shall be similar to a manhole. The base communications squadron shall specify when handholes shall be used.

10.8.4. Manholes/handholes shall be constructed from a precast, water resistant concrete equipped with a removable cover. The manhole size and type shall be specified. Manhole wall recesses, cable rack supports, sumps, pulling-in irons, frame and cover, and ground rod shall be provided in all manholes.

10.8.5. A 3/4 inch x 10 foot copper clad steel ground rod shall be installed in the floor of each manhole provided. Four inches of the rod, plus or minus 1/2 inch, shall extend above the finished floor level. The rod shall not enter the manhole more than 3 inches nor less than two inches out from the vertical surface of the adjacent wall. The installed ground shall have an impedance of 25 ohms or less. Precast manholes provided may require the ground rod to enter through the duct window.

10.8.6. Manhole and handhole covers may require locking devices. The covers requiring locking devices shall be identified by the communications squadron during the project design reviews.

10.9. DIRECT BURIED CABLE (cable placed in ditch, not in conduit)

10.9.1. Cable warning tape shall be a minimum of three inches wide, orange in color, and used for buried applications to mark cable paths. Warning tape shall be installed 12 inches below existing grade. Cable tags shall be provided for all cables at splice points, termination points and manholes/hand holes. All tags shall be permanently labeled and corrosion resistant IAW EIA-606.

10.9.2. Power and communications cables shall be separated by 12 inches (30.48cm) of well tamped, fine earth protection. The cable at the top of the crossing, whether power or communications cable, shall receive the same additional protection.

10.9.3. Communications cables shall be separated/protected from gas and water mains by 3 inches of concrete or 12 inches of fine earth. If the communications cables cross over the main, extend additional cable protection 3 feet from each side of the crossing.

SECTION 11. INSTALLATION AND TESTING

11.1. The contractor shall install the telecommunications and distribution system in accordance with manufacturer's specifications and current industry standards and procedures. All components and elements shall be properly identified and marked.

11.2. Before a contractor splices into the existing copper or fiber cable plant, a pre-test shall be accomplished to establish pre-existing cable conditions. The results of the pre-test shall be forwarded to 6th Communications Squadron project manager before splicing operations can start. An Optical Time Domain Reflectometer (OTDR) or other test equipment capable of showing splice loss shall be used to test for db loss in fiber optic cable.

11.3. After fiber optic cable is installed, all fiber optic cable shall be tested for db loss to ensure compliance with applicable industry standards. An OTDR or other test equipment capable of showing splice loss shall be used to test for db loss.

11.4. All copper cable splicing shall be completed using singular splicing connectors.

11.5. All copper cables shall be tested for the following: continuity, shorts, opens, grounds and crosses. In addition all level Cat-6 cables shall be tested to ensure compliance with TIA/EIA 568A standards. Test results shall be provided to base communications squadron project manager.

11.6. Provide a cover letter (on letter size, white paper) signed by LAN installer/tester certifying complete compliance with level Cat-6 or gigabit ethernet standards as specified by the latest EIA/TIA specifications. The cable certification letter shall contain a list of each test conducted and the test results. Also, provide an electronic copy of the certification letter and test results. The electronic copy shall be able to be read and processed by readily available Microsoft Word (version 2003 or newer) word processors or Microsoft Excel (Version 2003 or newer). The cable certification letter shall be turned over to the 6th Communications Squadron Plans Office when the facility is transferred from the construction agent to the Air Force.

11.7. Any cable(s) damaged during pulling shall be the responsibility of the pulling party/parties. Any cables failing tests shall be re-terminated, re-routed, re-tested, etc., until no other alternatives exist. At this time it shall be assumed that a bad cable run has resulted and the pulling party/parties shall have to bear the responsibility of re-pulling new cable to replace it.

11.8. Terminate all fiber optic cable and copper cables at both ends. Cables shall be labeled IAW TIA/EIA 606. Provide drawings, patch panel documentation, full testing and required reports, and warranty all parts and labor for a minimum of one year (using existing cable tests as reference point).

11.9. All contractor cable installations shall be inspected and tested; all defects discovered shall be repaired at no cost to the government

SECTION 12. DRAWINGS: DESIGN, CONSTRUCTION, AND AS-BUILTS

12.1. DESIGN DRAWINGS (shall include the Following Levels).

12.1.1. Site plan – shows physical and logical connections for a campus or site plan view. It shows actual buildings, major system nodes, exterior cables and exterior pathways. Includes site plan, riser drawings and pathways.

12.1.2. Floor layouts – shows layout of a complete building for each floor, revealing horizontal pathways, backbone systems, location of serving zones, access points and other systems.

12.1.3. Serving zones – shows outlets locations, telecommunications equipment rooms, access points, cable identifiers and riser diagrams.

12.1.4. Equipment rooms – shows layout for such things as racks, ladder racks and patch panels. Show elevations for racks, backboards, cables, conduits, etc.

12.1.5. Details – shows faceplate labeling, faceplate type, installation procedures, detail racking, fire-stopping, raceways and other project details.

12.1.6. Schedules – covers all miscellaneous requirements of the communications system.

12.2. UNDERGROUND CABLE CONSTRUCTION DRAWINGS (cable pulled through underground conduit)

12.2.1. The following information shall be included on construction drawings:

12.2.1. Size, gauge, pair count, cable number and cutting (cable) length of cable being placed.

12.2.2. Duct configuration of each run where cable is being placed.

12.2.3. Size, gauge, count, cable length and cable stub-up locations into buildings, if applicable.

12.2.4. Splice items (type of connectors and splice case)

12.2.5. Type, size, pair count and number of each terminal to be placed.

12.2. 6. All existing cables and terminals along the same route serving the same area (all cables and terminals in the construction area).

12.2.7. Any special precautions to observe.

12.2.8. Manhole cable racking diagram.

12.2.9. Direction to the dial central office, if dial central office is not shown on the drawings

12.3. DIRECT BURIED CABLE CONSTRUCTION DRAWINGS.

12.3.1. The following information shall be included on construction drawings:

12.3.1. Splice items.

12.3.2. Type, size, gauge, pair count, cable number and cutting (cable) length of cable.

12.3.3. Location of the cable in relation to curb or property lines, or other fixed points.

12.3.4. Type, size, pair count and number of each terminal to be placed.

12.3.5. Wiring limits and preferred count of each terminal being placed.

12.3.6. Depth cable is to be placed.

12.3.7. Type of construction, length of crossing under pavement, sidewalk, roadway, etc.

12.3.8. Direction to the dial central office, if dial central office is not shown on the drawings.

12.4. UNDERGROUND CONDUIT DRAWINGS.

12.4.1. The following information shall be included on construction drawings:

12.4.1.1. Number, type and size of ducts in each run; the type of protection; minimum depth of cover and duct configuration.

12.4.1.2. Size and type of each manhole; the thickness of the roof, wall and floor; the size and type of frame and cover; the minimum height of collar, the size of the drain or sump and the location of pulling-in irons.

12.4.1.3. Location of the conduit run with respect to the curb line, property line, right-of-way, or other fixed points.

12.4.1.4. Location of each manhole with respect to at least two fixed points.

12.4.1.5. Wall-to-wall and center-to-center measurements on main conduit runs; and the measurements on lateral ducts from the manhole wall to the end of the lateral duct at buildings, poles, etc.

12.4.1.6. Radius of all bends in the main conduit.

12.4.1.7. Any repair or rebuilding required of existing conduit or manholes.

12.4.1.8. Locations of all surface and underground obstacles.

12.41.9. Type, amount and condition of pavement or sidewalk to be cut and repaired.

12.4.1.10. Type of subsoil, if known.

12.4.1.11. Location of pull rope/cord.

12.4.2. The outside plant housings, buried splices, cable or wire lengths, etc., required for cable or wire repairs shall be so designated on the construction drawings to facilitate trouble-shooting later.

12.5. "AS-BUILT" DRAWINGS.

12.5.1. Following the project or turnover, the contractor shall furnish 2 copies of system drawings showing schematics of the entire communications and distribution systems and the physical runs of all communications wiring and equipment installed. These drawings shall be turned over to the 6CS (Plans Office) when the facility is transferred from the construction agent to the Air Force and will be provided in electronic format via CD/DVD ROM

12.5.2. The first copy shall be delivered in AutoCAD 2000 (or higher) or Microstation Ver. J (or higher) format, delivered in .DWG or .DGN file formats and will contain no more than 1 sheet.

12.5.2.1 Use the A/E/C CADD standard for the naming convention.

12.5.2.2 As a minimum, the contractor shall show cross-connect and termination points for each cable pair, locations and identification number for each modular outlet, and the location and value of each line amplifier and multi-port device throughout the cable system.

12.5.2.3 A communication riser diagram and cable routing shall also be shown. These drawings shall be updated to final "as built" conditions by the construction contractor and turned over to the 6th CS Plans Office.

12.5.3 The second copy shall be delivered in ESRI-ArcGIS 9.2 Personal GeoDatabase format, will include all locational (point, line, and polygon feature(s)) along with the original source files.

12.5.3.1 The Geospatial files shall have an external spatial reference (.prj) file attached specifying the parameters of the coordinate system used (as provided by the 6th CS).

12.5.3.2 All topologically correct geospatial data shall overlay on the installations latest orthorectified imagery that will be provided.

12.5.3.3 The contractor shall identify the classification, type, size, location, ID number, and any other necessary attributes (specified by the 6th CS) for all surveyed, mapped, designed, or proposed features.

12.5.3.4 All symbol and font libraries, text size, format, and placement shall be prepared in accordance with and conform to the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) Release 2 (or most current available).

12.5.3.5 The contractor shall provide metadata files for all locational data produced and shall conform to the Federal Geographic Data Committee's "Content Standard for Digital Geospatial Metadata, Version 2.0" (or latest version) The output from the metadata generator software shall be provided in ASCII text. The digital metadata files shall be provided to the 6th CS Plans Office along with each final product deliverable, unless otherwise approved in writing by the 6th CS CSO.

SECTION 13. OPERATION AND MAINTENANCE MANUALS FOR THE INSTALLED PREMISE DISTRIBUTION SYSTEM

13.1. Contractor shall furnish commercial-off-the-shelf manuals (operation, installations, configuration and maintenance) for all products installed as part of the premise distribution system.

