ENGINEERING-PDH.com
ONLINE CONTINUING EDUCATION

PROJECT MANAGERS' GUIDE FOR DESIGN & CONSTRUCTION

Main Category:	Project Management
Sub Category:	-
Course #:	PRJ-112
Course Content:	93 pgs
PDH/CE Hours:	8

OFFICIAL COURSE/EXAM

(SEE INSTRUCTIONS ON NEXT PAGE)

WWW.ENGINEERING-PDH.COM
TOLL FREE (US & CA): 1-833-ENGR-PDH (1-833-364-7734)
SUPPORT@ENGINEERING-PDH.COM

PRJ-112 EXAM PREVIEW

- TAKE EXAM! -

Instructions:

- At your convenience and own pace, review the course material below. When ready, click "Take Exam!" above to complete the live graded exam. (Note it may take a few seconds for the link to pull up the exam.) You will be able to re-take the exam as many times as needed to pass.
- Upon a satisfactory completion of the course exam, which is a score of 70% or better, you will be provided with your course completion certificate. Be sure to download and print your certificates to keep for your records.

Exam Preview:

Note that the course content is specific to AirForce terms, but the general principles can apply to commercial industries. The questions below are in terms of a general project manager, so note that some of the wording with regards to DM/CM versus Project Manager may differ.

1. Which is not one of the Five Principle Project Elements in the manual?
    a. Estimating
    b. Design
    c. Construction Contract
    d. Construction

2. Key to successful project management and execution is to establish a Project Management Plan (PMP) at the outset of the project design process. In the PMP the Project Manager (DM/CM) should sketch a project team ___ .
    a. organization chart
    b. budget chart
    c. plan chart
    d. schedule chart

3. The Project Manager (DM/CM) should up front set the rules to be followed for communication for the project, from design through contracting, construction and closeout.
    a. True
    b. False

4. When construction phasing is required, include possible strategies during the design phase for a design-bid-build project or RFP preparation for a design-build, note cost and schedule impacts, and discuss possible strategies to be considered by the A-E.
    a. True
    b. False
5. A project manager should incorporate sustainable development by using LEED™ criteria. LEED stands for:
    a. Leadership in Efficient Environmental Design
    b. Leading Effort Environmental Design
    c. Leadership in Energy and Environmental Design
    d. Leadership in Energy and Endangered Design
6. A project manager shall be aware that all functional areas shall be barrier-free and accessible to the physically handicapped. Site and building designs should enable physically handicapped persons to act independently and enjoy the full range of programs provided.
    a. True
    b. False
7. With regards to construction being handicapped accessible, level changes may be included but must be accommodated by ramps suitable for wheelchair access, but only for indoor areas.
    a. True
    b. False
8. Cost Control and Scope Changes during Design - Cost estimates during design put price tags on alternative building systems and materials before construction and predict the fair price for a bid.
    a. True
    b. False
9. Cost control success during the design process hinges directly on the AF DM/CM's ability to get the appropriate cost information and make decisions to correct deviations from the approved budget in a timely manner.
    a. True
    b. False
10. ____ is the systematic process of ensuring and documenting that all building systems perform according to specification and design intent, consistent with the owner's operational needs.
    a. System Startup
    b. Commissioning
    c. RedZone Meeting checklist
    d. Acceptance Inspections

United States Air Force Project Managers' Guide for Design and Construction

Revised: November 28, 2007

Supersedes these Publications:
The United States Air Force Manager's Guide for Design and Construction (June 1, 2000)

Publication Information:
OPR: HQ AFCEE/TDB
Certified by: HQ AF/A7CP
Distribution: This publication is available digitally on the AFCEE Website

Hyperlink Information:
Due to the reorganization of Air Force documents on some Internet servers, links to documents and other information previously available may not be accessible due to network firewalls and other security protocols. Hyperlinks that are not available to the general public on the Internet have not been included. The hyperlinks included in this document were tested for accuracy when this document was completed, however these links may become broken over time due to reorganization of documents. Please report broken links to the AFCEE Web Team at mailto:afcee.webmaster@brooks.af.mil.

The appearance of hyperlinks does not constitute endorsement by the Department of Defense, the United States Air Force or the Air Force Center for Engineering and the Environment of the information, products or services contained therein. AFCEE does not exercise any editorial control over the information you may find at these locations.

TABLE OF CONTENTS_Toc184035619

CHAPTER 1 - INTRODUCTION

Excellent installations foster pride, productivity, and enhance the Air Force mission. The quality of an installation influences the performance of our most important resource, our people. This Guide is written to assist Air Force Design and Construction Project Managers (AF DM/CM) in the quest for excellence in design and construction of Air Force facilities. **This guide is a recommendation of best practices to achieve successful MILCON execution and should not limit individual AF DM/CM flexibility.** You are encouraged to read and use AFI 32-1021, *Planning and Programming Military Construction (MILCON)* Projects and AFI 32-1023, *Design and Construction Standards and Execution of Facility Construction* information. AF DM/CM at OCONUS locations will need to consider host-nation procedures and requirements (not provided in this guidance). Air Force Transformation has changed the relationships and responsibilities between the Air Staff, Major Commands (MAJCOMs), Installations and the Field Operating Agencies (FOA). The following matrix illustrates these new relationships:

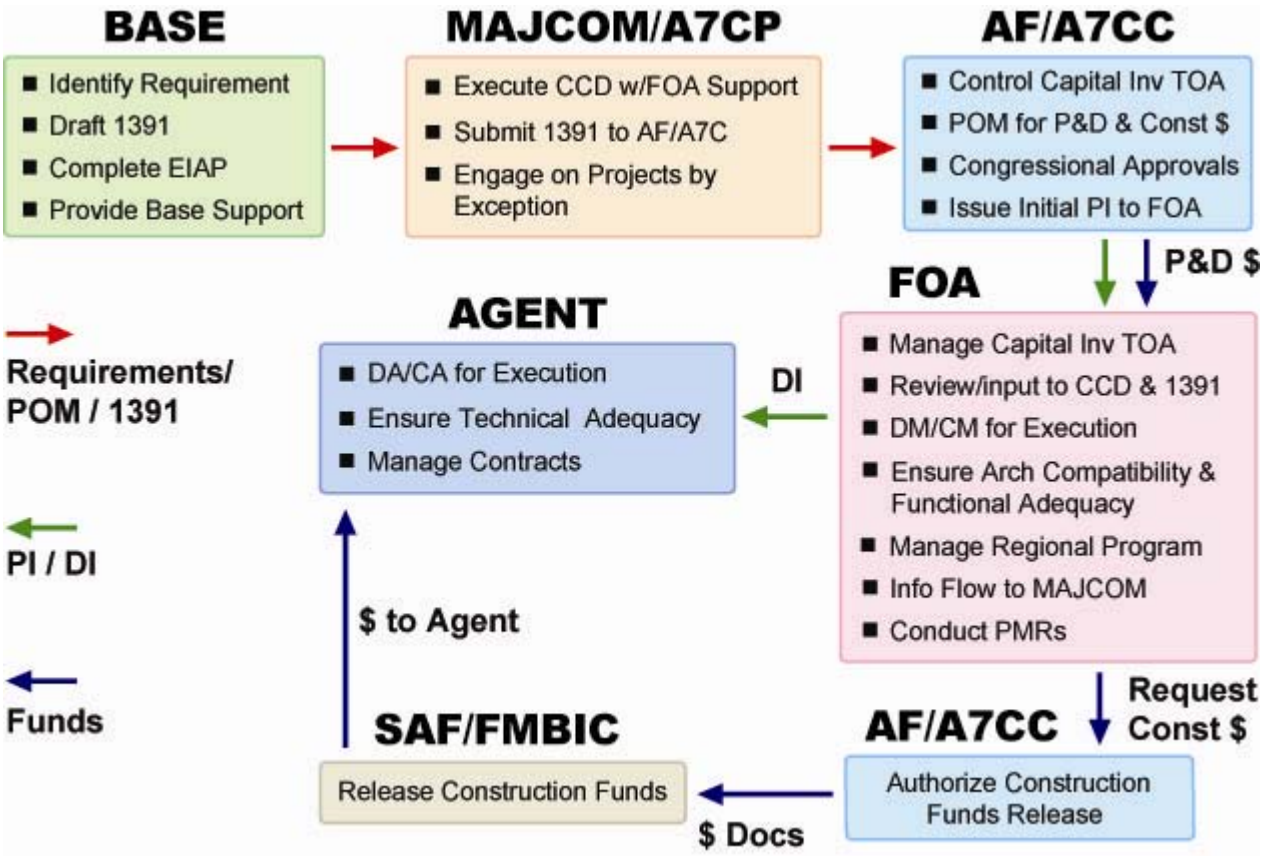
	Plan	Program	Design	Construct	Closeout
Base	P	S	S	S	S
MAJCOM	S	P	C	C	
FOA		S	P	P	P
HQ AF		S	S	S	

P **Primary Responsibility**

S **Supporting Responsibility**

C **Consulting Responsibility**

Air Force MILCON Process Ownership Matrix



Roles & Flow for Requirements & Funds Resulting from Transformation

Acronyms used in above diagram:

EIAP - Environmental Impact Analysis Process

CCD - Customer Concept Document

TOA - Total Obligation Authority

POM - Program Objective Memorandum

FOA – Field Operating Agency (AFCEE)

DM/CM - Design Manager/Construction Manager

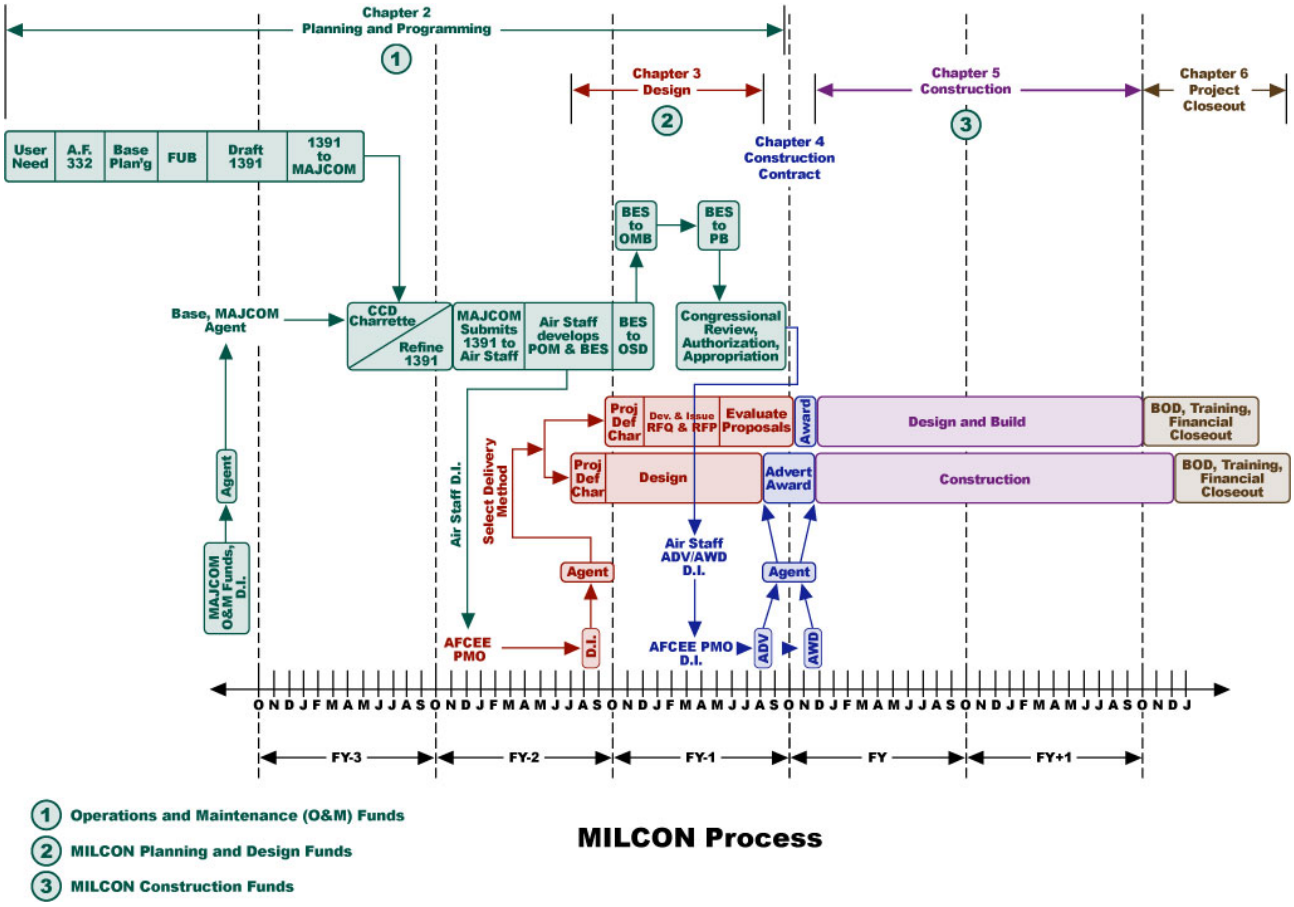
DA/CA - Design Agent/Construction Agent

PI/DI - Planning Instruction/Design Instruction (note: in ACES PM there is no 'PI'; it is DI #1)

SAF/FMBIC - Secretary of the Air Force Financial Management and Comptroller

1-1 OVERVIEW

The primary purpose of the Military Construction (MILCON) program is to provide major construction on DOD installations for all types of buildings, airfield pavements, utility systems, roads, etc, exceeding minor construction authority and to achieve the Air Force MILCON goal of "Building Quality Facilities…On Time and On Budget" to meet mission requirements. The MILCON Process Diagram below illustrates the time frame requirements and provides distinction between program development (Planning and Programming) and project management (Design, Construction Contract, Build, and Closeout):



This guide is generally focused on traditional design-bid-build (DBB) type projects. However, many of the principles outlined herein can be applied to design-build (DB), and where applicable, specific reference to DB is made. For detailed information on the DB process, refer to the *Air Force Guide to Design-Build* This guide follows MILCON projects from the earliest stages, through the approval and funding processes, and then through Design, Construction and Closeout. This guide also tries to help distinguish the differences between program development and project management in an effort to help AF DM/CMs recognize their specific responsibilities. Some chapters provide details regarding processes and activities that are outside the responsibilities of an AF DM/CM (Design Manager/Construction Manager) and are for information only.

While managers of other types of projects may benefit from this guide, it is intended to primarily address MILCON projects. Managers of Non-appropriated Fund (NAF) projects should refer to AFI 34-205, *Services Non Appropriated Funds Projects* and AFI 32-1022, *Planning and Programming Non-Appropriated Fund Facility Construction Projects*. Managers of Military Family Housing (MFH) projects should consult *US Air Force Family Housing Guide for Planning, Programming, Design, and Construction* for guidance. For construction of AF hospitals, clinics, and other medical facilities, AF DM/CMs should refer to UFC 4-510-01, *Design: Medical Military Facilities.*

1-2 FIVE PRINCIPLE PROJECT ELEMENTS

This Guide is intended to address MILCON project management. It is arranged according to five principle elements found in virtually every project an Air Force Project Manager is likely to encounter. Whether a project is Design-Bid-Build or Design-Build, the five principle elements are:

- Planning and Programming
- Design (or RFP preparation for design-build)
- Construction Contract
- Construction (or design and build for design-build)
- Project Closeout

These five elements follow the sequence of actions in a typical Design-Bid-Build project. Design-Build projects combine design with construction after contract award. For Design-Build, there is some design that occurs during development of the Request for Proposal (RFP) before contract award, however, the level of design prior to contract award for design-build may be as little as 10% or less.

1-3 RESPONSIBILITIES

1-3.1 Installations

Installations are responsible for requirements identification, to include development of initial draft DD Form 1391's, Requirements Documents and National Environmental Policy Act (NEPA) documentation. The installation will be the AF DM/CM Point of Contact (POC) for requirements verification during design and construction. The primary responsibility for programming MILCON projects lies with the installation commanders, who identify, plan, and program facilities to support their assigned missions in accordance with their base general plans.

1-3.2 Major Commands (MAJCOMS)

MAJCOMs are responsible for MILCON project requirements verification and preparation of programming documents, to include Official (final) DD Forms 1391 and Customer Concept Documents (CCDs) as applicable. MAJCOMs will be consulted on scope issues resulting from change of mission requirements or reductions required for execution within the PA. However, AFCEE will have final authority on acceptance of any changes. MAJCOMs are responsible for providing instructions to installation commanders for planning and preparing construction programs. In addition, MAJCOMs:

- Validate facility requirements and ensure maximum use of existing facilities
- Support installation programming and 1391 development
- Submit programs to the Headquarters Air Force, Programs Division (AF/A7CP)
- Consult with the FOA when required

1-3.3 Field Operating Agency (FOA)

Air Force Center for Engineering and the Environment (AFCEE) is the FOA responsible for managing all AF MILCON (i.e., DM/CM roles and responsibilities). AFCEE will manage the program as a corporate AF requirement and decisions will be driven by the corporate AF mission.

1-3.4 The Air Force Civil Engineer (AF/A7C)

The AF/A7C is responsible for policy development, interpretation, and oversight to ensure compliance and progress toward goals. The Programs Division (AF/A7CP) is the lead in AF/A7C for MILCON program development and execution. The AF/A7C is responsible for:

- Resource advocacy within the Planning, Programming, Budgeting and Execution System (PPBE) process
- Issuing guidance to the MAJCOMs for submitting their MILCON program
- Reviewing and validating MAJCOM submittals
- Issuing Design Instructions (DI) authorizing the start of project design (also called a Planning Instruction)
- Issuing Design Instructions (DI) authorizing any cost and/or scope changes for the project
- Working with other AF offices to determine the proper size and content of the MILCON program
- Advocating and defending the MILCON program during the OSD and Congressional reviews

1-3.5 Office of the Secretary of the Air Force (SAF)

The Deputy Assistant Secretary of the Air Force (Installations) (SAF/IEI) is responsible for facility construction planning and programming policy and oversight. The Deputy Assistant Secretary of the Air Force (Budget) (SAF/FMB) is responsible for budgeting and submitting the Air Force Budget Estimate Submission (BES) to OSD and the Air Force MILCON portion of the President's Budget (PB) to Congress. SAF/FMB is also responsible for distributing funds once MILCON projects are authorized and appropriated by Congress.

1-3.6 Congressional Committees

As part of the PB, AF/A7CP submits an AF BES to Congress. The BES is reviewed by the following four Congressional committees:

- House Armed Services Committee (HASC)
- Senate Armed Services Committee (SASC)
- House Appropriations Committee (HAC)
- Senate Appropriations Committee (SAC).

In order for the project to be approved for construction, it must be authorized by the joint conferences of the HASC and the SASC, and the funds must be appropriated by the joint conferences of the HAC and the SAC.

1-4 MILCON EXECUTION GOALS

MILCON execution goals provide various schedule and cost metrics for individual MILCON projects, and are outlined in the latest version of the Air Force MILCON *Program Management Plan* (PgMP).

1-5 MILITARY FAMILY HOUSING (MFH)

MFH MILCON projects will only involve USAF owned Military Family Housing (MFH). MILCON funds are never expended on leased or privatized MFH. For MFH MILCON, the AF goal is to provide quality, energy-efficient, sustainable, and low maintenance housing that supports the needs of military families and reinforces the development of a strong sense of community. Below is a list of reference documents that provide detailed information and guidance regarding AF MFH:

- AFI 32-6001, *Family Housing Management*
- AFI 32-6002, *Family Housing Planning, Design, and Construction*
- AFI 32-6003, *General Officer Quarters Management*
- AFI 32-6004, *Furnishings Management*
- *US Air Force Family Housing Guide for Planning, Programming, Design, and Construction*
- *Air Force Family Housing Support Facilities Guide*
- *Air Force Housing Privatization* website
- HQ USAF/ILE memo, "*New Military Family Housing (MFH) Size Standards*," 28 May 2002
- *USAF GOQ Guide Resident's Handbook*; GOQ Standards Volume I
- *USAF GOQ Standards for Planning, Programming, Design, and Construction*; GOQ Standards Volume II
- *Project Managers Guide to Military Family Housing*

1-6 MEDICAL CONSTRUCTION

For medical projects, the process varies somewhat from other MILCON. There are no Planning Instructions (PI) in the medical program, and the DM does not issue a Design Instruction (DI) to the agent; rather the Office of the Assistant Secretary of Defense (Health Affairs) (OASD (HA)) issues this authority directly to the agent. Medical MILCON has six major submittal points of which S4 represents the 35% point and S6 represents the 95% point. Below is a list of reference documents that provide detailed information and guidance regarding military medical construction:

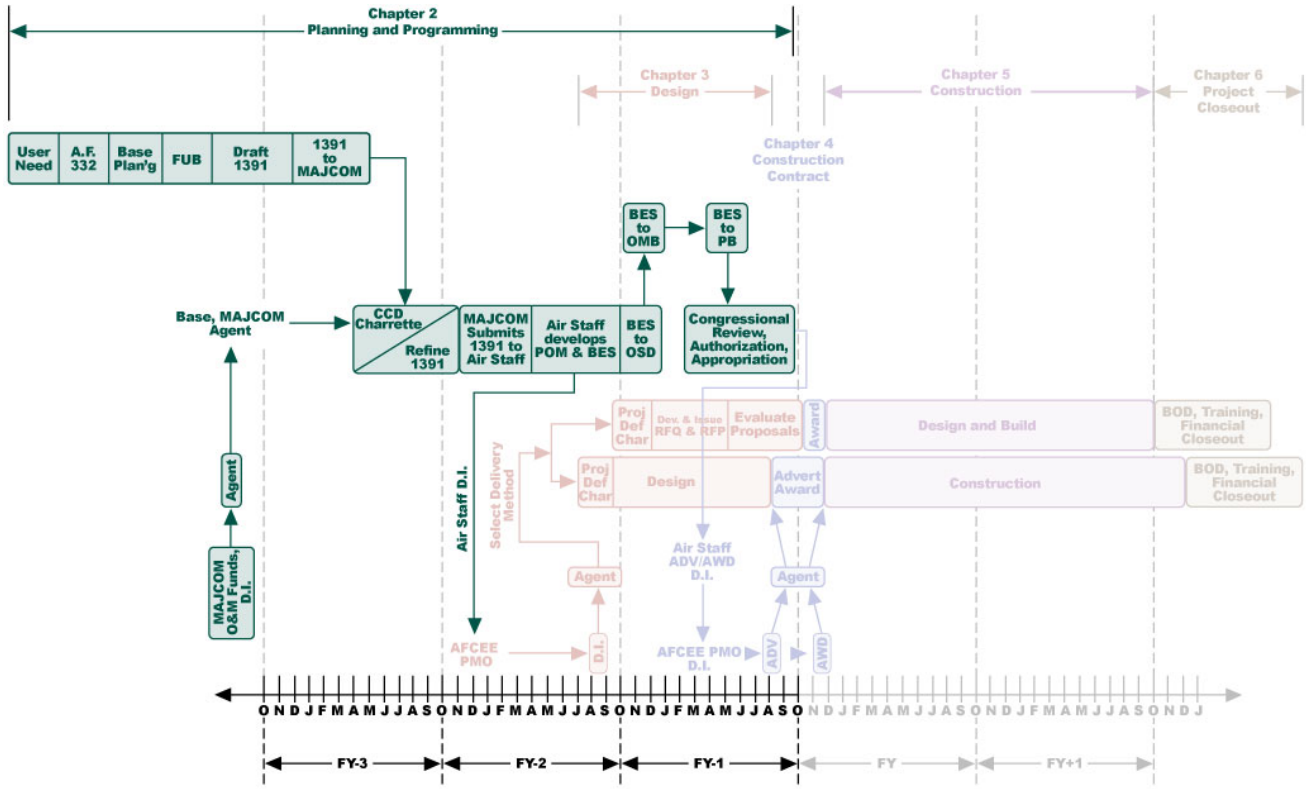
- UFC 4-510-01, *Design: Medical Military Facilities* (reprint of MIL-HDBK 1191)
- Memorandum of Understanding Between the AF and the USACE, *Design and Construction Management of Air Force Medical Facility Projects*

1-7 OPERATIONS AND MAINTENANCE (O&M)

O&M funding is generally for services, minor construction or repair projects or equipment and supplies for a MILCON project that are not funded with MILCON funds. Refer to the various Unified Facilities Criteria (UFC) for O&M guidance regarding specific topics.

CHAPTER 2 - PLANNING AND PROGRAMMING

The highlighted section of the MILCON Process Diagram below shows the planning and programming activities detailed in Chapter 2.



MILCON Planning and Programming

2-1 USER NEED

MILCON project planning begins at the installation when a user has a facility requirement which may not yet be well defined. The user looks to the Base Civil Engineer (BCE) and staff to assist with facility programming development. Usually, the BCE staff will ask that the user formalize his request by submitting an AF Form-332, *Base Civil Engineer Work Request*. From the work request, the BCE staff can begin project planning.

- **BCE staff works with the user to develop facility requirements needed to accomplish the mission.** This is a key step in the preliminary facility planning and programming process. The BCE staff will normally start with AFH 32-1084, *Facility Requirements*, which provides general requirements for a given facility type. From this book value, the programmer works with the user and engineering staff to make adjustments that may be required to determine a preliminary project scope for the draft DD1391.

- **Evaluate existing assets and determine the most economical means of satisfying the requirement.** New construction should be compared with upgrading an existing base facility. Upgrading is not always the most appropriate or economical option.

- **Develop a strong and justifiable case for programming action.** One of the most difficult but important aspects of planning and programming is expressing user needs in clear, concise and well justified terms. Projects that are well defined and easy to understand will compete better for scarce MILCON funds.

2-2 SITING AND PLANNING CONSIDERATIONS

Initial siting and planning are installation responsibilities. The BCE reviews the base planner's site recommendations and tentatively approves alternative sitings for a new MILCON facility. The site alternatives are then presented by the BCE to the Facilities Board (FB) working group, which is usually chaired by the Installation Support Group Commander. The FB working group, in-turn, presents the proposed facility siting to the FB which is chaired by the Installation Commander. After a review, the FB approves or disapproves the siting. During early phases of a MILCON 1391 project review, the BCE and AF DM/CM (when involved at this phase) should assure the following have been considered as a minimum:

- Base Comprehensive Plan
- General Plan
- Component Plans
  - Composite Constraints and Opportunities
  - Infrastructure
  - Land Use and Transportation
  - Capital Improvements Program (CIP)
- Antiterrorism/Force Protection (AT/FP)
- Collective Protection Systems (CPS) if required
- Environmental Impact Analysis Process (EIAP)
- AFI 32-7063*, Air Installation Compatible Use Zone (AICUZ) Program*
- UFC 3-260-01, *Airfield Planning and Heliport Design,* for imaginary surfaces, CZ (Clear Zone), APZ (Accident Potential Zone), etc.
- Sustainable Development, especially Leadership in Energy and Environmental Design (LEED)
- Architectural Compatibility
- Accessibility
- Interior Design
- Quantity Distance (QD) Arcs and Explosive Safety (Refer to AFMAN 91-201, *Explosive Safety Standards)*
- Temporary Facilities
- All special items incidental to the project - such as communications, local area network (LAN), TEMPEST, furnishings (including systems furniture), systems operating manuals, etc. - are properly identified as funded with non-MILCON accounts (O&M, Equipment, R&D, etc.) in accordance with the annual AF/A7CC MILCON call letter.

