



AIR NATIONAL GUARD DESIGN OBJECTIVES AND PROCEDURES

05 April 2024

ENGINEERING TECHNICAL LETTER (ETL)

AIR NATIONAL GUARD DESIGN OBJECTIVES AND PROCEDURES

Record of Changes (changes are indicated by \1\ ... /1/)

Change No.	Date	Location

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FOREWORD

In accordance with Air Force Instruction 32-1023, the Chiefs of the National Guard Bureau (NGB) and Air Force Reserve develop supplementary instructions and or guidance unique to the Air National Guard (ANG) and Air Force Reserve Component (AFRC) construction programs and oversee management of their respective programs. In accordance with Title 10, U.S.C. Chapter 133 *Service, Supply, Procurement*, the ANG and the AFRC facilities programs are executed under Title 10, U.S.C., Chapter 1803. As such they may coordinate with Air Force Installation Mission Support Center (AFIMSC) and portions of Air Force Civil Engineer Center (AFCEC), but execute under Title 10, U.S.C., Chapter 1803.

Air National Guard Engineering Technical Letters (ANG ETLs) provide requirements (i.e., defined by users and operational needs) and are intended for use with unified technical requirements published in DoD Unified Facilities Criteria (UFC). ANG ETLs are applicable only to the Air National Guard, and do not represent unified DoD requirements. Differences in requirements between DoD Components as well as local and state agencies may exist due to differences in policies and operational needs.

The UFC system is prescribed by MIL-STD 3007G Standard Practice Unified Facilities Criteria, Facilities Criteria and Unified Facilities Guide Specifications and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applicable to the Military Departments, Defense Agencies, and the DoD Field Activities. The UFC System also includes technical and functional requirements for specific facility types. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Systems Command (NAVFAC), and Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system. Technical content of UFC is the responsibility of the cognizant DoD working group.

ANG ETLs are living documents and will be periodically reviewed, updated, and made available to users as part of the Military Department's responsibility for providing technical criteria for military construction.

ANG ETLs are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide web site <https://www.wbdg.org/ffc/ang/engineering-technical-letters-angetl>

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

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AIR NATIONAL GUARD ETL REVISION SUMMARY SHEET

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Superseding: ANG ETL 10-03, Air National Guard Design Objectives and Procedures,
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Description: This ETL provides specific guidance on how and when to provide a project design deliverable for the ANG. This document is organized into design deliverables and design phases. Requirements for design deliverables, beyond or in more detail of what is already required by a Core UFC, are provided for ANG-only. The requirements for when or to what extent these deliverables are provided are in the Phase chapters.

Reasons for Document: Update procedures to coordinate with current commercial and government standards, procedures, and governing UFC's.

Impact: Improve efficiency and consistency of design procedures across ANG.

Unification Issues: Design and Submittal procedures contained herein are pertinent to standards, software, and templates used, required, and unified within the ANG, and centered around the ANG organization and operation. ANG activities may be located on active-duty air force bases, air reserve bases, naval air stations/joint reserve bases, or ANG bases and stations which are either independent military facilities or collocated as tenants on civilian-controlled joint civil-military airports. Therefore, design procedures for ANG activities may differ from NAVFAC, USACE, and Air Force operations due to organizational and operational differences.

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CHAPTER 1 INTRODUCTION

1-1 PURPOSE AND SCOPE.

The Air National Guard (ANG) Design Objectives and Procedures, developed by the National Guard Bureau (NGB)/A4I, is established to define the overall objectives in accomplishing the ANG facilities design and construction management program and the procedures to be followed in achieving that end.

1-1.1 Organization of Document.

This document is organized into design policy, roles and responsibilities, design deliverables, and design phases. The design deliverables chapters contain general requirements that apply throughout the design process. For the disciplines, additional information is provided only if it is not already in another UFC; thus, a discipline paragraph may not be provided if the Core UFC already provides the requirements for that deliverable, or the level of completion of that deliverable. Core UFCs are defined and listed in UFC 1-200-01, DoD Building Code.

1-2 APPLICABILITY.

This document is applicable to both Design-Bid-Build (DBB) and Design-Build (DB) projects. Regardless of the execution method (i.e., offload to USACE, NAVFAC, etc.; Appendix 1031; Facility, Sustainment, Restoration, and Modernization Cooperative Agreement (FSRMCA); or Military Construction Cooperative Agreement (MCCA), this document must be referenced and incorporated into **all** A-E contracts for the development of pre-design; design; post design/pre-construction award; and post construction award oversight for ANG projects.

1-3 GENERAL BUILDING REQUIREMENTS.

Comply with UFC 1-200-01, DoD Building Code, and UFC 1-200-02, High Performance and Sustainable Building Requirements. Use UFC 1-200-02 in conjunction with UFC 1-200-01 and the UFC and government criteria referenced therein. UFC 1-200-01 provides applicability of model building codes and government-unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, physical security, cybersecurity, high performance and sustainability requirements, and safety. UFC 1-200-02 provides minimum unified requirements and coordinating guidance for planning, designing, constructing, renovating, and maintaining high performance and sustainable facilities that will enhance DoD mission capability by reducing total ownership costs. Use this document in addition to UFC 1-200-01, UFC 1-200-02, and the UFC and government criteria referenced therein.

Note: Paragraph 1-5.2 of UFC 1-200-01, DoD Building Code states the Building Official/Authority Having Jurisdiction represents the DoD design and construction agent responsible for accomplishing the project. The Design Working Group should incorporate other agencies (e.g., Airport authority, active-duty host, etc.), as applicable

to the project.

1-4 CYBERSECURITY.

Plan, design, acquire, execute and maintain all facility-related control systems (including systems separate from a utility monitoring and control system) in accordance with UFC 4-010-06, Cybersecurity of Facility-Related Control Systems.

Cybersecurity is implemented to mitigate vulnerabilities to all DoD real property facility-related control systems to a level that is acceptable to the System Owner and Authorizing Official. UFC 4-010-06 provides requirements for integrating cybersecurity into the design and construction of control systems.

1-5 DEVIATIONS, EXCLUSIONS, OR MODIFICATIONS.

Any deviations, exclusions, or modifications to the ANG Design Objectives and Procedures requirements in A-E contracts requires pre-approval of the NGB A4I Division Chief.

1-6 REFERENCES.

Appendix A contains a list of references used in this document. The publication date of the code or standard is not included in this document. In general, the latest available issuance of the reference is used.

1-7 GLOSSARY.

Appendix B contains abbreviations.

1-8 ATTACHMENTS.

Appendix C contains the attachments referenced in this document.

CHAPTER 2 POLICY

2-1 CRITERIA.

Design Air National Guard (ANG) facilities in accordance with all ANG and Department of Defense (DoD) Criteria. DoD Design Criteria are available from the Whole Building Design Guide web site (<https://www.wbdg.org>). Design criteria include general criteria, as well as specific criteria on particular elements of the work and facility types. Design requirements are typically in the form of Unified Facilities Criteria (UFC). The contract will reference the specific requirements applicable to a particular project.

2-2 METRIC POLICY.

Comply with MIL-STD-3007 for the use of SI in projects and criteria documents.

2-2.1 SI Definitions.

Hard Metric measurement: The actual size, capacity, or other measurement characteristic of a product is changed to a rational metric value. This measurement is used in the manufacturing process.