SECTION 14. DD FORM 1391, MILITARY CONSTRUCTION PROJECT DATA

14.1. The DD Form 1391s for MILCON projects shall include site location, building sizes, scope of work, as well as the communication infrastructure costs (covered with MILCON funds). Communications equipment and other costs that are not covered with MILCON funds shall be annotated in the "Comm Cost Funded by SC" column:

14.1.1. End instruments (telephones, secure telephone units [STU], secure terminal equipment [STE], computers, printers, video projectors, scanners, fax machines, copiers) and installation.

14.1.2. Terminations of building wiring infrastructure at equipment or onto existing base networks (connection at communications/network equipment jack).

14.1.3. Special-purpose equipment (e.g., secure switches, radio transmitters, and audio-visual equipment) and installation.

14.1.4. Switching equipment (telephone switches, additional telephone central office line cards, and LAN switches) and installation.

14.1.5. Optical carrier equipment and installation.

14.1.6. CATV amplifiers and splitters which shall be government-owned.

14.1.7. Network servers, routers and installation.

14.1.8. Encryption equipment for classified systems and installation.

14.1.9. Power conditioning equipment such as uninterruptible power supplies (UPS) and installation.

14.1.10. Associated system engineering for items identified in this list.

APPENDIX I ENVIRONMENTAL RESTORATION

I-1 BEST MANAGEMENT PRACTICES FOR ADDRESSING CONTAMINATED SOILS ON MILITARY CONSTRUCTION AND FACILITIES SUSTAINMENT, RESTORATION, AND MODERNIZATION PROJECTS

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

March 4, 2025

MEMORANDUM FOR ALMAJCOM-ALFLDCOM-FOA-DRU/CC DISTRIBUTION C

FROM: SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

SUBJECT: Best Management Practices for Addressing Contaminated Soils on Military Construction and Facilities Sustainment, Restoration, and Modernization Projects

Handling contaminated soil during Military Construction (MILCON) and Facility Sustainment, Restoration, and Modernization (FSRM) projects can lead to significant extra costs and delays. To address this, facility project teams should communicate early and work closely with the Environmental Restoration Program (ERP) office.

The Department of the Air Force (DAF) wants to avoid dealing with contaminated soils where possible, especially those with per- and polyfluoroalkyl substances (PFAS), because there are not clear or cost-effective disposal options available yet. The attached **Best Management Practices** (BMPs) provide guidance for use across all DAF MILCON and FSRM projects, covering every stage from planning to execution.

This guidance must be implemented immediately. The Air Force Civil Engineer Center (AFCEC) will review and update the BMPs each year to include lessons learned from project experiences. The point of contact for this subject is Ms. Michelle Brown, Environmental Director, michelle.brown.36@us.af.mil.

Nancy J. Balkus
Digitally signed by BALKUS.NANCY.J.1082115974
Date: 2025.03.04 22:01:57 -05'00'

NANCY J. BALKUS, P.E., SES
Deputy Assistant Secretary of the Air Force
(Infrastructure, Energy, and Environment)

Attachment:
1. Guidance on Best Management Practices for Addressing Contaminated Soils on Military Construction and Facilities Sustainment, Restoration, and Modernization Projects

Best Management Practices for Addressing Contaminated Soils on Military Construction and Facilities Sustainment, Restoration, and Modernization Projects

Introduction

This document provides guidance on best management practices (BMPs) to avoid, minimize, or manage excavated soil (and dewatering liquid) that is contaminated with hazardous substances, pollutants, or contaminants, specifically per- and poly-fluoroalkyl substances (PFAS) at Military Construction (MILCON) and Facility Sustainment, Restoration, and Modernization (FSRM) project sites.

Narrative

Managing contaminated soil and dewatering liquids often incurs substantial additional project costs and delays. These issues can be avoided or minimized through early communication between the project team and the Environmental Restoration Program (ERP) office, thorough programming and planning, adjustments in site location or design, and targeted investigation and segregation of contaminated areas.

The Department of the Air Force (DAF) prefers to avoid managing contaminated soil and dewatering liquids, especially when impacted by PFAS, due to the lack of certain and cost-effective disposal methods for PFAS-contaminated materials. In many cases, the savings from avoiding soil and water disposal or treatment, regulatory requirements, and schedule delays far outweigh the cost of modifying project location or design.

If a contaminated site cannot be avoided, a cost-benefit analysis of disposal, treatment, and reuse options is essential when determining the best approach to manage contaminated soil and dewatering liquids. Figure 1 provides a summary of the BMPs that are covered in this document.

Background

Recently, PFAS impacted environmental media (e.g. soil, groundwater, surface water, sediments) encountered during MILCON or FRSM activities have led to major schedule delays and cost increases on projects. The Defense Environmental Restoration Program (DERP) manual, DoDM 4715.20, states MILCON or FSRM project funds must be used for management of contaminated materials related to MILCON or FSRM projects. When MILCON or FSRM projects encounter contaminated environmental media during construction or demolition activities (such as soil or concrete excavation and/or dewatering), the project teams must sample, test, and then treat or dispose of the impacted material, depending on the contaminants present and their concentrations. The MILCON and FSRM programs are conducted in accordance with United States Code (U.S.C.) Title 10, Chapter 169 and associated Department of Defense (DoD) directives, instructions, and policies; their processes include project planning, design, and execution.

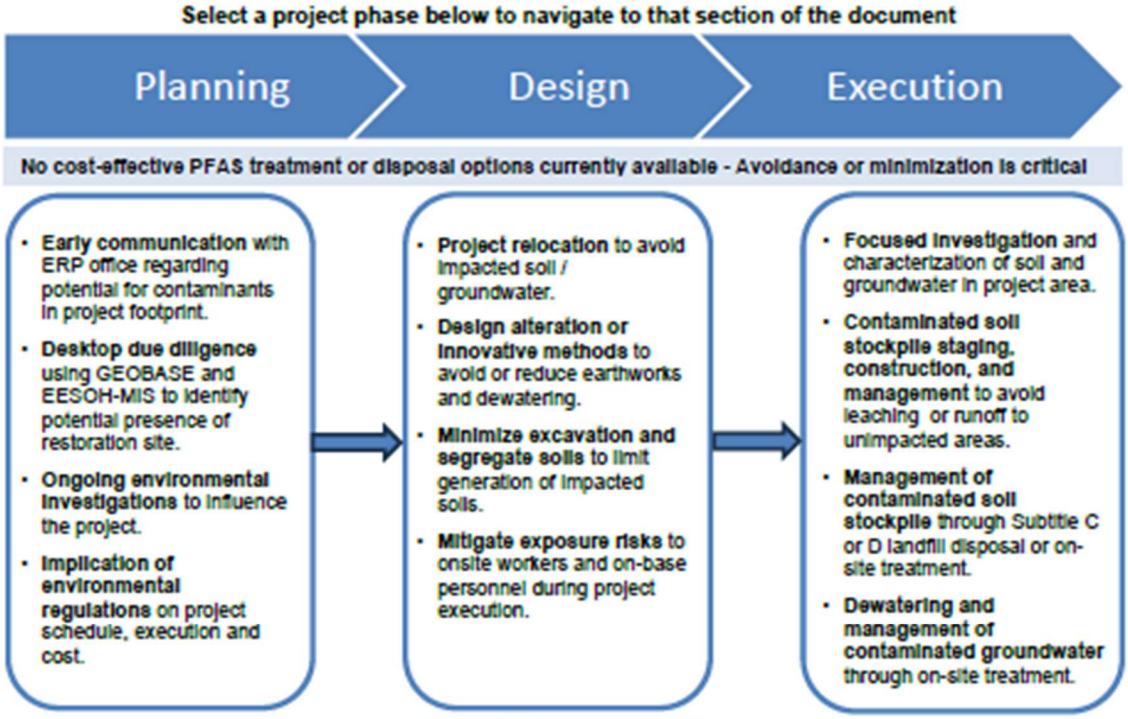


Figure 1 Summary of BMPs

Applicability

This BMP guidance applies to all Active and Reserve Air Force, Space Force, Air National Guard (ANG), and Base Realignment and Closure (BRAC) locations within the United States and its territories. This guidance pertains to management of soil that is contaminated by historic DAF activities which resulted in releases of hazardous substances, pollutants, or contaminants to the environment. While the guidance is relevant for soils impacted with legacy contaminants such as metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and herbicides, special emphasis has been given to management of soils contaminated with PFAS as currently there are no certain and cost-effective management or treatment options for PFAS contaminated soil. The scope of this BMP guidance does not include management of contaminated construction and demolition debris (CDD) such as asphalt, concrete, piping, carpet padding, drywall, etc. Preliminary guidance for the contaminated CDD is disposal in landfills. The landfills used must be certified for either hazardous or non-hazardous waste depending on the contaminants present in the waste and their concentrations.

Project Planning

The initial planning phase of a project presents a critical early opportunity to identify the presence of contaminated soil and water in the project footprint and to develop a plan to avoid or minimize generation of contaminated waste. Management of excavated soil and dewatering liquid impacted with hazardous substances, pollutants, or contaminants (e.g., VOCs, SVOCs, metals, pesticides, and herbicides) is challenging and costly. It becomes even more so if the soil is impacted with PFAS as there are currently no cost-effective management or treatment options for PFAS-impacted media. If a project must be located on a site with known contamination, fully identifying and accounting for it during the planning and programming stages can protect the project from schedule delays and budget overruns.

Early Communication and Due Diligence

The DAF regulation and policy documents that govern MILCON and FSRM processes require the project team to identify restrictions on land use that include environmental areas (e.g., wetlands, floodplains, critical habitat), remediation sites, unexploded ordnance areas, and areas with institutional controls when siting a MILCON project or planning an FSRM project.