- Refer to AFI 32-1021, *Planning and Programming of Facility Construction Projects* and AFI 32-1023 *Design and Construction Standards and Execution of Facility Construction Projects* for additional considerations.

QD arc Note: Every new construction project sited within a QD arc must be reviewed by the host base Weapons Safety Office (SEW). From AFMAN 91-201, *Explosive Safety Standards*; all planned construction in support of day-to-day and war plan operations, and MOOTW/contingency/combat operations exceeding 12 months, not meeting QD standards, ***must be approved by the Secretary of the Air Force (SAF)***. The SAF approval process can take up to *two years*. If at all possible, avoid siting new facilities not directly related to the handling of explosives inside QD arcs. If it's unavoidable, start the review process with the base SEW as soon as the project site has been finalized. Refer to the Exception Decision Nomograph - Day-to-Day Operations in AFMAN 91-201 to determine approval authority level if your project is sited within a QD arc.

The AF DM/CM should review the site selected by the installation for a MILCON at the earliest possible opportunity before design starts to determine, with the BCE and appropriate installation POCs, whether the proposed site meets criteria and future requirements of the base Comprehensive Plan including any environmental and QD issues. Siting and scoping decisions should be thoroughly reviewed before the DD1391 cost and scope are finalized. If the project reaches the Project Definition Charrette phase and requires re-siting, unforeseen site related costs (contaminated soils, longer utility runs, additional water, power or sewer requirements for example) may require an unacceptable level of de-scoping and/or loss of critical project features to remain within the approved programmed amount. The project can also be unacceptably delayed (see QD arc note above). Therefore, the initial siting can be critical to the viability of a MILCON project.

2-3 DRAFT DD 1391

The DD Form 1391, *Military Construction Project Data* document (simply referred to as a 1391) is a programming tool used to request and justify a user need. As previously noted, it is generated after the using organization's AF Form 332 work request is submitted to the BCE. This request is reviewed and validated by BCE programmer with assistance from the user. It is also checked against the siting and planning considerations noted above. The request is again reviewed when presented to and prioritized in the Installation MILCON priorities by the Facilities Utilization Board (FUB). The project request is further reviewed and prioritized by the MAJCOM, Air Staff and higher levels of authority during the MILCON approval process.

The DD Form 1391 submitted by the Installation to the MAJCOM is significant for the following reasons:

- It defines the scope and Programmed Amount (PA) for the project.
- This document serves as the budgeting basis for the installation, MAJCOM and the Air Staff in their long-range acquisition plans. Within these plans, projects are tentatively prioritized first by the installation, then by the MAJCOM, then by the Air Staff within a fiscal year.
- This document is used to generate future authorizations or update current authorizations for key project items such as project scope and PA.
- This document is ultimately updated and forwarded to Congress as part of the Department of Defense (DOD) budget request. Congressional approval of a specific MILCON, Military Family Housing (MFH), Reserve, or Medical project is based on the project scope and PA shown on the 1391.

2-4 CUSTOMER CONCEPT DOCUMENT (Developing Requirements)

As an AF DM/CM, you may be asked by the MAJCOM to assist in validation of the scope and PA in the 1391. A process can be utilized to improve the 1391 and facilitate initiation of technical design. This process is variously called Functional Analysis Concept Development (FACD), Customer Concept Document (CCD), Requirements Document (RD) or Project Planning Document (PPD). For simplicity, in this Guide the document will be referred to as a CCD.

2-4.1 CCD Preparation and Funding

The CCD is prepared prior to the start of the technical design to fully develop project requirements. Projects are selected from the FYDP that have the highest probability of becoming approved projects. The CCD consists of a charrette with the installation customers, BCE staff, MAJCOM, FOA, Agent and others from the installation with an interest in the project (Communications, Safety, Security Forces, etc) to fully define facility requirements. The CCD develops or validates the scope and PA of the 1391 and provides Installation Commander buy-in.

It is important to note that unless otherwise directed, the CCD is identified as an "advanced planning activity" and must be paid for with operations and maintenance (O&M) funds rather than planning and design (P&D) funds in accordance with Title 10 U.S.C. 2801, 2807, and DOD Financial Management Regulation, Vol 3 Chapter 17. See also AFMAN 65-604.

2-4.2 The CCD Process

The CCD should be prepared no later than the beginning of FY-2. A team of MAJCOM programmers and, if requested the AF DM/CM, review and prepare a list of candidate projects for CCDs to recommend to the MAJCOM CE for approval. Criteria considered for selection include: is the project in the FYDP, is it a high Base priority, is it a project in a special interest category, does it support a new mission, what is the probability of it being a congressional insert or being in next year's President Budget, etc. After selection, the MAJCOM and/or AF DM/CM develop a design strategy with the Agent with the preference that the designer who prepares the CCD would also prepare the final technical design or RFP (**Note:** the actual design strategy will be determined after a Planning Instruction (PI) is issued by A7). This allows the knowledge gained in the CCD process to be carried into the technical design or RFP. The Agent conducts a charrette at the installation with the customer, MAJCOM, and FOA as requested, to develop facility requirements, prepare alternatives, and conduct review meetings to provide a final consensual solution which is incorporated into a 1391.

2-4.3 CCD Benefits

CCDs help to accurately develop and/or validate the PA by insuring all project requirements and their costs are addressed. They also insure that often-overlooked or insufficiently programmed requirements (such as siting, adequate facility scope, site utilities - power, water, sewer, communications, parking, etc) are addressed and made part of the PA. CCDs also allow the project to move more expeditiously from planning to technical design, thus reducing design time. User buy-in at the beginning reduces user requested changes later in design and construction.

2-5 CCD CHARRETTE

The CCD Charrette is conducted at the installation and ideally occurs before the 1391 for the project has been finalized. The purpose of the charrette is to solidify the project site, justification, scope, and programmed amount. Base senior management buy-in and involvement is essential and their leadership helps to assure user and installation participation in the charrette process. User and Installation involvement is critical to develop a solid scope and PA for the 1391.

2-5.1 CCD Charrette Team

The services of a trained professional facilitator may be used to guide the CCD charrette. The charrette team may also be headed by the AFCEE PM who will act as Facilitator. Facilitators can take a group of people with diverse interests and backgrounds, who have been brought together to work on a project and transform them into a focused team with a comprehensive plan of action, specific deliverables to be achieved, and clear roles and responsibilities. The facilitator is also tasked with gathering data from the engineering disciplines on the team, then editing and consolidating the data to prepare the CCD report and preliminary Value Engineering proposals. Following is the makeup of a typical charrette team:

- AF DM/CM
- DA's project manager
- User's representatives
- A-E team (engineers, architects, cost estimator)
- Facilitator (AFCEE PM, part of A-E team or under separate contract)
- BCE and, depending on the project scope or complexity, other Base support representatives
- MAJCOM Programmer
- BCE Programmer
- Base Community Planner
- Fire Department representative
- Environmental Flight representative
- Bio-environmental representative
- Communication Squadron representative
- Security Forces Squadron representative
- Safety officer

2-5.2 CCD Charrette Report

The AFCEE PM, facilitator and/or A-E assembles a report to provide documentation of the products and process of the CCD Charrette. Such documentation provides the decision-history record for the PA, scope and justification for the 1391 CCD document. It provides a solid foundation for design or preparation of an RFP as well as the documentation necessary to revisit any decision. Following is an example of the content of a CCD charrette report:

- New DD 1391 and DD 1391C
- AF Form 813
- FUB approved site plan
- Engineering and Architectural Design Narratives (analysis)
- Parametric Cost Estimate - AF Form 1178 (cost estimate summary)
- Site Plan, Utility Plan, Demolition Plan, and Schematic Floor Plans and Elevations
- Briefing Presentations
- Briefing Comments
- Unresolved Issues/Action Items
- Final Agenda
- Acquisition Strategy (Design-Bid-Build or Design-Build)

- Bubble Diagrams
- Meeting Notes
- Attendee List
- Value Engineering Summary
- Value Improvement Matrix
- Creative Idea List
- Design Charrette Approach and Value Engineering Job Plan
- Sustainable development recommendations
- Supporting Data
- Pre-Charrette draft 1391's
- Pre-Charrette conference notes
- Hazardous Material surveys
- Soil Contamination Location
- Site Communications layout and information
- Base utility infrastructure information

The CCD charrette report is distributed for comment at the initial, pre-final, and final stages of completion. When comments are finalized, they are sent to the DA for incorporation in the charrette report. If any fundamental issues have been modified that will affect the schedule or budget (e.g., space requirements have been increased, new site conditions have been discovered, additional off-site utility work will be required, etc.), it may be necessary to reconvene the project team for additional analysis to resolve any major issues.

By utilizing automated parametric cost models, project managers can take advantage of the most productive period for smart cost-benefit tradeoffs—during planning and programming. Two critical outputs of project planning needed for developing the Programmed Amount (PA) are the scope (size and type of space with special requirements such as secure areas, clean rooms, hardening, etc.) and supporting facilities (site development, site utilities, landscaping, etc). With facility requirements as a basis, an initial cost estimate (AF Form 1178) and facility description is prepared using one or more of the following tools plus the personal experience of the PM, Agent, designer and programmer:

- UFC 3-701-07, *DOD Facilities Pricing Guide*
- *Historical Air Force Construction Cost Handbook*
- DOD 5000.4-M, *DOD Cost Analysis Guidance and Procedures* (Unit Costs, Area Cost Factors, Size Adjustment Factors, and Inflation Rates).
- Air Force Parametric Cost Engineering System (PACES), a parametric system used by the Air Force and the USACE; free to Air Force with subscription.
- Parametric Cost Estimating Models (PCEM), a parametric system used by NAVFAC
- RS Means Cost Estimating Guides

Note: Refer to current AF MILCON Program Management Plan for most recent AF/A7C Policy guidance for cost and scope approval authority levels.

2-6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP)

Per AFI 32-1021, *Planning and Programming of Facility Construction Projects*, installations shall complete the environmental impact analysis process (EIAP), or have it underway, for each MILCON project submitted to HQ USAF (via the MAJCOM). AFI 32-7061, *The Environmental Impact Analysis Process* describes the tasks and procedures for successfully conducting the AF EIAP. AF Form 813, *Request for Environmental Impact Analysis*, must be completed and submitted to the Civil Engineer Squadron Environmental Office at each installation after the submission of AF Form 332. The PM should review the 813 to be certain that any unusual items (for example, a facility located within a floodplain) have been included in the project costs. The disposal of all waste materials and storm water shall be in compliance with local codes and Environmental Protection Agency (EPA) requirements. When specifying products that are included in the EPA's list of affirmative procurement Guideline items, A/Es must include the requirements for these products to meet or exceed the recycled material content standards established by the EPA.

Safe provisions shall be incorporated for the storage and handling of hazardous materials and spill prevention precautions shall be provided. Refer to AF Engineering Technical Letters, local codes, and base environmental policies regarding storm and waste water disposal.

To stay on top of the permit application process, review at key check points during project design as follows:

1. **CCD Preparation:** The MAJCOM Programmer and AF DM/CM (when applicable) review project design expectations, including known and potential permits required for the project. The CCD should identify all required permits. Hazardous materials abatement should be discussed for all addition/alteration projects or when demolition is required.
2. **Project Definition Preliminary Submittal (10%):** The A-E and Design Agent provide completed permit applications with appropriate filing fee application checks to the AF DM/CM for review before submittal to the Base. The Base will submit permit applications to the proper authorities.
3. **Ready to Advertise (RTA):** AF/A7CP will not grant authority to advertise a project unless the EIAP has been completed and entered into the appropriate screens in ACES-PM. The BCE also should obtain all environmental permits or have reasonable assurances from the respective regulators of obtaining the permits prior to project award. AF/A7CP will review ACES to ensure the environmental construction requirements have been met and that the contact information for the various managers has been entered on the Managers tab.

2-7 MILCON PROGRAM DEVELOPMENT

Although the following discussion primarily relates to an OSD and Air Staff Program Manager's responsibilities, it is important for the PM to be aware of the overall MILCON review and funding process.

2-7.1 Air Staff and OSD Actions

AF/A7CP, in conjunction with other HQ USAF functional offices, reviews project requirements in detail and validates the needs, engineering feasibility, economic benefits, compliance with Air Force objectives, and project costs. In accordance with current corporate Air Force objectives and guidance, the validated projects are prioritized and a consolidated Air Force list is developed. Based on the total funding committed to MILCON in the Program Objective Memorandum (POM), the prioritized list is formulated into the MILCON portion of the Air Force Budget Estimate Submission (BES). (In addition, AF/A7CP notifies the MAJCOMs and FOA, and authorizes the initiation of the

design of validated projects. Congressional notification per 10 U.S.C. 2807 may be required prior to award of an Architect-Engineer (A-E) contract.) The MILCON BES submittal to OSD consists of the front pages of the DD Forms 1391 for all projects included in the program. The following actions take place after the BES has been submitted:

- OSD reviews each project in detail to see if the documentation is complete and that projects are well justified and in compliance with the latest OSD planning and programming guidance. OSD then issues draft Program Budget Decisions (PBDs) that transmit their proposed actions (delete, re-price, defer to a future year) on certain projects.
- After receipt of the draft PBD, the Air Force has an opportunity to appeal the proposed action by filing a written reclama. OSD actions on these reclamas (along with high-level negotiations) determine the final size and content of the MILCON program.
- OSD submits the adjusted BES to the President through the Office of Management and Budget (OMB). After receiving the approval of OMB and the President, the President's Budget (PB) is submitted to Congress.
- Congressional committees responsible for authorization and appropriation of MILCON requirements hold hearings attended by witnesses from each service. These hearings, along with detailed reviews of the MILCON requests, result in a report detailing the committee's recommendations. Committee differences are resolved in conference, and legislation is drafted that authorizes and appropriates the MILCON program in line-item detail.
- In addition to providing approval, disapproval, and revisions to the individual projects contained in the Air Force MILCON budget request, Congress often adds projects to the program (known as Congressional Inserts (CI)). These added projects, also line-item specific, become part of the authorized and appropriated MILCON program for the fiscal year. To help ensure that the projects added by Congress are valid requirements, the OSD Comptroller requires each service to prepare a project listing for all the FYDP years. Congress is encouraged to not add any projects that are not included on the FYDP list (known as the McCain Act), which is updated each year and submitted to OSD along with the BES.

2-7.2 Milestones of Typical Submissions

The Air Force submits a biennial (2 fiscal years) budget (which includes MILCON) to OSD. OSD submits the budget to Congress every even-numbered fiscal year. OSD reviews both years in detail and issues decisions on each. However, Congress does not review the second year's program, and it is resubmitted by the Air Force to OSD the next year as an amended program. After OSD reviews and approves the amended program, it is submitted to Congress for its review. The following section presents the key milestones of a typical submittal of MILCON programming documentation. Note: Fiscal Year (FY) represents the FY for which the MILCON project is programmed; FY-3, FY-2, and FY-1 represent three, two, and one year before the FY, respectively; and FY+1 indicates one year after the FY.

2-7.2.1 FY-3

- Early in 2nd Quarter, installations submit the FY and the FY+1 documentation to the MAJCOMs.

- MAJCOMs develop a prioritized list of MILCON requirements for both fiscal years and finalize the project documentation for submittal to Air Staff.

2-7.2.2 FY-2

- MAJCOMs submit initial documentation to the Air Staff in the 1st Quarter. (Normally, final submittals for the FY projects are in November and initial submittals for FY+1 projects are in December.)
- The Air Staff reviews the submittals and hosts MAJCOM briefings for project validation in the 2nd Quarter.
- After project validation, a prioritized list of Air Force construction projects is developed for each FY through an established corporate review process.
- During the Fourth Quarter, AF/A7CP conducts an investment budget review with SAF/ FMBI. Changes resulting from this review are made to the program, and it is submitted to Air Force senior leadership for final approval. The approved program becomes the MILCON portion of the BES.

2-7.2.3 FY-1

- The Air Staff submits the BES to OSD.
- OSD conducts a detailed review of the BES and issues PBDs, which contain proposed actions on the projects (approval, deferral to a later year, deletion from the program, price adjustment). After Air Force review, final PBDs are issued.
- The Air Force adjusts the biennial program according to directions contained in the final PBDs. The adjusted program becomes the Air Force MILCON portion of the PB, which is forwarded to Congress for review, authorization, and appropriation.

2-7.3 Approval Authority

As described above, the approval authority for MILCON projects rests with Congress. Re-approval authority for funded MILCON projects in cases where project scope and/or costs have changed are as indicated in Military Construction Execution Controls Policy and AFI 32-1023. Military Construction Execution Controls Policy can be found in the most recent Program Management Plan.

2-8 AUTHORIZATIONS

Required authorizations include the DD Form 1391 and Congressional Notification Action in accordance with Title 10 U.S.C. 2807.

2-8.1 Congressional Review

Every MILCON project is a line item in the Department of Defense (DOD) portion of the President's Budget request sent to Congress. The process of line item project approval and funding involves the review by the House of Representatives' Armed Services Committee (HASC), the House of Representatives' Appropriations Committee (HAC), the Senate's Armed Services Committee (SASC), and the Senate's Appropriations Committee (SAC). The budget request is actually two requests, one for authorization (HASC and SASC review/approval) and one for appropriation (HAC and SAC review/approval).

If a MILCON project clears all Congressional committees (commonly referred to as "marked"), it should be authorized and funded in the final bill. Sometimes requested projects don't clear all committees. As a result, the differences between the House and the Senate appropriations or

authorizations conference committees normally are negotiated before forwarding to the respective full bodies for a vote. It is during these negotiating sessions that projects which only cleared one of the committees may yet be added to the bill. Upon passage of the authorization and appropriation bills and the signature of the President, the MILCON projects can be awarded.

Typically, each bill authorizes a MILCON project for a period of three years and appropriates the funds for five years, both beginning from the start of the fiscal year or the signing of the bills if later. If the construction funds for a project are not obligated by the end of the three-year period, it is possible to request and receive an authorization extension from Congress when the situation warrants the extension. Authorization extensions are usually granted in one-year increments. Unobligated project funds normally expire at the end of five years and are held in an expired funds account at SAF/FMBIC for another five years. The expired funds are used to pay claims on financially closed projects and to make within-scope changes on the work of the original contract. The funds remaining in the expired funds account are withdrawn by the Department of the Treasury at the beginning of the tenth year and placed into a cancelled funds account available for use by other Federal agencies to pay claims.

The A7CP rule of thumb is to use all "old" money first and minimize the amount of funds that expire and can't be used on a project.

2-8.2 Notification Action (A/E Fees Greater than $1,000,000)

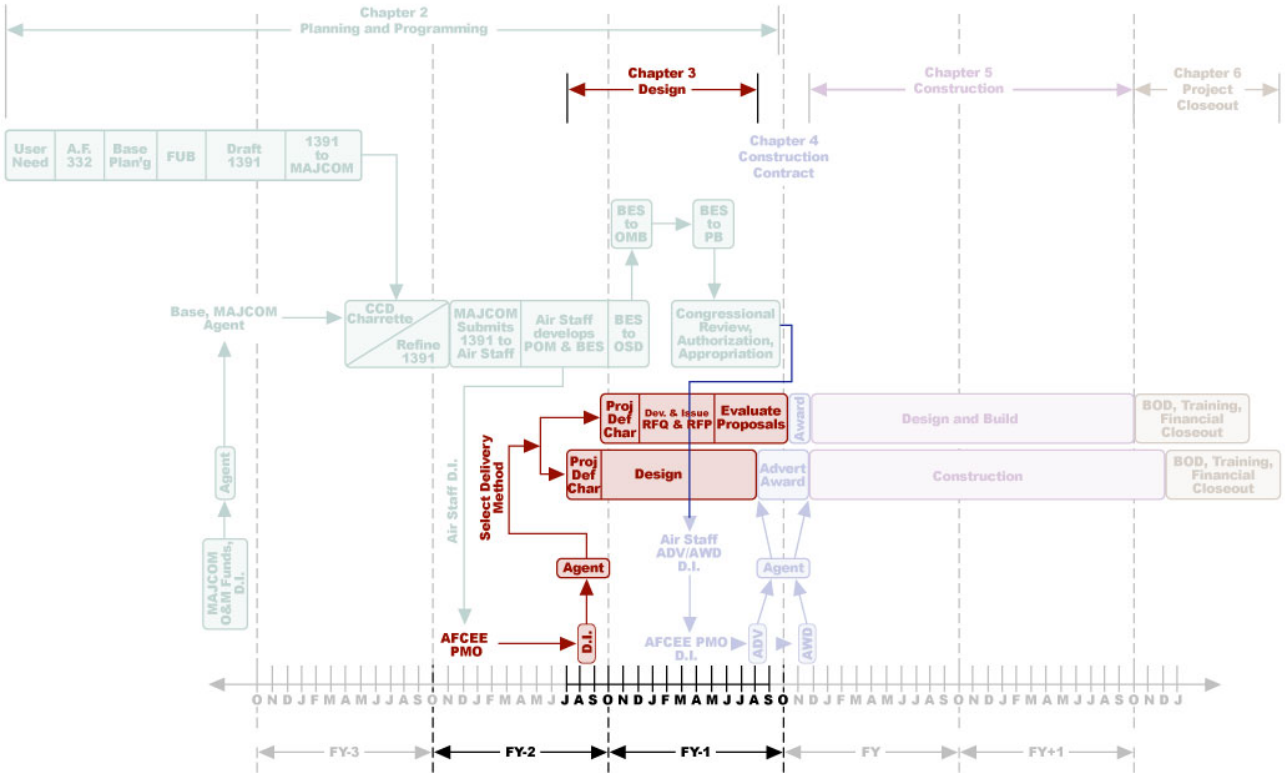
When the cost of A-E design services for a project, or a group of related projects is estimated to exceed $1,000,000 Congress must be notified in accordance with Title 10 U.S.C. 2807 to allow comment on the proposed action before publishing the Federal Business Opportunities synopsis. AF/A7CP will initiate this Congressional notification in the August-September timeframe and will notify the MAJCOM and FOA when DOD submits the notification package to Congress. Staffing actions for "2807 notification" typically take 30-45 days. The Federal Business Opportunities synopsis can be published once AF/A7CP has issued a Design Instruction in ACES-PM stating that the notification action is complete.

It is the AF DM/CM's responsibility to check the appropriate screen in ACES-PM and follow up at the end of the 30-45 day period if AF/A7CP has not issued a DI. Until the notification process is completed, the A-E contract cannot be awarded and a delivery order for an existing Indefinite Delivery Indefinite Quantity (IDIQ) A-E contract cannot be processed. The AF DM/CM must ensure that time for this process is included in the A-E Selection Schedule. The notification required by Title 10 U.S.C. 2807 does not apply to IDIQ contracts, but does apply to individual A-E delivery orders on the contract.

AF/A7CP may restrict the level of design if the expected design fees will exceed $1,000,000 (requiring Title 10 U.S.C. 2807 notification to Congress), or because of unusual circumstances. If the project is included in the AF POM and the design notification complete, AF/A7CP typically authorizes MAJCOMs to design the project to the Ready to Advertise (RTA) milestone. Once PMs receive the Air Staff DI, the AF DM/CM issues a DI to the design/construction agent (most frequently the U.S. Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC, AFCEE or AF Waterbeach (UK only).

CHAPTER 3 - DESIGN

The highlighted section of the MILCON Process Diagram below shows the Design activities detailed in Chapter 3



MILCON Design Process

3-1 DESIGN DIRECTIVES

Below are the different types of MILCON design directives that will be issued throughout the design and construction process:

3-1.1 Air Staff Design Instruction (DI)

AF/A7CP requires the AF DM/CM to enter design data into ACES-PM to include design method (usually IFB-Invitation for Bid or DBD - Design Build Contract) and design funds required before the initial DI is issued. An AF/A7CP DI (sometimes referred to as a Planning Instruction or PI) issued via ACES-PM changes the project from programming status to design status, and, barring any need for "2807 notification" to the Congress, authorizes the AF DM/CM to initiate design for a conventional design-bid-build project or to initiate preparation of the RFP for a design-build project, at the AF DM/CM's discretion subject to limitations stated in the DI and coordination with the installation, Agent and MAJCOM. The AF DM/CM has 30 days after the issuance of the Air Staff DI to issue the DI to the design agent.

During the design process AF/A7CP can issue subsequent DIs to the AF DM/CM. These DIs inform the AF DM/CM when the "2807 notification" is complete; identify changes in project status, scope, programmed amount; grant Authority to Advertise and Authority to Award; and identify other actions that affect the project.

3-1.2 AF DM/CM Design Instruction (DI)

AF DM/CM Issues DIs (also referred to as Field DIs) to the DA as the AF/A7CP DIs are received. For either design-build or conventional design-bid-build projects, the AF DM/CM must promptly issue DI authorizing the DA to proceed with RFP preparation or design. The initial AF DM/CM DI to the DA is the authority to start design actions such as A-E selection and award, site investigation, and design or RFP preparation. The authorization includes as a minimum the project title, program, the "design to" authority, programmed amount, and scope. Follow-on AF DM/CM DIs should include only the changes and updates to the initial AF DM/CM DI. The AF DM/CM should provide copies of all AF DM/CM generated DIs and their attachments, as necessary, to all appropriate organizations; information copies should go to the MAJCOM programmer, installation PM, and AF/A7CP.

> Note: See Section 3-5, *Design Development* for a discussion of ACES-PM milestones for design-build projects.

The AF DM/CM issues the authority to proceed with design at the following stages, based on project validation and required milestones for Congressional approval:

- **Selection of A-E (2%)**. Includes A-E negotiations, and all other associated activities up to, but excluding, award of RFP or design contract.
- **Notice to Proceed (3%)**. Directs the A-E under contract or Design Agent in-house staff to initiate RFP preparation or design.