Soft Metric measurement: A simple arithmetical change from inch/pound to SI units, using a conversion factor, so that actual measurable characteristics remain virtually unchanged, or at least within the former tolerance limits.

2-2.2 General Policy.

In accordance with Public Law 94-168, design and construction of new or renovated facilities must use the metric system of measurement, unless its use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms. Specify hard metric products unless such products are unavailable or uneconomical. Do not use dual units on drawings on any type of project. The design agent project manager is responsible for making the determination on whether or not to use the metric system of measurement on a project-by-project basis. Decisions to not use the metric system must be justifiable and documented in permanent project files.

2-3 OWNERSHIP OF PROJECT DOCUMENTS AND DATA.

The clauses set forth in DFAR 252.227-7023, Drawings and Other Data to Become Property of Government, DFAR 227.71, Rights in Technical Data, and DFAR 227.72 Rights in Computer Software and Computer Software Documentation, apply to all project documents and data.

2-4 OPERATION SECURITY (OPSEC).

The OPSEC process provides a means of screening information prior to public release in order to prevent aggregation with other information, ultimately revealing DoD intentions or capabilities. Publicly released documents such as field investigations, reports, studies, Basis of Design, calculations, drawings, specifications, or Design-Build

Request for Proposals (RFP) must not reveal sensitive or critical information.

2-4.1 OPSEC Review.

Include an OPSEC review by the [Base's OPSEC Manager](#) as part of the normal review process; prior to public release to identify any information that may require protection. Where applicable, modify details and identifying information in order to eliminate information the [Base OPSEC Manager](#) has identified as sensitive or critical.

2-4.2 Mission Information.

DoD installations support units and missions that may be considered sensitive, critical or even classified. In addition, every DoD command performs a core, unclassified mission. Although unclassified, individual tasks required for a command to accomplish its mission may contain information that when pieced together with other information, reveal sensitive, critical, or even classified information.

2-4.3 Information Compilation.

The compilation of information that is individually unclassified may be classified as a result of the compilation. Classification requires a classification decision by an Original Classification Authority (OCA).

2-4.4 Sensitive or Critical Information.

Sensitive or critical information is unclassified or controlled unclassified information (CUI) concerning the DoD activities, intentions, capabilities, limitations, or vulnerabilities. The following is provided to help avoid the disclosure of sensitive or critical information that must not be included in any publicly releasable material (e.g., BOD, drawings, specifications, etc.).

- Do not identify a command if their mission or portion of their mission is considered critical or classified
- Do not identify a command's mission or the mission supported by a facility if the mission is considered critical or classified
- Do not identify the capabilities or vulnerabilities of physical security or antiterrorism protective measures.
- Do not identify the location of a Sensitive Compartmented Information Facility (SCIF)
- Do not identify location of a Special Access Program Facility (SAPF)
- Do not identify Defense Critical Infrastructure
- Do not identify the location of Communications Security (COMSEC)

Equipment.

- Do not identify Take Charge and Move Out (TACAMO) systems or mission.
- Do not identify Nuclear Command, Control and Communications (NC3) systems or mission
- Do not identify Military Strategic and Tactical Relay (MILSTAR) systems or mission
- Do not identify Advanced Extremely High Frequency (AEHF) systems or mission
- Do not identify purpose or frequency range of antennas or communication systems
- Do not identify Low Frequency (LF) or Very Low Frequency (VLF) transmission systems, missions, or specific location or site of the LF or VLF system.

Sensitive area locations such as SCIF and SAPF, may be labeled as "Controlled Area," "Secure Area," or "Restricted Area" and may be shown on public releasable documents with the approval from the [Base's Site Security Manager or Officer](#).

2-5 REGISTRATION

Develop project documents under the direction of a Registered Architect or a Professional Engineer currently licensed in accordance with FAR 52.236-25 Requirements for Registration of Designers.

Each drawing must only be signed, sealed, and dated by the Registered Architect or the Professional Engineer who is registered to practice in the particular field involved for work depicted on that drawing, serves as the Designer of Record (DOR) for that work, and complies with requirements of FAR 52.236-25. Sign Record Documents in accordance with [Chapter 12, Electronic Design Deliverables \(EDD\) Format](#).

2-5.1 Certification.

Where special certifications are required for the design, certify in accordance with the contract and local requirements.

2-6 PROHIBITION OF POSTING CUI DESIGN DELIVERABLES ON UNSECURED SERVERS.

Design deliverables may contain Controlled Unclassified Information (CUI) such as For Official Use Only (FOUO) or Department of Defense Unclassified Controlled Nuclear

Information (DoD UCNI). The release of this type of information into the public domain may compromise an installation or facility's antiterrorism (AT) or physical security protective measures. Examples include the design analysis where the design basis threat (DBT) is an explosive weight and the location of a Sensitive Compartmented Information Facility (SCIF) or Special Access Program Facility (SAPF). Protect deliverables, such as drawings, specifications, calculations, cost estimates, and other design related information, that contain CUI, in accordance with DoDI 5200.48, Controlled Unclassified Information.

CHAPTER 3 ROLES AND RESPONSIBILITIES

3-1 CONTRACTING.

The Contracting Officer (KO) is the only individual who has the authority to obligate federal funds on a contract. The Contracting Officer may designate a Contracting Officer's Representative (COR), usually the Base Civil Engineer (BCE). The COR is given limited authority, as defined in the appointment letter, to communicate with the A-E and construction contractor. The Contracting Officer (KO) is the only individual who has the authority to negotiate, enter into, or modify the contracts.

The Contracting Officer (KO) incorporates the consolidated submittal review comments in the issuance of the Notice To Proceeds to (Type A-1, 15%, Concept Proposal; Type A-2, 35% Concept Development; and to Type B-1, 65% Design) and submittal acceptance of (Type B-1, 65% Design; Type B-2, 100% Pre-Final Design; and Type B-3, 100% Final Design).

If the A-E proceeds with the design, or any changes to the design, without the express authority of the Contracting Officer, the A-E does so at its own risk.

3-2 PROGRAM MANAGEMENT.

The Asset Management Division (NGB/A4FD) of the Installations and Mission Support Directorate, Air National Guard Readiness Center, located at Joint Base Andrews, MD, plans, budgets, and reviews projects (e.g., Sustainment, Restoration, and Modernization (SRM); Specified Major Military Construction (MILCON); and Unspecified Minor Military Construction (UMMC)).

NGB/A4FD releases MILCON, UMMC, and selected high cost, complex SRM projects, for Advance Planning to finalize programming documentation.

NGB/A4FD release projects for design once all programming documentation is complete and projects have been approved by the appropriate authority.

The NGB/A4FD Programmer reviews projects and provides his/her submittal review comments to the NGB/A4I Project Manager.

NGB/A4FD does not have the authority to direct changes to the contract. If the A-E interprets any direction given by NGB/A4I as a change in contract requirements, the A-E shall immediately notify the Contracting Officer and the NGB/A4I PM before taking any action.

3-3 DESIGN MANAGEMENT.

3-3.1 Operations Division (NGB/A4I).

The Operations Division (NGB/A4I) of the Installations and Mission Support Directorate, Air National Guard Readiness Center, located at Joint Base Andrews, MD, provides

management, oversight, and acceptance of construction projects, including criteria, designs, and project funding.