Early coordination with the ERP office and identification of environmental issues within the project footprint are primary initial steps that can help project teams plan. Some suggested actions are listed below:

- Communicate with the ERP office early during the project planning stage to determine if environmental impacts could be encountered within the project area.
- Consult with Community Planners and research the Air Force Civil Engineer Center (AFCEC) Administrative Record (https://ar.cce.af.mil), State level contaminated sites database, the Enterprise, Environmental, Safety, Occupational Health Management Information System (EESOH-MIS), and publicly available Geographic Information System (GIS) data (i.e., GeoBase layers) or from the GeoBase office to evaluate if the planned project siting could be contaminated. In accordance with Unified Facilities Criteria (UFC) 2-100-01 Appendix D, a constraints map should be prepared using geospatial boundaries of each existing cleanup site being addressed under the CERCLA or Resource Conservation and Recovery Act (RCRA) process and Land Use Controls (LUCs) associated with a cleanup site.
- During the planning phase, the project team should account for ongoing or planned investigations or remedial actions if the project site is located within a DERP site. PFAS Remedial Investigations (RIs), and other aspects of remedial processes are ongoing at many DAF installations. During development of the project, new information may become available, which could change site management needs and approach. Regular communication and coordination with ERP personnel is critical to obtain the most up-to-date information and understand the severity of environmental issues as well as to enable coordination with appropriate regulatory agencies as needed.
- In addition to soil, the project team should also determine the presence of contaminated groundwater. Due to high mobility in groundwater, elevated PFAS concentrations may be present in groundwater far from the original area of release. Additionally, impacts of VOCs and PFAS in groundwater underneath a building may result in exposure to contaminated vapor.
- Based on the findings from communications with the ERP office and desktop research, the project team should use an environmental scoping checklist such as the example included as Enclosure 1 and the Air Force Form 813 (AF Form 813) included as Enclosure 2 for providing environmental impacts analysis. Also, the project team should ensure environmental planning documents (e.g., Environmental Impact Statement [EIS], Environmental Assessment [EA], Categorical Exclusion [CATEX]) include the site contamination issue. Failure to include the environmental impact analysis could extend the National Environmental Policy Act (NEPA) process, as it may be raised during public comment or legal review. If contamination is identified, further discussion is encouraged between the project team and the ERP office regarding potential options for managing and/or treating the contaminated soils and associated dewatering liquid.

Regulatory and Funding Considerations

When a DERP site is identified within a MILCON/FSRM project footprint, it is also important to determine the applicable regulatory framework under which that site is managed. Regulatory requirements will have implications for project cost and schedule. Many DAF installations are listed on the US Environmental Protection Agency (USEPA) National Priority List (NPL) and are governed by Federal Facilities Agreements (FFAs). Depending on the maturity of the program there may be LUCs or other restrictions on activities at different sites across the installation. These sites will add complexity, time, as well as cost to MILCON/FSRM projects. DoDM 4715.20 and DAFI 32.7020 both direct that Environmental Restoration Account (ERA) funds may only be used on remediation sites, and MILCON funds must be used to address contaminants encountered and managed as part of a MILCON project. The DAF regulatory and policy documents governing MILCON and FSRM processes mandate that the project team follow all environmental regulations and requirements applicable to the project site. At a minimum, DAF manages contaminated soil from construction projects in accordance with 42 USC §§ 6901- 6992, Solid Waste Disposal Act and the Resource Conservation and Recovery Act (RCRA) and applicable DoD and DAF policy. (DAFMAN 32-7002, *Environmental Compliance and Pollution Prevention*). Following are some recommended actions:

- Consult with the ERP office on the site's regulatory program (State, RCRA, or CERCLA) and status. This will also govern the regulatory criteria applicable to soil and groundwater at the project site as well as contaminant limits that must be achieved for disposal or discharge of media.
- Workplans for fieldwork to disturb or remove contaminated soil or groundwater may require approval from one or more regulatory agencies. Regulatory review and approval timeframes need to be considered in the overall project schedule.
- Performing a focused environmental investigation will help the project team understand the extent of the contamination and adequately estimate costs associated with soil/water management that can be programmed early in the project planning process.

Project Design Considerations and Value Engineering

Practices for treatment, disposal, and reuse of contaminated soil are well-established and management of such soils is not uncommon. However, managing soils contaminated with PFAS has proven challenging; as there is currently no cost-effective and reliable way to treat or dispose of large quantities of PFAS-impacted soils. It is therefore critical that wherever possible projects should avoid PFAS impacted sites. Following are some recommendations:

- DAF's preference is to avoid disturbance of contaminated soil. Explore options to relocate the project to an alternate, preferably uncontaminated location.
- In many cases, relocation of a project may not be an option. In these cases, reconsider the design and implement design changes that avoid or minimize earthwork and construction over a contaminated site. The goal is to avoid generating stockpiles of contaminated soils, especially those impacted with PFAS.
- If design change is not feasible, consider construction methods that minimize soil excavation and dewatering and provide opportunities to segregate contaminated soils from uncontaminated soils. Utility projects offer their own opportunities for avoiding management of contaminated materials. The following recommendations should be considered in potential design modifications:
    - Use deep foundations instead of shallow foundations such as a pile instead of spread footings.
    - Build up instead of out to minimize excavation footprint.
    - Use direct-push casing or conduit rather than trenching when installing utilities.
    - For utilidors, use precast concrete features when working at the water table whenever possible; this will reduce the amount of water that will need to be pumped and discharged.
    - Institute remedial measures for site preparation, such as chemical stabilization or treatment, rather than stockpile/haul/dispose. Get agreement with regulators during design because some alternatives aren't applicable from a regulatory or technical perspective once the soil is excavated.
    - Consider adding a paved area made up of reused, chemically stabilized excavated material, in lieu of disposal.
    - For vapor intrusion concerns, consider installing vapor barriers if building above contaminated soil or contaminated shallow groundwater.
    - Utilize the Utility Waiver when appropriate for soil, stormwater, and groundwater. The Waiver allows for replacing Petroleum, Oil, and Lubricants (POL)-contaminated soil and water on utility projects; it has been recently utilized for sites within PFAS plumes as well. Clean cover material is required to eliminate direct contact.
- The project team should also consider design concepts and changes from a worker health and safety standpoint to limit exposure to contamination by construction workers and others around the project site.
- Once the project site is approved, the project team must first test the soil to determine the presence of any hazardous substances, pollutants, or contaminants. After testing, the team should provide the installation ERP office with a written description detailing the contaminants (e.g., concentrations, cleanup site boundaries, proposed remedies, LUCs) considered in the site selection, along with evidence that these impacts are accounted for in the project design, cost, and schedule.

Project Execution

Construction projects at or near DERP sites should be closely coordinated with the ERP office and in compliance with applicable State and Federal environmental regulations. For execution of projects planned and programmed prior to the development of this BMP guidance, engage with the ERP office to identify any site changes and to adopt the BMPs where needed. Develop a Soil Management Plan (SMP) or consult with the ERP office to determine if there is an installation SMP to outline storage, handling, and management of soils. At some sites it may be beneficial to conduct soil and groundwater sampling as part of a pre-design investigation to understand the nature and extent of contamination in the planned project footprint. This information will be useful to inform potential design changes to avoid or minimize excavation of contaminated soil. Additionally, projects in contaminated areas must consider health and safety measures to protect project workers and others nearby from exposure to contamination.

Focused Environmental Investigation

A focused environmental investigation of soil and groundwater within the project footprint should be performed concurrently with the geotechnical investigation for project sites where there is no prior environmental investigation data available or where the available historic data was collected using outdated analytical methods. Such an investigation is not required in project areas where recent data has been collected using current approved analytical methods (e.g. USEPA method 1633 for PFAS) and the results of samples within the project footprint show contaminant concentrations to be below the applicable State, USEPA or DoD and/or DAF screening criteria (e.g. USEPA Regional Screening Levels [RSLs] for screening PFAS).

Prior to performing such an investigation, preparation of a work plan is recommended for regulatory review. The work plan should outline the sampling locations and approach; sample analysis and analytical methods; and screening criteria for each contaminant or contaminant class depending on project end-use (residential or industrial/commercial use) and exposure pathways (i.e., inhalation, ingestion, or dermal contact). Regulators in some states may agree to establishing site-specific risk-based soil and groundwater screening criteria that can benefit projects by allowing reuse of less impacted soils. Development of such site-specific criteria may require evaluation of natural background levels of the contaminants and the potential for contaminants to leach from the soil to groundwater. Establishing such alternative site-specific screening criteria should be considered by the project team in consultation with the ERP office. USEPA's Soil Screening Guidance: User's Guide provides additional information on sampling, analysis, and establishing screening levels. The following are recommended steps for performing a focused environmental investigation:

- Space out sampling locations adequately to ensure proper data density can be collected to inform boundaries for excavation and segregation. Generally, a spacing of 100 feet is standard practice in site investigations; but this spacing can be increased or decreased based on the size of the sampling area and data needs. Interstate Technology and Regulatory Council (ITRC) recommends the Incremental Sampling Methodology (ISM) approach.
- Sampling can be performed using a hand auger for shallow investigations (<10 feet) or using one of several drilling methods such as direct push technology (DPT) or hollow stem auger with split spoon samplers for deep investigations (>10 feet).
- Collect soil samples at discrete depth intervals from the surface to the lowest depth of the planned excavation. It is standard practice to collect samples every 2 to 3 feet, but sample depths can be adjusted depending on excavation depth and data needs to identify contaminated and uncontaminated intervals for soil segregation purposes.
- For groundwater characterization at each location, one sample should be collected at or just below the water table using low-flow sampling. This sampling method is the USEPA's accepted standard practice for sampling groundwater. The details of USEPA acceptable methods for groundwater sampling at RCRA and CERCLA site can be found at https://www.epa.gov/remedytech/ground-water-sampling-guidelines-superfund-and-rcra-project-managers.
- If the contaminants are known from prior environmental investigations, soil and groundwater samples should only be analyzed for those site-specific contaminants. A full suite of analysis including VOCs (USEPA Methods 5035A and 8260C), SVOCs (USEPA Methods 3510C and 8270D), metals (USEPA Methods 6010 or 6020), total petroleum hydrocarbons – diesel range organics (TPH-DRO) (USEPA Methods SW-846 3510C and 8270D), total petroleum hydrocarbons – gasoline range organics (TPH-GRO) (USEPA Methods SW-846 3510C and 8270D), pesticides (USEPA Methods 3510C and 8081B), herbicides (USEPA Methods 3510C and 8151A), and PFAS (USEPA Method 1633) will be required for soil and groundwater samples where prior information on contaminants does not exist. All samples should be analyzed by a DoD Environmental Laboratory Accreditation Program (ELAP)-certified laboratory.
- Based on State-specific soil disposal regulations, soil samples may require additional analysis by the Toxicity Characteristic Leaching Procedure (TCLP) for the above analytes (excluding PFAS) and/or the Synthetic Precipitation Leaching Procedure (SPLP) to assess if the soils will be characterized as hazardous or non-hazardous waste for disposal purposes. Depending on site-specific contaminants, the analyses will include one or more from the following list:
    - TCLP RCRA metals and mercury via USEPA Methods 1311, 3010A, 6010C/D, 6020C, and 7470A/7471A
    - TCLP VOCs via USEPA Methods 1311, 5030C, and 8260C
    - TCLP SVOC via USEPA Methods 1311, 3510C, and 7270D
    - TCLP pesticides via USEPA Methods 1311, 3510C, and 8081B

  - TCLP herbicides via USEPA Methods 1311, 3510C, and 8151A
  - pH/corrosivity (USEPA Method 9040C/9045C)
  - Flash point (USEPA 1010A)
  - Reactivity (sulfide and cyanide; USEPA 335.4).
- Detailed requirements for TCLP analysis are available from the USEPA at https://www.epa.gov/hw-sw846/sw-846-test-method-1311-toxicity-characteristic-leaching-procedure.
- All equipment that comes in contact with contaminated media must be properly decontaminated prior to mobilization outside project area boundaries. Decontamination and other investigation derived wastes are to be collected and stored in 55-gallon drums. The drums must be properly labeled and stored on pallets in an on-base waste accumulation area in a timeframe not to exceed the requirements of a RCRA Central Accumulation Point (usually 90 days for a Large Quantity Generator) and applicable laws until sampled, characterized, and disposed at an appropriate disposal facility based on TCLP analysis on composite soil samples listed above. A test of ignitability may also be required in accordance with methods outlined in United States Code of Federal Regulations (CFR) (40 CFR § 261.21).