3-1.3 Authority to Advertise Construction

The AF DM/CM updates the Milestones in ACES-PM and notifies AF/A7CP via email when a project is Ready to Advertise (RTA). AF/A7CP in-turn grants authority to advertise (ATA) by issuing a Design Instruction (DI) to the AF DM/CM via ACES-PM. This DI signals the AF DM/CM, MAJCOM, Base Civil Engineer (BCE) and User that the project has been included in the authorization and appropriation bills signed by the President. AF/A7CP will grant authority to advertise for a project if **all** of the following criteria are satisfied:

- Project included in the authorization and appropriation bills signed by the President;
- Project at least 95% designed as reported in ACES-PM;
- Basic CWE/PA ratio is not greater than 110%;
- Overall AFCEE fiscal year MILCON program CWE/PA ratio does not exceed 100%; and
- EIAP is completed and reported in ACES-PM.

Once ACES-PM is updated for their project, the AF DM/CM will send an email to their AF/A7CP PM to request authority to advertise. The email must contain the following information:

- Project Number
- Project Title
- FY
- PA
- CWE
- CWE/PA ratio
- DD1391 scope
- Scope as designed
- Copy of DD1391

The AF/A7CP PM will issue an Authority to Advertise date (in the Design Instruction menu of the Air Staff drop down in ACES-PM) when the above information is provided. The AF DM/CM cannot issue a DI to the Agent authorizing advertisement until this date is provided in ACES-PM.

A project with a basic CWE/PA ratio greater than 110% may not receive authority to advertise if the AF/A7C funding position does not support the higher cost or the likelihood of exceeding the construction threshold amount during bidding or construction is too great. In these situations, the AF DM/CM must pursue cost reduction measures such as project re-design, project scope reductions within authorized limits, deletion of project requirements, or identification of additive bid items. AF/A7CP, as a rule, will grant advanced authority to advertise prior to the authorization and appropriation bills signed by the President if certain criteria are satisfied:

- Project has passed Congressional review by at least three of the four committees without adverse language;
- Project at least 95% designed as reported in ACES-PM;
- Basic CWE/PA ratio is not greater than 95%; and
- EIAP is completed and reported in ACES-PM

3-1.4 Authority to Award

ACES-PM Milestones must be updated to show: Actual Advertise Date and Actual Bid Opening Date. Construction funds for most MILCON projects are transferred to the Agent after bid opening. The AF DM/CM notifies AF/A7CP of the proposed award CWE via email and ACES-PM. If the award CWE does not exceed the PA, AF/A7CP issues a DI via ACES-PM to the AF DM/CM granting authority to award the contract and requests that SAF/FMBIC send funding equal to the award CWE to the Agent. At this time the AF DM/CM will send the Agent a DI authorizing award and update ACES-PM Milestones to show the Actual Award Date when the contract is awarded.

In accordance with Title 10 United States Code (U.S.C.) Section 2853, Authorized Cost and Scope of Work Variations, if the award CWE is greater than the PA but within the authorization threshold, the AF DM/CM must identify available funding source(s) for the difference between the award CWE and the PA. If the award CWE exceeds the PA by 25% or $2.0 million, whichever is less, the AF cannot award the contract and the project must be redesigned, re-bid, or reprogrammed. Additionally, if the bid CWE is less than 75% of the PA or the award scope is less than 75% of the DD1391 scope, Congressional Notification is required **before** the project is awarded. See the latest AF Program Management Plan for a detailed discussion on approval levels for cost and scope variations that approach Air Staff and/or Congressional thresholds.

Once ACES-PM is updated for their project, the AF DM/CM will send an email to their AF/A7CP PM to request authority to award. The email must contain the following information:

- Project Number
- Project Title
- FY
- CWE/PA ratio
- Low Bid CWE
- Copy of bid report

The AF/A7CP PM will issue an Authority to Award date (in the Design Instruction menu of the Air Staff drop down) in ACES-PM when the above information is provided. The AF DM/CM cannot issue a DI to the Agent authorizing contract award until this date is provided in ACES-PM.

3-2 PROJECT MANAGEMENT

3-2.1 Project Management Plan

Key to successful project management and execution is to establish a Project Management Plan (PMP) at the outset of the project design process. In the PMP the AF DM/CM should sketch a project team organization chart and set the rules to be followed for communication for the project, from design through contracting, construction and closeout. The PMP should include information about who calls whom, who gets copied on information, how many copies of which A-E submittals go to whom, and so forth. Make sure that everyone understands each other's roles and responsibilities.

3-2.2 Acquisition Strategy

Contracting is a Design and Construction Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. However, before design starts, the AF DM/CM should decide the appropriate project delivery (business) strategy in conjunction with the MILCON Program Manager, Design Agent, the customer and base civil engineering staff. To establish a strategy, the AF DM/CM must decide, with the Design Agent's recommendations, on the appropriate delivery method. Selection of the delivery method and contract type set the framework for determining the appropriate project acquisition strategy. Refer to Appendix B, *Construction Contract Types* for additional information to assist the decision making process. The acquisition strategy should also address the selection of a qualified architect-engineer. Refer to Section 3-4, *A-E Service Acquisition* for details.

3-2.3 Delivery Methods

The booklet, *Selecting Project Delivery Systems*, published by the Project Delivery Institute compares Traditional Design Bid Build (DBB) with Design Build (DB). In summary, the booklet shows that on average, unit costs are about 6% lower for DB versus DBB, DB projects are constructed about 12% faster than DBB, and DB projects are delivered approximately 33% faster than DBB. Additionally, DB projects have about 5% less cost growth and about 11% less schedule growth than traditional DBB projects. In terms of quality, DB has been shown to consistently provide better performance in these areas of concern: ease of startup, lack of call backs, low operation and maintenance cost, quality of envelope (roof, structure, and foundation), quality of interior space and layout and quality of process equipment and layout.

Whether a variation of DB or DBB is selected as the appropriate delivery method for a project, the Air Force assumes considerable up-front responsibility in the development of project requirements. In the case of DBB, the AF is assuring the constructor that the drawings and specifications that are provided are complete and error free. In the case of DB, the AF must carefully prepare performance specifications and any required drawings as a part of the request for proposal (RFP). The quality of the final constructed product is only as good as the up front preparation of requirements.

For DBB, the AF assumes all liability (risk) for the completeness and accuracy of the drawings and specifications. In DB, however, nearly all risk is shifted to the DB contractor who begins a project with as little as a 10% design; however, the AF assumes risk in writing the performance specifications. In DB, the AF reviews the design only for compliance with the requirements of the performance specifications and RFP.

For DBB, the AF warrants to the contractor that the plans and specifications are 100% complete. The AF is responsible for any errors or omissions that may have been included in these documents. For DB, however, the DB contractor warrants to the AF that his plans and specs are complete. The DB contractor owns the details of the design and is liable for errors or omissions.

Ultimately, the decision whether to use DBB or DB requires a change in the level of trust between the contractor community and the AF. DBB affords a large degree of control of the design to the AF and is a process that is familiar, Whereas DB requires the AF to relinquish much of that control and trust that the DB contractor will provide a quality facility on time and in budget.

> Note: Refer to the Air Force *Design-Build Guidelines* for detailed information about the Design-Build process.

The Air Force is at the forefront of innovative execution methods in the DOD and new methods are constantly being refined. More information regarding delivery methods may be found in Appendix C, *Common Delivery Methods*.

3-2.4 Milestones and Submittals

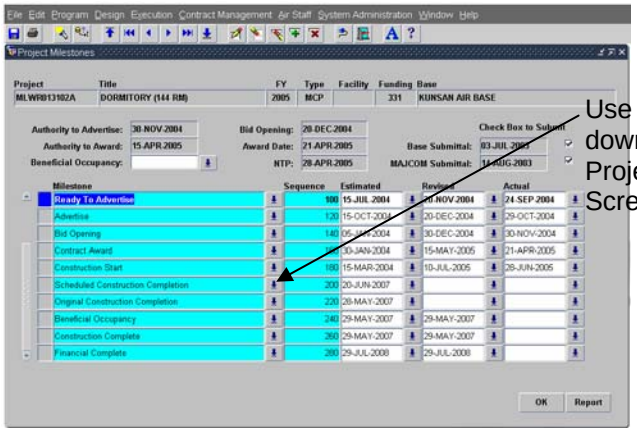
The design schedule is established by the DA, but the AF DM/CM must ensure the schedule adequately addresses Air Force requirements. The AF DM/CM must review/confirm the design schedule with the DA. Track progress closely and obtain justification for any slippage.

Minimize schedule revisions by:

- Providing Air Force requirements in a timely manner.
- Communicating with the DA regularly and confirming submittal dates.
- Being alert to circumstances that may result in delay. Notify the appropriate office of any concerns by phone, e-mail, message, or official correspondence.
- Verifying that site visits, surveys, and data collection occurred when expected.
- Elevating issues to higher levels when reasons for delays are inadequate or do not match the facts.

For new MILCON projects, the AF DM/CM is responsible for entering the project milestones into ACES-PM from the PMP. The Air Staff PMs use these project milestones to manage the MILCON program, which includes the calculation of the Dirtkicker metrics. **Use the drop down menus on the Project Milestones screen** in ACES-PM and **at a minimum** select and include the following eleven milestones:

- Design Start
- Design Complete
- Ready to Advertise
- Advertise
- Bid Opening
- Contract Award
- Notice to Proceed
- Construction Start
- Beneficial Occupancy
- Construction Complete
- Financial Complete



The AF DM/CM may add additional milestones from the drop down menus or create their own milestones as long as they are in addition to the eleven listed above which are required by AF/A7CC.

3-2.5 Scheduling and Critical Need Dates

Identify any critical need dates associated with the project as soon as possible since these dates' impact design requirements and the construction schedule. The "critical need date" is the date established by the AF DM/CM or the user as the last date the facility can be turned over to the user for occupancy without adverse mission impacts. These dates may be driven by a new or changed mission, or may be due to the established delivery date of specialized equipment integral to the facility and/or a critical mission.

3-2.6 Design Agent Schedules

The AF DM/CM should set tentative schedules based upon the MILCON execution goals in the AF Program Management Plan and request a schedule from the Agent. The Agent should provide the shortest possible realistic design schedule within 10 days of issuance of the AFCEE DI for initial input into ACES-PM. The AF DM/CM should revise ACES-PM, as necessary, after acceptance of the Agent schedule. Review the schedule and compare it with the historical averages. Question the Agent if significant differences occur. Adjustments may be required to meet Air Force goals.

3-2.7 Construction Phasing

When construction phasing is required, include possible strategies during the design phase for a design-bid-build project or RFP preparation for a design-build, note cost and schedule impacts, and discuss possible strategies to be considered by the A-E. Include phasing plans in the drawings and specifications. Reasons for phasing may include demolition, temporary facilities, hazardous materials abatement, renovation, critical need date, or other justified requirements. Complex construction phasing will require at least one coordination meeting specifically addressing the subject. Ensure the phasing plan is coordinated and completely understood by the Users and that the milestone dates are included as a construction contract requirement.

3-3 DESIGN CONSIDERATIONS

Good design must incorporate a variety of different requirements that will have a profound impact on the development of the project. Primary design considerations include the following:

3-3.1 Environmental Permitting

As part of the project definition charrette, discuss the known environmental issues surrounding the project with the DA and the A-E. Require the A-E to review current governing environmental regulations and talk with the Base environmental office to determine all environmental impacts of the proposed project. Require the A-E to identify all environmental construction permit requirements as part of the Design Analysis. AF/A7CP policy is that the Environmental Impact Analysis Process (EIAP) must be initiated (and ideally completed) before a DD Form 1391 is submitted to AF/A7CP. The optimum situation is that the EIAP is completed before the start of the project definition phase. Air Force policy is that a project will not be advertised until the EIAP is complete. Refer to Section 2-6, *Environmental Impact Analysis Process* for additional information.

3-3.2 Sustainable Development

It is AF policy to incorporate sustainable development by using Leadership in Energy and Environmental Design (LEED™) criteria as defined by the United States Green Building Council (USGBC). The *Air Force Sustainable Facilities Guide* provides tools, suggested guidelines for selecting candidate projects, and complete AF sustainable development policies. The *Whole Building Design Guide* further explains the environmental issues related to building materials and provides technical guidance on green building material selection and environmental issues. Sustainable development must be one of the primary objectives in the planning, design, construction, and operations and maintenance of Air Force facilities and infrastructure. This means looking for planning, design, and construction solutions that enhance the project's environmental performance in addition to its life cycle cost. Make every effort throughout the facility delivery process to make the project environmentally sustainable. Refer to most recent *Air Force Sustainable Development Policy* for further guidance.

3-3.3 Architectural Compatibility

The Air Force has established architectural compatibility Guidelines to reflect the cultural, regional, architectural, and environmental influences for most Air Force installations. These Guidelines include architectural style, materials, colors, and landscaping recommendations and should be a part of the CCD. Refer to the *Air Force Architectural Compatibility Design Guide* for general guidance regarding architectural compatibility issues. In addition, many bases also have unique architectural compatibility guidelines or facilities excellence standards that may influence design. Consider other related documents such as the *USAF Assistance Team Program Handbook*, General Plans (GP) that address pedestrian and vehicular traffic circulation, projected base growth, consolidation of functions, open areas, and overall land use requirements.

Ensure the A-E reviews the portions of the GP dealing with architectural compatibility before the start of design. Identify key or cornerstone facilities at the CCD Charrette. Ensure the A-E reviews this plan, and designs the project in accordance with its goals and objectives. The AF DM/CM must ensure the A-E understands the Base Architectural Compatibility Guidelines are part of the design criteria.

3-3.4 Antiterrorism/Force Protection (AT/FP)

The DOD objectives are to reduce personnel exposure to security threats and limit property damage. The DOD policy and guidance for antiterrorism and the physical security of facilities is contained in UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings* and UFC 4-010-

02, *Design (FOUO) DOD Minimum Standoff Distances for Buildings*. These requirements are applicable for new construction, restoration, and modernization of existing facilities. Additional AT/FP guidance may be found at the following:

- AFI 10-245, *Air Force Antiterrorism (AT) Standards*
- AFI 31-101, *The Air Force Installation Security Program (FOUO)*
- AFI 31-203, *Security Forces Management Information System (SFMIS)*
- *USAF Installation Force Protection Design Guide*
- *USAF Entry Control Facilities Design Guide*
- DOD Directive (DODD) 2000.12, *DOD Antiterrorism/Force Protection (AT/FP) Program*
- DOD Instruction (DODI) 2000.14, *DOD Combating Terrorism Program Procedures*
- *EUCOM Operations Order 03-11 with FRAGO* (latest edition) for United States Air Forces in Europe (USAFE) installations

The AF DM/CM should ensure that base level personnel knowledgeable of special security requirements are present at the CCD Charrette and project definition charrette to thoroughly explain the requirements particular to the project, including security issues during construction

3-3.5 Interior Design Policy

In terms of a total integrated facility design, the Air Force considers the functional and visual aspects of design as essential as the electrical, mechanical, and structural systems. In accordance with UFC 3-120-10, *Design: General Interior Design Requirements* interior design is required on new building construction and renovation projects regardless of funding source or type of project unless otherwise directed. Reference this document for specific requirements.

The AF DM/CM should ensure what interior design requirements are included in the CCD or as part of the project requirements. Communicate exceptional requirements to the Design Agent. The AF DM/CM should also ensure these issues are discussed and resolved with the Base and MAJCOM (as appropriate) personnel early in the design process. Advise the Design Agent that interior design requirements should be included in the Federal Business Opportunities Synopsis. The AF DM/CM should help establish the furnishings budget for the project. Data collecting conferences between the user and interior designer usually occur during the various design review conferences. On larger projects and those with controversial or high visibility interest, the AF DM/CM should attend and serve as the facilitator at such conferences. Small or simple jobs may not warrant the same attention.

For the interior design effort to be successful, the A-E must have a working knowledge of the Federal procurement system. A furniture acquisition strategy must be developed early in the facility design process. Options can include Contractor Furnished/Contractor Installed FF&E (CFCI), Government Furnished/Government Installed FF&E (GFGI), and Government Furnished/Contractor Installed FF&E (GFCI).

3-3.6 Accessibility

As a matter of law, new construction, additions, and renovations of existing facilities must be designed and constructed in compliance with the Architectural Barriers Act (ABA), which requires that people with disabilities have access to facilities designed, built, or altered with Federal money or leased by Federal agencies. DOD has not yet issued implementing guidance for the new ADA

and ABA Accessibility Guidelines published by the U.S. Access Board (Federal Register July 23, 2004 and amended August 5, 2005). Nonetheless, the best practice is to comply with these guidelines.

All functional areas shall be barrier-free and accessible to the physically handicapped. Site and building designs should enable physically handicapped persons to act independently and enjoy the full range of programs provided. Level changes may be included but must be accommodated by ramps suitable for wheelchair access, both indoors and outdoors. Include access to all areas and facilities, including staff and work areas, restrooms, water fountains, and pay telephones.

3-3.7 Building Codes

The DOD criteria are based on national standards, private sector consensus standards, and model codes. Refer to UFC 1-200-01, *Design: General Building Requirements* for specific guidance. In the event of conflicts between model codes and DOD criteria, use DOD requirements.

3-3.8 Renderings and Models

The decision to obtain a rendering, model, computer based simulation, or Building Information Modeling (BIM) must be included in the Statement of Work for a Design-Bid-Build project and the requirement should be included in the RFP for Design-Build projects. The final color rendering should accompany the Pre-final Design Submittal (90%) and should clearly illustrate the colors, textures, and shape of the final design.

In some cases, a scale model is the only way to adequately address all the complexities of a proposed facility. The A-E should submit an example of the proposed model style at the 10% submittal for AF DM/CM approval before initiating development of the final model. Make sure the DA and the A-E understand that all rendering and model originals, photographs, and slides will be turned over to the AF DM/CM for distribution within the Air Force.

3-4 A-E SERVICE ACQUISITION

A-E Service acquisition is an Agent responsibility. For detailed requirements, see FAR Part 36 and Architectural Engineer Services with the Air Force. The AF DM/CM should work with the Agent to review and clarify responsibilities prior to commencement of the A-E selection process. The purpose of this chapter is to help the Air Force Project Manager (AF PM) through these selection and contracting steps. While some of the information in this section applies to Operation and Maintenance (O&M), P-341, Minor Construction, Military Family Housing, Medical, and Non-Appropriated Funded (NAF) projects, it is intended to address primarily the Military Construction (MILCON) program. This section is written from the perspective that the Air Force Project Manager (AF PM) is the Design Agent (DA) at the FOA. When the AF PM is not the DA, the AF PM's responsibilities change (serves as the AF DM/CM). In these situations, the AF PM should work with the DA to review and clarify the AF PM responsibilities prior to commencement of the A-E selection process. Refer to Appendix B, - *Construction Contract Types* for information regarding the different contracting methods. The AF DM/CM should be a voting member of the selection committee for single A-E contracts and recommends to the Agent the A-E to be selected from the IDIQ list.

3-4.1 Architectural-Engineering (A-E) Services

See AFPAM 32-1005, *Working in the Engineering Flight* for additional information on acquiring A-E Services.

Design Phase (Title I) services consist of field surveys and investigations to obtain design data and the preparation of contract plans, specifications, and cost estimates.

Construction Phase (Title II) services are broadly defined as services provided by A-E firms, in-house personnel, construction management firms, or other sources during the construction of a project. Funding for such services depends upon whether these services are provided for the purpose of completing the design effort or assuring contractor compliance with requirements. See AFPAM 32-1005 and AFI 32-1023 for additional information on selecting A-E firms.

These services relate to specific construction projects and consist of construction supervision and inspection of construction. Other A-E Services involve design and construction related services, but are not connected with a specific construction project. The services consist of developing design criteria, fact finding studies, surveys, investigations, and the performance of environmental projects involving prevention, compliance, and restoration when the services of registered architects or engineers are required. Excluded are services that need not be performed by a registered engineer or architect, such as providing design and construction equipment or computer programs.

Describe the specific type of A-E service required, such as planning, design, engineering, surveying or mapping, or construction phase. The following section addresses types of A-E services and funding criteria in greater detail.

6% Fee Limitation: Title 10, United States Code, *Armed Forces* sections 4540 *(Army)*, 7212 *(Navy)*, and 9540 *(Air Force)* limit that portion of the A-E's fee for direct design services to 6% of the estimated cost of the construction project for producing and delivering the designs, plans, drawings, and specifications needed for a construction project. FAR 15.404-4, *Profit* and DFARS 236.606-70, *Statutory Fee Limitation* provide additional guidance. The record of negotiations and the Government estimate must clearly show that the cost of direct design services does not exceed the 6% limitation.

Not Considered Direct Design: The following are examples of A-E services that are not considered an integral part of direct design services for a military construction project and should be EXCLUDED from the A-E fee when determining compliance with the 6% limitation. These services, as well as direct design services, should be funded from the planning and design (P-313) account:

- Initial site visits
- Field, topographic, property, boundary, utility, and right-of-way surveys
- Subsurface explorations and borings, soils and materials testing, and resultant reports
- Flow gauging and model testing
- Reproduction of design documents for review purposes
- Preparation of construction cost estimates
- Interior Design services
- Preparation of general and feature design memoranda
- Models, renderings, computer simulations or photographs of completed designs
- Construction-phase services
- Preparation or verification of as-built drawings during construction
- The services of consultants not specifically applied to the preparation of designs, plans, drawings, or specifications for a project
- Preparation of general and development criteria not specifically related to a military construction project

- Management and contract administration of A-E services contracts in connection with services excluded from the 6% limitation
- Document reproduction, travel, and per diem costs in connection with services excluded from the 6% limitation

The following A-E services are considered "advanced planning" and must be funded from the operations and maintenance (O&M) account:

- Developing a master plan for an installation
- Developing and validating MILCON documentation prior to commencing project design (such as the CCD Charrette and CCD documentation)
- Preparing engineering analyses and studies to develop technical design parameters
- Preparation of as-built drawings of existing facilities prior to subsequent renovation or alteration projects
- Preparing environmental impact assessments, statements, and supporting data
- Management and contract administration of A-E services contracts in connection with the above services
- Document reproduction, travel, and per diem costs in connection with the above services

See Appendix Section A-13, *Federal Acquisition Regulations* for a list of FAR references pertaining to A-E contracting.

3-5 DESIGN DEVELOPMENT

The following discussion pertains to traditional design-bid-build projects; however, some requirements are the same for either design-bid-build or design-build. See Appendix B for an abbreviated discussion of contract types and Appendix C for common delivery methods. Design progress submittals are an opportunity to review the A-E's design products, to check compliance with criteria, to add or change design criteria, to answer questions, and to discuss design issues and problems. Identify the User's needs early in design, not during construction.

As design progresses, enter the percentage complete in the Design Actual % of the Design Tab in ACES PM. Note that when the Air Staff enters the DI in ACES-PM, the Design Actual % is automatically updated to 2%. Determine which submittals are needed for a particular project and track design completion in ACES-PM during the design process:

- Air Staff DI issued which permits the AF DM/CM to issue a Field DI to the Agent and set design parameters (2%).
- Air Staff DI issued, but Title 10 U.S.C. 2807 notification action required (2%).
- 2807 notification completed, if required, and architect-engineering (A-E) contract awarded (3%).
- Project Definition (PD)
  - PD Charrette Report submitted (10%)
  - PD Charrette Report completed and approved (15%)
- Early Preliminary Design (if required)
  - Early Preliminary Design submitted (30%)
  - Early Preliminary Design completed and approved (35%)
- Preliminary Design (if required)
  - Preliminary Design submitted (60%).
  - Preliminary Design completed and approved (65%)
- Pre-Final Design
  - Pre-Final Design submitted (90%).
  - Pre-Final Design completed and approved (95%)
- Corrected Final Design Submittal (100%)

Design-build progress must also be tracked in ACES-PM. However, ACES-PM is a tool that was developed for execution of traditional design-bid-build projects. With design-build, ACES-PM must be "adapted" to accept information that it was not designed to track. For example, a Request for Proposal (RFP) at a 15% level of design in a design-build project must be entered in ACES-PM as 100% designed in order to receive Authority to Advertise (ATA) the Request for Proposals (RFP) from the Air Staff.

If the design authority is rescinded after the initiation of design, the AF DM/CM must determine whether it is in the best interest of the Government to complete the design to the next submittal point or to stop design immediately. The AF DM/CM should work closely with the Air Staff to get the design authority changed if necessary.

3-6 CONTRACT DOCUMENT DEVELOPMENT

Preparation of contract documents is a Design and Construction Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. However, the AF DM/CM should participate in all charrettes and will be included in the review cycles of the various design submittals.

For a traditional design-bid-build project, the Contract Document Development phase includes design development and preparation of working drawings and specifications, and culminates with 100% complete design documents that are ready for contracting. For design-build projects, the

CCD or a separate design (equivalent to a Project Definition) as described below, or lesser levels of design) is considered 100% design for purposes of developing the Request for Proposal (RFP). For traditional design-bid-build projects, a project is considered Ready to Advertise (RTA) with 100% design complete documents, completion of the Environmental Impact Analysis Process (EIAP), and the addition of the contract bid documents. The contract bid documents are provided by the Contracting Officer with technical assistance from the base architects and engineers. Try to hold design submittals to the minimum necessary to produce a functionally adequate, technically sound design.

3-6.1 Charrette (15% Design or Project Definition)

> The PD Charrette is critical to the clear and accurate definition of a project and is one of the most important actions you can take to ensure the project's success. Its development is a team effort. The definition is an agreement among key participants in a project, and must have input from all of those participants. Lack of a definition leads to unclear and ambiguous goals, confusion, misunderstanding, and poor communication. Failure to formalize and document scope, goals, and expectations puts a project at risk before it even begins.

For Design-Build, the charrette may take place before the RFP is advertised, in which case the charrette report becomes part of the RFP. If the DB RFP is entirely based on performance specifications, there may be very minimal or no design at all. In this case, the charrette occurs very soon after award of the D-B contract. Normally, the same Air Force and DA team members participate as those attending the RFP development charrette. As with the RFP charrette, senior installation leadership and approvers will be briefed at the beginning, as design progresses, and at the conclusion of the charrette sessions. Since the project is now entering a phase that will result in design and engineering solutions, the A-E must add team members to complete the design including structural and civil engineers, landscape architects, interior designers, and mechanical, electrical, and plumbing engineers as well as a cost estimator and a facilitator. The team (AF DM/CM, Base/User, Agent and A-E) should validate the RFP charrette documentation. This can be accomplished in a pre-charrette meeting or during the Charrette in the data gathering phase.

Charrette Objective: The objective of the charrette is to reach consensus on the schematic design. The approved solution becomes the basis for preparation of construction documents during the Contract Document Development phase. The effort involves intensive work sessions with a collaborative team of Users and design specialists.

Who is Involved: Using Agency Commander and appropriate staff, BCE and Staff should be scheduled in advance of the charrette. Base management involvement is essential to assure user involvement and participation in the charrette process. User and base involvement is critical to develop a solid direction for the design.