NGB/A4I is the only office with the authority to change or clarify design criteria.

NGB/A4I is the acceptance authority for all submittals that are required to be submitted to NGB/A4F and NGB/A4I. The NGB/A4I PM provides the KO and BCE the submittal acceptance with the attached BCE and A4I review comments.

NGB/A4I does not have the authority to direct changes to the contract. If the A-E interprets any direction given by NGB/A4I as a change in contract requirements, the A-E shall immediately notify the Contracting Officer and the NGB/A4I PM before taking any action.

3-3.2 Civil Engineer Technical Services Center (CETB).

The Civil Engineer Technical Services Center (CETB), NGB/A4IC, located in Minot, ND. NGB/A4IC has engineers in all major disciplines and technicians involved in specialty areas, including aircraft arresting systems; petroleum, oils and lubricants (POL) facilities; airfield pavements; and fire suppression systems.

NGB/A4IC will forward all review comments to the BCE and NGB/A4I PM.

The Contracting Officer (KO) will incorporate the review comments in the issuance of the NTP or acceptance of the submittal, as applicable.

NGB/A4IC does not have the authority to direct changes to the contract. If the A-E interprets any direction given by NGB/A4IC as a change in contract requirements, the A-E shall immediately notify the Contracting Officer and the NGB/A4I PM before taking any action.

3-3.3 Base Civil Engineer (BCE).

For projects requiring NGB funding and/or approval, the Base Civil Engineer (BCE) develops and submit required programming documents to NGB/A4FD through the Programming, Budgeting and Justification (P, B & J) Tool.

The BCE is the Government's local engineering management coordinator and usually serves as the COR for the A-E contract.

The BCE is responsible for furnishing the Construction Security Plan (CSP), Mission Assurance Category (MAC), and existing information of on-site conditions, including Environmental Restoration Program (ERP) sites, utility locations, etc., and is the point of contact for the A-E to meet with the Base's other offices.

The BCE will:

- (1) compile and edit all Base level submittal review comments;
- (2) complete the respective certification (Reference [Attachment 4](#), [Attachment 5](#), [Attachment 7](#), [Attachment 8](#), [Attachment 10](#), [Attachment 11](#), [Attachment 13](#), [Attachment 14](#), [Attachment 16](#), [Attachment 17](#)); and
- (3) send the Base Review Comments, completed Certification and Checklist; and all submittal documents identified on the Checklist to the NGB/A4I Project Manager, NGB/A4F Programmer, and NGB/A4IC Civil Engineer Technical Services Center (CETB).

The BCE does not have authority to change design criteria or direct changes to the contract. If the A-E interprets any direction given by the BCE as a change in contract requirements, the A-E shall immediately notify the Contracting Officer before taking any action.

3-3.4 Base Using Activity (User).

The Base Using Activity (User) will be the occupant of the facility being designed. The User, in coordination with the BCE, is responsible for providing the A-E with information on its operations and on special or unique equipment that will be in the facility.

The User reviews projects and provides his/her submittal review comments to the BCE.

The User does not have the authority to change design criteria or direct any changes to the contract. If the information supplied by the User appears to conflict with criteria provided in the contract, the A-E shall immediately notify the Contracting Officer and BCE before taking any action.

3-3.5 Design Working Group (DWG).

The Design Working Group (DWG) is established for each project through written appointment by the Facilities Board chairperson. The DWG is the Base's team that is responsible for providing functional area requirements to the design team and ensures these requirements are incorporated throughout the design process. The BCE usually serves as the DWG's chairperson. Other members normally include, but are not limited to, representatives from the using activity, the fire department, safety, security, communications, and environmental management. Representatives of the User shall be assigned to the DWG for the duration of the project and should be available for all meetings, reviews, and other design activities. Representatives of the User must have delegated authority to speak for the User activity for all requirements. The same DWG should be retained and delegated to work with the A-E's design team and provide information and guidance throughout the development of the Basis of Design (BOD) and project design process. The DWG will meet with the A-E's design team as needed. Each DWG member reviews projects and provides his/her submittal review comments to the BCE.

The DWG does not have the authority to change design criteria or to direct changes to the contract. If the A-E interprets any direction given by the DWG as a change in contract requirements, the A-E shall immediately notify the Contracting Officer before taking any action.

3-3.6 Base Environmental Manager (BEM).

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties that are eligible for listing in the National Register of Historic Places (NRHP). Historic properties may include archaeological sites, individual buildings, historic districts, landscapes, structures, objects, and traditional cultural properties. In accordance with established procedures at each Installation (e.g., Base), the Base Civil Engineer files a National Environmental Policy Act (NEPA) Compliance Checklist plus a copy of the Work Request or Project Description with the Base's Environmental Manager. The Base Environmental Manager then reviews the Project Description and determines whether the project has the potential to affect historic properties or whether it is exempt from Section 106 compliance. The Base Environmental Manager will then either record that the undertaking is exempt or engage in consultation for Section 106 Compliance as required by 36 CFR 800.

3-3.7 Site Security Manager (SSM).

Special coordination is required for projects associated with a Sensitive Compartmented Information Facility (SCIF) or Special Access Program Facility (SAPF). A designated, Government Site Security Manager (SSM) is assigned to the project. The SSM is responsible for the project's security requirements and will prepare a Construction Security Plan (CSP), Fixed Facility Checklist (FFC) and the TEMPEST addendum to the FFC (referred to as the TEMPEST Form A) for the project. The SSM will submit these documents to the Accrediting Official (AO) for approval. The Designer of Record assigned to the project must assist the SSM in documenting the facility and site requirements necessary for the preparation of these documents. The AO-approved CSP, FFC and TEMPEST Countermeasure Review contains project requirements that must be incorporated into the project for the facility to be accredited. Refer to UFC 4- 010-05, Sensitive Compartmented Information Facilities Planning, Design, and Construction, for additional information.

3-4 DESIGNER OF RECORD.

3-4.1 Coordination with Air National Guard Bureau and Design Working Group.

Engage in and provide liaison with the Air National Guard Bureau, and appropriate Design Working Group (DWG) personnel, as required by the contract, during the early design-development or Request for Proposal (RFP) development.

The DOR is responsible for architectural and engineering aspects of the project to ensure reasonable facility cost appropriate for the functions to be performed through

design and RFP development.

3-4.2 Response to Review Comments.

Respond to comments in accordance with this document. The DOR or DB Contractor is responsible for the resolution and incorporation of government comments into the project design. At each submittal, return and address previous review comments. Provide responses to review comments that clearly indicate what action is being taken to resolve the comment. If the comment was incorporated into the design, a response must so indicate; otherwise, provide acceptable technical justification for comments not being incorporated. Prior to the next submittal, contact the Government reviewer to discuss and resolve any comment that will not be incorporated.

The DOR is responsible for using professional judgment and technically evaluating user comments that suggest technical changes to design.

3-4.3 Final Approval.

The DOR reviews and gives final approval for contract project documents prepared under their direction. The DOR must be registered in the discipline for the documents they approve as described in Chapter 2 in paragraph "Registration".