Focused Environmental Investigation

- Soils sampling locations are generally 100 feet apart but spacing can be less or more based on investigation area size
- Discrete soil sampling at each location vertically every 2–3 feet from surface to the lowest depth of excavation, but interval size can be >2–3 feet depending on data needs
- Groundwater sampling at the water table, if encountered
- If no prior sampling data, analyze soil and groundwater samples for contaminants – VOCs, SVOCs, metal, pesticides, herbicides, TPH-DRO, TPH-GRO, and PFAS
- Investigation derived waste (IDW) (soil, groundwater) will be stored in drums for characterization and disposal or treatment
- TCLP analysis of soil and IDW to determine disposal options

If unexpected impacted environmental media are discovered at an ongoing MILCON or FSRM site, consult with the ERP office to assess if concentrations of contaminants are at levels governed by environmental standards or DoD and DAF policies. This guidance does not specify the concentration limits to be met, but instead requires the project team to work with the installation's ERP office, and possibly the installation's legal office to establish media specific management requirements.

A solid waste is designated as hazardous if it is listed as a hazardous waste or has one of the following characteristics of a hazardous waste: ignitable, corrosive, reactive, or toxic. Based on the results of the focused investigation, the soils may be classified into three categories:

1. *Soils for reuse without disposal requirements* – Contaminant concentrations are below laboratory detection levels. Such soils can be reused on-site with regulatory approval and excess can be disposed without restrictions.
2. *Soils for reuse with disposal requirements* – Contaminants are detected but concentrations are below the appropriate soil screening criteria. Such soils can be reused on-site with regulatory approval, but excess may need to be disposed of at non-hazardous waste disposal (RCRA Subtitle D Landfill) or municipal landfill depending on contaminants present.
3. *Impacted Soils for treatment or hazardous waste disposal* – One or more of the contaminants exceed the soil screening criteria. Such soil needs to be disposed in a RCRA Subtitle C landfill or will require pretreatment for reuse or disposal in a RCRA Subtitle D landfill.

Site Preparation and Construction

There are steps that the project team can take during the initial phases of project execution to avoid or minimize disturbance of contaminated media. Wherever possible, plan projects and stage materials and equipment in areas free from contamination. Avoiding impacted areas is preferable to mitigation, provided that operational requirements do not necessitate placing the project in a contaminated location. For most projects, any added cost of changing project location and/or design to avoid contaminated areas will likely be offset by costs and schedule delays associated with managing contaminated media, especially if PFAS are present. Following are some recommendations:

- Look for opportunities to implement remedial actions such as chemical stabilization or treatment rather than stockpiling and disposing of contaminated soils during site preparation. Regulatory concurrence may be required prior to implementation of remedial actions.
- Normally frozen ground should not be thawed during construction if nearby groundwater is contaminated. Frozen ground obstructs the flow of contaminated groundwater; working in permafrost or frozen wetland areas will minimize dewatering, as well as prevent contaminated groundwater from entering the site. Thawing allows the groundwater to flow and potentially spread contamination, as well as creating a contaminated dewatering issue. Shallow cutoff walls or ice walls should be considered to stop incoming contaminated water in sites with very shallow groundwater.
- During construction, do not allow water ponding in low lying areas as this could result in more contaminated water and raising the nearby water table, which will increase dewatering volumes.
- Ensure that the site-specific construction Storm Water Pollution Prevention Plan (SWPPP) delineates suspected areas of contamination, area(s) for stockpiling soil, and desired actions for managing the contaminated soil.
- Account for applicable stormwater permit requirements, which include implementation of pollution control measures such as controlling runoff from stockpiles. Installation Municipal Separate Storm Sewer System (MS4) or individual stormwater permits may require oversight of construction activities including activities covered under a construction stormwater permit.
- Depending on the contaminants present, especially PFAS, and their concentrations in soil and water, the construction area may need to be managed as a cleanup site. This would entail avoiding tracking contaminated soil onto roads; covering soil loads being transported; covering soil stockpiles; restricting access; creating a decontamination area for equipment and workers; and instituting sediment runoff controls.

Soil Segregation and Handling

Excavation in a contaminated footprint should be approached surgically with equipment and methods that allow removal of soils from contaminated locations and depth intervals without mixing contaminated soils with uncontaminated soils. The following are some best practices on segregation and handling of contaminated soils:

- Decontaminate excavating equipment between locations and depth intervals to avoid cross-contamination. To the extent practicable, sequence field activities such that clean soils are excavated first followed by contaminated soils in increasing order of contamination. This sequencing will avoid the need to frequently decontaminate the equipment and will limit the risk of cross-contamination.
- Store Excavated soils from uncontaminated locations and depth intervals separately from soils from contaminated locations and depth intervals (i.e., create separate stockpiles of clean and contaminated soils). Saturated and unsaturated soils should be segregated if the contamination is only in groundwater.
- Where possible, stage the contaminated soil stockpile within the boundaries of the active work zone and away from civilian work areas. Construct the contaminated soil stockpile with a sufficiently strong and durable impermeable liner or plastic both underneath and on top in a covered enclosure. This cover will prevent contaminated soils from being blown by wind and runoff from rainwater infiltration. The placement of a liner will help to delineate where the impacted soil ends, and the regular ground surface begins, so that there is no risk of over-excavation when the soil is moved for disposal or treatment.
- Stockpiles can also be constructed in lined roll-off containers that are placed in secondary containment.

Contaminated Soil Stockpile Construction

- Impermeable liner underneath prior to pile construction over an impervious surface such as asphalt or concrete
- Enclosure or impermeable cover on top and around the pile to prevent runoff and wind erosion
- Erosion and runoff controls with straw berms or silt fencing surrounding the stockpile
- Institutional and engineering controls for health and safety to prevent contaminant exposure

- If the contaminated soil is stockpiled in an enclosure, then it should have restricted access and adequate ventilation to prevent accumulation of contaminated soil vapor in the indoor air.

- For wet contaminated soils, the stockpile should be constructed with an underdrain and water collection system for dewatering purposes.
- Runoff and erosion control measures such as silt fencing or straw berms may be required.
- Regularly inspect and maintain soil stockpiles to ensure the cover remains intact, excessive water does not accumulate, wattles remain in place, signs are legible and in place, and safety warning devices are present and upright.

Soil Management and Treatment

While clean soil can be reused at the project site without further treatment, the contaminated soil will need to be managed either through landfill disposal or through treatment prior to disposal or reuse. Depending on the contaminants present in the soil stockpile and their concentrations, the stockpile will qualify for disposal either as hazardous or non-hazardous waste. Disposal of contaminated soils in landfills as hazardous or non-hazardous waste has been in practice for decades. However, disposal of PFAS-impacted soils is presenting a challenge because it is costly and many landfills are unwilling to accept PFAS wastes because of compliance issues and lack of adequate treatment technologies for PFAS in landfill leachate. If PFAS contamination is encountered, follow the DoD Interim Guidance and State-specific waste disposal regulations. The guidelines and recommendations in the DoD Interim Guidance are generally consistent with USEPA's Interim Guidance.

Perform a cost-benefit analysis between disposal and treatment options to decide on the most cost-effective means of managing contaminated soils.

Soil Disposal or Reuse

Generation and disposal of solid waste is generally governed by the Solid Waste Disposal Act, then amended as RCRA. The DAF follows requirements in the DERP manual (Section 6b) for transfer of wastes to off-site facilities. In addition to other contaminants, in February 2024, the USEPA proposed listing nine PFAS as RCRA hazardous constituents. These nine PFAS are perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), hexafluoropropylene oxide-dimer acid (HFPO-DA or GenX), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluorodecanoic acid (PFDA), perfluorohexanoic acid (PFHxA), and perfluorobutanoic acid (PFBA). Once the listing of PFAS as hazardous substances under RCRA is finalized, this listing will govern the duration of time (expected to be 90 days) the PFAS-contaminated soils are permitted to remain stockpiled on site.

The stockpiled soil will require sampling to confirm the initial classification from the focused environmental investigation. Composite samples from the stockpile should be analyzed for site-specific contaminants or the same constituents as those analyzed during the focused investigation although additional parameters may be required by the specific disposal facility. Number of samples depends on the size of the stockpile. Table 1 provides recommended guidance based on recent stockpile sampling performed at Ellsworth Air Force Base.

Table 1 Recommended number of samples based on stockpile size

Stockpile Size (cubic yards)	Number of Stockpile Samples
0 to 100	2
101 to 1,000	3
1,001 to 50,000	5
50,001 to 100,000	10
>100,000	10 + 1 for each additional 50,000 cubic yards

Following is recommended guidance on contaminated soil disposal or reuse:

- Compliance with applicable Federal, State, and local requirements is required for any task involving the transportation and disposal of solid or hazardous wastes. These include 40 CFR 260-265 and 268, and 49 CFR 171, 172, 173, 178, 179 and other applicable regulations.