The Design Team: The services of a trained professional facilitator should be considered to guide the charrette. As a minimum, the following should be involved in the Charrette:

- DA's project manager
- User's representatives
- MAJCOM representative
- A-E team (engineers, architects, cost estimator)
- Facilitator (may be part of A-E team or under separate contract)

- BCE and, depending on the project scope or complexity, other Base support representatives
- AF Project manager
- BCE project programmer
- BCE community planner
- BCE Fire department representative
- BCE Environmental flight representative
- Bio-environmental representative
- Communication squadron representative
- Security forces squadron representative
- Safety officers
- Wing ATFP representative
- Readiness flight representative

In overseas and high-threat areas the BCE Readiness Flight can address CBRNE/FSTR (Chemical, Biological, Radiological, Nuclear, and high-yield Explosive/Full-Spectrum Threat Response) concerns and provide input to the team on these areas. It is important to design Collective Protection Systems into applicable facilities.

The Agenda: Review the agenda/schedule with the Agent before the charrette. The agenda should be segmented into about two-hour slots. All participants need not attend every session but must be available when their interests are addressed. Total team working sessions should be specifically scheduled to bring the team together at least daily. The core team should be present through all sessions. A kickoff session, numerous review sessions and a wrap-up session with the team and user are essential.

The Results: The Charrette Report document contains much of the same material as a CCD, but typically in greater detail.

3-6.1.1 Inputs of the Charrette

The following items are major topics that may need to be addressed at the conference, although not every topic is applicable for every project:

- CCD (if available).
- Updated Project Management Plan, to include a Team Directory - Review and establish a current team directory. Include functional title, address, telephone and fax numbers, and e-mail address for each member.
- General Plan and Design Guidelines - Give the A-E all available criteria documents such as installation standards, architectural compatibility Guidelines, GP component plans and reference drawings, and Assistance Team (AT) studies.
- Environmental Concerns - Create or mark-up an environmental permitting checklist. Explain to the A-E what is known and not yet known about environmental issues for the project. Identify the points of contact for Base environmental issues.
- Utility Drawings and As-Builts - Give the A-E all pertinent Base site and utility plans and as-builts for existing facilities that will be affected by the new project.

- Approval Process - Document the decision making and approval processes for the various project issues - budget, scope, function, aesthetics, etc.
- Budget Assumptions - Give the A-E all back-up data that supports the DD Form 1391 budget and identify the Construction Cost Limit (CCL).
- Special Design Considerations - Give the A-E any special design considerations for the project that may not be fully explained in the CCD or other documentation. These may include EMP/TEMPEST shielding, heat recovery, standby power, special environmental requirements, ATFP and Collective Protection requirements, etc.

3-6.2 Early Preliminary Design Submittal (30% Design)

The Early Preliminary Design submittal is important for most MILCON projects as it allows the AF DM/CM, Base, DA, and User to review the A-E's design intentions and to confirm that the A-E understands all project requirements. This is the best point in the Contract Document development phase to check on design development efforts, make corrections to the design development documents, and incorporate project criteria changes. Incorporating changes later in the design process will be more costly and cause delays. The AF DM/CM should ensure that all team members in the design process thoroughly review the submittal products to ensure the A-E is proceeding in the right direction. Typical Early Preliminary Design submittals include items such as:

- An updated parametric cost estimate.
- Any changes necessary to comply with the charrette report review comments.
- Further developed site plans, floor plans, elevations, building sections, and wall sections.
- Design narrative and analysis including code analysis by all disciplines (civil, architectural, structural mechanical, plumbing, power and lighting, communications, fire detection/protection, life safety etc)
- Single line schematic drawings for mechanical, electrical, communications, etc.
- Comprehensive Interior Design (CID) plans if authorized.
- Color boards.
- Preliminary furniture footprints.
- Environmental permitting and Sustainable development requirements.
- A listing of the proposed specifications for the project.
- Value engineering considerations.
- Check status of any required waivers or exemptions (DDESB, design criteria, etc).

Upon acceptance of the early preliminary design submittal the Air Force PM reports 35% design completion in ACES-PM. Enter the percentage complete in the Design Actual % of the Design Tab.

3-6.3 Preliminary Design Submittal (60% Design)

At this stage, all basic design decisions should have been made, and design development is in full progress. Formal submittals are usually not required for most projects, and construction document

reviews are typically conducted through on-board meetings in the A-E's office. This allows team members to provide the necessary design oversight without stopping design. Formal Preliminary Design submittals may be necessary for complex or unique projects and projects with significant HVAC or industrial operations requirements. Typical Preliminary Design submittals include:

- An updated, detailed cost estimate
- Any changes necessary to comply with the Early Preliminary Design review comments
- Complete floor plans with details
- Roof plans
- Elevations
- Building sections
- Structural, mechanical, plumbing, communication, and electrical plans with details
- CID plans (if required)
- Furniture footprints
- Color boards and materials
- Site and landscaping plans
- All the analyses and discussions that were part of the Early Preliminary Design submittal
- Specifications in rough draft
- Updated design analysis
- Check status of any required waivers or exemptions (DDESB, design criteria, etc)

Equipment layouts with necessary clearances and utility support should also be shown at this stage of design. Construction specifications for renovation projects should include testing for lead-based paint (LBP) and asbestos-containing material (ACM).

Since government furnished equipment (GFE) installed by the Contractor is covered for installation warranty only, consider using Contractor-furnished equipment as much as possible unless there is excess GFE.

Upon acceptance of the preliminary design submittal the Air Force PM reports 65% design completion in ACES-PM. Enter the percentage complete in the Design Actual % of the Design Tab.

3-6.4 Pre-Final Design Submittal (90% Design)

The A-E must submit the drawings and specifications as ready-to-advertise (RTA). The Pre-Final Design submittal includes:

- An updated, detailed cost estimate
- Any changes necessary to comply with the Preliminary Design review comments
- Complete plans and specifications
- Final design analysis
- Color boards and finishes
- Check status of any required waivers or exemptions (DDESB, design criteria, etc)

Upon acceptance of the final design submittal the Air Force PM reports 95% design completion in ACES-PM. Enter the percentage complete in the Design Actual % of the Design Tab. Once the design is 95% complete the AF DM/CM can request Authority to Advertise (ref sec 3-1.3) from AF/A7CCM IAW the MILCON Execution Controls Policy.

3-6.5 Corrected Final Design Submittal (100% Design)

The Corrected Final Design submittal should include:

- An updated, detailed cost estimate
- Any changes necessary to comply with the Pre-Final Design review comments
- Any corrections to the final design analysis
- Color boards and finishes
- Cost estimate
- Furnishings order forms

Upon acceptance of the final design submittal the Air Force PM reports 100% design completion in ACES-PM. Enter the percentage complete in the Design Actual % of the Design Tab. Enter the Design Complete date in the project Milestones.

3-6.6 Ready to Advertise (RTA)

A MILCON project is considered RTA once the following activities are completed:

- The A-E has submitted the Corrected Final Design documents (working drawings, specifications, and cost estimate)
- The Agent has completed a technical and constructability review of the completed working drawings and specifications
- If necessary, the A-E has modified the working drawings, specifications, and cost estimate to comply with concerns identified during the Agent's technical and constructability review
- The Independent Government Estimate (IGE) has been completed by the Agent.
- The Agent has completed the contract bid package

Enter the Ready to Advertise and Advertise dates in the project Milestones of ACES-PM.

3-6.7 Procedures for "On-Hold" Projects

If a project has been on hold for more than six months, the AF DM/CM needs to weigh the various factors that affect the review and revalidation approach before completing the design. As a minimum, these factors include how long the project has been on hold, the technology associated with the User's mission, the extent of the development of the project documents, the cost of the project when placed on hold, changes in User personnel, and changes in Air Force criteria. For example, the AF DM/CM may want to hold a revalidation or follow-up Charrette and use the latest submittal documents that were developed before the project was shelved as the basis of the conference. Regardless of the project, allow more time in the design schedule to revalidate and complete the design of the "shelved" project than for an on-going design at an equivalent stage.

The AF DM/CM also should request the Agent to conduct a back-check of any project that has been 100% design complete or Ready-to-Advertise (RTA) for more than six months. A back-check is a review to mitigate the modifications that may occur from changes in the user's mission or personnel. The back-check should include a complete review by the users, BCE, AFCEE, and Agent in the area of criteria satisfaction. Also, the AF DM/CM should determine whether a new cost estimate and further technical or constructability reviews are required.

3-7 CONTRACT DOCUMENT FORMAL REVIEW PROCESS

Upon receipt of a design submittal, the AF DM/CM should promptly notify all reviewing Air Force organizations, advising them of the date review comments must be submitted to the AF DM/CM for consolidation. Exercise care in forwarding late comments to avoid delays in the design process, while ensuring user needs are met. Late comments should be discouraged as much as possible. Design schedules should allow for Air Force review as follows Project Definition, Early Preliminary Design, and Preliminary Design submissions: typically 21 calendar days maximum from Air Force receipt to delivery of Air Force comments to the Agent. Pre-Final Design submissions: typically 15 calendar days maximum from Air Force receipt to delivery of Air Force comments to the Agent.

3-7.1 Review Process Content

The importance of a conscientious early review cannot be overemphasized. The Agent focuses on the technical aspects of the design. Air Force project reviewers should not be limited to only the functional aspects (e.g., mission requirements, appearance, and spatial relationships) of the design, especially if technical concerns affect operations and maintenance. The AF DM/CM should consolidate all Air Force comments, ensure they are legible and relevant, then forwards to the Agent.

Conflicts between AF specifications or drawings and the A-E's specifications or drawings should be addressed since they have tremendous potential for cost increases and delays during construction. Only with unforeseen extenuating circumstances should any new requirements or scope changes be identified after completion of the Project Definition. The AF DM/CM should require the Commander of the Using Organization to sign any change requests submitted after Project Definition is complete.

3-7.2 Review Process Transmittal

The AF DM/CM should be the single point of contact between the AF and Agent. Comments should not be sent to the Agent by Air Force organizations that do not perform the AF DM/CM function, either directly or by informational copy. Air Force review comments should not be accepted by the Agent unless the comments are verified by the AF DM/CM. In most cases, the Agent should hold a meeting where the review comments are consolidated and reviewed with the A/E. Design review comments are normally entered into the current Agent reporting system. For more information about the current Agent reporting system, contact your Agent.

3-7.3 Review Process A-E Annotations

Instruct the Agent to provide a copy of the A-E's annotated Air Force review comments directly to each of the reviewing organizations. Annotations must identify which comments will be incorporated into the design, include a brief explanation of rebutted technical comments, and provide a detailed explanation of rebutted functional comments. Instruct the Agent to provide the annotated comments within 15 days of receipt of the transmitted A-E review comments responses. This allows the Air Force adequate time for response prior to the next design milestone.

3-8 COST CONTROL AND SCOPE CHANGES

It is the AF DM/CM's responsibility to assure adherence to the PA. Cost control is of great importance throughout the entire process, especially since the AF DM/CM is the focal point for most cost control measures for MILCON projects. Project management generally provides forecasting, effective reporting systems, and a means of control. Refer to the support services for cost engineering provided by AFCESA.

3-8.1 Cost Control and Scope Changes during Design

> Note: Refer to the current AF Program Management Plan for most recent AF/A7C policy guidance for cost and scope approval authority levels.

Cost estimates during design put price tags on alternative building systems and materials before construction and predict the fair price for a bid. Cost control success during the design process hinges directly on the AF DM/CM's ability to get the appropriate cost information and make decisions to correct deviations from the approved budget in a timely manner.

When the current working estimate (CWE) exceeds the approved PA, corrective actions may be necessary. Conservative estimating and excessive contingencies are often reasons for high cost estimates. The AF DM/CM should discuss cost increases with the Agent to determine the appropriate course of action. The A-E or Agent develops the estimates and is responsible for accuracy. Deletion of items from the project should be a last resort. If the A-E's estimate at completion of the Project Definition phase is higher than the DD Form 1391's programmed amount (PA), determine why the difference occurred. Possible actions include:

- Redefine the Project Definition requirements and select items that should remain in the contract documents as bid options or bid additives. If the bid climate is favorable and bids are within the PA, these items can easily be added back into the project.
- Continue the project design with a reduced project scope or reduced requirements that will fit within the DD Form 1391 programmed amount and identify additive bid items or bid options.
- If it appears impossible to design the project within 125% of the programmed amount, even after reducing the scope by a maximum of 25% of the approved scope and deleting expensive items, request that AF/A7CP reprogram the project. Identify potential funding sources from other authorized projects to offset the additional funding required by the reprogramming request. Reprogramming is a last resort measure.

The Agent is required to provide recommendations to bring the estimated construction cost of the project within the construction budget established. The AF DM/CM and the User must approve all proposed cost reduction measures. The Agent cannot implement these measures unless formally authorized by the AF DM/CM.

3-8.2 Value Engineering

> As stated in the AFCESA Value Engineering ETL, "Value Engineering (VE) is not a design/peer review or a cost-cutting exercise. VE is a creative, organized effort, which analyzes the requirements of a project for the purpose of achieving the essential functions at the lowest total costs (capital, staffing, energy, maintenance) over the life of the project. Not a first cost option. Through a group investigation, using experienced, multi-disciplinary teams, value and economy are improved through the study of alternate design concepts, materials, and methods without compromising the functional and value objectives of the client."

The *Office of Federal Procurement Policy Act* (Title 41 U.S.C. 401, et seq.) as amended in 1996, requires each executive agency to establish and maintain cost-effective value engineering procedures and processes. Air Force Policy requires VE for projects with PA greater than $10M. VE is not required for Design-Build projects or for projects to be LEED™ certified. A value engineering change proposal (VECP) clause may be included in the solicitation in accordance with FAR 48.202, *Value Engineering; Clause for Construction Contracts* for all construction projects costing >$100K. When the head of the contracting activity determines that the cost of calculating and tracking collateral savings will exceed the benefits to be derived in a construction contract, the VE requirement may be waived. Classified projects or projects in a classified area may be exempted, if the AF DM/CM determines that a study will create an unnecessary security problem. Although the AF DM/CM may conduct studies with in-house staff or by A-E contract, the AF DM/CM generally relies upon the Agent to conduct VE studies. The AF DM/CM must identify the VE requirement in a DI to the Agent and provide the additional funds from the planning and design (P&D) account. The Agent may use in-house staff or an A-E contract different from the A-E designing the project.

The intent of a VE study is to review the project design with a set of eyes independent of the project A-E and to offer alternatives that may produce life-cycle cost savings. Perform VE no later than the Early Preliminary Design phase for most eligible design-bid-build projects as VE done later may delay design progress and increase design costs.

> DB is inherently a value engineering exercise as the design and constructor work together through out the life of the project to achieve the budget, quality and schedule. If VE is used for a DB project, the effort is best spent on the procurement documents (SOW, performance specs, drawings, RFP). This meets the FAR requirement for VE and these are the key contract documents and guide the entire design-build project.

All proposed VE recommendations should be reviewed by the User, Base, AF DM/CM, and Agent. The Base and the AF DM/CM must concur with any VE recommendations regarding maintenance and aesthetic appearance. The evaluators must be alert to the possibility that VE suggestions may be contrary to sustainable development goals established for the project. If in doubt, consult the team's environmental or sustainable development specialist before approving the suggestion. Approved VE recommendations should not sacrifice functionality, sustainability, maintenance and operations, or aesthetic appearance, but should improve the quality of the facility at a lower, or equal, life cycle cost. The AF DM/CM has the final approval or disapproval of VE items and must report whether a VE study was required in ACES-PM.

For design-bid-build projects, VE also may be applied after construction contract award. The proposals come from the contractor, who has the best knowledge of the methods and means at that location to fabricate the facility. Value engineering change proposals (VECPs) are submitted to the Construction Agent (CA). These VECPs are reviewed by the User, Base, AF DM/CM, and the Agent and must be approved by the AF DM/CM and the CA. VECPs need to be accepted

early enough to incorporate savings without disrupting the schedule. Approved VECPs are implemented as contract modifications and reported in ACES-PM. Net savings are shared between the Contractor and the Air Force. See the FAR Part 48, *Value Engineering* and FAR 52.248, *Value Engineering Provisions and Clauses* for additional information.

3-9 PERFORMANCE PERIODS AND OCCUPANCY PHASING

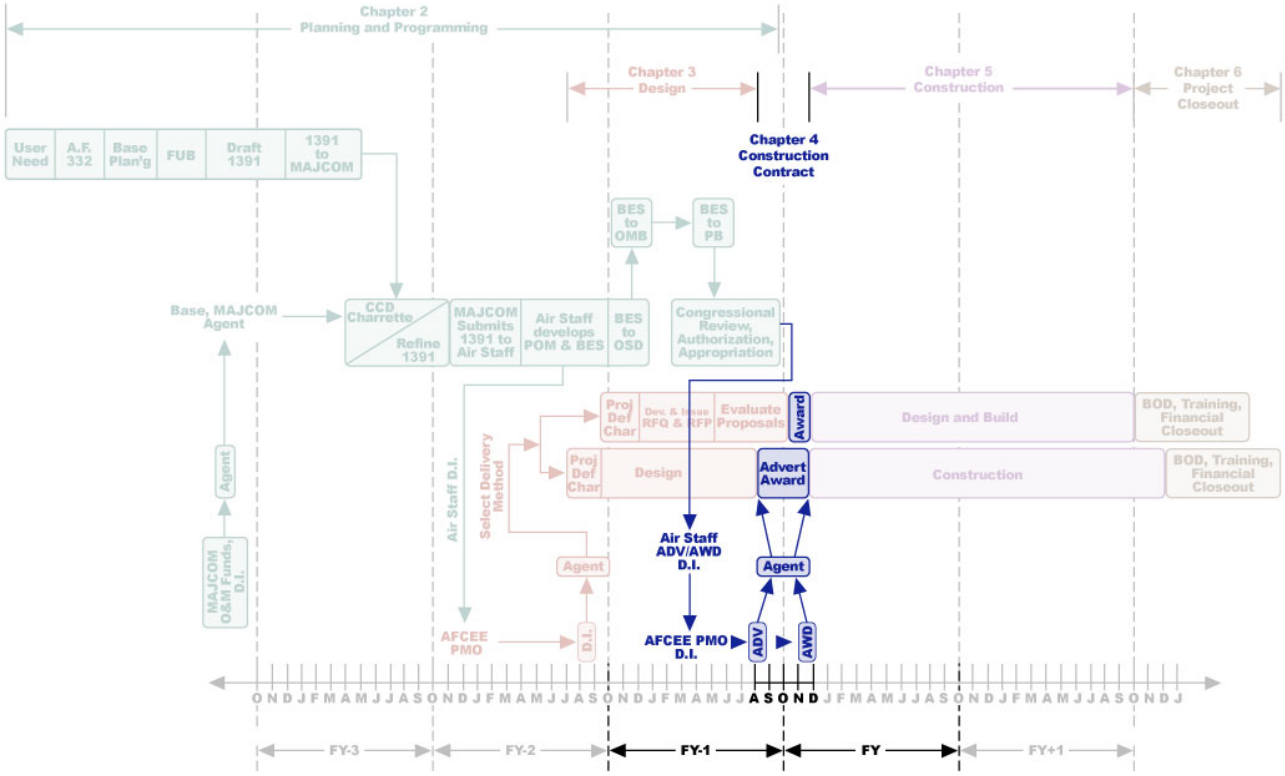
If temporary facilities are required, they must be documented and shown as line item costs in the 1391. Occupied sites are a special problem during the design and construction process. A construction phasing schedule must be developed early during the design process. It encompasses the user's needs for continued operation by phasing the contractor's work, and keeps the project within the cost limitation. Accomplishing this task early in the design allows the users to plan "work around" procedures and budget for any extra costs of operation during construction. The Commander of the Using Organization should review and sign off on the phasing plan.

Projects with complicated phasing should have a specification section devoted to just phasing. It should be referenced in the drawings, and address areas to remain in operation, utility service, move times, site restrictions, etc.

To accommodate a more complicated phasing, building systems may need a special design. Air conditioning equipment may have to be sized and controlled to accommodate parts of the facility that must remain in operation while the rest of the facility is altered. A second possible problem could be the establishment of a critical needs date for completion of all or a part of the facility (e.g. predetermined equipment delivery or mission bed-down date). Challenge the Design Agent to set demanding performance periods. Discuss any critical need dates with the A-E and the users, and then ensure that the construction performance period is sufficient to both accomplish the project and meet the critical needs dates. This may require construction phasing to allow early occupancy of certain work areas. Again, these problem areas should be identified early in the planning and design process, even as early as the CCD. Assure that the 1391 includes line items for temporary facilities or additional costs to accommodate phasing requirements.

CHAPTER 4 - CONSTRUCTION CONTRACT

The highlighted section of the MILCON Process Diagram below shows the construction contract activities detailed in Chapter 4.



MILCON Construction Contract

4-1 CONTRACT TYPES

Contracting is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility and the content of this section is provided for AF DM/CM information only. A wide selection of contract types is available to the AF and contractors in order to provide needed flexibility in acquiring the large variety and volume of supplies and services required by agencies. Detailed descriptions of the various types of contracts are described in FAR Part 16, *Types of Contracts.* Appendix B, *Construction Contract Types* of this document includes abbreviated descriptions for typical contract types.

A Design-Build contract is considerably different than a conventional Design-Bid-Build contract. The focus of this chapter is on the construction contract award phase of Design-Bid-Build projects. Detailed information on Design-Build can be found in the *AF Design-Build Guide*.

Federal Acquisition Regulation FAR Part 15 encourages negotiated acquisitions based on a best value continuum, and an agency can obtain best value in negotiated acquisitions by using any one or a combination of source selection approaches. The new approach provides Federal agencies greater flexibility, and the ability to consider past performance as well as price. FAR Part 15, *Contracting by Negotiation*, and the Air Force FAR Supplement (AFFARS) 15 have significant impacts on the award of Federal construction contracts. Award of construction contracts based on lowest bid by a responsible contractor is still permissible and may be appropriate under the

conditions in FAR 6.401, *Sealed Bidding and Competitive Proposals*. **Note:** Restrictions to the use of cost reimbursable contracts exist. See DFARS 216.

4-2 CONTRACT DOCUMENTS

Preparation of Contract Documents is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only.

The construction contract contains General Provisions (also called Special Conditions) in Division I of the specifications, which set forth the procedures and responsibility for implementing the contract. While the contract drawings and technical specifications identify specific project requirements, the General Provisions for a project normally include items such as:

- Work Description
- Government Furnished Equipment
- Submittals
- Construction Sign Requirements
- Utility Outages
- Availability of Utility Service
- General Safety Requirements
- Work Hours and Holidays
- Disposal Procedures
- Final Inspection

During design, the AF DM/CM should review the General Provisions to ensure the contract meets the unique requirements of the project and doesn't adversely affect the project. Ensure that a Critical Path Method (CPM) network will be provided. The network should always be provided in manageable items. On a single facility, the CPM network should be broken down by subsystem and smaller than subsystem on multi-facility projects.

Ensure that items such as contractor offices, lay-down and storage areas, contractor parking, disposal of waste materials, clean up, mowing, environmental protection, and safety provisions are included when appropriate. Projects in high visibility areas, such as in front of the Wing Commander's office, require special attention during construction activities defined as much cleaner than usual construction practices. Projects near family housing units need childproof fencing and barricades. Industrial and high tech projects often have special requirements. Operation and maintenance manuals have to be more than a gathering of each manufacturer's specification pamphlets. The manuals must reflect an integrated systems approach. Likewise, testing operations and acceptance may have unique requirements. These all have to be specified in the contract.

Temporary Government offices are often included in projects for field personnel during construction. Ensure adequate facilities are provided at a reasonable cost. Color boards demonstrate the Contractor's understanding of the contract requirements; be sure the Contractor is required to provide timely submittals. Copies of certain submittals (such as fire detection alarm systems, special finishes, fixtures, etc.) are required for Air Force review, so be sure the Agent has included the required extra copies in the contract.

Sustainable development must be one of the objectives in the planning, design, construction, and operations and maintenance of Air Force facilities and infrastructure. This means looking for planning, design, and construction solutions that enhance the project's environmental performance

in addition to its life cycle cost. Make every effort throughout the facility delivery process to make the project environmentally sustainable. Refer to the current *AF Sustainable Development Policy* letter and Section 3-3.2, *Sustainable Development* for additional information.

If the Contractor is to participate in any management meetings, those particular meetings should be clearly identified. Joint occupancy should be addressed if required. Any special warranty requirements such as six-hour response time for refrigeration system malfunctions should be specified. If the contract includes any unusually long lead items, require a copy of the Contractor's procurement schedule.

4-2.1 Liquidated Damages

A liquidated damages (LDs) clause is contained in construction contracts over $500,000 except where the Contractor cannot control the pace of the work. LDs are optional in contracts under $500,000 per DFARS 211.5, *Liquidated Damages*. LDs are intended to establish in advance a fair compensation to the Air Force for each day the beneficial occupancy is delayed by the Contractor beyond the scheduled completion date. Make sure the AF DM/CM coordinates with the using organization to justify the LDs.

Clearly define all added costs to the Air Force in the justification for increasing the amount of LDs. LDs can be established within the context of the project such as contract phasing or special operational needs that can only be out of service for limited periods. Define the need(s) for LDs in the project and seek to determine the expected costs to the Air Force should the Contractor exceed the performance period. The Agent will identify separately the cost impact to their operations. Ensure LDs are not set so high, relative to the contract amount, that contractors either put excess contingencies in their bids, refuse to bid the project, or the LD clause could be viewed as a "penalty" and thus unenforceable.

4-2.2 Construction Sign Standards

The project construction sign is one of the most visible features on a project site. Be sure it conforms to Air Force requirements detailed in UFC 3-120-01, *Design*: *Air Force Sign Standard*.

4-3 CONSTRUCTION BID PROCESS

The construction bid process is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only) responsibility. The content of this section is provided for AF DM/CM information only.

Prior to any public notification of the construction project, the Contracting Officer will make a determination on the level of bidding restrictions to be placed on every construction project. The determination is made by asking these basic questions:

- Is the project a candidate for a Small Business Administration (SBA) 8(a) set-aside solicitation (See FAR Part 19, *Small Business Programs)*, or has the SBA requested the project for one of their 8(a) contractors?
- Does the project meet the criteria for an emerging small business (ESB) set-aside in accordance with FAR Subpart 19.10, *Small Business Competitiveness Demonstration Program*?
- If small business set-asides have been re-instituted by the Contracting Officer, does the project meet the criteria for a small business set-aside?
- If none of the above, then the project will be advertised as an unrestricted solicitation.