CHAPTER 4 OVERVIEW OF THE DESIGN PROCESS

NGB/A4I initiates the design project by authorizing the BCE to procure A-E services through the Contracting Officer. The NGB/A4I PM will issue a Design Instruction (DI) establishing the cost and scope and outlined the required A-E services for the project. Once an A-E has been selected, the NGB/A4I PM will conduct the Criteria Review Conference (CRC) in conjunction with the BCE and Contracting Officer. [Attachment 3](#) provides a CRC Addendum sheet to be used to track any changes to this document (i.e., ANG Design Objectives and Procedures), as applicable, that were defined during the CRC. This should be used along with the Checklist of A-E Services Requirements (provided to the Base with the DI) to establish the scope of the A-E services to be provided. At the CRC, the Government will review the project scope and budget. The Government will define the level of services required from the A-E. The A-E will also be presented with any available Government project information. Further, the Government will review in detail procedures to follow in the contract as well as all submittal requirements from the A-E. The A4I PM, BCE, and Contracting Officer shall develop a tentative design schedule during the CRC. At the close of the CRC, the A-E will be presented a Request for Price Proposal (RFPP) for A-E services. Following A-E fee negotiations, legal review of the contract documents, and award of the signed contract, the design shall proceed as follows:

- Step 1.** KO issues A-E **Notice to Proceed** (NTP) to Preliminary Design (Type A-1, 15%).
- Step 2.** A-E facilitates kickoff/Preliminary Design Charrette.
- Step 3.** A-E prepares Part I (Design Intent) of the Basis of Design (BOD) and submits to BCE for acceptance. (see Chapter 6 and [Attachment 1](#))
- Step 4.** Upon BCE acceptance of BOD, A-E conducts Concept Proposal Meeting.
- Step 5.** A-E prepares Type A-1 (15%, Concept Proposal) Certification (see [Attachment 4](#) or [Attachment 5](#)) and referenced Type A-1 (15%, Concept Proposal) Checklist (see [Attachment 6](#)) for BCE review and completion.
- Step 6.** BCE, User, and DWG review submittal and complete the Type A-1 (15% Concept Proposal) Certification and Checklist.
- Step 7.** BCE sends the following **via DoD SAFE** to the NGB/A4I/PM, NGB/A4F Programmer, and NGB/A4IC:
 - BCE Review Comments (i.e., The consolidated BCE, User, and DWG comments).
 - Completed Type A-1 (15%, Concept Proposal) Certification.
 - Completed Type A-1 (15%, Concept Proposal) Checklist.
 - **All** documents identified on the Type A-1 (15%, Concept Proposal) Checklist.

PRELIMINARY DESIGN STOP

- Step 8.** NGB/A4I PM, NGB A4FD Programmer, and NGB/A4IC review the BCE comments and the complete Type A-1 (15% Concept Proposal) Submittal provided by BCE.
Note: The review time is 21 calendar days after receipt of the complete submittal.
- Step 9.** NGB/A4I PM provides the KO and BCE the Type A-1 (15%, Concept Proposal) acceptance and attaches the BCE and NGB/A4 review comments.
- Step 10.** KO incorporates the BCE and NGB/A4 Type A-1 (15%, Concept Proposal) review comments into the **NTP** to Type A-2 (35%, Concept Development).
- Step 11.** A-E conducts Type A-2 Concept Development Meeting.
- Step 12.** A-E develops concept to 35%.
- Step 13.** A-E prepares Type A-2 (35% Concept Development) Certification (see [Attachment 7](#) or [Attachment 8](#)) and referenced Type A-2 (35% Concept Development) Checklist (see [Attachment 9](#)) for BCE review and completion.
- Step 14.** BCE reviews submittal and completes the Type A-2 (35% Concept Development) Certification and Checklist.
- Step 15.** BCE sends the following **via DoD SAFE** to the NGB/A4I PM and NGB/A4IC:
- BCE Review Comments (i.e., The consolidated BCE, User, and DWG comments).
 - Completed Type A-2 (35%, Concept Development) Certification.
 - Completed Type A-2 (35%, Concept Development) Checklist.
 - **All** documents identified on the Type A-2 (35%, Concept Development) Checklist.

PRELIMINARY DESIGN STOP

- Step 16.** NGB/A4I PM and NGB/A4IC review the BCE comments and the complete Type A-2 (35%, Concept Development) Submittal provided by the BCE.
Note: The review time is 21 calendar days after receipt of the complete submittal.
- Step 17.** NGB/A4I PM provides KO and the BCE the Type A-2 (35%, Concept Development) acceptance with the attached BCE and A4I review comments.

- Step 18.** KO incorporates the BCE and NGB/A4 Type A-2 (35%, Concept Development) review comments into the **NTP** to Design (Type B) Services.
- Step 19.** A-E develops Contract Documents to 65% design (Type B-1) and conducts Contract Document Development Meeting.
- Step 20.** A-E prepares Type B-1 (65% Design) Certification (see [Attachment 10](#) or [Attachment 11](#)) and referenced Type B-1 (65% Design) Checklist (see [Attachment 12](#)) for BCE review and completion.
- Step 21.** BCE reviews submittal and completes the Type B-1 (65% Design) Certification and Checklist.
- Step 22.** BCE sends the following **via DoD SAFE** to the NGB/A4I/PM and NGB/A4IC:
- BCE Review Comments (i.e., The consolidated BCE, User, and DWG comments).
 - Completed Type B-1 (65%, Design), Certification.
 - Completed Type B-1 (65%, Design) Checklist.
 - **All** documents identified on the Type B-1 (65%, Design) Checklist.

DESIGN STOP

- Step 23.** NGB/A4I PM and NGB/A4IC review the BCE comments and the complete Type B-1 (65%, Design) Submittal provided by the BCE.
Note: The review time is 21 calendar days after receipt of the complete submittal.
- Step 24.** NGB/A4I PM provides KO and the BCE the Type B-1 (65% Design) acceptance with the attached BCE and A4I review comments.
- Step 25.** KO incorporates the BCE and NGB/A4I Type B-1 (65% Design) review comments into the Type B-1 (65% Design) **acceptance**.
- Step 26.** A-E develops Contract Documents to Type B-2 (100%, Pre-Final Design).
Note: The level of effort for the Type B-2 Prefinal Submittal shall be "100% - Not For Construction". The Type B-3 submittal shall only require minor modifications.
- Step 27.** A-E prepares Type B-2 (100%, Pre-Final Design) Certification (see [Attachment 13](#) or [Attachment 14](#)) and referenced Type B-2 (100% Pre-Final Design) Checklist (see [Attachment 15](#)) for BCE review and completion.
- Step 28.** BCE reviews submittal and completes Type B-2 (100%, Pre-Final Design) Certification and Checklist.

- Step 29.** BCE sends the following **via DoD SAFE** to the NGB/A4I/PM and NGB/A4IC:
- BCE Review Comments (i.e., The consolidated BCE, User, and DWG comments).
 - Completed Type B-2 (100%, Pre-Final Design) Certification.
 - Completed Type B-2 (100%, Pre-Final Design) Checklist.
 - **All** documents identified on the Type B-2 (100%, Pre-Final Design) Checklist.