- For soils contaminated with PFAS, DoD guidance recommends disposal at RCRA Subtitle C Landfills with environmental permits. There are currently 33 such landfills located across the lower 48 states. These landfills can be found using the USEPA Incident Waste Decision Support Tool (*I-Waste DST*) website (https://iwaste.epa.gov/treatment-disposal-facilities). If disposal at a RCRA Subtitle C Landfill is not feasible because such a landfill does not exist within a reasonable distance from the project site, the next disposal option is a Solid Waste Landfill with an environmental permit that has a composite liner along with leachate and gas collection and treatment systems.
- Consider the cost-benefit of treating contaminated soils with amendments or binders prior to disposal as this treatment can stabilize contaminants and reduce leachability thereby allowing for disposal as non-hazardous waste.
- With regulatory approval, impacted soil and groundwater can be placed back at the construction site in the location from which it was removed but the location of the reused soil must be documented for possible future investigations.
- Documentation of any sampling and testing results, and reuse or disposal actions should be prepared in a summary report in accordance with Unified Facilities Guidance Specification (UFGS) Section 01 57 19 – Temporary Environmental Controls, Section 02 61 13 – Excavation and Handling of Contaminated Material, and Section 02 81 00 – Transportation and Disposal of Hazardous Materials.

Soil Treatment

Depending on the soil volume and contaminants present, it may be cost-effective for some sites to treat the contaminated soil (and groundwater if needed) in place prior to project start or in stockpiles upon removal for reuse or disposal as non-hazardous waste. Soil treatment technologies for legacy contaminants (e.g., VOCs, SVOCs, metals) are well established and a compilation of these technologies is available from Federal Remediation Technologies Roundtable (https://www.frtr.gov/matrix/). Additionally, USEPA developed BMPs for soil treatment technologies (https://www.epa.gov/hw/best-management-practices-bmps-soils-treatment-technologies). For PFAS contaminated soils, however, treatment technologies are still being developed and tested. These technologies are summarized in Sections 12.3 and 12.7 of ITRC's PFAS guidance document (https://pfas-1.itrcweb.org/12-treatment-technologies/). Following are some recommendations for considering soil treatment:

- Review the above referenced technical resources for detailed information and consult with the ERP office to identify technology(ies) suitable for site-specific contaminants and conditions.
- Prior to selecting a treatment technology to address contaminated soils in place or in stockpiles, small-scale bench and/or pilot tests may be required to screen technologies and assess their performance for site-specific soils before full-scale treatment.
- Technologies may be limited by the volume of soil they can treat at one time. Depending on the technology, large stockpiles may need to be treated in small batches to maximize treatment efficiency.
- Along with bench- or pilot-scale testing, perform a cost-benefit and sustainability analysis for the screened technologies when selecting a treatment option for the site.

Dewatering and Water Treatment

Dewatering via pumping groundwater or pooled rainwater from the excavation area may be required at some project sites. Additionally, dewatering may also be necessary for wet soil stockpiles. The focused environmental investigation in the excavation area will provide information on the potential for the extracted water to be contaminated. Water removed during construction excavation activities that will be discharged to surface water or injected underground must comply with the Clean Water Act (CWA) or underground injection requirements including dewatering permits and construction stormwater permits. In addition, the control of contaminants due to construction activities may be subject to base environmental compliance oversight as a minimum control measure (MCM) of the Installation MS4 permit. The project team should coordinate with the ERP office to ensure discharges from the project do not contain hazardous substances, pollutants, or contaminants above regulatory or applicable permit limits. The following is recommended guidance on dewatering and management of contaminated water:

- Account for permitting requirements in the project plan. Some State or Federal regulatory agencies with CWA primacy issue dewatering permits which may include requirements to control the spread of pollutants.
- Communicate with the ERP office to obtain a better understanding of previously tested technologies at the site.

- Temporary storage of extracted groundwater in holding tanks may be required prior to treatment
- While a temporary treatment system can be constructed at the project site, it may be possible at some installations to transfer the extracted groundwater to a centralized water treatment plant, only if it is capable of handling PFAS-impacted water.
- The treatment system will likely require removal of suspended solids as an initial step followed by treatment with one or more technologies depending on the contaminants present and the level of impacts.
- If the water is impacted with PFAS, granular activated carbon (GAC) alone will not be sufficient to treat it as GAC is known to be ineffective in removing short-chain PFAS. In addition to GAC, the treatment train will likely include PFAS-tailored sorbent, ion-exchange resin (IER), or foam fractionation depending on concentrations of PFAS, flow rates, and water quality.

Dewatering and Liquid Management

- Need for temporary holding tank and water treatment prior to discharge
- Use of temporary onsite treatment system or on-base centralized water or effluent treatment plant
- Solids removal will likely be required prior to water treatment
- Bench-scale testing recommended to help with treatment media and technology selection and design for any temporary onsite treatment system

- Prior to implementation of water treatment, small-scale bench testing is recommended to screen treatment technologies, assess performance, and inform treatment system design for site-specific conditions. Such tests may not be needed for sites where centralized treatment plants are present and technologies have been vetted previously.

The DoD currently prohibits incineration of materials containing PFAS. Treatment media, such as the used granular activated carbon (GAC) or ion exchange resin, can be disposed of at a municipal solid waste facility or be sent to a treatment media regeneration facility.

Health and Safety Considerations

Project work on a contaminated site must conform to 29 CFR § 1910.120, Occupational Safety and Health Administration (OSHA) requirements for workers' health and safety as there are likely to be dermal and inhalation exposure risks from impacted soil and groundwater. Additionally, measures are needed to control dust and prevent airborne spread of contaminated soils to surrounding areas. An advantage of changing project location or making design changes to avoid a contaminated area is eliminating the need (and therefore the cost) to provide extensive health and safety controls. Often, more time is required for performing activities when using additional health and safety precautions thereby extending the project schedule. The following is recommended guidance for addressing health and safety concerns associated with management of contaminated soil and groundwater from excavation:

- Depending on the contaminants present and their levels in soil and groundwater, consider provisions for special personal protective equipment (PPE) beyond Level D, which is typically required for construction workers.
- Ensure that construction workers and site personnel have appropriate level of health and safety trainings such as the Hazardous Waste Operations and Emergency Response (HAZWOPER) and the Site Supervisor HAZWOPER.
- Dust monitoring and other contaminant-specific monitoring equipment are required to monitor levels in the active work areas during excavation, handling, and stockpiling of contaminated soils.
- Contaminated soils transported for disposal must be covered and decontamination measures may be needed for equipment and workers to ensure that contamination does not spread to uncontaminated areas.

References and Resources

- Policies and Regulations
  - AFI 32-1015, Integrated Installation Planning, Corrective Action, January 4, 2021
  - Assistant Secretary of Defense Memorandum "Interim Guidance on Destruction or Disposal of Materials Containing Per- and Polyfluoroalkyl Substances in the United States" July 11, 2023
  - Assistant Secretary of Defense Memorandum "Guidance on Incineration of Materials Containing Per- and Polyfluoroalkyl Substances" July 14, 2023

- Assistant Secretary of Defense Memorandum "Establishing a Consistent Methodology for the Analysis of Per- and Polyfluoroalkyl Substances in Matrices Other than Drinking Water" May 1, 2024
- Assistant Secretary of Defense Memorandum "Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program" January 21, 2025
- 42 U.S.C. §§9601-9675, CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
- DAFI 32-1020, Planning and Programming Built Infrastructure Projects (July 20, 2023)
- DAFI 32-7020, Environmental Restoration Program, May 16, 2024
- DAFM 32-1067, Water and Fuel Systems, August 13, 2024.
- DAFM 32-7002, Environmental Compliance and Pollution Prevention, February 4, 2020
- Department of Defense Memorandum "Interim Guidance on Destruction or Disposal of Materials Containing Per- and Polyfluoroalkyl Substances in the United States" July 11, 2023
- DoDM 4715.20, Defense Environmental Restoration Program (DERP) Management, August 31, 2018
- National Defense Authorization Act (NDAA)
- Resource Conservation and Recovery Act (RCRA)
- UFC 3-460-01 Chapter 14
- UFC 2-100-01 Appendix D
- UFGS 01 57 19 – Temporary Environmental Controls
- UFGS 02 61 13 – Excavation and Handling of Contaminated Material
- UFGS 02 81 00 – Transportation and Disposal of Hazardous Materials
- 10 USC, Chapter 169
- 10 USC, 2701
- 42 USC, 6901- 6992
- USEPA, "Interim Guidance on Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances - Version 2", April 8, 2024
- 10 CFR, 261.21
- 29 CFR, 1910.120
- 40 CFR, 260-265 and 268
- 49 CFR, 171-173 and 178-179

- Forms
  - Enclosure 1 - Air Force Form 813 (AF Form 813)
  - Enclosure 2 – Example Environmental Scoping Checklist
- Websites
  - https://ar.cce.af.mil/
  - https://www.epa.gov/remedytech/ground-water-sampling-guidelines-superfund-and-rcra-project-managers
  - https://www.epa.gov/hw-sw846/sw-846-test-method-1311-toxicity-characteristic-leaching-procedure
  - https://iwaste.epa.gov/treatment-disposal-facilities
  - https://www.frtr.gov/matrix/
  - https://www.epa.gov/hw/best-management-practices-bmps-soils-treatment-technologies
  - https://pfas-1.itrcweb.org/12-treatment-technologies/
  - https://semspub.epa.gov/work/HQ/175238.pdf

Enclosure 1 – AF Form 813

PFAS Contamination (Per- and Polyfluoroalkyl Substances)					
#	EPC/EPF Environmental Scoping Questions	No	Unknown	Yes	Notes
1	Is there a documented PFAS release or a validated PFAS site within the Proposed Action/Activity (PA/A) boundary? Check with base installation restoration team (IRT).	☐	☐	☐	
2	Is there PFAS impacted shallow soil (less than 2 feet bgs or as defined by local jurisdiction) that would be disturbed as a result of the PA/A?	☐	☐	☐	
3	Is there PFAS impacted deep soil (greater than 2 feet bgs or as defined by local jurisdiction) that would be disturbed as a result of the PA/A?	☐	☐	☐	
4	Will the PA/A involve excavating PFAS impacted soils for which establishing a soil stockpile(s) would be required?	☐	☐	☐	
5	Is there PFAS impacted surface water or sediment that would have the potential to be disturbed by the PA/A requiring engineering controls to prevent impacts to the other environmental media identified in the AF813?	☐	☐	☐	
6	Is there PFAS impacted groundwater that would be disturbed by the PA/A? (i.e. dewatering operations)	☐	☐	☐	
7	Does the PA/A potentially impact Water Resources which require Special consideration due to PFAS for drinking water sources, stormwater discharges, wastewater discharges or biosolids management?	☐	☐	☐	
8	Will the PA/A generate wastewater that potentially contains PFAS and must be collected and possibly treated prior to discharge? (Check with EPA/State RPMs)	☐	☐	☐	
9	Would the PA/A have the potential to spread PFAS impacted media that could affect biological resources?	☐	☐	☐	
10	Is there suspected PFAS presence from current or past activities known to result in PFAS releases: • Fire Training areas? • Hangar fire suppression system use/test? • Storage areas of PFAS? • Aircraft firefighting activities? • Electrical/chemical firefighting activities? • Historical releases or dumping?	☐	☐	☐	