4-4 SOLICITATION PHASE

The contract solicitation process is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only.

The Contracting Officer begins solicitation Invitation for Bid (IFB), or Request for Proposal (RFP) by notifying all prospective offerors with a notice in the Federal Business Opportunities unless exempted by FAR 5.202. FAR 5.203 requires the notice to be published in advance of the issuance of the IFB/RFP. To ensure qualified offerors respond to the notice and to help prevent disputes and potential problems, the Contracting Officer should prepare a detailed/descriptive Federal Business Opportunities synopsis. The key to a good synopsis is a descriptive scope that attracts firms with the desired construction and management skills.

During the solicitation period, the Contracting Officer compiles a solicitation package that includes the project drawings, specifications, special clauses, the current Davis-Bacon wage rates, and the particulars on the solicitation procedures such as the bid opening/proposal closing date and the bid/proposal acceptance period. The typical bid/proposal acceptance period is prepared in accordance with the FAR and Contracting Officer requirements.

4-4.1 Predefinition of Responsibility in Solicitations

Although there are different acquisition procedures, Federal agencies are required to award a contract to a responsive and responsible contractor. If delivery of the project on time is critical to a mission, or it is of such a complicated nature that the Contractor must possess unusual skills, the Agent PM should include specific responsibility criteria in the solicitation to avoid problems, as required by FAR 9.104, *Standards*.

Generally, a determination of responsibility includes an assessment of the contractor's technical, financial, management, and performance capabilities. If insufficient information is available to make a determination of responsibility, the Agent PM should request the contracting officer to conduct a pre-award survey in accordance with FAR 9.106, *Pre-Award Surveys*. The Federal test for responsibility is that a prospective contractor must meet the general standards of FAR 9.104-1.

4-4.2 Invitation for Bids and Requests for Proposals

The Contracting Officer normally will issue the solicitation notice to all contractors listed in the Contracting Officer's mailing list and to as many "clearinghouses" as possible so as to seek the widest possible competition for the construction work. The Agent PM has to provide the necessary justification to the Contracting Officer in order to obtain approval for "other than full and open competition" contracts (see FAR 6.304, *Approval of the Justification*).

> A public opening is not conducted for RFPs for design-build projects. The offeror expected to receive the award is not known until completion of the evaluation process and selection of the best value offeror.

For extremely complex or difficult projects, the time set for receipt of bids or proposals can be lengthened to improve the competition on the project. Upon the expiration of the bidding period, the bids are opened and read aloud to all present. At the end of the reading of the bids, an apparent low bidder is declared. At this point the process of contract award begins.

When required, the solicitation can be amended; however, revisions requested during the solicitation response period contribute to delay, confused requirements, and ultimately more expensive or reduced quality projects. If the solicitation package requires changes, the solicitation response period may have to be adjusted so as to allow at least 10 days between the issuance of an amendment and the time set for receipt of bids or proposals. If the issuance of an amendment

will delay the due date for bids or proposals, the Contracting Officer must first request the AF DM/CMs concurrence prior to its issuance. Have the Contracting Officer provide the AF DM/CM the reasons and consequences for either issuing or not issuing the amendment. Dependent on the revisions involved and the timing, it may be advisable to incorporate the change as a "known" modification rather than delay the due date. In any case, the AF DM/CM must work closely with the Contracting Officer to avoid any changes to the solicitation, especially those that unnecessarily delay the bid opening.

4-4.3 Bid Reports

The Contracting Officer usually handles all bidding and contract award activities, and should provide the bid report within 24 hours. The report includes the names and bid amounts of the first and second low bidders, including additive items, the high bid with any additives, the Government estimate, an analysis of the CWE, a note on the funding status, and a recommendation concerning the low bid and any additives. Refer to Section 3-1.4, *Authority to Award*.

Upon receiving the bid report, notify AF/A7CP and enter the bid opening information into ACES-PM; from the main drop down menus in ACES-PM, select the Bid Opening tab under Execution. Enter the Bid Details in the appropriate tab and Detailed costs as well. Also assure that the Bid Opening date is entered in the Milestones. AF/A7CP will not authorize contract award until this information is entered into ACES.

4-4.4 Protests

Be aware that any interested party whose direct economic interest could be affected by the award of, or failure to award, a particular contract has the right to protest the award. The party can protest to:

- The Contracting Officer of the agency doing the contracting, or
- The General Accounting Office (GAO).

The protest is generally filed with the Contracting Officer before filing with the GAO. The protest can be filed before or after award. If filed before, award cannot be made until the matter is resolved by the Contracting Officer's decision, except under special conditions. The Contracting Officer does not have to suspend the contract if the protest was received after award. If the protest is filed directly with GAO, GAO must notify the Contracting Officer within one day after the protest is filed. The Contracting Officer must then submit a report to GAO within 25 working days. GAO can take up to 90 work days after they receive the protest before issuing a recommendation. If the Contracting Officer elects not to follow GAO's recommendation to the Contracting Officer, the rationale must be provided to the Comptroller General within 60 days.

4-5 CONTRACT AWARD

For a design-bid-build project, the award CWE is typically based on the apparent low bid which includes the basic bid plus any additive or optional bid items to be awarded, management and contingency reserves, and Agent supervision and administration fees. The bidding documents must clearly identify the order of acceptance of additive bid items to avoid any perception of juggling additive bid items to favor a particular contractor. Bid options do not have to be awarded in the order listed, and for that reason, are most often preferred over additive bid items.

4-5.1 Pre-Positioning Funds

Near the end of the fiscal year, AF/A7CP normally requests that SAF/FMBIC transfer construction funds to the Agent for MILCON projects scheduled for award by the end of that fiscal year. This is

known as pre-positioning of construction funds. The amount of funds pre-positioned generally is equal to the PA but may vary depending upon individual project considerations. Although bids may be opened any time after the project is included in the authorized and appropriated bills signed by the President, the Contracting Officer cannot award the contract until the funds are actually received.

4-5.2 Adverse Bids

Loosely defined, an adverse bid occurs when the contract cannot be awarded to the low bidder because the resulting award CWE exceeds the Congressional reprogramming threshold or the CWE is expected to exceed the threshold amount during construction. Adverse bids can be caused by a number of problems individually or collectively. These include design flaws, overly restrictive contract requirements, inadequate bidding competition, errors in the Government estimate, or significant increases in the cost of construction materials. The decision to award a marginally adverse bid depends on mission need, the Contractor's reputation, and complexities and unknowns within the project.

Potential remedies for overcoming adverse bids include re-bidding the existing contract documents in a more favorable bid climate, revising project bid content through deletion of project scope or requirements, reducing project bid content through identification of additive bid items, basing award on negotiated acquisition rather than sealed bids (see FAR 15.102, *Oral Presentations*), or reprogramming the project with Congress.

The AF DM/CM must aggressively seek a solution based on the various factors impacting the project design, such as critical need dates, available funding, bidding climate, and the needs of the user and Base. The bid or proposal expires at the end of the acceptance period stated in the IFB or RFP. In addition to seeking the appropriate solution for an adverse bid, the AF DM/CM must also track progress towards a reaching a decision in order to determine if bid extensions are appropriate.

4-5.3 Award and the Contract Award Report

The contract award marks the point where the project requirements and ideas discussed during the planning and design process begin to become a reality through construction. If the Agent responsibilities are in the same organization, the project management responsibilities are transferred after award. However, if these responsibilities are in different organizations, transfer is made prior to solicitation.

The Agent submits the contract award report to the AF DM/CM. The report information should be entered in ACES-PM within 24 hours after contract award and include the complete funding summary, award date, number and cost of additive items awarded, award scope including additive items, and bidding restrictions.

4-5.4 Funding and Authority to Award

Construction funds for most MILCON projects are transferred to the Agent after bid opening. The AF DM/CM notifies AF/A7CP of the proposed award CWE. If the award CWE does not exceed the PA, AF/A7CP issues an Air Staff DI via ACES-PM to the AFCEE granting authority to award the contract and requests that SAF/FMBIC send funding equal to the award CWE to the Agent.

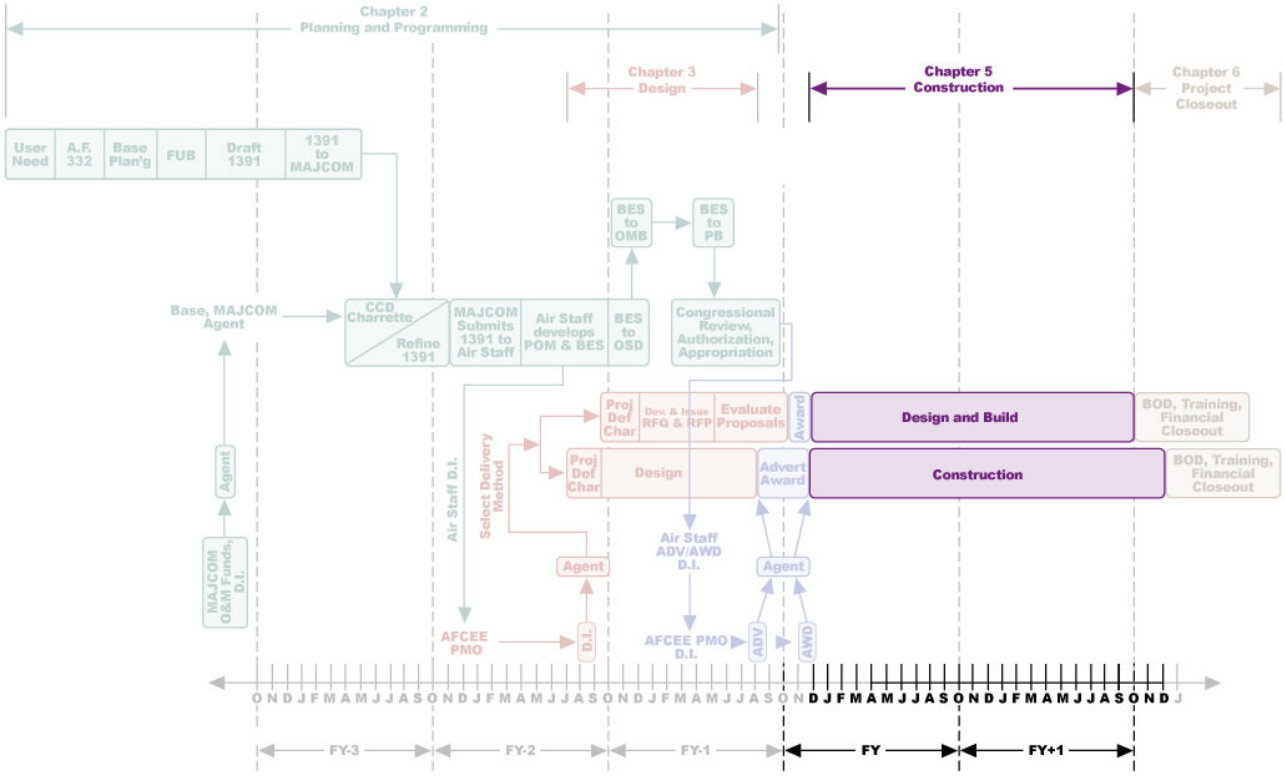
If the award CWE is greater than the PA but within the authorization threshold, the AF DM/CM must identify available funding source(s) for the difference between the award CWE and the PA. If the award CWE exceeds the PA by 25% or $2.0 million, whichever is less, the AF DM/CM cannot award the contract and the project must be redesigned, re-bid, or reprogrammed. Additionally, if the bid CWE is less than 75% of the PA or the award scope is less than 75% of the DD1391

scope, Congressional Notification is required **before** the project is awarded. See Section 3-1.4, *Authority to Award*.

Upon receiving a DI from AF/A7CP authorizing award, enter the Contracts information in either the Execution or Contract Management drop-down in ACES. Also assure that the Actual Contract Award date is entered in the Milestones. Fill in the fields of the Contract Management tab, such as the NTP date, authority to award date, basic bid and so on. At this point, the Construction Agent should have provided a construction schedule. Fill in the estimated or updated dates for Construction Start and, as a minimum Construction Completion, BOD, Construction Complete, and Financial Completion.

CHAPTER 5– CONSTRUCTION

The highlighted section of the MILCON Process Diagram below shows the construction activities detailed in Chapter 5.



MILCON Construction

Construction monitoring is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility; however, the AF DM/CM is responsible for closely monitoring progress throughout the duration of the construction contract to provide cost control, schedule control, and quality control. Successful management of cost, schedule, and quality in a manner compatible with user satisfaction is, indeed, a tough challenge. Meeting this challenge successfully will achieve the objective of delivering a quality facility meeting the user's needs, on time, and within budget.

During construction the AF DM/CM must manage details involved with meeting the project goals, continue to provide information as part of the management team, and must be a key participant in executing and controlling contract changes.

The AF DM/CM must continue to be closely involved and monitor status during contract award and construction processes. Working in step with the Agent, AF DM/CMs monitor the project schedule and budget. Track Construction progress in ACES-PM. Pro-active AF DM/CMs spot problems early and take action to minimize impacts to cost and schedule. Successful AF DM/CMs must manage the inevitable project changes due to changes in customer requirements, unforeseen site conditions, or design errors and omissions.

5-1 CONSTRUCTION STARTUP

The construction phase of the project receives the most attention by the users since they can see construction progress. Seeing the construction is a potential source for change requests. Just as

certain contract modifications are absolutely necessary for a successful project and satisfied user, excessive and unnecessary modifications may adversely impact both the user and the project. The AF DM/CM must constantly make judgments about potential contract changes and their impact on schedule, other construction work, funding, phasing requirements, Government Furnished Equipment (GFE) and Government Furnished Materials (GFM).

The AF DM/CM's management actions provide cost control, schedule control, and quality assurance. Successful management of cost, schedule, and quality in a manner compatible with user satisfaction is, indeed, a tough challenge. Meeting this challenge successfully will achieve the objective of delivering a quality facility meeting the user's needs on time and within budget.

For design-build, the start of construction is also the start of design. In ACES-PM, on the Design tab, upon award of the D-B contract, enter 100% in the Design Actual % field. In the Milestones, Enter a Design Complete date (actual). These entries along with RTA and Contract Award dates 'unlock' the Contract Management tab so construction progress can be entered. In the Milestones tab, enter the design and construction progress. ACES will allow custom text in the Milestone field, so the AF DM/CM can tailor the Milestone statements to the actual design build phases of work.

5-1.1 Preconstruction Conference

The preconstruction conference is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information and because the AF DM/CM should actively participate in the conference.

The Preconstruction Conference (sometimes referred to by the Agent as the Pre-Performance Conference) is a meeting held at the job site to establish local ground rules, both covered (e.g., labor standards clauses) and not covered (e.g., Base regulations) by the contract documents that are directly related to Contractor actions and interactions on the Base. Attendees should include the Agent and the AF DM/CM, the Base Civil Engineer (BCE), the User, and the Base Fire Protection Flight, Environmental Management, Bioenvironmental Engineering, Security Forces, Wing Safety, and Communications organizations.

The Agent conducts the meeting, but the AF DM/CM should be prepared to address issues such as phasing, GFE/GFM items, and coordination in restricted areas. Resolve all such issues before the Preconstruction Conference and present a unified AF position in the Contractor's presence. The AF DM/CM's role at the conference is to ensure that Air Force interests and resources are protected. The Preconstruction Conference is not the time to discuss potential change requests unless the changes have a direct impact on user mission, construction startup and contractor progress.

The most important step to cover to ensure a successful project is "Partnering." Key stakeholders should be identified from each of the following groups: the User, the A-E, the Agent, the AF DM/CM, and the Contractor. These individuals should agree to meet on a regular basis to identify and resolve problem areas quickly to the satisfaction of the team members. Use partnering to alleviate problems such as delayed submittals and questions for Air Force entities and as a tool to keep the project on track.

5-1.2 Notice to Proceed

The Notice to Proceed (NTP) is the formal instruction from the Contracting Officer to the Contractor to start work on the project. This notice authorizes the Contractor to spend money and establishes the start date for the contract performance period. The AF DM/CM should participate in fixing this date to ensure that the BCE and User are ready for the Contractor to start and that the start date is consistent with any critical need dates and schedules that are important to project success. Most Contractors will work with the Contracting Officer and the Base to minimize User disruption. The Agent will normally issue the NTP between 15 to 30 days after contract award. Minor adjustments to that time frame can be made if it is in the best interests of the AF. However, excessive delays in issuing the NTP may result in a Contractor claim unless the intent to delay NTP issuance was specified in the bid documents. The NTP triggers the start of the period of performance (POP) which is a critical milestone for schedule management.

The AF DM/CM must enter the NTP date in the Contract Management Tab of ACES-PM.

5-2 SUBMITTALS

The submittal review process is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility; however, the AF DM/CM may have approval responsibilities.

The construction contract will require the Contractor to submit material and equipment data, samples, and shop drawings prior to the start of any segment of work related to the items involved. The AF has a responsibility to provide timely review and prompt return of the submittals to the contracting officer and hence to the Contractor; otherwise delays and claims may result. Those items submitted for Air Force approval need special attention because of the number of organizations that may be involved in the review process. Reviews must be thorough, accurate, and quick. Submittals such as color boards and O&M manuals are typically reviewed by the AF DM/CM or the Base.

Late, incorrect, or incomplete submittals from the Contractor can adversely affect the job. Just as importantly, the Agent's review process must be timely and responsive to critical items in the contract schedule. If there is a problem without a timely response, elevate the concern and ask for help. Be alert to these instances and encourage the Agent at the appropriate management level, to make the necessary corrections. If the Agent does not make the necessary corrections, elevate the concern within both the Agent's management system and the Air Force's system. This philosophy and action in working with the Agent is important in all the issues of construction management. Use partnering techniques to solve problems of this nature before the project is adversely affected.

For fast-track design-build projects, the using Agency and/or AF DM/CM may request to review the design packages before construction of each phase begins. The AF DM/CM should include additional time in proposed schedule included in the RFP and clearly identify the requirement to review the design packages.

5-3 QUALITY CONTROL AND QUALITY ASSURANCE

Quality control is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility; however, quality issues may arise during the progress of construction that requires AF DM/CM involvement.

The Contractor is responsible for inspecting, testing, and documenting those tests and inspections that are required by the contract to control material quality and workmanship. The Contractor is also required by the terms of the contract to employ a Quality Control (QC) representative. The contract specifications spell out in detail what inspections and tests are to be performed and the detail of reporting.

The Agent, through the Quality Assurance (QA) program, oversees the Contractor Quality Control (CQC) program. Quality cannot be "inspected" into the project; rather, the individual instances of workmanship and overall job quality must be directly related to the Contractor's reputation and pride of accomplishment. Although over-inspection can reduce cooperation and result in changes, ensure the Agent is effective in assuring quality. It is difficult to make corrections for appearance-related work as the construction nears completion, so bring these issues to the Agent's attention immediately.

Encourage the Agent's QA effort aimed at enhancing the Contractor's pride in order to receive the desired project quality. This may include quizzing CQC personnel, frequent meetings with Contractor's superintendent or project executive on quality issues, and checking preparatory inspection work to include CQC. Understanding of CQC enables the AF DM/CM to become aware of potential issues in a timely manner and encourage the Agent, at the appropriate management level, to make the necessary corrections.

5-3.1 Construction Inspection

Continuous construction inspection is the responsibility of the Contractor. This responsibility, established by FAR 52.246-12, *Inspection of Construction,* requires the Contractor to maintain an adequate inspection system and perform such inspection to ensure that the work performed conforms to contract requirements. The Contractor must maintain inspection and test records and make these available to the Government. The AF reserves the right to inspect and test any phase of the work at all reasonable times without relieving the Contractor of any responsibility for contract compliance.

5-3.2 Construction Surveillance

The Agent performs construction surveillance on the job site and at off-site locations (fabrication locations or stored materials) when necessary. Construction surveillance differs from inspection in that specific technical inspection and tests are not performed on a continuing basis. Those items are the responsibility of the Contractor. The AF DM/CM's job is to review project function and overall appearance and to raise any cost and time issues that affect the Air Force. Additionally, the AF DM/CM represents the using agency and BCE's concerns with functional and technical issues to the Agent. **Do not discuss or provide any comments and suggestions directly to the Contractor.** Instead, document concerns using photos, videos, and notes and discuss discrepancies with the Agent. Notify the Agent in writing regarding any job site, schedule, cost, or quality problem areas needing prompt attention and resolution. An AF DM/CM should assure that the following checklists of construction surveillance items are being performed:

1. Verify appropriate coordination has been effected between the Agent and the Base Civil Engineer to ensure smooth job progression in areas such as security, utility outages, etc.
2. Confirm that the Agent's personnel are familiar with Base Civil Engineer and AF DM/CM representatives who will be performing surveillance inspections.
3. Confirm the status of actions on AF furnished items.

4. Check adherence to plans and specifications and take necessary actions to correct deficiencies. Ensure shop drawings are submitted timely and color boards are sent to appropriate reviewing offices.
5. Review the approved construction schedule to determine any changes in schedule or disparity with actual progress. Review the schedule for reasonableness. Differences of 5% or greater between scheduled/actual progress require detailed justification to include steps to correct. Also look at any phased construction scheduling. All indicated slippages in BOD or completion date must be reviewed with the Agent. Where critical need dates have been established for the total or a portion of the facility, possible ways of removing slippage should be reviewed with the resident engineer and higher echelons of the Agent as necessary. Actions will be coordinated with the using command and their concurrence obtained as required.
6. Review status of change orders and their effect on construction progress and project funding. Indicate in surveillance reports the status of these change orders which have been in progress more than 30 days, together with reasons for delays. Review funds status to ensure proper fiscal management and adequate funding in the field.
7. Check quality of construction and workmanship and initiate the required appropriate action.
8. Review the AF Form 1477, *Construction Inspection Record,* prepared by the BCE, with individuals responsible. Discuss deficiencies, if any, and problems noted. Note visit and findings on BCE AF Form 1477 and sign. BCE construction inspection personnel should be reminded to alert your office of potential or actual problems immediately.
9. Discuss any claims received or anticipated with the Agent. Review his experience with "Request for Information" (RFI) including timely response. Discuss any problems or anticipated difficulties to include any induced by the Air Force.

5-3.3 Quality Indicators

The following items are primary indicators of the quality of the Contractor's operations. If these indicators are good, the project is probably in good overall condition. If these indicators are not good, additional AF DM/CM attention may be warranted. Poor cleanup, for example, often is a sign of careless supervision.

- Workmanship and craftsmanship
- Overall job cleanup and appearance
- Daily housekeeping
- Hard hat discipline and other safety issues
- Material storage procedures

A good project will have an organized appearance during all stages of construction.

5-3.4 Quality Assurance by Agent

The Agent's Contracting Officer is the AF's legal contact with the Contractor. The Resident Construction Manager (RCM) is the Agent's day-to-day representative in the field. The Agent's responsibilities for the project from start of construction to completion include:

- Acting as single-point-of-contact between the Contractor and the AF

- Providing Quality Assurance of the work
- Reviewing and approving submittals
- Maintaining schedules
- Administering the contract; modifying the contract when necessary
- Protecting the AF's interests

Expect and require the Agent to maintain good communications with the Contractor's superintendent and Quality Control, as this will improve project management effectiveness. Under the QA/QC system, the Contractor is required to control quality. The Agent has the right and responsibility, in a QA oversight role, to ensure that the Contractor performs the QC that is required in the contract. Therefore, the level of quality desired and expected in the completed project must be accurately reflected in the contract documents. Insist that the Agent ensures that the level of quality specified is indeed received.

5-4 RESIDENT CONSTRUCTION MANAGER (RCM)

Construction management is provided by the Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)). The AF DM/CM provides oversight. The Agent RCM's primary responsibility is to provide on-site project management for the Air Force, although the RCM also has an oversight management role in contract compliance. The project management role is an absolute necessity because simply ensuring contract compliance is rarely adequate for a successful project. Design errors, unforeseen site conditions, bad weather, mission changes, and User changes are but a few of the common issues encountered in projects that the RCM is charged with resolving.

5-4.1 Agent RCM Authority

The Agents' RCM is responsible for the project management activities identified in the Project Management Plan and described below. The authority includes providing instruction, direction, and guidance to the project contractor, and answering questions from the Agent PM, User, AF DM/CM, and BCE, as long as these actions are within the Agent's authority. Responding to User change requests must be approved by the AF DM/CM.

5-5 SCHEDULE CONTROL

Schedule Control is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility; however, it is the AF DM/CM's responsibility to help assure the contract remains on schedule. The construction schedule is prepared by the Contractor, and details how the contract completion date(s) will be met. Network schedules are used by Air Force Construction Agents on MILCON construction contracts to schedule work and track progress of the Contractor.

While the Agent must approve reasonable Contractor schedules, the AF DM/CM should question any schedule that provides for a disproportionate amount of work in the last month or two of the contract. The schedule is a major construction management tool. Identify in the schedule and watch very closely those areas that may cause the critical points during the construction or the construction completion date to slip. Compare the schedule with actual construction progress because the Contractor should be paid only for the work accomplished. Especially review the status of pending modifications and their potential effect on the schedule. Finally, question the Agent on actions taken to meet the schedule when the Contractor falls behind in construction. Extended overhead can add considerable cost to a project when construction completion is delayed through no fault of the Contractor.

The Agent is responsible for review and approval of the schedule. The Air Force can require changes to the schedule, and does so when mission changes dictate. A network schedule, properly administered by the Agent, provides an accurate means of measuring the time impact of potential changes. The AF DM/CM should continually encourage the Agent to obtain an approved schedule as required by the contract. Changes in the work and time extensions due the Contractor must be included in the network concurrent with the performance of the change or immediately after a delay. Otherwise, the critical path network and schedule will not reflect the current status of work performed or progress attained.

5-6 IN-PROGRESS COST CONTROL

In-progress cost control is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only. An important cost control element deals with keeping informed of changes as the project progresses. Good cost forecasting, like updating a current working estimate (CWE) during construction, involves knowing costs to date, project status, and history of changes. This information is essential to determine the cost to complete, compared with the budget and funds available, so that decisions can made on the funding overage or shortage. There are three basic reports that the Agent must provide to show financial history, status, and progress for a project at summary and detail levels. These reports are: Cost Status, Work-in-Place, and Change and Claim Detail Reports.

5-6.1 Cost Status Report

The Cost Status Report is a conglomerate of information compiled by the Agent and the AF Funds Manager from the Agent's Construction Manager's Report, from the project information contained in the ACES-PM Civil Engineering Project Management system, and from job site observations. The goal of the report is not only to reflect the current financial health of the project, but to forecast the future financial needs as well. Proper cost forecasting should allow the AF Funds Manager sufficient notice for locating and transferring the needed funds to the Agent before they are actually required. The results of poor cost forecasting are typically either stop work orders or work deletion modifications.