DESIGN STOP

- Step 30.** NGB/A4I PM and NGB/A4IC review the BCE comments and the complete Type B-2 (100%, Pre-Final Design) Submittal provided by the BCE.
Note: The review time is 21 calendar days after receipt of the complete submittal.
- Step 31.** NGB A4I/PM provides KO and BCE the Type B-2 (100%, Pre-Final Design) acceptance with the attached BCE and A4I review comments.
- Step 32.** KO incorporates the BCE and NGB/A4I Type B-2 (100%, Pre-Final Design) review comments in issuance of Type B-2 (100%, Pre-Final Design) **acceptance**.
- Step 33.** A-E develops Contract Documents to 100% Final Design (Type B-3).
- Step 34.** A-E prepares Type B-3 (100%, Final Design) Certification (see [Attachment 16](#) or [Attachment 17](#)) and referenced Type B-3 (100% Final Design) Checklist (see [Attachment 18](#)) for BCE review and completion.
- Step 35.** BCE reviews submittal and completes Type B-3 (100% Final Design) Certification and Checklist.
- Step 36.** BCE sends the following **via DoD SAFE** to the NGB/A4I PM and NGB/A4IC:
- BCE Review Comments (i.e., The consolidated BCE, User, and DWG comments).
 - Completed Type B-3 (100%, Final Design) Certification.
 - Completed Type B-3 (100%, Final Design) Checklist.
 - **All** documents identified on the Type B-3 (100%, Final Design) Checklist.
- Step 37.** NGB/A4I PM and NGB/A4IC review BCE comments and the complete Type B-3 (100%, Final Design) submittal provided by BCE.
Note: The review time is 21 calendar days after receipt of the complete submittal.

Step 38. NGB/A4I PM provides KO and BCE with Type B-3 (100%, Final Design) **acceptance**.

Step 39. KO issues A-E Type B-3 (100%, Final Design) **acceptance**.

DESIGN COMPLETE

FOLLOW-ON CONTRACTS, as required.

Step 40. Designer of Record (DOR) Support and Post Construction Award Services.

- Update Cost Estimate.
- Code and Criteria Review.
- Procurement Support Services (i.e., response to offerors questions preparation of addenda to solicitation documents; evaluation of offerors, etc.).
- Type C Services (i.e., Contract Administrations + Construction, Defects + Post-Construction).

CHAPTER 5 DELIVERABLE: FIELD INVESTIGATION

5-1 PURPOSE AND SCOPE.

The site approval process includes field investigation and verification. This early effort provides more defined project scope and cost; and it can rule out a site. Many of the functions identified under this heading are also essential during the DD Form 1391 validation process to assure the project has the appropriate funding based on the scope of work. This section is not applicable for post-award design services of design-build contracts unless specifically addressed in the RFP.

5-2 RESPONSIBILITIES.

The DOR must obtain all site and building data and investigate existing site conditions, utilities, and facilities as necessary to properly integrate the design of the project with existing conditions. Except as otherwise contracted, field investigations must include complete and accurate site investigation, topographic survey, and verification of location, ownership, and availability of utility and drainage systems. When available, research existing record drawings for information. Field verify Record drawings information and other site features that may influence project design.

In a Design-Build contract, the DOR is responsible to verify all site information furnished in the Government issued RFP. In addition, the DOR must provide additional field investigations and verification of existing site conditions as may be required to support the development of the design and construction of the project.

5-3 COORDINATION.

Coordinate all site work, including topographic and soil surveys, with the Base Civil Engineer. During execution of field investigation work, the DOR is responsible for obtaining necessary permits, and complying with applicable laws, codes, and regulations, including OSHA regulations. The exact location of the geotechnical excavation, whether by drilling or digging, must be approved by the appropriate authorities, be it the local utility service or by a company hired by the geotechnical engineering firm to “scope” utilities. The DOR is responsible for all damages to persons and property that occur as a result of their fault or negligence. The DOR must take proper safety precautions to protect the public, the property of the public and the Government from physical hazards and unsafe conditions. Upon completion of field investigation, return the property to its original condition except as released in writing by the Contracting Officer.

5-4 TOPOGRAPHIC SURVEY.

Provide a topographic survey of the project site in accordance with the National Society of Professional Surveyors (NSPF) *Model Standards of Topographic Surveys* with the following modifications:

- Project drawings by the Government must be in English or Metric as directed for

each specific project.

- Ensure that adequate adjacent areas are included within the survey limits to clearly indicate and accommodate standoffs required by antiterrorism criteria, offsite drainage and offsite utility connections impacting the project.
- Provide a boundary survey and location of easements, standoffs, and security clear zones within the limits of the scope of work.
- Show horizontal control used during field survey. Indicate the reference coordinate plane and provide two permanent control points for reference. Include descriptions of points (such as PN nail and cap). Provide minimum of three reference distances to existing permanent structures (reference points) so that control can be re-established.
- Show elevations on paved or impervious surfaces (including rims of utility structures) to the nearest 0.04 feet (0.005 meters for metric designs). Show elevations on unpaved or pervious surfaces to the nearest 0.1 feet (0.05 meters for metric designs).
- Indicate the name of the surveying firm and date of survey.
- If match lines are used involving more than three sheets, provide a key map with current sheet highlighted. Remove any extraneous lines and text from key map.
- Orient North toward the top (or left edge) of the plotted sheet. Coordinate north direction with other disciplines so that all plans are oriented the same.
- Accurately locate (by means of structures visible from the surface and through research of utility maps, record drawings, data from local utility companies) the following list of utilities (both above and below ground), structures and features. Provide notes indicating the sources, and limitations or assumptions of the data, and that the Contractor must field verify the location of all utilities prior to construction. Include in the survey the following specific items and their related appurtenant above-ground features, but is not limited to:
 - Buildings: Describe building material and number of stories.
 - Pavements: Include type of material. In areas where pavement demolition is to occur, note all pavement thicknesses, including layer thicknesses and joint patterns for replacement. Pavement layer thicknesses must be obtained by reviewing record drawing information, digging at the edge of the pavement, core drilling, and consulting with the BCE. Where proposed pavements are expected to abut existing pavements, provide pavement markings, joint pattern and indicate joint types of the existing pavements.
 - Surface Drainage Features: Indicate normal water level for permanent standing water.
 - Utilities: Include rim elevations for utility structures; location and identification of lines as underground or aboveground; pipe sizes and materials. Identify water system as potable, non-potable, high pressure or saltwater as applicable.

- Fences: Note height, type of fabric, barbed wire, direction of outrigger, top or bottom rails, tension wires, gate locations and types.
- Foundations: Indicate visible foundation of demolished buildings.
- Fuel Pipes and Storage Tanks: Include information such as fill ports, vent lines, and tank drains.
- Pump Stations: Include invert of influent pipe and elevation of force main. Locate all above ground elements including controls.
- Railroads and Crane Rails: Include turnouts, rail sizes, compromise locations, and curve information as they may be applicable to the design requirements of the proposed project.
- Tidal Shoreline: Note water elevation, time of day, date, tidal conditions time of survey. Indicate normal high/low water elevations referenced to the datum used.
- Trees/Woods: In wooded areas, locate outside drip line of wooded area, include general density and type of trees. Where selective clearing will be accomplished, locate individual trees and tree size over 6-inch (152.4 mm) diameter.
- Wetland Areas: Wetland and marsh areas must be flagged and numbered by the Government prior to the survey. Locate flags and label in the same manner as marked in the field. If unanticipated wetlands are found during the survey, advise the Contracting Officer to establish any additional survey requirements.

5-5 GEOTECHNICAL INVESTIGATION REPORT.

5-5.1 Existing Information.