Comments:

☐ No further action required ☐ See attached analysis ☐ Continue EIAP

Date: Office symbol: Signature:

Enclosure 2 – Environmental Scoping Checklist

Environmental Scoping Checklist			
	Environmental Scoping Questions	**Status**	**Notes**
1	Is there impacted soil on the site of the Proposed Action/Activity (PA/A)? Check with the base installation restoration team (IRT).	☐ No ☐ Unknown ☐ Yes	
2	Will the PA/A involve excavating impacted soil for which establishing holding areas or soil stockpile(s) may be needed?	☐ No ☐ Unknown ☐ Yes	
3	Is there a water source nearby that may be impacted by construction activities that may spread or migrate contamination? Example: Dewatering in or near groundwater contamination.	☐ No ☐ Unknown ☐ Yes	
4	Will the disturbance of impacted media affect any drinking water sources?	☐ No ☐ Unknown ☐ Yes	
5	Will there be any restrictions on discharges or wastes because of the presence of contamination?	☐ No ☐ Unknown ☐ Yes	
6	Is there suspected contaminant presence on any surfaces or media that may incur additional testing or disposal costs? Example: PFAS impacted asphalt or concrete associated with: • Fire Training Areas • Hangar fire suppression system use/test • AFFF storage areas • Aircraft firefighting activities • Electrical/chemical firefighting activities	☐ No ☐ Unknown ☐ Yes	
Comments			
☐ No Further Action Required		☐ See the Attached Analysis	
Date (mm/dd/yyyy)	Office Symbol	Signature	

This checklist is not intended to introduce or require any particular action or additional cost to the process. This checklist should be used at the planning stage for every facility project, where the risk of encountering hazardous substances, pollutants, or contaminants should be assessed and planned for. Prior to engaging in additional testing, stockpiling, or prior to making commitments to local regulators, consult with the ERP office and seek legal advice from AF/JAOE-FSC and Air Force Emerging Contaminants team (AFCEC/CZR) or SMEs in AFCEC/CZTE and AFCEC/CZTQ.

Acronyms and Abbreviations

AF Form 813	Air Force Form 813
AFI	Air Force Instruction
AFCEC	Air Force Civil Engineer Center
ANG	Air National Guard
BMP	best management practice
BRAC	Base Realignment and Closure
CATEX	Categorical Exclusion
CDD	construction and demolition debris
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DAF	Department of the Air Force
DAFI	DAF Instruction
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DPT	direct push technology
EA	Environmental Assessment
EIS	Environmental Impact Statement
EESOH-MIS	Enterprise, Environmental, Safety, Occupational Health Management Information System
ELAP	Environmental Laboratory Accreditation Program
ERA	Environmental Restoration Account
ERP	Environmental Restoration Program
FFA	Federal Facilities Agreement
FSRM	Facility Sustainment, Restoration, and Modernization
GAC	granular activated carbon
GenX	hexafluoropropylene oxide-dimer acid (also known as HFPO-DA)
GIS	geographic information system
HAZWOPER	Hazardous Waste Operations and Emergency Response
HFPO-DA	hexafluoropropylene oxide-dimer acid (also known as GenX)
IDW	Investigation derived waste
IER	Ion exchange resin
IRT	Installation restoration team
ISM	Incremental Sampling Methodology
ITRC	Interstate Technology and Regulatory Council
LUC	Land Use Control
MCM	minimum control measure
MILCON	Military Construction
MS4	Municipal Separate Storm Sewer System
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
PA/A	Proposed Action / Activity
PFAS	per- and poly-fluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
POL	Petroleum, Oil, and Lubricants
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	semi-volatile organic compound
SWPPP	Storm Water Pollution Prevention Plan
TCLP	Toxicity Characteristic Leaching Procedure
TPH-DRO	Total petroleum hydrocarbons – diesel rang organics
TPH-GRO	Total petroleum hydrocarbons – gasoline range organics
UFC	Unified Facilities Criteria
UFGS	Unified Facilities Guide Specifications
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

APPENDIX J ENVIRONMENTAL

J-1 ENVIRONMENTAL MEMORANDUMS

J-1.1 Environmental Action Information for Project Planning and Execution

DEPARTMENT OF THE AIR FORCE
6TH AIR REFUELING WING (ARW)
MACDILL AIR FORCE BASE, FLORIDA

MEMORANDUM FOR 6 CES/CP/CEP/CEPE/CEC/CEO/CCS/CELC

FROM: 6 CES/CEIE

SUBJECT: Environmental Action Information for Project Planning and Execution

1. Please review and disseminate the following information regarding environmental issues and potential necessary actions for projects at MacDill AFB. The intent of this information is to ensure all personnel are aware of potential environmental requirements during the planning and execution phases of all projects. To better serve our customers, we have developed the attached "Environmental Awareness Quick Look List" for typical project activities and their area of potential regulatory concern. This list is intended to provide the personnel that are responsible for planning future projects an early indication that environmental regulations may apply to the proposed project and that coordination with 6 CES/CEIE is required. This document provides minimal required guidelines. It is not intended to replace and/or supersede existing associated regulatory and USAF publications. In addition, tabs A-G provide more detailed information that will help you identify additional requirements for specific areas of regulatory concern.

2. Coordination with the Environmental Element may be simple and only involve a review to determine regulatory applicability or exemption from National Environmental Policy Act (NEPA) planning (AF Form 813). Projects may require outside coordination with a local regulatory agency for permitting, sampling and/or laboratory analysis. Some projects require Environmental Assessment (EA) preparation and HQ AMC approval prior to implementation or construction. In all cases, early coordination with the Environmental Element will reduce delays, enable smooth project execution and help MacDill AFB stay in compliance with the various Federal, State and local regulations.

3. Please contact Jason Kirkpatrick, 6 CES/CEIE, at 828-0459 if you have any questions or require assistance identifying environmental requirements for future projects. The Environmental Element is available to provide training upon request.

Andrew W. Rider, GS-12
Govt. Chief, Environmental Element

MISSION FOCUSED...VALUED AIRMEN

J-1.2 MacDill AFB Commitment Statement

DEPARTMENT OF THE AIR FORCE
6TH AIR REFUELING WING (AMC)
MACDILL AIR FORCE BASE, FLORIDA

MEMORANDUM FOR DISTRIBUTION C

SUBJECT: MacDill AFB Environmental Commitment Statement/Policy

1. Every member of the MacDill AFB community makes a commitment to the United States of America. This commitment includes a responsibility to be role models in all facets of life, both at home and in the places where we work. Our work space contains a tremendous diversity of wildlife amidst an amazing backdrop of land and water. The natural beauty of MacDill AFB and Tampa Bay is a reminder that we must also commit to conserve and protect the natural environment that surrounds us. To meet this environmental commitment and responsibility, all base personnel, including active duty, civilians, contractors, tenants, and visitors must follow our Environmental Commitment as described below.

2. MacDill's Environmental Commitment is to:

a. **E**xecute our mission. Execute our mission of air refueling and mission support while protecting our natural surroundings through environmental education, green procurement, waste generation reduction, and environmental sustainability.

b. **P**revent pollution. Prevent pollution with the help of our installation personnel, mission partners, tribal partners, contractors, regulatory agencies, and the community through training and education.

c. **I**mprove continuously. Improve continuously in mission and environment by setting and tracking manageable, attainable, measurable, and realistic objectives, targets, and goals.

d. **C**omply. Comply with all environmental regulations and Air Force requirements by actively implementing environmental plans, permits, instructions, and executive orders.

3. MacDill AFB is committed to the highest standards of environmental protection and together we can achieve an environmental program of **EPIC** proportions, one that conserves and sustains our natural environment for future generations.

4. If you have any questions or need additional information, please contact Mr. Chris Sutton, Environmental Management System Coordinator, at 828-0458.

Approved by the MacDill AFB Environmental, Safety, and Occupational Health Council on 21 Jul 2021

MISSION FOCUSED...VALUED AIRMEN

APPENDIX K ASBESTOS

K-1 ASBESTOS NOTIFICATION REQUIREMENTS

Business and Professional Regulation (DBPR) requirements. All employers of workers who require employees to handle asbestos must comply with OSHA asbestos regulations (29 CFR Part 1910.1001 and 1926.1101).

If I obtain a building permit, does this meet the federal asbestos notification requirement?

No, the receipt of a city or county permit is not the same as providing the federally required asbestos notification to the EPC. A copy of the state notification form [DEP 62-257.900(1)] can be obtained from the EPC or from the following website address:

http://www.dep.state.fl.us/air/forms/asbestos/dep62_257_900(1).pdf

What if I have an emergency project?

Notification is required as soon as possible before, but not later than, the following working day for any emergency renovation operation or emergency demolition (if the building has been declared structurally unsound and in danger of imminent collapse by a State or local governmental agency). The asbestos NESHAP requirements for a thorough asbestos inspection (survey) prior to the start of the demolition or renovation activity and disposal of waste debris in an appropriate landfill are still applicable for all emergency projects. If a thorough asbestos inspection is not done prior to the start of the activity and a means of complying with this requirement is not possible, then all of the building waste materials must be treated as RACM and disposed of in an appropriate regulated landfill per the provisions of 40 CFR 61.154. Contact our office for more information.

Where can I obtain additional information about asbestos-related issues?

For more information please contact the Air Division of the Environmental Protection Commission at (813) 272 - 5530. Our office is located at 1410 N. 21st Street in Ybor City. Or visit these websites:

- EPA Asbestos Home Page: http://www.epa.gov/asbestos/
- EPA NESHAP Regulation: http://www.epa.gov/opptintr/asbestos/40cfr61.pdf
- EPC Asbestos Home Page: http://www.epchc.org/Asbestos.htm
- OSHA Asbestos Safety and Health http://www.osha.gov/SLTC/asbestos/index.html

POLLUTION PREVENTION TOPICS

Pollution prevention is the reduction or elimination of discharges or emissions to the environment. This can be achieved by reducing the generation of waste at the source (source reduction) or by using, reusing or reclaiming wastes after generation (recycling).