The Cost Status Report compares the latest current working estimate (CWE) to finish a project with the programmed amount (PA), the funded amount and other financial limits such as the apportioned amount and the threshold. The Report will also include other pertinent financial data such as contract price, executed modifications, engineering and design (E&D) during construction, supervision and administration (S&A), available contingency funds, available management reserve funds, and other associated costs.

The most important inputs to this report, and probably the most difficult to assess, are the estimated costs for potential changes and undecided claims. The AF DM/CM, along with the Agent, must observe the interaction between the contract documents, the Contractor, the RCM, and the Contracting Officer so a price tag may be put on these future costs and included in this report. The best and most current information is at the job site, so use whatever technique works to ensure the data is accurate and up-to-date, especially in dealing with the CA's office above the RCM level. Not knowing the scope and cost of pending items has caused jobs to stop or needed work to be deleted because sufficient notice could not be given to the AF Funds Manager to obtain additional funds or authority. Cost status reports should be revised at least monthly or every time there's a change. Stay on top of the following two cost status items, update these items in ACES-PM and be able to answer fundamental questions:

- Current cash position. Is there currently sufficient funding to execute validated pending modifications?

- Forecast to completion. Is there sufficient funding to execute validated pending modifications and finish the job within available contingencies and management reserves? If no, seek contingency replenishment on unplaced work by requesting additional funds. If yes, maintain excess funds until the project has reached nearly 100% completion to ensure unforeseen problems will be funded in a timely manner.

5-6.2 Work-In-Place Report

This payment status report shows the value of work earned and the value projected (either by dollar value or by percentage of the total contract cost). It is commonly a graphical plot of the earned and projected values against time and is an indicator of the Contractor's progress. It is customary to allow payment for off-site fabrications and for materials that have been invoiced and set aside in bonded storage. There are two noteworthy observations about the WIP Report:

- Since WIP is based on dollar-valued (not man-hour-valued) activities, the Contractor may be behind in the completion schedule because lack of concentration on critical activities.
- If the actual WIP exceeds the projected WIP, make sure the payment retainage or deficiency disallowance, stored materials, and off-site fabrication allowance and construction progress all make sense when considered together, and that the Contractor is not being overpaid. Remember, leverage is shifting to the Contractor as the job progresses, so the AF DM/CM needs to remain continually aware of the cost to remedy defective work and the potential defects in untested work.

5-6.3 Change and Claim Detail Report

Cost control requires that each change or claim is separately identifiable; otherwise control is lost. The detail required for forecasting completion cost follows:

- Summary of validated or confirmed changes organized by number (total, negotiated, canceled, and un-negotiated), those within 0-60 days and those over 60 days. The AF DM/CM should focus first on the pending modifications (validated changes not yet negotiated) that are holding up work or causing a work sequencing problem. Have a preliminary estimate of the pending changes that don't yet have Contractor proposals for cost.
- Summary of changes by type and value for issued and pending changes.
- For changes pending, the AF DM/CM should know the cost estimating status for each proposal and the action needed for each. Assign suspenses.
- Potential or anticipated change requests must be scoped, validated, designed, and estimated before the Contracting Officer can negotiate. A pre-validation cost estimate should be used as part of scoping to develop total cost exposure.
- To determine the cost exposure for unresolved claims (which have the potential to become contract modifications), request the Agent provide status detail of each claim (description, claimed amount, associated performance time, and number of days since receipt by the Contracting Officer). Stay on top of the Agent to ensure that claims are resolved within 60 days, that meetings are held quickly so all parties understand the claim, and that a Government negotiating position is established if the claim appears to have some merit.
- The Agent sometimes negotiates modifications without negotiating time and associated costs. These items are often lumped into a "time extension" modification

to be negotiated and executed later. Modifications which ignore time should be considered a "bomb ready to explode," as the final time and associated cost settlements are often considerably higher than anticipated. Press the Agent to negotiate time with each modification or unilaterally add time when appropriate to force the discussion with the Contractor. Do not let the Agent execute modifications which invite the Contractor to re-open negotiations on the modification at a later time.

5-6.4 Value Engineering Change Proposals (VECP)

(See also Section 3-8.2, *Value Engineering*) VECPs are the Contractor's suggestions to reduce construction costs without sacrificing project functional requirements or quality, based on life-cycle cost analysis. The Contractor and the AF share the savings. See FAR 48.104, *Sharing Arrangements*. VECPs are considered Construction Agent Change Requests (CACRs) and must be approved by the AF DM/CM, Base, and User before they may be executed as modifications. The AF DM/CM has final approval authority for VECPs. VECPs need careful review to ensure that design objectives and long term functional requirements are not overlooked in the face of initial cost savings. Reviews must be completed quickly, because construction continues and savings opportunities may be overcome by events. Also, Contractors lose interest in submitting VECPs if the AF cannot act quickly enough to realize legitimate savings opportunities. Value engineering (VE) is not required for NAF projects.

5-6.5 Requests for Information (RFIs)

Contractor RFIs should be recorded and aggressively tracked and resolved.

5-7 CONTRACT MODIFICATIONS

Preparation of contract modifications is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The Agent should report and request authorization for changes from the AF DM/CM, especially when the modification affects cost or schedule. The AF DM/CM assures that contingency and management reserve are adjusted in ACES-PM as contract modifications are executed.

Modifications are negotiated "mini-contracts," formalized within the context of the original contract. Modifications allow equitable adjustments to the contract requirements so as to accommodate differing site conditions, unforeseen conditions, changes in building codes and criteria, correction of errors and omissions (design deficiencies), VECP delays and impacts to the work, administrative changes, weather delays, work suspensions, additions, and deletions. Within this list fall the various Agent changes and Air Force-requested changes. Modifications should not significantly change the scope of work. If a modification represents a scope increase or decrease of 5% or more, the project must be examined to gain a clear understanding of why and be carefully examined and justified. Unfortunately this may cause delay in the construction and therefore should be avoided.

5-7.1 Types of Changes

Mandatory Field Change: Mandatory changes are changes that must be made to allow the construction to proceed in a normal manner or to provide a fully functional facility. Mandatory changes may be generated as a result of differing site conditions, errors or omissions in the plans and specifications, or directed changes in applicable engineering or medical criteria.

Implementation of Mandatory Changes: Mandatory changes will receive top priority for implementation. Approval authority for these changes rests with the AF DM/CM. Mandatory

changes are normally funded from project contingency funds. The AF DM/CM will monitor contingency funds usage, estimated requirements, and will notify the AF A7CP of any anticipated requirements in excess of the allocated amount.

Non-Mandatory or User Requested Changes: Non-mandatory changes are generated by changes in procedures, equipment, or capabilities; or are to improve the maintainability or functional characteristics of the facility. These are generally changes to the construction contract initiated by the Air Force. Such changes after award of the construction contract are normally very expensive, may delay completion of the project and should be held to a minimum. Non-mandatory changes may provide benefit to the Government, but are optional in nature, i.e.; failure to implement these changes will not prevent the completion of a fully functional facility.

Implementation of Non-Mandatory Changes:

1. Non-mandatory changes will be managed to avoid exhausting available contingency funds on non-mandatory changes prior to identification and resolution of all mandatory changes and so that implementation of non-mandatory changes does not cause unacceptable schedule or cost impacts to the contract.

2. Non-mandatory changes may be deferred for future consideration if funds are still available following completion of the basic contract work and all mandatory changes. Deferred changes, if implemented, may be competitively bid in a separate follow-on contract at the end of the main contract. Non-mandatory changes may be implemented during the basic contract work if they cannot reasonably be deferred due to the nature of the work or if earlier implementation is in the best interest of the Government. The AF DM/CM will maintain a priority list of deferred non-mandatory changes with preliminary cost estimate(s).

3. All requests for non-mandatory changes from Air Force agencies will be processed through the AF DM/CM. When requested, the AF DM/CM will provide a preliminary cost and impact estimate for proposed non-mandatory changes.

4. The AF DM/CM will review the proposed change to identify project scope, criteria, schedule, and cost impacts. If the review determines that the change is out of project or contract scope, exceeds available funds or that the change should be deferred, the AF DM/CM may submit the change request for consideration by AF A7CP.

A checklist regarding change requests should include the following items:

1. Does the change fit within the scope of the original project, both as it relates to the concept of the project and the construction contract?
2. How does the change affect the contractor's schedule?
3. Does the project have a critical need date, and if so, how is it affected by changes in the completion schedule, if any?
4. What is or will be the status of project at the time of change?
5. Will the change cause the project CWE to exceed the PA? If an Air Force Change Request (AFCR) is truly mandatory, it should be approved and funding obtained for its implementation regardless of whether the CWE exceeds the PA or not.
6. Will the change cause a statutory limit to be exceeded? If so, higher level AF or congressional approvals and additional funding source will need to be sought.

5-7.2 Managing Modifications

Modifications are expensive because they are not usually competitively bid. They frequently add time to the construction schedule. The AF DM/CM should always question the requirement for the modification and possibly consider a competitive contract as an alternate method of implementation. The AF DM/CM determines the requirements for Air Force-requested changes and the Agent designs and executes the modification. Agent changes (changed conditions, design errors, etc.) must be reviewed and questioned, particularly where time extensions are involved. To keep on top of the modifications, the AF DM/CM should track status and push for progress at every possible opportunity. Review the outstanding modifications regularly, including length of time to execute and those modifications that are negotiated without time limits. Enter information about contract modifications as they are received in ACES PM under the main drop down for Contract Management in the Change Orders tab.

One of the AF DM/CM's more important tasks is to ensure that the User is not left out of the modification process, especially on Agent changes. The Agent must manage changes by keeping up with their processing so that the Air Force has sufficient time to line up additional resources or funding authority, if necessary. Additionally, each modification has the potential to affect the User's operational or planned occupancy date. Occasionally, the Air Force may elect to finance an accelerated delivery to meet fixed occupancy requirements. If the Agent executes modifications with little or no coordination, the User's plans may be adversely impacted.

5-7.3 Construction Contract Modification Funding

Contingency funds are provided to the Agent at construction contract award to pay for mandatory and optional changes not stemming from Air Force changes. Mandatory changes are: those required for a complete and usable facility when actual conditions found on the construction site differ from the plans and specifications; those needed to meet changed safety requirements; or those needed to correct technical errors or omissions in the plans and specifications. Normally 2% of the contract amount at award is set aside for contingency.

> Monitor contract changes and costs in ACES-PM on the Execution drop down menu, contracts, and modifications. Identify whether funds are contingency or management reserve. As contingency is consumed, the AF DM/CM requests replenishment from the Air Staff at 2% of unplaced work, unless directed otherwise.

Optional changes recommended by the Agent are known as Construction Agency Change Requests (CACRs). These requests result from changes in technology since design completion, value engineering change proposals (VECPs), and disputed items between the Contractor and Agent which affect schedule. As with mandatory changes, CACRs are funded from the project's contingency fund account, and require AF DM/CM approval.

Management reserve funds also are provided to the Agent at construction contract award for most projects. These funds are used to support Air Force requested modifications and may be used to replenish the contingency 'account' when required. As previously discussed, these modifications may be generated by the User, the BCE, or higher levels for improving the operations and maintenance of the facility and its systems or when revised operational missions impact the facility's functional use. Normally 3% of the contract amount at award is set aside for the Air Force management reserve (AFMR) account as long as the CWE is less than the PA. **The Agent may use management reserves only with AF DM/CM approval.**

The project CWE during construction is the summation of the original contract amount, executed modifications, SIOH, E&D, the contingency account, estimated costs for pending modifications, and other construction costs such as follow-on contracts. Thus, each contract modification may

cause an increase to the CWE. Although the Agent tracks construction costs by contract and is required to report these values to the AF DM/CM in the form of a CWE, the AF DM/CM must continually obtain project financial status information from the Agent in order to reflect an accurate cost to finish the project.

When the Agent's contingency account has been exhausted and pending modifications dictate the need for additional funds, the AFMR account must be used to fund those modifications. When both the AFMR and the contingency accounts have been depleted, the AF DM/CM may request the replenishment of the accounts. The AF Funds Manager will determine if management reserve and/or contingency accounts will be replenished. The contingency account is replenished to a level equivalent to 2% of the unplaced construction work, plus the pending modifications.

5-7.4 PA Threshold Limits

Per MILCON execution controls policy; if the total cost of all contract modifications cause the CWE to exceed the PA by more than 125% or $2 million, (whichever is less), the project will require Congressional Cost Variation Reprogramming. Refer to the latest Air Force MILCON *Program Management Plan*.(PgMP) for details on approval authorities and procedures when the CWE approaches PA thresholds. The AF DM/CM must stay on top of the costs of the project and encourage the Agent to submit information in sufficient time to request funds in accordance with current policy, especially when cost variation or reprogramming actions are required. In all cases, have the Agent submit a funds request in writing to the AF DM/CM.

5-8 SPECIAL INTEREST CONSTRUCTION PROGRAM

Execution of special interest construction programs, for example tri-service facilities, new mission bed downs or highly complex/technical MILCON, are primarily an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility and requires close AF DM/CM involvement. Special interest programs require more intense management and senior leadership involvement, therefore, the AF DM/CM should assure that the following items are also considered in the PMP:

5-8.1 Management Meetings

The number of interested organizations makes it necessary to have a means of providing everyone with project status information on a continuing basis. Coordination meetings are an important tool for managing the project, controlling costs, resolving current problems, and identifying potential problems. Weekly, monthly, and quarterly are the meeting frequencies that are generally recommended. The primary purposes of these meetings are indicated in the following:

Weekly Meetings – Primarily for information, problem solving, and decision making within authority provided to discuss the following:

- Current problems.
- Status of modifications and change requests.
- Quality assurance and quality control.
- Schedules and progress.
- Other pending actions.
- Funding status and issues.

Monthly Meetings – Meeting between key organizations listed in the Project Management Plan to discuss the following:

- Project status.

- Funding status.
- Issues requiring resolution above the authority provided to the weekly working group.

The Contractor might be invited to discuss progress achieved during the last 30 days and plans for the next 30 days. Contractors should not be present for government-only deliberations and discussions.

Quarterly Meetings – For project reviews by Commanders and Executives of the AF DM/CM, BCE, and User organizations, attendees should be limited to executives and those principals directly involved with the project. Purpose is to inform Executives and Commanders of project status and get resolution of issues for which there was insufficient authority at the lower levels.

The RCM or the parent Agent should prepare and distribute the minutes of the monthly and quarterly meetings for coordination. The minutes should be distributed within five days. The monthly meeting minutes will constitute a record of project status and actions taken.

5-8.2 Quality Assurance Plan (QAP)

At Air Force request the Agent prepares a QAP in conjunction with the Contractor's Quality Control Plan in addition to the Contractor's standard quality control plan. The following list indicates the salient features of the QAP:

- Inspection Assignments: The QAP should spell out the responsibilities of each Government agency inspecting the job.
- Contractor Inspections: The QAP should cover the responsibilities of the Contractor's quality assurance inspection team (if applicable), as well as how and when inspection will be done.
- Off-site Inspection: The QAP should cover any requirements that will require the Agent to go off-site for inspection.
- Safety Inspection: The QAP should provide a good description of the safety plan and inspection program that the Agent will be performing.
- Inspection Records: The QAP should spell out the requirements for inspection records for each section/individual of the inspection team.
- Testing: The QAP should, in conjunction with the contract documents, specify the different tests required and when each will be performed.
- Shop Drawings: The QAP should outline the procedures for review of shop drawings.
- O&M Instruction and In-house Training: The QAP should specify what types of O&M manuals are required and when training will be provided.

5-8.3 Financial Information

It is important that the AF DM/CM knows how much money has been obligated on a project and what the balances are in the management reserve and contingency accounts. The AF DM/CM should also know which pending contract modifications are critical and which are merely desirable.

5-8.4 Special Considerations

If the facility being constructed has special elements such as secure local area networks (LAN), equipment, furnishings, or special security systems, these items should be shown on a schedule

that shows the proposed and actual dates for each major development and installation milestone. These items can easily become pacing factors and should be intensively managed and visible throughout the construction phase.

5-9 A-E RESPONSIBILITY

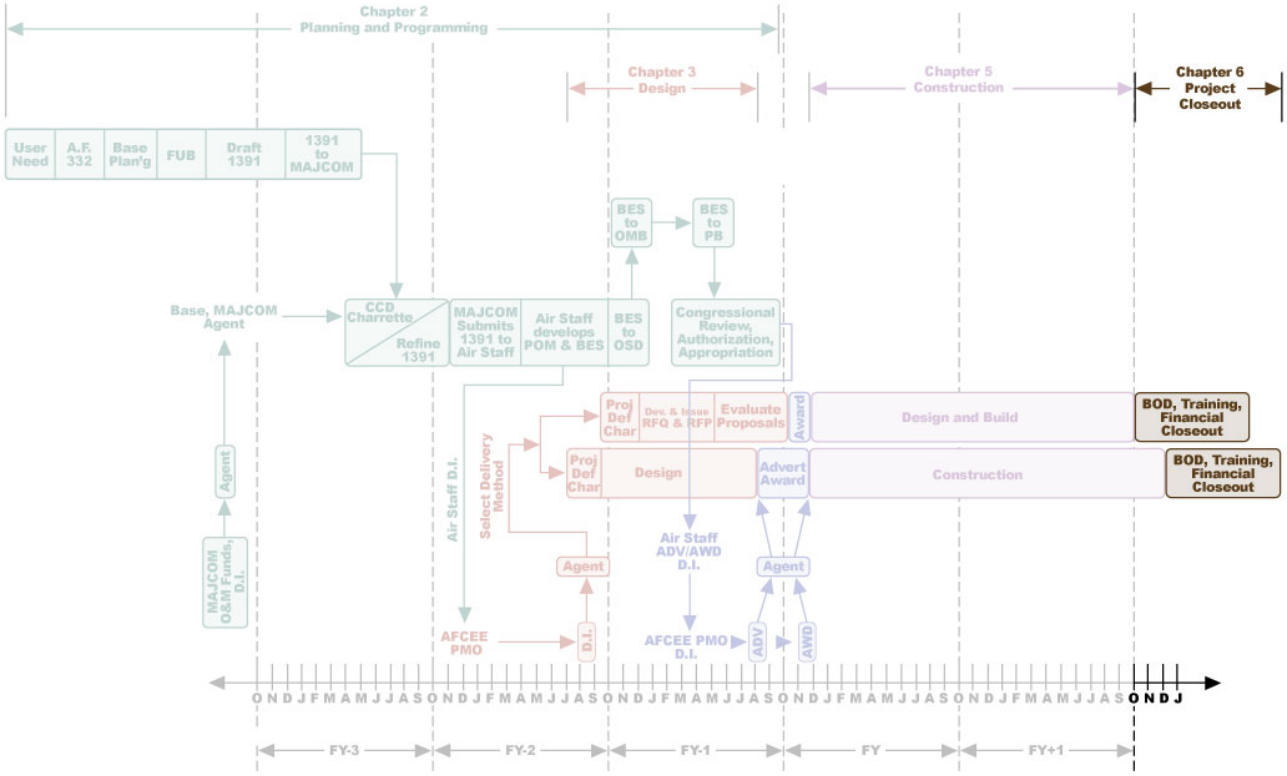
Determining A-E responsibility is primarily an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only.

The means for establishing A-E responsibility is contained in FAR 36.609-1, *Design Within Funding Limitation* and FAR 36.609-2, *Redesign Responsibility for Design Errors or Deficiencies*. The "*Design within Funding Limitations*" clause (FAR 52.236-22) and the "*Responsibility of the Architect-Engineer Contractor*" clause (FAR 52.236-23) are routinely included in the A-E's design contract. The Government will pursue A-E liability in cases where a Agent change modification was necessary due to an error or omission (design deficiency) by the A-E and the error or omission caused damages or additional costs without adding value to the work.

The Contracting Officer of the Agent has the obligation for pursuing A-E liability utilizing funds from construction Supervision and Administration (S&A) accounts. The Agent notification to the A–E must be quick to minimize damages and to allow the A-E an opportunity to propose corrections. The A-E, even if not negligent, must correct the design error(s) or omission(s) in the plans and specifications at no additional cost to the Government. Regardless of the outcome of any A-E responsibility determination, document the A-E performance regarding design quality and responsiveness in the Architect-Engineer Contract Administration Support System (ACASS) managed by the USACE, for use on future A-E selections.

CHAPTER 6 – PROJECT CLOSEOUT

The section of the MILCON Process Diagram below shows the project closeout activities detailed in Chapter 6.



MILCON Project Closeout

Inspections and documentation of project completion is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only, however, the AF DM/CM should work with the Agent to see that the contract is financially closed out. A project becomes physically complete when the Agent certifies that the project is construction complete and all deficiencies listed on the reverse side of the DD Form 1354 have been corrected.

6-1 RED ZONE POLICY ON PROJECT CLOSE-OUT

The "Red Zone" policy approach, originally developed by Air Combat Command, begins with a meeting held 60 days before the anticipated Beneficial Occupancy Date (BOD). Air Staff policy requiring AF DM/CM to implement "Red Zone" meetings was established on 22 July 2002 in a memorandum from AF/A7C. The "Red Zone" meeting gets its name from the football term used to describe the concentration of team effort to move the ball the last 20 yards into the end zone. The close-out of a MILCON project sometimes can be equally as hard and most definitely requires the whole team's effort. At this meeting, the whole Project Delivery Team (PDT) meets to discuss the close-out process including the following:

- Discuss, define, and achieve consensus on action necessary to complete construction

- Build a schedule of events and assign responsibilities and actions necessary to produce a timely physical and fiscal close-out of the project
- Support user occupancy
- Perform financial closeout
- Document the fiscal closeout of the project in the Real Property Records

The Corps of Engineers has also adopted the policy to apply the "Red Zone" meeting process to all MILCON projects according to their most recent Engineering and Construction Bulletin (ECB). The "Red Zone" meeting shall be included in every Project Management Plan (PMP). The Corps Project Manager will chair the meeting and ensure all key players are in attendance. Below is a partial checklist regarding topics and actions to be addressed at the "Red Zone" meeting. Refer to the ECB for additional checklist items. Note that the items shown below and in the ECB are only a sample; additional items should be added as required.

6-1.1 Red Zone Meeting Checklist

RED ZONE MEETING CHECKLIST

Installation: **Project:**	**Program Manager:**	**Date:**

Summary: Today's meeting established the financial status as well as milestones estimated completion dates and OPRs for all the actions necessary to complete the project.

COMPLETION MILESTONES

RED ZONE MEETING

What is the Red Zone Meeting?

The Red Zone meeting is held to discuss, define and achieve consensus on the construction and financial status of a MILCON project. The ultimate goal is to build a schedule of events necessary to achieve project completion and financial closeout. The meeting is held 60 days before anticipated beneficial occupancy.

Why is it called "The Red Zone"?

The name refers to the term used in football to describe the effort required to get the ball the last 20 yards into the end zone. Once you get inside the 20, things start to tighten up, and it takes coordination and a concerted team effort to achieve the goal of getting 6 points.

How does that relate to this project?

Typically, getting to within 60 days of beneficial occupancy is easy. The tough part comes with the final push to complete the project, get the users moved in, finish the financial end of the business and close it out.

Who should attend the Red Zone Meeting?

FINANCIAL STATUS

Knowing the finding status is crucial to building the plan to complete and closeout the project. Determine these amounts from the following calculations:

Contract Funding

Contract Award Amount	$_____
Executed Modifications	+$_____
Total Contract Funding	$_____
Progress Payments	-$_____
Value, unplaced work	$_____

Contingency Funding

Contingency at Award	$_____
Contingency replenishment	+$_____
Total contingency	$_____
Executed Modifications	-$_____
Unobligated contingency	$_____

Note: Any use of remaining contingency funds after the date of the Red Zone meeting requires AF PM approval.

SIOH Funding

SIOH at award	$_____

	AF PM, Contractor, CE Ops Flight, CE Engineering Flight, Communications, A/E of Record, CoE program Manager, User, CE Fire Protection Flight, CoE Resident Engineer, Contracting Officer. ***How will this meeting be run?*** The AF PM will chair this meeting, and guide discussion in two main areas; financial and construction status. Key project elements in these areas will be discussed, and consensus achieved on remaining balances for the project funding accounts. Responsibilities will also be assigned for specific actions relative to project completion required to achieve financial completion. The results will be recorded by the AF PM and become a part of the project file.	SIOH after award +$_____ Total SIOH $_____ Billed to date -$_____ Unobligated SIOH $_____ **CONSTRUCTION STATUS:** In order to determine the specific actions required to finish this project and assign responsibilities for those actions, it is necessary to establish the current completion schedule: Notice to proceed: _____ Original duration: _____ Original contract complete: _____ Executed time extensions: _____ New contract complete date: _____

6-1.2 Key Project Completion Milestones Checklist

KEY PROJECT COMPLETION MILESTONES

During the Red Zone meeting, the AF PM will record the agreed to dates for all of the below items as well as the OPR for meeting those dates

ITEM	DATE	OPR
Red Zone Meeting (60 days before BOD):		
Mechanical Test and Balance:		
Landscaping complete:		
Final Cleanup:		
Fire Inspection:		
Safety Inspection:		
Pre-final inspection:		
DDForm 1354 signed:		
Beneficial Occupancy Date (BOD):		
Punch-list completion:		
Physical Completion (90 days from BOD):		
Furniture delivery:		
Equipment delivery:		
Communications equipment installation:		
O&M training:		
User move-in:		
Ribbon cutting date:		

As-built delivery:		
O&M manuals delivery:		
Final invoice:		
Final payment:		
Release of claims:		
Final SIOH billing:		
Return of unobligated funds:		
Financial completion (180 days from BOD):		

6-2 OPERATIONS, MAINTENANCE, AND TRAINING

Operations, maintenance and training is primarily an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility; however, the AF DM/CM may become involved in system testing and training if the AF DM/CM has special knowledge or qualifications that make participation essential.

Ensure operating and maintenance (O&M) manuals, systems operating manuals, spare parts lists, and publications describing the equipment or materials, etc., are provided to the BCE as required by the contract specifications. Ensure a signed and dated receipt indicating the person and office receiving these manuals is received and placed in the project file.

6-2.1 System Testing and Training of O&M Personnel

The Agent must ensure that all systems are tested in accordance with the contract documents. Certain tests (e.g., fire protection systems) may require attendance by the BCE's Engineering and O&M staff and/or other personnel. Coordinate with the Agent to ensure that system testing and training have been scheduled in advance to allow maximum participation of interested Air Force personnel. Also, require the Agent to have complete O&M manuals available before testing and training.