Each BCE maintains record files pertaining to the geotechnical aspects of previously constructed projects. Architecture and engineering firms preparing, planning or designing documents are encouraged to use this resource to research existing conditions or past design approaches for facilities, structures, or pavements. Viewing or discussion of the files' contents is possible by contacting the BCE. For Design-Build contracts, any relevant geotechnical or pavement information that is available will be furnished in the Design-Build RFP.

5-5.2 Foundations and Soils Investigation.

Perform foundation and soils investigations, including sampling, testing, and evaluation, with requirements and guidance set forth in International Building Code (IBC); UFC 3-250-01 Pavement Design for Roads and Parking Areas; UFC 3-260-02 Pavement Design for Airfields; and UFC 3-220-01 Soil Mechanics. In using the IBC, the terms owner, applicant, and building official are synonymous with the Government. In addition, the following requirements apply:

5-5.2.1 General.

Investigations and evaluations (including soil borings, test pits, ground penetrating radar surveys, seismic refraction surveys, and electrical resistivity testing, laboratory testing) must be in accordance with ASTM standards to the fullest practical extent. The classification and investigation of the soil must be supervised by a registered professional engineer. Where ASTM methods are not applicable, procedures and apparatus used must be in accordance with generally accepted engineering practice.

5-5.2.2 Qualifications of the Testing Firm.

The qualifications of the geotechnical testing laboratory and personnel must meet ASTM D3740 Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

5-5.2.3 Use of Positioning System with Soil Investigation.

Global Positioning System (GPS) coordinates, with an accuracy of at least 3 feet (1 meter), must be taken at each soil boring, coring, or test pit location and stated on the boring/coring/test pit logs. The coordinates must reference World Geodetic System 1984 (WGS84) and be stated in degrees of latitude and longitude.

5-5.2.4 Field Testing.

Field testing for geotechnical investigation typically consists of soil borings and standard penetration tests (SPT) or cone penetration tests (CPT). Conduct and provide the soil borings, SPT, and CPT in accordance with ASTM D1452, Standard Practice for Soil Exploration and Sampling by Auger Borings; ASTM D1586-11 Standard Test Method for Standard Penetration Test and Split-Barrell Sampling of Soils; and ASTM D5778, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils, respectively. For standard penetration testing, modify the ASTM D1586-11 procedure to make continuous standard penetration and sampling tests for the initial 13 feet (4 meters) of the boring. If the proposed building will have a basement level, the ASTM D1586 procedure must be modified to make continuous standard penetration and sampling tests for the initial 13 feet (4 meters) of the boring below the proposed basement floor elevation. During drilling, visually classify all soils in accordance with ASTM D2488. If evidence is discovered indicating soil or groundwater contamination, report it immediately to the Contracting Officer. If soft cohesive materials are discovered within 20 feet (6 meters) below the ground surface, take undisturbed samples for laboratory testing. Undisturbed sampling and testing must be performed at the discretion of the Geotechnical Engineer responsible for performing the investigation. Perform other testing, such as percolation testing, seismic refraction surveys, and soil resistivity testing, as required by the contract, or by the Contractor's Geotechnical Engineer or DOR in a Design-Build contract.

5-5.2.5 Use of Piezometers.

If drilling techniques are used that prevent the measurement of the water table levels, provide at least two piezometers per drilling site to more accurately measure the depth to the water table. Piezometers are required for storm water pond investigations. Piezometers are not required if the ground water levels can be accurately measured during drilling operations or there is good evidence that the water table is not within the depth of the borings or zone of influence for the foundation or structure.

5-5.2.6 Seismic Site Class Determination.

Base seismic site class on field testing for all projects.

For Design-Build projects, A-E shall state the seismic site class to be used for design in the RFP.

5-5.2.7 Laboratory.

The minimum laboratory testing must include grouping like samples, conducting a sieve analysis and Atterberg Limits tests, and performing natural moisture content determinations to effectively depict in-situ conditions. Update the field logs in accordance with ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). Perform other testing, such as California Bearing Ratio, unconfined compressive strength, consolidation testing, triaxial testing, and potential volume change in suspected expansive clay areas, as required by the contract, or by the Contractor's Geotechnical Engineer or DOR in a Design-Build contract.

5-5.3 Geotechnical Report.

Provide a geotechnical report on all contracts unless waived by the Contracting Officer or as stated otherwise in the contract. Describe in the report the regional geology, topography, and any other physiographic information that may influence the geotechnical design. Describe and discuss the investigation program, exploration and testing techniques/procedures used to characterize the site. Depict in the report the soil stratigraphy, materials, and groundwater conditions at the site. Specifically address in the report the groundwater levels expected to be encountered in construction under normal conditions, and any site-specific factors (such as tidal action, climate, seasonal flooding or droughts) that may influence the groundwater levels. Include copies of pertinent U.S. Geological Survey Maps used. Provide the boring logs and laboratory testing results in a DWG compatible format. Provide a PDF copy of geotechnical report. Produce the PDF copy of the report directly from the report's authoring software. All Geotechnical Reports must be signed by a registered Professional Engineer.

5-5.4 Boring Logs.

Provide a scaled location plan, boring logs, ground water observations, laboratory data,

and boring log description notes on drawings. Summarize the laboratory data in tables. No scanned boring logs will be accepted.

5-5.5 Foundation and Site Preparation.

Discuss the facility under design and make recommendations for the foundation type. Describe and specify the improvements that are required for shallow foundations, such as compaction, removal and replacement, surcharging, and wick drains. Describe the soil bearing capacity, anticipated settlements, seismic aspects, pile capacity, pile length, pile type and special instructions such as jetting, pre-drilling and testing required. Discuss earthwork associated with foundation design and construction or site improvements, including settlement, liquefiable soils, expansive soils, slope instabilities or near surface groundwater. The discussion must address existing conditions, studies, or analysis performed, and recommendations for mitigation of the effects of these conditions. Address dewatering, and sheeting/shoring considerations, in design and construction, as applicable. If required by the DOR, state the pavement design parameters and the pavement design. If the pavement design is to be completed by others, provide design parameters determined from the subsurface investigation. If multiple structures are being designed, address structures on an individual basis. Discuss the site preparation and susceptibility to rain and construction equipment. Discuss any soil conditions relating to potential concrete or piping corrosion and recommendations to mitigate effects thereof.

5-5.6 Airfield Pavements Evaluations.

Provide Airfield Pavement Evaluations in accordance with UFC 3-260-03.

5-6 FIRE PROTECTION INVESTIGATIONS AND SURVEY.

5-6.1 Utilities and Infrastructure.

5-6.1.1 Water Flow Testing.

5-6.1.1.1 Existing Water Supply.

Water flow testing of the existing water supply system(s) is required to determine the capability of the available water supply to support the expected fire flows and fire suppression system demands. Perform testing in accordance with NFPA 291. Provide a fire protection water flow test report in the Basis of Design (BOD). Comply with UFC 3-600-01, Fire Protection Engineering for Facilities. While historical flow data may be a valuable resource when performing an analysis of the existing water supply system, historical data must not be the sole source of data. Water flow testing must be performed by the Qualified Fire Protection Engineer (QFPE) during the field investigation.

5-6.1.12 Combined Sprinkler and Hose Stream Demand.