Minimize the hazards of demolition

Inventory and list materials that may be hazardous prior to demolition (ACM, lead pipes and paint waste, drums or other containers of unknown type and origin). Ensure non-recyclable waste material is disposed of in accordance with all local, state and federal regulations.

Material Reuse and Recycling

Inspect the site before demolition and list materials that should be saved and select the appropriate methods and procedures the will promote reuse. This will reduce disposal costs and reduce materials costs at the construction site where they are used. These materials may include bricks and block; doors and windows; plumbing fixtures and pipes; electric fixtures and wiring.

Recycling is the use, reuse or reclamation of waste after it has been generated. Special precautions should be taken to ensure any materials that are reused or recycled do not contain, or have not been contaminated by, hazardous materials (such as asbestos).

Examples of opportunities to recycle demolition waste include the recycling of glass and plastic; the creation of mulch or chips from wood; the use of milled asphalt from road construction; the use of crushed concrete as aggregate or base material; and the removal and recycling of scrap metal before demolition.

ASBESTOS NOTIFICATION REQUIREMENTS FOR HILLSBOROUGH COUNTY

AN INFORMATIONAL GUIDE FOR RENOVATION AND DEMOLITION PROJECTS

Environmental Protection Commission
of
Hillsborough County

Air Management Division

(813) 272-5960

Guide to Asbestos NESHAP Notifications for Demolitions and Renovations

What projects require notification?

Only single, isolated, family residential structures with four dwelling units or less are **exempt** from the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements for notification (40 CFR 61, Subpart M).

All other structures, or multiple residences, demolished as part of a single project and located on one site, are subject to the notification requirements for demolition whether or not asbestos-containing material (ACM) is present.

Only renovation projects involving regulated asbestos-containing material (RACM) above certain threshold amounts require notification. Written notification is not required for renovation projects where asbestos containing materials are not disturbed or made regulated during the planned activity.

What is Asbestos-Containing Material (ACM) and Regulated Asbestos-Containing Material (RACM)?

ACM is any material containing more than 1% asbestos as determined using Polarized Light Microscopy (PLM). There are two types of ACM. Category I nonfriable ACM means asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products. Category II nonfriable ACM means any material, excluding Category I nonfriable ACM.

RACM is any friable asbestos-containing material containing more than 1% asbestos as determined using PLM material that can be crumbled, pulverized or reduced to powder by hand pressure when dry. RACM also includes Category I or Category II non-friable asbestos material that has become friable prior to, or during, demolition or renovation operations.

In addition, Category I or II ACM that has a high probability of becoming RACM (crumbled, pulverized or reduced to powder) during demolition must be removed prior to the start of the demolition activity.

What are the notification requirements?

Written notification is to be mailed or hand-delivered:

• Ten (10) working days prior to a **demolition**,

even if there is no asbestos present

• Ten (10) working days prior to a **renovation** activity, if the amount of RACM to be stripped, removed, dislodged, cut, drilled or disturbed is greater than 160 square feet (SF) on facility components or 260 linear feet (LF) on pipes, or 35 cubic feet off facility components where the length or area could not be measured previously

Written revisions, including changes to the start date, may be faxed to our office at (813) 272-5605 and must be submitted no later than the originally notified start date if the activity will fall after the original start date. Otherwise the 10 working day requirement must be met for any proposed activities to start earlier than the originally notified start date.

When is an asbestos inspection required?

A thorough asbestos inspection (survey) is required by a state Licensed Asbestos Consultant before *any* renovation or demolition activity begins, regardless of the age of the building or the building materials. This requirement also applies to buildings that are damaged by fire or water. Attach a copy of the asbestos inspection or asbestos survey report to all demolition notifications. In addition, a copy of the asbestos (survey) report should be maintained at the job site during all renovation or demolition activities.

Where do I send notification?

All asbestos notifications for projects to be performed in Hillsborough County must be mailed or hand-delivered to the Environmental Protection Commission (EPC), along with the appropriate Hillsborough County fee and a copy of the Asbestos Inspection Report or Asbestos Survey:

EPC Air Management Division Attn: Asbestos Program Coordinator 1410 N. 21st Street Tampa, FL 33605

What are the county asbestos fee requirements?

Fees are due at the time of notification. The fee may cover multiple structures, as long as the structures are located on a single site and the project demolition or renovation activities are not phased. *For projects involving renovation and demolition activities, separate fees are due for* ***each*** *activity performed at the site.* Make checks payable to the EPC. The Hillsborough County fee schedule for asbestos is as follows:

• Demolition of structure less than 50,000 SF: $200.00

• Demolition of structure greater/equal to 50,000 SF: $300.00

• Renovation 160 SF/260 LF up to 1000 SF/LF: $300.00

• Renovation greater than 1000 SF/LF: $500.00

Who can remove asbestos-containing material?

A Florida Licensed Asbestos Contractor must perform all activities involving the removal or handling of ACM and RACM. Licensure is **not** required if certain criteria are met for moving, removal, or disposal of asbestos containing roofing materials, resilient flooring materials, and exterior conduit or piping as specified under F.S. Chapter 469.002. Supervisors and/or workers must be trained in accordance with Florida Department of Environmental Protection.

APPENDIX L SWFWMD

L-1 SWFWMD PERMIT PROCESSING FEE EXAMPLE

40D-1.607 Permit Processing Fee.

A permit application processing fee is required and shall be paid to the District when certain applications are filed pursuant to District rules. These fees are assessed in order to defray the cost of evaluating, processing, advertising, mailing, compliance monitoring and inspection, required in connection with consideration of such applications. Fees are non-refundable in whole or part unless the activity for which an application is filed is determined by the District to qualify for a permit with a lower fee or not require a permit. Failure to pay the application fees established herein is grounds for the denial of an application or revocation of a permit. The District's permit application processing fees are as follows:

(1) Environmental Resource or Management and Storage of Surface Waters Permit Applications

(a) The fee for a permit application for activities reviewed pursuant to Chapters 40D-4, 40D-40, and 40D400, F.A.C., are as follows:

1. Application for Conceptual Permit $ 4,550.00
2. Application for Conceptual Permit Modification $ 2,275.00
3. Application for Individual Permit$4,550.00

4. Application for Individual Permit and General Permit for Incidental Site Activities $ 3,861.00

—. Application for Individual Permit Modification $ 2,275.00
—. Application for General Permit pursuant to Chapter 40D-40, F.A.C. $ 2,912.00
—. Application for General Permit Modification $ 1,456.00
—. Application for General Permit for Minor Surface Water Systems $ 364.00
—. Application for General Permit for Minor Surface Water System Modification $ 182.00
—. 10. Application for General Permit for an activity which has less than 10 acres of project area and impacts 5,000 square feet or less of wetlands or other surface waters $ 1,456.00
—. 11. Application for permit modification for an activity which has less than 10 acres of project area and impacts 5,000 square feet or less of wetlands or other surface waters $ 728.00
—. 12. Application for general permit for a public highway project which has less than 10 acres of project area and has less than two acres of new impervious surface area $ 316.00
—. 13. Application for permit modification for a public highway project which has less than 10 acres of project area and has less than two acres of new impervious surface area $ 158.00

14. Application for a noticed general permit pursuant to Chapter 40D-400, F.A.C. $ 250.00

(b) The fees for permit applications concerning the establishment and operation of a mitigation bank under Chapter 40D-4, F.A.C., are as follows:

—. Individual Mitigation Bank Permit $ 3,632.00
—. Individual Mitigation Bank Permit Modification $ 1,816.00
—. Mitigation Bank Conceptual Permit $ 3,632.00
—. Mitigation Bank Conceptual Permit Modification $ 1,816.00
—. (c) Transfer of permit to another entity $ 91.00
—. (d) Verification that an activity is exempt from regulation under Part IV of Chapter 373, F.S., or Section 403.813, F.S. $ 100.00
—. (2) Application fees for proprietary authorization under Chapters 253 and 258, F.S., are in accordance with the fee schedule provided in Chapter 18-21, F.A.C.

(3) The following types of applications are exempt from the fees identified in subsection (1):

(a) APPLICATIONS FOR PERMITS OR PERMIT MODIFICATIONS WHICH INVOLVE;

1. Less than one-half acre of new project area for non-agricultural projects or less than ten acres of new project area for agricultural projects; and
2. No new impacts to wetlands or surface waters or new impacts only to those wetlands less than one-half acre in size, unless such wetlands are regulated pursuant to Chapter 40D-4, 40D-40 or 40D-400, F.A.C.

(b) PERMIT MODIFICATIONS USING MODIFICATION SHORT FORM: Applications for permit modifications using the Modification Short Form authorized pursuant to paragraph 40D-4.331(2)(b) or subsection 40D-40.331(2), F.A.C.

APPENDIX M GREEN PROCUREMENT

M-1 MACDILL AFB GREEN PROCUREMENT PROGRAM FACT SHEET

MACDILL AFB
GREEN PROCUREMENT PROGRAM
Fact Sheet

Most projects require compliance with MacDill's Green Procurement Program. The GPP mandatory purchasing lists include such common items as: carpet, insulation, cement, paint and roof coatings.

The Green Procurement Program, also known as the GPP, is a purchasing program to protect the environment and reduce energy consumption with environmentally friendly goods and services. The GPP includes six mandatory program elements and one voluntary element. The mandatory programs are:

Products manufactured from **recycled and reclaimed materials** as identified in EPA's Comprehensive Procurement Guideline (CPG).

Biobased products identified by USDA are made from rapidly renewable plant materials (usually agricultural products). Examples include straw-board construction panels, soy inks, vegetable-based lubricating oils, and "plastics" made from starch.

Energy Star® labeled lighting equipment, roofing products, heating and cooling systems and appliances, or Low Standby Power office equipment that switches into a "sleep" mode, are examples of **energy-efficient products.**

The EPA SNAP Program lists alternatives to **ozone-depleting substances**.

Substitutes for the EPA Priority Chemicals (lead, PCB, mercury, naphthalene, and cadmium) are identified by the base pollution prevention program.

Why "buy green"?

- *Benefit the environment by conserving resources, preventing waste, reducing landfill space, conserving energy and water, and reducing pollution.*
- *Reduce life cycle costs and stimulate recycling markets.*
- *Close the recycling loop by purchasing products made from materials that have been recycled.*
- *Show the USAF's commitment to environmental stewardship.*
- *Demonstrate compliance with laws, regulations and executive orders.*

Purchases of **alternative fueled vehicles** (AFV), alternative fuels and fuel efficient vehicles are required for Federal fleets and supported by GSA and DLA.