6-2.2 System Startup

The AF DM/CM should ensure that O&M personnel are allowed hands-on participation as part of the systems start-up, testing and training. Have the Agent include time to allow O&M personnel to turn on and operate all systems so that problems can be identified for correction by the Contractor. For systems complicated enough to require training as a permanent record, the AF DM/CM should specify that Contractor training be videotaped.

6-2.3 Commissioning

Commissioning is the systematic process of ensuring and documenting that all building systems perform according to specification and design intent, consistent with the owner's operational needs. The commissioning process begins in the project-planning phase, is an integral part of facility delivery and continues through the first year of occupancy. Fundamental building systems commissioning is a prerequisite for obtaining LEED™ certification, and additional commissioning actions can achieve further LEED™ points. All new facilities and major renovation project will include commissioning to the extent practicable. Commissioning requires the coordinated efforts of a team comprised of the user, designer, construction agent, construction contractor and personnel performing operations and maintenance. Typical facility systems that are the focus of commissioning includes HVAC; plumbing; electrical; fire alarm and suppression; security; and all

types of audio, visual and computer communications. For additional guidance, refer to the Corps of Engineers Engineering and Construction Bulletin No. 2003-19, *Directory of Expertise on Design Construction Commissioning*, the *Whole Building Design Guide*, and the LEED™ *Green Building Rating System* from the United States Green Building Council.

6-3 ACCEPTANCE INSPECTIONS

Note: The Prefinal and final inspections are primarily a Design and Construction Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. However, the AF DM/CM should participate in these inspections, whenever possible.

6-3.1 Applicable Programs

This section outlines the procedures and responsibilities for transferring and accepting constructed facilities. Additional information can also be found in UFC 1-300-08, *Criteria for Transfer and Acceptance of Military Real Property*.

Types of MILCON Acceptance Inspections - MILCON projects require preliminary, pre-final and final inspections. The Agent must ensure the participants receive a timely invitation for any of these inspections.

Preliminary Inspection - During preliminary inspection, the Construction Agent and Air Force personnel identify deficiencies, establish standards of quality for acceptance and mutually agree on a beneficial occupancy date. The construction contractor does not attend. This inspection should occur when the construction work is substantially complete, and is usually scheduled in conjunction with the Pre-Final Inspection. This inspection must be conducted in the absence of the contractor to allow the Agent and the Air Force enough time to discuss and settle construction questions. During the inspection, all facility systems should be in operation, except by prior agreement or as specified in the contract, for the various representative of the BCE organization to observe and review. In addition, the possible date for the Final Inspection should be discussed.

Pre-final Inspection - The Construction Agent and the contractor conduct a detailed and thorough inspection to identify construction deficiencies and remaining contractual items (such as systems operating manuals, spare parts lists, as-built drawings and training requirements). The Agent should schedule the Pre-Final Inspection to occur as soon as possible after the Preliminary Inspection as these inspections go hand-in-hand. The Agent should compile the list of defects (punch list) which may have been identified during the Preliminary Inspection. A copy of the punch list shall be provided to the BCE, as well as the contractor. The Agent should not skip inspections stages by re-designating a Pre-Final Inspection as a Final Inspection.

Final Inspection - The primary purpose of the Final Inspection is to accept the constructed facility from the contractor, and to transfer the facility from the Agent to the Air Force. The Agent should provide the AF DM/CM, the host and tenant major commands, and the BCE a copy of the list of defects (punch list) identified during the Preliminary and Pre-Final Inspections in advance of the inspection date. It is strongly preferred that all deficiencies on the punch list be corrected before conducting the Final Inspection. If any deficiencies remain uncorrected on the date of the Final Inspection, they must be itemized on the DD Form 1354 along with their estimated correction date.

Final Acceptance - This occurs when all punch-list items have been corrected by the contractor and the Agent accepts the work as complete. If there is no follow-on work under another contract or task order, then Final Acceptance would also be the Physical Completion date.

6-3.2 Responsibilities

The Air Force Construction Manager and the Construction Agent share the primary responsibility for delivering the user a quality facility. If Construction Manager responsibilities have been delegated by the AF DM/CM to the BCE, or will be performed by the AF DM/CM, then that office shares the responsibility with the Construction Agent.

Quality Assurance - Government personnel (normally the Construction Agent for MILCON and the BCE for O&M) perform quality assurance and serve as Contracting Officer Representatives.

6-3.3 Design Deficiencies

In a design-bid-build project, the building contractor is contractually required to build according to the plans and specifications and is not responsible for deficiencies caused by errors or omissions in the design or contract documents. The A-E and the Design Agent are responsible for correction of design deficiencies within the scope of the project. Normally these deficiencies will be identified during the course of construction and corrected by modification to the construction contract. However, if these items are not identified until near or after contract completion, it may be best to correct these deficiencies through a separate contract or other purchasing action, although this strategy should be employed only as a last resort. Strive for early resolution of design deficiencies.

6-3.4 Construction Deficiencies

Construction deficiencies are the result of poor workmanship, inadequate inspection or QA/QC, incomplete construction, inferior or damaged materials, unacceptable substitution of material, and failure to construct according to the contract plans and specifications. If the construction does not comply with the contract specifications and drawings, the Contractor is responsible for correction of the deficiencies. Have the Agent follow-up with the Contractor to ensure these construction deficiencies are properly corrected.

The Contractor is responsible for latent deficiencies, or deficiencies that become apparent after construction completion, even if final release has been issued. Good craftsmanship and correct engineering practices are always the key to good construction. When responsibility is not quickly determined, have the Agent unilaterally direct the A-E and the Contractor to correct the deficiency and establish liability and payment responsibilities later, although this strategy should be employed only as a last resort. As with design issues, strive for early resolution of construction deficiencies.

6-3.5 Joint Occupancy

Approval - The Construction Manager may recommend approval of joint occupancy to the Contracting Office when it is advantageous to the government.

Joint Occupancy Date - The AF DM/CM (working with the customer and BCE), and the Agent jointly determine the joint occupancy date.

Facility Maintenance Responsibility - When agreeing to joint occupancy, the Air Force assumes responsibility for maintenance and repair of items not under warranty and for operations of portions of the facility occupied during joint occupancy.

Contractor Occupancy After Joint Occupancy - When the Air Force agrees to let a contractor continue to occupy or use a facility after it has accepted the facility, for any purpose other than to finish correcting deficiencies, the Air Force treats the contractor as a tenant and receives payment (according to AFI 65-601, Volume 1, *Budget Guidance and Procedures,* for any logistical support the Air Force provides to the contractor).

There may be occasions when it is desirable for the Air Force or third-party contractors to occupy a portion of a new facility prior to beneficial occupancy. This is a joint occupancy condition and may

be selectively used to enhance the overall outcome of a project. However, use this tool only after very careful consideration and only after formal agreement among all involved parties. Joint occupancy is provided for by the "*Use and Possession Prior to Completion*" clause (FAR 52.236-11). Joint occupancy does not relieve the Contractor of the responsibility for complying with the terms of the contract. Joint Occupancy should be discussed in a Pre-performance Conference in the presence of all Contractors, if possible.

The AF DM/CM needs to know what situations warrant consideration for joint occupancy. There may be a requirement for the Air Force or other contractors to install and test critical equipment (i.e., communications, computer, medical, etc.) which must be operational before the facility can be beneficially occupied. Another situation is a firm requirement to occupy a well-defined area that will be sufficiently completed and accessible before the rest of construction is complete. There are many potential joint occupancy situations, and all situations must be weighed carefully before proceeding.

Joint Occupancy can be a useful tool, but use it judiciously. It is absolutely essential to have a Joint Occupancy Agreement (JOA) covering the particulars of the occupancy, signed by all appropriate parties. Some of the specifics that the JOA should cover include:

- The areas involved
- Critical times for the various areas
- Government and Contractor access
- O&M responsibilities
- Phasing requirements
- Inspection requirements—before and after occupancy
- Warranties

In general, ensure the JOA defines the responsibilities and limitations of all parties concerning the construction, protection and use of the areas to be jointly occupied. The JOA should be signed by the Contractor, the Agent, the BCE, the AF DM/CM, and the User. The Health Facilities Office should also sign the JOA for medical projects.

6-3.6 DD Form 1354

The DD Form 1354, *Transfer and Acceptance of Military Real Property,* is the legally established method for transferring ownership of Government real property. The Agent must prepare the DD Form 1354 only for the area(s) inspected and ready for acceptance by the Air Force (see UFC 1-300-08, *Criteria for Transfer and Acceptance of Military Real Property* for additional information). The AF DM/CM and the BCE must ensure that all punch list items identified during the pre-final and final inspections are corrected or have been properly annotated with the anticipated correction date on the back of the DD Form 1354 before it is signed. When all the work has been completed, including the punch list items, the Agent should prepare a final DD Form 1354 and submit it to the BCE. All BCE-signed DD Forms 1354 must be filed in the Base's real property records.

6-3.7 Facility Acceptance/Beneficial Occupancy Date (BOD)

After the final inspection acceptance and completion of DD Form 1354, the Air Force may accept the facility from the Agent. This point marks the date that the facility is ready for occupancy by the User and is referred to as the Beneficial Occupancy Date (BOD). Although BOD normally occurs after all the construction and the final inspection have been completed, a partial BOD can take place in order to allow the User to vacate other space scheduled for construction or to immediately begin performing part of the User's mission. Partial BODs should be discouraged if the partial

occupancy serves no real advantage for the performance of the User's mission as it may cloud the issue of warranties expiration. The major role of the AF DM/CM at BOD is to return all funds except those required for approved modifications not yet executed. No funds will be held for pending modifications or pending claims.

Beneficial Occupancy is the term used to describe the procedure when the Government occupies or makes use of any part of the work prior to *Substantial Completion*. The presence of the Government within the project site may cause disruption of the contractor's activities; therefore, Beneficial Occupancy is subject to conditions set forth in the General Conditions of the contract.

The Government is not required to take Beneficial Occupancy and may wait for completion of the DD form 1354 to occupy and use the site. However, if the Government decides to occupy any portion of the project space prior to acceptance, the Construction Agent (CA) must issue a Certificate of Beneficial Occupancy. A Certificate of Beneficial Occupancy is not issued without concurrence of the AF DM/CM if Beneficial Occupancy will occur prior to *Substantial Completion* or acceptance of the facility.

Substantial Completion means that stage in the progress of the work, as determined by the AF DM/CM, when the work is complete and in accordance with the contract documents except for minor items which do not impair the users' ability to occupy and fully utilize the work for its intended purpose. With concurrence of the AF DM/CM, the CA issues the Certificate of Substantial Completion certifying that, all work is in place, all required agency approvals have been received, all systems and equipment are fully functioning. Examples of minor punch list items such as patching, repair or replacement of light switches, touch-up painting, repair of scratches on walls or floors remain to be completed.

The BOD is an important milestone and is used in calculating multiple Dirtkicker performance measures to include: Construction timeline, schedule growth, and financial closure.

6-3.8 Warranty

The typical construction contract requires the Contractor to warrant all workmanship, materials, and equipment for a period of one year from the date of substantial completion or beneficial occupancy, whichever occurs first. In addition, the contract may specify that some work or equipment will be warranted for longer periods and may contain specific response times. Also, there are specific manufacturer's warranties not required by specifications but available due to the Contractor's choice of materials allowed in submittals. Examples of contract-specific warranty items are window systems, roof membranes, and HVAC equipment.

To preserve the warranty on expensive and/or complex equipment, it may be necessary to require the Contractor to provide periodic maintenance and repair in the presence of O&M technicians. The FAR clause for construction warranties is FAR 52.246–21, *Warranty of Construction*. Have the Agent provide to the BCE a composite listing of all warranties in effect from the construction work along with points of contact and telephone numbers in the event of problems. Normally this list is part of the contents of the DD Form 1354, but having a duplicate of that list of warranty items makes distribution and discussion significantly easier.

6-3.9 As-Built Drawings

The Contractor is required to mark one set of the contract drawings and specifications with the differences between what was required in the contract documents and how the project was actually built. These differences should include not only the contract modifications, but any differences due to the Contractor's or using agency's selection of materials and contractor installation techniques. These marked-up documents are turned over to the Agent to incorporate the noted differences onto the original (usually mylar) drawings and mark the drawings "as-built." Check with the Agent to ensure this is accomplished by the required time, and that the as-built drawings are provided the BCE.

On most installations, the base drawings are digitized for storage and retrieval through a computer aided design/drafting (CADD) system. Ensure that the Construction Agent and the Design Agent are working together to accomplish the updating and digitizing in a timely manner. Be sure to follow through to see that the digitized records are turned over to the BCE. Also assure that one complete set of as-builts, including drawings, design analysis and specifications on CD-ROM(s) or other appropriate electronic media are provided to the AF DM/CM.

6-4 CLAIMS

Note: Management of claims is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only

Modifications made to a contract after they have been awarded have the potential for claims from the Contractor. The Contracting Officer represents the AF in executing these changes. The most important thing to remember is that once a contract is awarded, the contract terms and requirements are binding on both the AF and the Contractor.

Claims can be minimized with proper planning, early problem recognition and resolution through partnering, and the use of claims avoidance techniques. Many of the problems that arise during construction come from indecision and poor planning early in the project. The following list provides insight and guidance on claims mitigation and avoidance:

- Have a pre-acquisition strategy. The delivery method, type and number of contracts, delivery organization, and project scope should be established before design begins. The quality and type of contract documents may vary substantially with the acquisition strategy chosen and the scope definition. Conflicting specification sections most frequently occur when the acquisition strategy, scope, or building system selection change, and the design or construction reviews don't correct the resulting conflicts.
- Use particular care in reviewing User comments concerning specialty equipment and functions. Users often request contract modifications to have the most up-to-date equipment in the project. These equipment changes usually result in easy-to-show delay claims because of their close association with the previously completed or planned contract work. When the risk of change for technical improvements is very high, include language in the contract to cost these modifications on the basis of time and materials.
- Grant all justifiable requests by the Contractor for extensions of time unless there is substantial reason for not doing so. Failure to issue time extensions will seldom result in an earlier job completion; rather, it is more likely to result in claims for accelerated performance of the work. Reasonable extensions of time due to weather, strikes, and other delays for which the AF does not have to compensate the Contractor should be granted when warranted.

- At the start of the job, require the Contractor to identify in advance when the AF's input will be needed on items such as GFE delivery dates and rough-in data. Require the Contractor to include this information in the project schedule. This action may preclude later claims that the AF DM/CM failed to fulfill responsibilities assigned under the contract.
- Resolve claims in a timely manner. The Contracting Officer should normally render a decision within 60 days for claims less than $50,000. In claims for errors and omissions, be cautious that the A-E is not unduly protecting its position at the expense of the AF. Claims resolution includes prompt investigation of the situation and prompt response to all Contractor notices (notification of changed contract conditions) and claim letters (intent to file request for time or compensation).
- Resolve modifications and claims as they occur. At the end of the project, the AF has little leverage over the Contractor as most of the work has been completed and most of the payments have been made to the Contractor. Also, the Contractor can more easily develop impact and delay claims on a "ripple effect" from multiple changes when resolution is delayed to the conclusion of the project.
- Keep good records, particularly about Contractor manpower levels, days or part days worked, and areas where work is performed. These records may be useful in the event that a delay, acceleration, or a loss-of-efficiency claim is submitted. These records should also document errors and failings by the Contractor and contain letters that place the Contractor formally on notice of defects. Use of dated photographs and video can really make a difference as a supplement to the documentation.
- Modifications executed by the Contractor for additional work or as compensation for design errors and omissions should expressly state that the contract time is not extended because of the work within the modification if that is the case. **Avoid situations where the Contractor is paid labor and material costs, but reserves the right to claim additional compensation later for delay, disruption, and loss of efficiency.** Make every reasonable effort to negotiate such costs as part of the modification. There may even be projects where the AF DM/CM must ask the Contracting Officer to unilaterally determine that the time and compensation associated with a modification occurred because of an uncooperative Contractor.

When Claims come in:

- Treat them in a business-like manner. Do not get hostile and close communication channels with the Contracting Officer or the Contractor that might hinder subsequent negotiations.
- Insist that the Contracting Officer meet face-to-face with the Contractor if the claim is not easily understood or seems invalid.
- Make sure the AF's attorney is involved immediately.
- Don't succumb to payment of invalid claims just to get rid of them.

6-5 PHYSICAL COMPLETION

Documentation of project completion is an Agent (US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only)) responsibility. The content of this section is provided for AF DM/CM information only, however, the AF DM/CM should work with the Agent to see that the contract is physically and financially closed out. A

project becomes physically complete when the Agent certifies that the project is construction complete, all deficiencies listed on the reverse side of the DD Form 1354 have been corrected, copies of all O&M manuals and as-builts have been provided to the installation BCE, and equipment training has been completed. The Agent must assure that the O&M manuals and as-built drawings are provided not later than the Red Zone meeting.

6-5.1 Financial Closeout

A MILCON project is defined as financially closed when:

- All costs applicable to the MILCON project are recorded and those costs are included in the final CWE.
- All MILCON project obligations have either been liquidated or canceled.
- All accounts receivable pertinent to the MILCON project are collected.

The AF target financial closeout period is twelve months for CONUS projects and 15 months for PACAF and USAFE projects. This period starts on the beneficial occupancy date (BOD) when the User occupies the facility and ends on the date the Agent initiates the revocation directive certifying payment of all outstanding bills. Financial closeout enables the Air Force to withdraw surplus funds and to complete processing of the new facility into the Real Property Records in a timely manner.

Work closely with the AF DM/CM Funds Manager and the Agent Financial Manager to complete financial closeout. On the other hand, do not let pending claims that cannot be settled within the prescribed time period preclude financial closeout or let the Agent retain funds for potential claims or for pending claims to be acted upon by an appeals board. Monitor closely any remaining deficiencies to ensure that any cause for closeout delay is resolved promptly.

Although the Air Force goal is to reduce the closeout time, do not financially close a project with outstanding construction or design deficiencies.

6-5.2 Post Occupancy Evaluation

The Contractor is required by contract to warrant the project's workmanship and material for one year. Perform a Post Occupancy Evaluation during the ninth to eleventh month period after beneficial occupancy, noting any and all defective work. Report all construction deficiencies to the Agent for correction by the Contractor. Document problems or mistakes that were made during the design and give this information to the DA to review for other similar projects. The Post Occupancy Evaluation Team should include the Agent, the User, the BCE, and the AF DM/CM. The Agent summarizes "lessons learned" and distributes them to the AF DM/CM and BCE. The AF DM/CM sends items of interest concerning criteria to AF/A7CP. BCE personnel check 1-year warranty items even when a post-occupancy evaluation team inspection does not take place. BCE personnel will coordinate corrective action with the Construction Agent for discrepancies discovered during the 1-year warranty check.

APPENDIX

APPENDIX A – REFERENCES AND LINKS

A-1 Accessibility References

AFCEE Accessibility Page

Americans with Disabilities Act Accessibility Guidelines (ADAAG)

Architectural Barriers Act of 1968 (Public Law 90-480)

Uniform Federal Accessibility Standards (UFAS)

U.S. Access Board

A-2 Air Force References and Organizations

Achieving Design Excellence

Air Force Center for Engineering and the Environmental (AFCEE)

Air Force Civil Engineer Support Agency (AFCESA)

Historical Air Force Construction Cost Handbook

Air Force Institute of Technology (AFIT)

Air Force Link

Air Force MILCON *Program Management Plan* (PgMP)

Air Force Parametric Cost Engineering System (PACES)

Air Force e-Publishing

Air Force Services Agency (AFSVA)

Air Force Technology Transfer Program

AFSVA Golden Eagle Standards

Architect-Engineer Services with the Air Force

USAF Dirtkicker Criteria

Level 2 Memorandum of Understanding with Army Corps of Engineers

Memorandum of Understanding Between the AF and the USACE

MILCON Coach

Remedial Action Cost Engineering and Requirements (RACER)

USAF Design Awards Program

USAF Assistance Team Program Handbook

A-3 Air Force Design and Project Management Guides

Air Force Architectural Compatibility Design Guide

Air Force Interior Design Guides

Air Force Sustainable Facilities Guide

US Air Force Family Housing Guide for Planning, Programming, Design, and Construction

Air Force Family Housing Support Facilities Guide

Air Force Housing Privatization

Architectural - Engineering Services with the Air Force

Master Landscape Construction Specifications

Project Managers Guide to Military Family Housing

USAF Design-Build Plus User's Guide

USAF Entry Control Facilities Design Guide

USAF GOQ Guide Resident's Handbook; GOQ Standards Volume I

USAF GOQ Standards for Planning, Programming, Design, and Construction; GOQ Standards Volume II

USAF Landscape Design Guide

USAF Installation Force Protection Design Guide

A-4 Air Force Instructions (AFI)

AFI 10-245, *Air Force Antiterrorism (AT) Standards*

AFI 31-101, *Air Force Installation Security Program* (FOUO)

AFI 31-203, *Security Forces Management Information System* (SFMIS)

AFI 32-1001, *Operations Management*

AFI 32-1021, *Planning and Programming Military Construction (MILCON) Projects*

AFI 32-1022, *Planning and Programming Non-Appropriated Fund Facility Projects*

AFI 32-1023, *Design and Construction Standards and Execution of Facility Construction Projects*

AFI 32-1067, *Water Systems*

AFI 32-6001, *Family Housing Management*

AFI 32-6002, *Family Housing Planning, Design, and Construction*

AFI 32-6003, *General Officer Quarters Management*

AFI 32-6004, *Furnishings Management*

AFI 32-7063, *Air Installation Compatible Use Zone Program*

AFI 32-7061, *The Environmental Impact Analysis Process*

AFI 33-104, *Base-Level Planning and Implementation*

AFI 34-201, *Use of Non-Appropriated Funds*

AFI 34-209, *Non-Appropriated Fund Financial Management and Accounting*

AFI 34-105, *Programming for Non-Appropriated Fund Facility Requirements*

AFI 65-601*, Budget Guidance and Procedures*

AFI 48-145, *Occupational Health Program*

AFI 65-106, *Appropriated Fund Support of Morale, Welfare, and Recreation and Non-Appropriated Fund Instrumentalities*

A-5 Air Force FAR Supplements (AFFARS)

AFFARS *Table of Contents*

AFFARS 5323.890-7, *Contract Clauses*

AFFARS 5336.6, *Architect-Engineer Services*

AFFARS 5336.690 *Contracting with 8(a) or Disadvantaged Architect-Engineer Businesses*

AFFARS 5336.691, *Use of the indefinite-delivery/indefinite-quantity (IDIQ) contract type for the acquisition of architect-engineer services*

AFFARS 5352.223-9000, *Elimination of Use of Class I Ozone Depleting Substances (ODS*).

AFFARS Appendix BB

A-6 Air Force Handbooks (AFH) and Manuals (AFM)

AFH 32-1084, *Facility Requirements*

AFM 32-1089, *Air Force Military Construction and Family Housing Economic Data Analysis Guide*

AFMAN 91-201, *Explosive Safety Standards*

A-7 AF Occupational and Health Standards (AFOSH)

AFOSH Standard 91-10*, Civil Engineering*

AFOSH Standard 91-46*, Materials Handling and Equipment Storage*

AFOSH Standard 91-501*, Air Force Consolidated Occupational Safety Standard*

A-8 Antiterrorism/Force Protection (AT/FP)

AFI 10-245, *Air Force Antiterrorism (AT) Standards*

AFI 31-101, *The Air Force Installation Security Program (FOUO)*

AFI 31-203, *Security Forces Management Information System (SFMIS)*

USAF Installation Force Protection Design Guide

USAF Entry Control Facilities Design Guide

DOD Directive (DODD) 2000.12, *DOD Antiterrorism/Force Protection (AT/FP) Program*

DOD Instruction (DODI) 2000.14, *DOD Combating Terrorism Program Procedures*

EUCOM Operations Order 03-11 with FRAGO (latest edition) for USAFE installations

UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*

UFC 4-010-02, *Design (FOUO) DOD Minimum Standoff Distances for Buildings*

A-9 Construction Industry References

American General Contractors (ACG)

American Institute of Architects (AIA)

America Society of Civil Engineers (ASCE)

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

ASTM International (ASTM)

Construction Specifications Institute (CSI)

Construction Criteria Base (CCB) a service of the Whole Building Design Guide

Design Build Institute of America (DBIA)

Dun and Bradstreet (D&B)

Engineering News Record (ENR)

Illuminating Engineering Society of North America (IESNA)

International Code Council (ICC)

National Electric Code (NEC)

National Fire Protection Association (NFPA)

National Institute of Building Sciences (NIBS)

The Carpet and Rug Institute

Underwriters Laboratories (UL)

United States Green Building Council (USGBC)

A-10 Department of Defense

Architect-Engineer Contract Administration Support System (ACASS)

Micro Computer Aided Cost Engineering System (MCACES)

Corps of Engineers (USACE)

Department of Defense (DOD)

DODI 1010.15, *Smoke-free DOD Facilities* (enclosure 11)

DOD Directive (DODD) 2000.12, *DOD Antiterrorism/Force Protection (AT/FP) Program*

DOD Instruction (DODI) 2000.14, *DOD Combating Terrorism Program Procedures*

Naval Facilities Engineering Command (NAVFAC)

Tri-Service Detailed Cost Engineering System

TI 800-03, *Technical Requirements for Design-Build* (USACE)

DOD Directive 4270.5, *Military Construction*

A-11 Department of Defense FAR Supplements (DFARS)

DFARS, *Table of Contents*

DFARS 211.5, *Liquidated Damages*

DFARS 236.6, *Architect-Engineer Services*

DFARS 236.602-1, *A-E Services Criteria Selection*

DFARS 236.606-70, *Statutory Fee Limitation*

DFARS Part 19, *Small Business Programs*

DFARS 219.000, *Scope of Part*

DFARS 219.001, *Definitions*

DFARS 219.1005, *Applicability*

A-12 Engineering Technical Letters (ETLs)

Information regarding AF ETLs may be obtained from the Whole Building Design Guide website at the following URL: http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125

ETL 00-1, *EPA Guideline Items in Construction and Other Civil Engineering Specifications*

ETL 02-12, *Communications and Information System Criteria for Air Force Facilities*

ETL 02-17, *Use of Non-Potable Water to Replace Potable Water*

ETL 07-4, *Air Force Carpet Standard*

A-13 Federal Acquisition Regulations (FAR)