During water supply testing, flow sufficient water to meet or exceed the combined sprinkler and hose stream demand. If the Installation (e.g. Base) existing water distribution system or dedicated fire main includes existing fire booster pumps, conduct testing with pump controller(s) configuration configured based on Installation policy for normal operating conditions. If there is a requirement for a redundant pump, disable one pump for the duration of the test. If, at the time of design, the booster pumps cannot be run and accurate flow testing cannot be conducted, include the following information in the contract documents:

- Show all water distribution piping back to the booster pumps. Show the location of water supplies such as elevated water storage tanks.
- Identify make, model, rated characteristics of each booster pump and the number of booster pumps expected to be operating, based on the anticipated hydraulic demand. For stations with multiple pumps, confirm that one pump was designated “redundant” when there is a requirement for redundancy.
- Identify available water supply (flow test data) at the suction side of the booster pump(s).

5-6.1.2 Hydraulic Supply Analysis.

Evaluating the available water supply is critical for buildings with and without sprinkler protection. Documents cannot be released for advertisement with expectations of the contractor determining the available water supply. The capability of the water supply to support the required fire flow demand must be confirmed prior to advertisement. The Qualified Fire Protection Engineer (QFPE), as defined in UFC 3-600-01, Fire Protection Engineering for Facilities, is responsible for obtaining water distribution maps, establishing flow testing procedures and coordinating flow testing with the base fire department. If the station does not allow contractors to conduct the flow tests, the station personnel can perform the flow test under the direct supervision of the QFPE. The QFPE must not, under any circumstance, rely on data from flow tests which they did not personally supervise. The QFPE is responsible for conducting the actual flow testing for facilities that are not on federal property. The QFPE must graph the results for comparison with the anticipated hydraulic demand. This analysis is required for both sprinklered and non-sprinklered facilities.

5-6.1.3 Base-wide Fire Reporting and Mass Notification Systems.

Obtain information regarding the exterior fire alarm reporting system and the base mass notification systems.

5-6.2 Site and Building Surveys.

Design services must include surveys to obtain information about adjacent structures

and property lines, existing building construction, and existing building systems and features.

5-6.2.1 Site Planning and Adjacent Structures.

When the proposed construction is within 60-ft (18.3-m) of existing adjacent structures, conduct a site survey to obtain information regarding the adjacent structures. Information about adjacent structures must include: construction type, fire resistive rating of exterior walls, number of floors, area per floor, total building area, occupancy classification, and if the building is fully protected with an automatic fire sprinkler system.

5-6.2.2 Work in Existing Facilities.

Projects involving repairs, renovations, or modifications to existing facilities must include a survey, to establish the existing conditions regarding compliance with current life safety code and building code requirements, based on the intended use of the building facility. Survey must also include a description of the active fire protection systems (fire alarm and fire control/suppression). Determine the make, model, type and year of the building fire alarm system. Projects modifying existing fire protection systems must include a thorough investigation of existing systems and site conditions to determine capabilities of the existing utilities to support the modifications/expansions of the effected fire protection systems. The existing systems being modified must also be thoroughly investigated to determine that compatible products, devices and components are available.

5-6.3 Building Additions.

Building additions must include a building code and a life safety code survey to establish the existing conditions and, based on the intended use of the building, the level of compliance with the current editions of the IBC and Life Safety Code. Conduct an existing building survey to obtain construction type, fire resistive rating of exterior walls, number of floors, wall openings, area per floor, total building area, occupancy classification, types of fire protection systems and extent of protection. Building code assessment must establish the maximum allowable size (height and area) based on the existing building features and the proposed building expansion. Determine the make, model, type and year of the building fire alarm system. Determine expansion capabilities of the existing fire alarm system, power supply and circuits to support the additional devices, appliances, and functions. Validate that new devices are available and compatible with the existing fire alarm system. Provide a Life Safety Code assessment of the existing building. Perform Building Code and Life Safety Code surveys in accordance with UFC 3-600-01, Fire Protection Engineering for Facilities.

5-7 ENVIRONMENTAL REQUIREMENTS.

Conduct surveys, gather information, and provide analytical testing required by the contract.

5-7.1 Permits.

Identify, assist or provide, as applicable, all permits, approvals and fees required for the design, construction and operation of the proposed project from Federal, state and local regulatory authorities. Licensure in the state where the project is located may be required to obtain permits and approvals. Coordinate with the Base Environmental Manager (BEM) to obtain the project NEPA documentation, as applicable, for project specific requirements.

5-7.2 Regulatory Notifications.

Identify all regulatory notification requirements in accordance with Federal, state, and local regulations. Where the Air National Guard needs to provide public notification, coordinate with the NGB/A4I Project Manager and the Base Environmental Manager (BEM). Require the Contractor to provide copies of all regulatory notifications to the Government Project Manager and the Base Environmental Manager (BEM). Typically, regulatory notifications are provided for the following (this listing is not all inclusive): demolition, renovation, national pollutant discharge elimination system defined site work, or remediation of hazardous materials (such as asbestos, hazardous waste, and lead-based paint)

5-7.3 Field Investigations.

Ensure that the contract documents include information and survey data sufficient to identify and quantify the materials listed in the following paragraphs.

Complete all field investigations (e.g., information gathering, surveys, sampling and testing), for the environmentally sensitive materials indicated below. Each Installation maintains record files pertaining to the environmental aspects of previously constructed projects.

Contact the Base Environmental Manager and obtain all existing surveys, test reports, and drawings prior to beginning field investigations.

5-7.4 Asbestos-Containing Materials (ACM).

5-7.4.1 ACM Field Investigations, Surveys, and Sampling.

Perform facility asbestos investigation, survey and sampling in accordance with 40 CFR 763 Asbestos. Data from previous asbestos surveys may be available from the Base Environmental Manager. Earlier surveys may not have included all suspect Regulated Asbestos-Containing Materials (RACM) that will be impacted by the project. This may include, but is not limited to, roofing materials, crawl-space soils, and confined utility chases.

Provide personnel who are currently Environmental Protection Agency (EPA) accredited asbestos inspectors to perform ACM sampling.

5-7.4.2 ACM Laboratory.

Use laboratories that are fully equipped and proficient in conducting analyses of suspect RACM bulk samples in accordance with 40 CFR 763 Asbestos, are accredited by the National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program (NIST/NVLAP), and are a successful participant and maintain proficiency in the NIST/NVLAP sponsored quality assurance program for asbestos identification.

5-7.4.3 Control of ACM.

Identify what requirements apply to the project, based on the National Emission Standards for Hazardous Air Pollutants (NESHAP) compliant survey, and include in the specifications. Identify the requirements for notification to the regulatory agency and include in the specifications.

5-7.5 Paint.

5-7.5.1 Lead-Based Paint in Commercial or Industrial Facilities.

Take a representative sample of the waste material and analyze using the toxicity characteristic leaching procedure (TCLP). Samples equal to or greater than 5.0 milligrams per liter (mg/L) TCLP are considered hazardous and need to be disposed of in an approved hazardous waste landfill. Samples less than 5.0 mg/L TCLP are considered nonhazardous and may be disposed of in a municipal solid waste landfill or a C&D landfill. Specify final disposition of the waste material in accordance with the test results.

5-7.5.2 Paint – Lead, Cadmium, Chromium, and Other Hazardous Metals.