The voluntary program element, Environmentally Preferable Purchasing, promotes purchase of goods and services that have **lesser or decreased effects on human health and the environment** compared to competing goods that serve the same purpose.

It's the Law!

GPP was originally authorized under the **Resource Conservation and Recovery Act (RCRA)**, which requires federal agencies to "give preference in their purchasing programs to products and practices that conserve and protect natural resources and the environment." **Executive Order (EO) 13423, *"Strengthening Federal Environmental, Energy, and Transportation Management"***, fully explains the GP program elements. The **2002 "Farm Bill"** requires us to purchase biobased products. The **Energy Policy Act and EO 13123** require us to purchase energy efficient products and AFVs. The **Federal Acquisition Regulations** (FAR) Subparts 23.2, 23.4, 23.7 and 23.8 support these requirements. GPP applies to commodity purchases, construction contracts, service contracts, items bought from base supply stores, items used for in-house construction and services, and everything else purchased by Air Force personnel and their contractors.

Are there any exemptions from having to buy compliant recycled-content or biobased products?

Yes. The following are acceptable reasons for not buying a compliant product:

- Product costs more than a comparable non-recycled/biobased product
- Product does not meet reasonable technical requirements
- Product is not available competitively within a reasonable period of time

It is **everyone's responsibility** to comply with GPP requirements. Government-wide Purchase Card (GPC) purchases, purchase orders, and contracts must all address the procurement or use of GPP items, regardless of the amount of money to be spent. Contract statements of work (SOWs) and specifications and service contract Performance Work Statements must require the use of GPP-compliant items. The GPP requirements are outlined in the base GPP Plan. **Training and documentation** are critical elements in achieving compliance with these requirements. See the Air Force *Guide to Green Purchasing* (at AFCEE web link below) for more information.

Where can I buy GPP-compliant products? Many GPP-compliant goods are available from the purchasing programs already known to you, and other resources that are relatively new:

- √ Javits-Wagner-O'Day (JWOD) Procurement List products can be purchased from office supply stores or online. In the JWOD Catalog, http://www.nib.org/JWOD%20Catalog/index.html, look for the recycling symbol and the earth-friendly JWOD logo.
- √ The Biobased Manufacturers Association offers an online catalog of biobased products: www.thefarmdepot.com/tfd/bma/departments.jsp
- √ For Federal Prison Industries, Inc. (UNICOR) products and services, see www.unicor.gov. Visit http://www.unicor.gov/about/erecycle.htm for information on their environmental initiatives.
- √ Energy Star® and FEMP computers and other information technology products are available through the AFWay Computer Store purchasing system. See www.energystar.gov/products for information about other energy efficient products.
- √ Visit the Alternative Fuels Data Center for information about AFVs and alternative fuels: http://www.eere.energy.gov/afdc/
- √ EPA's EPP Database is a comprehensive source of information about environmentally preferable products: http://yosemite1.epa.gov/oppt/eppstand2.nsf

Here are additional resources for more information on the GPP:

MacDill Environmental POC: Jason Kirkpatrick, 828-0459, Jason.Kirkpatrick.2.ctr@us.af.mil The "USAF Guide to Green Purchasing:" http://www.afcee.brooks.af.mil/eq/ap/gg/guide.doc

Additional information by program element:
-Recovered/recycled materials: http://epa.gov/cpg
-USDA Biobased: http://www.biobased.oce.usda.gov/fb4p/Default.aspx
-EnergyStar items: http://www.energystar.gov/products
-FEMP Low Power Standby devices: http://oahu.lbl.gov
-ODSs (Ozone Depleting Substances): http://www.epa.gov/ozone/snap/lists/index.html

Green Procurement Requirements Reference Sheet

Select Sources of Supply

GSA: *http://www.gsa.gov/environ*
DLA: *http://www.dscr.dla.mil/catalogs/catalog.htm*
Energy Star®: *http://www.energystar.gov/* (note: Energy Star® does not sell products, but provides a list of manufacturers and their certified products)
JWOD: *http://www.nib.org/JWOD%20Catalog/index.html*
UNICOR: *www.unicor.gov/about/erecycle.htm*
FEMP: *http://oahu.lbl.gov/cgi-bin/search_data.pl*

Determining EPP Attributes for Specific Purchase Types

- For paints, carpet, office supplies, cleaners and particle board purchases: *http://www.greenseal.org/recommendations.htm*
- For cleaners: *http://www.epa.gov/opptintr/epp/cleaners/select/*

For construction projects: *http://www.epa.gov/opptintr/epp/tools/bees.htm*

GPP Compliant Product Listings

- CPG: *http://www.epa.gov/cpg/products.htm* (see reverse side of this page for the 2004 list of recycled-content products)
- Biobased: *http://www.biobased.oce.usda.gov/fb4p/Default.aspx*
- FEMP: *http://oahu.lbl.gov*
- Energy Star: *http://www.energystar.gov/index.cfm?fuseaction=find_a_product*.
- Alternatives to Ozone-Depleting Substances: *http://www.epa.gov/ozone/snap/lists/index.html*

Resources for EPP Product Selection

EPA Database of Environmentally Preferable Products and Services: *http://yosemite1.epa.gov/oppt/eppstand2.nsf*

The **EPA-designated CPG** items are:

Construction Products

__Carpet
__Carpet Cushion
__Cement and Concrete
__Floor Tile/Patio Blocks
__Flowable Fill
__Insulation
__Latex Paint
__Laminated Paperboard
__Modular Threshold Ramps
__Non-Pressure Pipe
__Railroad Grade Crossing Surfaces
__Roofing Materials
__Shower/Restroom Dividers
__Structural Fiberboard

Landscaping Products

__Compost from Yard/Food Waste
__Compost from Manure/Biosolids
__Garden/Soaker Hoses
__Fertilizers
__Lawn and Garden Edging
__Plastic Timbers and Posts

Non-Paper Office Products

__Binders
__Clipboards (Plastic)
__Plastic File Folders
__Plastic Clip Portfolios
__Plastic Presentation Folders
__Office Furniture
__Office Recycling Containers
__Office Waste Containers
__Plastic Desktop Accessories
__Plastic Envelopes
__Plastic Trash Bags
__Remanufactured Printer Ribbons
__Remanufactured Toner Cartridges

Paper and Paper Products

__Printing and Writing Paper
__Newsprint
__Bathroom Tissue
__Paper Towels
__Paper Napkins
__Facial Tissue
__General Purpose Industrial Wipers
__Corrugated Containers
__Solid Fiber Boxes
__Folding Cartons
__Industrial Paperboard (tubes, cores, drums)
__Misc. (book covers, mailing tubes, pad backs)
__Padded Mailers
__Carrierboard
__Brown Papers (Wrapping Paper and Bags)
__Tray Liners (Place Mats)

Park and Recreation Products

__Benches and Picnic Tables
__Plastic Fencing
__Playground Equipment
__Rubber/Plastic Running Tracks
__Rubber/Plastic Playground Surfaces

Transportation Products

__Channelizers
__Concrete
__Delineators
__Flexible Delineators
__Parking Stop
__Traffic Barricades
__Traffic Cones

Vehicular Products

__Engine Coolants
__Rebuilt Vehicular Parts
__Re-refined Lubricating Oils
__Retread Tires

Miscellaneous Products

__Awards/Plaques
__Bike Racks
__Blasting Grit
__Industrial Drums
__Manual-Grade Strapping
__Mats
__Pallets
__Signs and Posts
__Sorbents

The **USDA-designated biobased** items are:

___ Mobile Equipment Hydraulic Fluid
___ Roof Coatings
___ Water Tank Coatings
___ Diesel Fuel Additives
___ Penetrating Lubricants
___ Bedding, Bed Linens and Towels

___ Adhesive and Mastic Removers
___ Insulating Foam for Wall Construction
___ Hand Cleaners and Sanitizers
___ Composite Panels
___ Fluid-filled Transformers
___ Biodegradable Containers
___ Fertilizers
___ Metalworking Fluids
___ Sorbents
___ Graffiti and Grease Removers
___ 2-Cycle Engine Oils
___ Lip Care Products
___ Biodegradable Films
___ Stationary Equipment Hydraulic Fluids
___ Biodegradable Cutlery
___ Glass Cleaners
___ Greases
___ Dust Supressants
___ Carpets
___ Carpet and Upholstery Cleaners
___ Bath and Tile Cleaners
___ Clothing Products
___ Concrete and Asphalt Release Fluids
___ Cutting, Drilling and Tapping Oils
___ De-icers
___ Durable and Plastic Films
___ Firearm Lubricants
___ Floor Strippers
___ Laundry Products
___ Wood and Concrete Sealers

The **EnergyStar** and/or **FEMP Low-Power Standby** Devices are:

___ Battery Chargers
___ Clothes Washers
___ Dehumidifiers
___ Dishwashers
___ Refrigerators & Freezers
___ Air-source Heat Pumps
___ Boilers
___ Central AC
___ Ceiling Fans
___ Furnaces
___ Home Sealing (Insulation and Air Sealing)
___ Roof Products
___ Windows, Doors & Skylights
___ Cordless Phones

___ Room AC
___ Room Air Cleaners
___ Water Coolers
___ Computers
___ Copiers
___ Fax Machines
___ Laptops
___ Mailing Machines
___ Monitors
___ Multifunction Devices
___ Printers
___ Scanners
___ Water Coolers
___ Geothermal Heat Pumps
___ Home Sealing (Insulation)
___ Light Commercial
___ Programmable Thermostats
___ Ventilating Fans
___ Compact Fluorescent Light Bulbs (CFLs)
___ Residential Light Fixtures
___ Ceiling Fans
___ Exit Signs
___ Traffic Signals
___ Transformers
___ Vending Machines
___ Combination Units (TVs)
___ DVD Products
___ External Power Adapters
___ Home Audio
___ Televisions
___ VCRs
___ Commercial Fryers
___ Commercial Hot Food Holding Cabinets
___ Commercial Solid Door Refrigerators and Freezers
___ Commercial Steam Cookers

APPENDIX N CONTRACTOR HAZMAT LIST

N-1 CONTRACTOR HAZMAT LIST FORM

Contractor Hazmat List					
Project #	Contractor Name			POC Phone#	
Brief Project Description and Location:				6 CES/CEC POC	
Product Name	Manufacturer	Manufacturer's Part/Product Number	Container Size	Container Type	Estimated Maximum Quantity
Bio-Environmental Review		Safety Review		Environmental Review	