Federal Acquisition Regulation, (FAR) *Table of Contents*

FAR Part 1, *Scope of Part*

FAR Part 2, *Definitions of Words and Terms*

FAR Part 3, *Improper Business Practices and Personal Conflicts of Interest*

FAR Part 4, *Administrative Matters*

FAR Part 5, *Publicizing Contract Actions*

FAR 5.203, *Publicizing and Response Time*

FAR 5.207(b), *Synopses of Proposed Contract Actions*

FAR 5.207(g), *Cancellation of Synopsis*

FAR Part 6, *Competition Requirements*

FAR 6.304, *Approval of the Justification*

FAR 6.401, *Sealed Bidding and Competitive Proposals*

FAR Part 7, *Acquisition Planning*

FAR Part 8, *Required Sources of Supplies and Services*

FAR Part 9. *Contractor Qualifications*

FAR 9.104, *Standards*

FAR 9.106, *Pre-Award Surveys*

FAR Part 14, *Sealed Bidding*

FAR 14.404-4, *Restrictions on Disclosure of Descriptive Literature*

FAR Subpart 14.5, *Two Step Sealed Bidding*

FAR Part 15, *Contracting by Negotiation*

FAR 15.102, *Oral Presentations*

FAR 15.202. *Advisory Multi-Step Process*

FAR 15.203, *Requests for Proposals*

FAR 15.403-4, *Requiring Cost or Pricing Data*

FAR15.404-2, *Information to Support Proposal Analysis*

FAR 15.404-4, *Profit*

FAR 15.406-3, *Documenting the Negotiation*

FAR 15.605, *Content of Unsolicited Proposals*

FAR 15.609, *Limited Use of Data*

FAR Part 16, *Types of Contracts.*

FAR 16.202, Subpart 16.2 - *Firm Fixed Price Contracts*

FAR 16.203, Subpart 16.2 - *Fixed Price Contracts with Economic Price Adjustment*

FAR 16.304, Subpart 16.3 – *Cost Plus Incentive Fee Contracts*

FAR 16.305, Subpart 16.3 – *Cost Plus Award Fee Contracts*

FAR 16.306, Subpart 16.3 – *Cost Plus Fixed Fee Contracts*

FAR 16.403, Subpart 16.4 - *Fixed Price Incentive Contracts*

FAR 16.404, Subpart 16.4 - *Fixed Price Contracts with Award Fees*

FAR 16.601 Subpart 16.6 – *Time and Material Contracts*

FAR 16.603, Subpart 16.6 - *Letter Contracts*

FAR Part 19, *Small Business Programs*

FAR 19.1001, General

FAR 19.1005, *Applicability*

FAR 19.805, *Competitive 8 (a)*

FAR 19.1006, *Exclusions*

FAR Part 23, *Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace*

FAR 23.401, Subpart 23.4 - *Use or Recovered Materials – Definition*

FAR Part 36, *Construction and Architect -- Engineer Contracts*

FAR 36.6, Subpart 36.6 - *Architect - Engineer Services*

FAR 36.300, *Scope of Part*

FAR 36.601-1, *Public Announcement*

FAR 36.602-1, *Selection Criteria*

FAR 36.602-2, *Evaluation Boards*

FAR 36.609-1, *Design Within Funding Limitations*

FAR 36.609-2, *Redesign Responsibility for Design Errors or Deficiencies*

FAR Part 48, *Value Engineering*

FAR 48.104, *Sharing Arrangements*

FAR Part 52, *Solicitation Provisions and Contract Clauses*

FAR 52.102, *Incorporating Provisions and Clauses*

FAR 52.215-8, *Order of Precedence*

FAR 52.222-6, *Davis-Bacon Act*

FAR 52.236-11, *Use and Possession Prior to Completion*

FAR 52.236-22, *Design Within Funding Limitations*

FAR 52.236-23, *Responsibility of the Architect-Engineer Contractor*

FAR 52.246,

FAR 52.246-12. *Inspection of Construction*

FAR 52.246–21, *Warranty of Construction*

FAR 52.248, *Value Engineering Provisions and Clauses*

FAR Supplement, AFAC 92-44

A-14 Forms

AF Form 9, *Request for Purchase*

AF Form 66, *Schedule of Material Submittals*

AF Form 327, *BCE Work Order*

AF Form 332, *Work Request Authorizations*

AF Form 813, *Request for Environmental Impact Analysis*

AF Form 1178, *Project Cost Estimate Summary*

AF Form 1178a, *Project Cost Estimate Worksheet – Building Description*

AF Form 1178b, *Project Cost Estimate Worksheet – Detailed Cost Estimate*

AF Form 1477, *Construction Inspection Record*

DD Form 1391, *Military Construction Project Data*

DD Form 1354, *Transfer and Acceptance of Military Real Property*

SF 254, *Architect-Engineer Related Services Questionnaire*

SF 255, *Architect-Engineer Related Services Questionnaire for Specific Project*

SF 1442*, Solicitation Offer and Award*

A-15 Government References

Code of Federal Regulations

Commerce Business Daily

Competition in Contracting Act

Davis-Bacon Act

Electric Current Abroad

Environmental Protection Agency

Federal Acquisition Institute

Federal Energy Management Program

National Archives and Records Administration

Office of Management and Budget

A-16 Sustainable Development References

Air Force Sustainable Development Policy

Air Force Sustainable Facilities Guide

Leadership in Energy and Environmental Design (LEED™)

Construction and Demolition Waste Management Guide

Energy Policy Act (EPAct) 2005

Environmental Protection Agency

Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management

Instructions for Implementing Executive Order 13423

Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU)

Green Procurement

Greening the Government, *A Guide to Implementing Executive Order 13101*

LEED™ Application Guide for Lodging

National Pollutant Discharge Elimination System

Resource Conservation and Recovery Act (RCRA)

UFC 1-900-01, *Design: Selection Methods for Reduction, Reuse, and Recycling of Demolition Waste*

U.S. Fish and Wildlife Agency (Section 7 Consultation)

United States Green Building Council (USGBC)

Whole Building Design Guide

A-17 Unified Facilities Criteria (UFC)

Downloadable PDF files for UFC may be obtained from the following URL:
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 1-200-01, *Design: General Building Requirements*

UFC 1-300-08, *Criteria for Transfer and Acceptance of Military Real Property*

UFC 1-900-01, *Design: Selection Methods for Reduction, Reuse, and Recycling of Demolition Waste*

UFC 3-120-01, *Design*: *Air Force Sign Standard*

UFC 3-120-10, *Design: General Interior Design Requirements*

UFC 3-230-02, *Operations and Maintenance: Water Supply Systems*

UFC 3-260-01, *Airfield Planning and Heliport Design*

UFC 3-310-01, *Design: Structural Load Data*

UFC 3-310-02A, *Design: Structural Design Criteria for Buildings*

UFC 3-310-04, *Design: Seismic Design for Buildings*

UFC 3-400-01, *Design: Energy Conservation*

UFC 3-410-01FA, *Design: Heating, Ventilating, and Air Conditioning*

UFC 3-410-02A, *Design: Heating, Ventilating, and Air Conditioning (HVAC) Control Systems*

UFC 3-420-01, *Design: Plumbing Systems*

UFC 3-520-01, *Design*: *Interior Electrical Systems*

UFC 3-600-01, *Design: Engineering Fire Protection*

UFC 3-600-01, *Design: Fire Protection Engineering for Facilities*

UFC 3-600-02, *O& M: Inspection, Testing, and Maintenance of Fire Protection System*

UFC 3-701-07, *DOD Facilities Pricing Guide*

UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*

UFC 4-010-02, *Design: DOD Minimum Standoff Distances for Buildings (FOUO)*

UFC 4-021-01, *Design and O&M: Mass Notification Systems*

UFC 4-510-01, *Design: Medical Military Facilities*

A-18 United States Code

U. S Code Collection, *Table of Contents*

Title 10 U.S.C 2305, *Contracts: planning, solicitation, evaluation, and award procedures*

Title 10 U.S.C 2305a, *Design-build selection procedures*

Title 10 U.S.C. 2323, *Contract goal for small disadvantaged businesses and certain institutions of higher education*

Title 10 U.S.C. 2805, *Unspecified minor construction*

Title 10 U.S.C. 2807, *Architectural and engineering services and construction design*

Title 10 U.S.C. 2851, *Supervision of military construction projects*

Title 10 U.S.C. 2852, *Military construction projects: waiver of certain restrictions*

Title 10 U.S.C. 2853, *Authorized cost variations*

Title 10 U.S.C. 2854, *Restoration or replacement of damaged or destroyed facilities*

Title 10 U.S.C. 2855, *Law applicable to contracts for architectural and engineering services and construction design*

Title 10, U.S.C. 2855(a), *Law applicable to contracts for architectural and engineering services and construction design*

Title 10 U.S.C. 2856, *Limitations on barracks space by pay grade*

Title 10 U.S.C. 2857, *Use of renewable forms of energy in new facilities*

Title 10 U.S.C. 2858, *Limitation on the use of funds for expediting a construction project*

Title 10 U.S.C. 2859, *Construction requirements related to antiterrorism and force protection*

Title 10 U.S.C. 2860. *Availability of appropriations*

Title 10 U.S.C. 2862. *Turn-key selection procedures*

Title 10 U.S.C. 4540, *Architectural and engineering services (Army)*

Title 10 U.S.C. 7212, *Employment of outside architects and engineers (Navy)*

Title 10 U.S.C. 9540, *Architectural and engineering services (Air Force)*

Title 15 U.S.C. 631, et seq, *Aid to Small Business*

The Brooks Act - Public Law 92.582

APPENDIX B – CONSTRUCTION CONTRACT TYPES

B-1 Indefinite Delivery Indefinite Quantity (IDIQ) Contracts

Currently IDIQ contracts for MILCON, Minor Construction, MFH, Medical, O&M, and NAF projects consist of the basic contract year, plus four option contract years. Maximum fee limitations are $750,000 per contract year and $299,000 per delivery order. However, the initial delivery order in any contract year may be up to the contract year limitation, or $750,000.

- **$750,000 or less**: The Commanders of AFCEE and AFCESA are the selection Approval Authorities for IDIQ contracts where the expected fee in any single contract year is $750,000 or less. AFCEE may delegate this authority to the BCE if that organization possesses the necessary technical staff and registered professionals to satisfy the requirements for selection boards.
- **More than $750,000**: AF/A7C is the selection Approval Authority for IDIQ contracts where the expected A-E fee in any single contract year is expected to exceed $750,000.
- The number of IDIQ contracts that a base may have in place generally is limited only by the requirement that sufficient A-E workload exists to justify the multiple contracts and that these multiple IDIQ contracts do not unduly restrict competition. When multiple A-E contracts are awarded from a single solicitation, the fee limitations apply separately to each contract.

AF/A7C and SAF/AQC may grant waivers to these IDIQ fee limitations when justified by unusual circumstances or requirements. Two separate waiver requests are required: The requesting Base, AFCEE, or AFCESA must submit a waiver request to AFFARS 5336.691, to SAF/AQC. The AFCEE/CC, or AFCESA/CC also must submit a waiver request for selection Authority Approval from AF/A7CC. The notification required by Title 10 U.S.C. 2807 does not apply to IDIQ A-E contracts. Refer to AFFARS Subpart 5316.5, *Indefinite-Delivery Contracts* for additional information.

B-2 Firm Fixed Price (FFP)

A firm fixed price is equivalent to a "lump sum" contract that includes all labor, materials, expenses and other costs. The low price is the critical element, assuming all other considerations are equal. It is not subject to any adjustment on the basis of contractor's cost experience and places the maximum cost risk on the contractor. This contract type gives the contractor has greater incentive to control costs and places a minimum administrative burden on all parties. The level of effort payment is based on effort expended, rather than results achieved. Contractor provides specified effort over a stated period for fixed price.

Utilize a Firm Fixed Price contract when a reasonable basis for firm pricing exists. The limitations depend entirely on Government's ability to quantify and specify all aspects of the construction desired and its ability to use negative incentives to ensure that the contractor adheres to the specifications. This encourages the contractor to pursue grounds for change orders to increase profit. Refer to FAR 16.202 for additional information.

B-3 Fixed Price with Economic Price Adjustment (FPEcPA)

When utilizing a Fixed Price with an Economic Price Adjustment (FPEcPA), the price paid by the Government may be advised upward or downward if certain contingencies occur. This contract type provides for price adjustment to protect parties against significant economic fluctuation or

changes in contractor's established prices. FPEcPA provisions can be based on established (published) prices, actual costs, or cost index. Adjustments based on established prices are restricted to industry-wide contingencies. Adjustments based on labor or material costs are limited to contingencies beyond contractor's control. This decreases the contractor's risk and cost responsibility. This contract type may be utilized when contingencies resulting from unstable market or labor conditions can be identified and covered by a separate price adjustment clause. The limitations of this contract type are the same as for Firm Fixed Price contracts. Refer to FAR 16.203 for additional information.

B-4 Fixed Price with Incentive Firm (FPIF)

A Fixed Price Incentive Firm contract is a fixed price contract that provides for adjusting profit and establishing the final contract price by application of a formula based on the relationship of total final negotiated cost to total target cost. The final price is subject to a price ceiling, negotiated at the outset.

A fixed price incentive (firm target) contract specifies a target cost, a target profit, a price ceiling (but not a profit ceiling or floor), and a profit adjustment formula. These elements are all negotiated at the outset. The price ceiling is the maximum that may be paid to the contractor, except for any adjustment under other contract clauses. When the contractor completes performance, the parties negotiate the final cost, and the final price is established by applying the formula. When the final cost is less than the target cost, application of the formula results in a final profit greater than the target profit. Conversely, when final cost is more than target cost, application of the formula results in a final profit less than the target profit or even a net loss. If the final negotiated cost exceeds the price ceiling, the contractor absorbs the difference as a loss. Because the profit varies inversely with the cost, this contract type provides a positive, calculable profit incentive for the contractor to control costs.

A fixed price incentive (successive target) contract specifies that at a predetermined construction point, the firm target cost will be negotiated and firm target profit determined in accordance with an adjustment formula, and then either an FPIF or FFP can be negotiated. This contract type offers the lowest contractor's cost responsibility in the fixed price family of contracts.

Fixed Price Incentive contracts should be used when the assumption of a degree of cost responsibility by contractors will provide incentive for effective cost control. These contracts can combine with incentives on performance and schedule. Adequate cost or pricing date must be available to establish targets. The sole purpose of these contracts cannot be to shift cost responsibility to the Government and they require simultaneous agreement on all elements of pricing structure. The Contractor must have a sound cost accounting system. The Government assumes a larger contract monitoring role. These contracts are appropriate only for competitive proposals or other than competitive procedures. Refer to FAR 16.403 for additional information.

B-5 Fixed Price with Award Fees (FPAF)

Award fee provisions may be used in fixed price contracts when the Government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively. These contracts shall establish a fixed price (including normal profit) for the effort. This price will be paid for satisfactory contract performance. Award fee earned (if any) is paid in addition to that fixed price. These contracts should also provide for periodic evaluation of the contractor's performance against an award fee plan. Refer to FAR 16.404 for additional information.

B-5 Cost Plus Incentive Fee (CPIF)

A Cost Plus Incentive Fee (CPIF) contract is a cost reimbursement contract that provides for an initially negotiated fee to be adjusted later by a formula based on the relationship of total allowable costs to total target costs. The Government pays allowable cost and incentive fee with CPIF contracts. The incentive fee is determined by comparing actual cost to target and adjusting target fee in accordance with a fee adjustment formula (share ratio). Fee adjustments are established at the outset within minimum and maximum limits. Performance incentives can be incorporated if development is feasible and the Government performance objectives have been determined. Contractor's risk and cost responsibility is substantially reduced from those of the fixed price family of contracts.

These contracts are appropriate where a profit incentive is likely to provide motivation for more effective management and only for competitive procedures. The fee limits are the same as CPFF contracts. Contractor must have a sound cost accounting system and the Government assumes a large contract monitoring role. Refer to FAR 16.304 for additional information.

B-6 Cost Plus Award Fee (CPAF)

A Cost Plus Award Fee (CPAF) contract is a cost reimbursement contract that provides for a fee consisting of (a) a base amount (which may be zero) fixed at inception of the contract and (b) an award amount, based upon a judgmental evaluation by the Government, sufficient to provide motivation for excellence in contract performance. The Government pays an allowable cost and incentive fee. Contractors earn a base fee, which does not vary with performance and all or part of an award fee based on subjective evaluation by the Government of the contractor's performance. The amount of the award fee is unilaterally determined by the Government and is not subject to Disputed Clause. Evaluation of performance and corresponding partial payment of fee are made at stated intervals. Contractor's risk and cost responsibility is the same as with CPIF.

These contracts are appropriate where subjective evaluation is likely to increase contractor's motivation for excellence in such areas as quality, timeliness, technical ingenuity, and cost effective management. They are also appropriate when finite performance objectives cannot be established in advance to measure actual performance. The award fee may be used in conjunction with other types of contracts. The base fee shall not exceed percentage of estimated cost and the maximum fee limits are the same as CPFF contracts. The Government assumes larger administrative burden forward fee determination. The contract amount, performance period, and expected benefits must be sufficient to warrant the additional workload. Other limitations from CPIF apply. Refer to FAR 16.305 for additional information.

B-7 Cost Plus Fixed Fee (CPFF)

A Cost Plus Fixed Fee (CPFF) contract is a cost reimbursement contract that provides for payment to the contractor of a negotiated fee that is fixed at the inception of the contract. The fixed fee does not vary with actual cost, but may be adjusted as a result of changes in the work to be performed under the contract. This contract type permits contracting for efforts that might otherwise present too great a risk to contractors, but it provides the contractor only a minimum incentive to control costs. The Government pays allowable cost and fixed fee.

A completion form requires the contractor to deliver the end product (preferred form). Term form requires specified level of effort over stated period of time. Consider utilizing these contracts where CPIF contracts are not practical. Fees shall not exceed 15% of estimated cost for research and development (R&D) or 10% of estimated cost for normal construction contracts. The price of A-E contract shall not exceed 6% of all estimated costs of the public work or utility project. Assistant Secretary of Defense, Production and Logistics (ASD P&L) approval are required in the

U.S. if an A-E contract is over $25,000. Determination and findings must be approved by agency head or designee. Other limitations of CPIF apply. Refer to FAR 16.306 for additional information.

B-8 Letter Contracts

Although seldom used, a letter contract is a method of contracting for design or construction when work must be started immediately to minimize impacts to the mission. As an undefinitized contractual instrument, it starts construction before negotiation of terms and price. This contract type is not open-ended (indefinite quantity); rather, the specific design or construction needs must be specified as completely as feasible under the given circumstances. The Contracting Officer must complete definitization within 180 days after the date of the letter contract or before completion of 40% of the work, whichever occurs first, in accordance with FAR 16.603.

The Contracting Officer must execute a Determination and Finding (D&F) showing that no other contracting method is suitable before this method may be used. The letter contract must not commit the Government to a definitive contract in excess of a not-to-exceed price, cannot be amended to satisfy a new requirement unless the new requirement is inseparable from the existing exigent requirement, and must not circumvent competition stipulations when required by other sections of the FAR. For further information on this contract type, see FAR 16.603.

B-9 Time and Materials Contracts

A time and materials contract provides for acquiring supplies or services on the basis of the following:

- Direct labor hours at specified fixed hourly rates that include wages, overhead, general and administrative expenses, and profit; and
- Materials at cost, including, if appropriate, material handling costs as part of material costs.

A time and materials contract may be used only when it is not possible at the time of placing the contract to estimate accurately the extent or duration of the work or to anticipate costs with any reasonable degree of confidence. Refer to FAR 16.601 for additional information.

B-10 Low Price Technically Acceptable Solicitation

Use of this type of two step sealed bidding as described in FAR Subpart 14.5 might occasionally be appropriate, but use of this method requires award of the contract to the lowest priced technically acceptable offer. The use of sealed bidding, as described in FAR Part 14, *Sealed Bidding,* Subparts 14.1 through 14.4, is seldom appropriate for MILCON projects and can generally be applied to routine projects, such as base maintenance delivery contracts. The number of IDIQ contracts that a base may have in place generally is limited only by the requirement that sufficient A-E workload exists to justify the multiple contracts and that these multiple IDIQ contracts do not unduly restrict competition. When multiple A-E contracts are awarded from a single solicitation, the fee limitations apply separately to each contract.

APPENDIX C – COMMON DELIVERY METHODS

C-1 Traditional (Design-Bid-Build)

The Design-Bid-Build (DBB) process starts when the Air Staff issues a Design Instruction through ACES-PM authorizing the AF DM/CM to start design. Typically, the PM works with a Design and Construction Agent (DA/CA), such as the US Army Corps of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), AFCEE or AF Waterbeach (UK only), to select a design firm, usually an A-E already under contract with the DA/CA. The AF DM/CM and DA/CA work with the Base level PM to arrange for a design charrette to be performed at the installation. The charrette is a critical step since the scope of the project outlined in the official 1391 is fully defined during this process. A charrette report is prepared that fully describes the project scope and cost. The report becomes the basis for completion of the drawings, specifications, design analysis and cost estimate. Usually interim reviews of the design documents occur at the 35%, and 95% design stages. Occasionally, additional "over the shoulder" reviews (typically at 65% design) will be required if project complexity warrants them. The DA will usually provide a back check design review after which the contract drawings and specifications are ready for construction contract action.

The contract drawings and specifications are transmitted to contracting with a written request to contract for construction. The construction contractor is selected through a separate contract action and competitive bid process where the offeror with the lowest bid is usually awarded the contract. This delivery method provides management simplicity and a reasonable level of confidence in the estimated cost for construction since the estimate is based on a 100% design. Construction contracts are awarded based upon low competitive bids and bonding is required as part of the Invitation for Bids (IFB). In the design-bid-build process, the Government retains a high level of design control and receives a firm fixed price for the construction of a thoroughly defined product. The PM continues to follow the project and update status in ACES-PM until construction is complete, the user assumes Beneficial Occupancy of the facility and the construction contract is closed out. Contract Closeout is the final phase of the project and is frequently the most difficult to accomplish in a timely manner.

However, there are situations where the design-bid-build process creates concerns because construction costs are not fixed until the project is completely designed. The design suffers from a lack of input from contractors and subcontractors, since these groups are not involved in the design process. The Architect-Engineer is not always the most knowledgeable about recent innovations in construction technology. The responsibility for the successful result (the completed project) is divided between the Architect-Engineer and the contractor. Divided responsibility increases the potential for litigation.

C-2 Two-Step Design Build

This acquisition process provides another design tool to improve design execution (time and cost), especially for late start inserts and supplementals.

The Process: AF DM/CM, BCE PM, and design agent PM mutually agree on the acquisition process before design starts. Design charrette deliverable provides the prescriptive and narrative technical portion of the design build solicitation. Step-one selects a short list of 3-4 contractors, typically based on qualifications to execute a specific project, who will compete for the contract. Step-two provides the short list contractors the technical requirements to prepare a technical proposal and presentation that receives a technical score from a Technical Evaluation Board (TEB). A Source Selection Board (SSB) receives a briefing from the TEB on the merits of each proposal and its technical score that is used in combination with the bids to determine the best

value offer. The RFP describes the Contractual Process in detail and indicates the stipend amount to second step selected participants.

Sometimes, as an incentive to the proposers a stipend may be used to help offset some of the proposal preparation costs. The stipend amount is determined as a factor of the overall PA of the project, its complexity and the extent of detail required in the proposal. The AF DM/CM and Agent coordinate these factors and determine final amount which is in the range of 0.1% to 0.2% of the PA. Planning and Design (P&D) funds are the appropriate source for stipends.

The design-build approach addresses many of the issues of concern described in the DBB process. The cost of the project is fixed earlier with design-build. The A-E of record and the construction contractor collaborate to provide the best balance between design, construction technology, and cost. The AF holds a single contract with one organization responsible for design and construction, thus reducing conflict and potential litigation.

C-3 One-Step Design Build

With the One Step variation of the DB delivery method, the RFP is usually based on performance specifications and a general description. Proposals are detailed and evaluated on technical merit and cost. This type of delivery method should also be utilized only when well established industry standards and materials are available and control after contract award is not desired. Potential vendors must be willing to risk higher costs to compete.

C-4 Bridging Design Build

The Bridging variation of the DB delivery method involves a detailed description of the project from AF's perspective and utilizes preliminary design drawings and specifications. This provides the DB contractor with latitude in the final detailed development of the design and in the execution of working drawings. The AF must approve specific design packages for compliance with standards in the RFP before releasing the contractor to build. This method offers greater AF control, but must thoroughly communicate all requirements thus stable requirements are important. The project can be more complex than for Turnkey or One Step and potential vendors have lower cost risk.

C-5 Design Build+ (DB+)

DB+ is similar to Traditional Design Build, however, it is essentially a form of design and construction that retains all the advantages and flexibility of traditional Design-Build. It still allows for use of performance specs and a low level of design. It allows the flexibility of award to the contractor offering the "best value" instead of going to the low bidder. The construction delivery team, known as the DB+ contractor, is brought "on-board" during the advanced planning activities, the planning, site selection, and programming phase of effort and they remain on the team throughout construction and the project delivery effort. The construction industry today often refers to this process as either Construction Management at Risk or Design-Build at Risk. Key distinguishing features of DB+ are:

- Uses multi-award, IDIQ contracts to accomplish tasks
- DB+ construction team is "on-board" at design start - part of the team
- Is a *program* ceiling contract vice an *individual* ceiling contract for each contractor
- Program ceiling contract creates incentive for cadre members to perform great work in order to get more work

The winning DB+ construction team performs surveys and investigations during design and as such will be held accountable for their work during construction (differing/unforeseen site condition).

C-6 Design Build (Turnkey)

Another form of design-build is called Turnkey. A Turnkey project establishes a fixed price, usually based on a written RFP with no sketches or drawings. Air Force personnel prepare the RFP defining the minimum design requirements (usually in a narrative form), and the design-build teams submit design concepts along with price proposals and qualifications packages. This form of acquisition is usually selected for repetitive type construction projects such as housing, temporary living facilities, etc. This type of contracting has the highest level of risk for the offeror and often involves a significant amount of money for preparation of each proposal. Turnkey construction may include a requirement for the offeror to complete land acquisition in order to achieve the final facilities.

The Turnkey variation of the DB delivery method involves an RFP that contains little more than a general description of the project requirements. Proposals are more technical and detailed. Functions other than design and construction are typically included, such as land acquisition, financing, and operations and maintenance (O&M). This type of delivery method should be utilized only when well established industry standards and materials are available and control after contract award is not desired. Potential vendors must be willing to risk higher costs to compete.

C-7 Design Build (Fast Track)

The Fast Track delivery method is a form of design-build, in which construction begins before working drawings and specifications are complete, and work is based on multiple bid packages for each phase of work, with all contracts and managed by the AF. This delivery method offers the highest potential for reduced acquisition time and cost. Disadvantages are that it is more complex and time consuming to administer, and requires greater construction management skills. There is also the potential for higher costs and schedule risk. The best application for the Fast Track delivery method is for bona fide emergency where time savings carries high premium. The work must also be divisible into discrete packages.