Require control and management of dust and particulates containing lead, cadmium, chromium, and other hazardous metals generated from construction activities in accordance with 29 CFR 1926.62 Lead, 29 CFR 1910.1026 Chromium (VI), and 29 CFR 1910.1027 Cadmium to avoid contaminated indoor air or contaminated dust on building surfaces. Identify the potential factors that affect the thresholds and exposures to building occupants and construction workers in accordance with DoDI 6055.01 DoD Safety and Occupational Health (SOH) Program and state codes and laws. Require facility engineering controls, building occupant protection, construction activity requirements for worker protection, and any additional requirements for safe environmental conditions in the specifications.

5-7.5.2.1 Paint Laboratory.

Use laboratories that are fully accredited by the EPA NLLAP and rated proficient in the National Institute for Occupational Safety and Health; EPA ELPAT to perform analysis for air

samples.

5-7.6 Beryllium.

5-7.6.1 Beryllium Field Investigations and Surveys.

Perform a beryllium investigation and survey where beryllium is known to have been used or processed. Sample and testing all surfaces impacted by the project for beryllium dust in accordance with applicable ASTM and industry standards.

5-7.6.2 Beryllium Laboratory.

Use laboratories that are fully accredited by Industrial Hygiene Laboratory Accreditation Program.

5-7.6.3 Beryllium Management.

Specify control and management of beryllium during construction in accordance with 29 CFR 1910.1024 Beryllium, 29 CFR 1915.1024 Beryllium, and 29 CFR 1926.1124 Beryllium.

5-7.7 Radon.

5-7.7.1 Radon Field Investigations, Surveys, and Sampling.

Obtain all existing radon test information from Base Environmental Manager. Use short-term testing detectors or long-term alpha tracking detectors to determine if radon is present at the project site.

5-7.8 Polychlorinated Biphenyls.

5-7.8.1 Polychlorinated Biphenyls Field Investigations, Surveys, and Sampling.

Obtain a current environmental survey from the Base Environmental Manager that indicates the status of Polychlorinated Biphenyls (PCB) in the building to be renovated, repaired, altered, or demolished. Provide an inspector who is familiar with the various uses of PCB. Based on the age of the facility and the extent of the project, determine the potential PCB sources. During the field survey, the inspector is to examine the potential PCB sources for labeling and manufacturer information. If there is no label that states "non-PCB", contact the manufacturer for more information or assume the source contains PCB.

5-7.8.2 Polychlorinated Biphenyls Management.

Specify the management and disposal of PCB in accordance with the Toxic Substance Control Act (TSCA) and with state and local requirements. Dispose of PCB materials at facilities meeting the requirements of incineration or in a chemical waste landfill as

required by 40 CFR 761 Polychlorinated Biphenyls (PCBs) Subpart D.

5-7.9 Low-Level Radioactive Components.

5-7.9.1 Low-Level Radioactive Field Investigations and Surveys.

Obtain a current environmental survey from the Base Environmental Manager that indicates the status of Low-Level Radioactive (LLR) components in the building to be altered, renovated, repaired, or demolished. Provide an inspector familiar with the various building components that could contain LLR material. Based on age of the facility and the extent of the project, determine potential sources. During the field survey, the inspector is to examine the potential sources for labeling. If there is no label that states the contents contain potential LLR material, contact the manufacturer for more information or assume the source contains LLR material.

5-7.10 Animal Droppings.

Use best practice document DHHS 2005-109 Histoplasmosis Protecting Workers At Risk when conducting surveys or preparing specification for building renovation, alteration, or demolition projects.

5-7.11 Mold and Spores.

Design moisture barriers and retarders as defined in UFC 3-101-01 Architecture. Additional requirements can be found in EPA 402-K-01-001 "Mold Remediation in Schools and Commercial Buildings".

5-7.11.1 Mold and Spores Field Investigations, Surveys, and Sampling.

Complete the Microbial Assessment Survey and Report prior to the preparation of the project specifications.

5-7.11.2 Mold and Spores Laboratory.

Use laboratories that are fully accredited by the Environmental Microbiology Proficiency in Analytical Testing program of the American Industrial Hygiene Association to perform analyses for fungi (molds) or bacteria.

5-7.12 Storage Tanks.

These requirements apply to hazardous waste storage tanks regulated under 40 CFR 264 Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities Subpart J Tank Systems and 40 CFR 265 Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities Subpart J Tank Systems. UFC 3-460-01 Design: Petroleum Fuel Facilities covers the general environmental criteria and standards for storage tanks containing regulated substances subject to the provisions of the Resource Conservation and

Recovery Act (RCRA) Part 280 Technical Standards and Corrective Action Requirements For Owners and Operators of Underground Storage Tanks (UST). Evaluate sites with known tanks, known soil, or groundwater contamination prior to the preparation of the project specifications.

5-7.12.1 Tank Installation.

Projects that include the installation of new storage tanks, including reinstalled tanks or replaced tanks, used to contain hazardous waste at treatment, storage, and disposal facilities are subject to Federal regulation and are to comply with the requirements set forth in Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities Subpart J Tank Systems and 40 CFR 265 Interim Status Standards For Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities Subpart J Tank Systems. Design storage tanks to meet Federal regulation for tank location, secondary containment, cathodic protection, leak-detection system, leak-detection testing, and similar.

5-7.12.2 Tank Removal.

These requirements apply to sites and projects where aboveground storage tanks (AST) or underground storage tanks (UST) are known to exist. Obtain copies of available reports, such as tank integrity assessment reports, groundwater sampling and testing, contaminated soil sampling and testing, and Closure Reports from the Base Environmental Manager. Coordinate with the Base Environmental Manager in order to determine the requirements to initiate a permanent closure process of the storage tank as applicable. Closure activities are regulated at the state level. Refer to the paragraph entitled "Hazardous Waste" when specifying disposal of AST or UST.

5-7.12.2.1 Tank Removal Field Investigations, Surveys, and Sampling.

Where the project site contains tanks, a site inspection must be performed. Before performing field investigations and sampling, obtain all available information regarding AST and UST from the Base Environmental Manager. Develop a soil and groundwater sampling and testing plan. See paragraph entitled "[Contaminated Soil or Groundwater Field Investigations, Surveys, and Sampling](#)". Encompass all tank system components. Include information such as the age of the unit, corrosion-protection measures in place, and results of prior leak tests or inspections of the tank. See information required in the paragraph entitled "Report - Tanks".

5-7.12.2.2 Storage Tanks Laboratory.

Use laboratories to analyze potentially contaminated soils, free product, or sludge that are fully equipped and proficient in conducting analysis in accordance with EPA SW-846 Hazardous Waste Test Methods, EPA 540/R-99/008 USEPA Contract Laboratory Program, EPA-540-R-014-002 National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-04-004 USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, and certified by the National Environmental Laboratory Accreditation Conference (NELAC).

5-7.13 Contaminated Soil or Groundwater.

Evaluate sites with known soil or groundwater contamination during the planning phase and before initiating any facility design work. Obtain copies of available reports, such as groundwater sampling and testing, contaminated soil sampling and testing, and remediation reports, from the Base Environmental Manager. Coordinate with the Base Environmental Manager to identify permit conditions applicable to soil, restrictions on land development, and other requirements that must be considered for the project. Prepare specifications and construction documents that accurately convey existing site conditions as they pertain to soil and groundwater contamination. Manage and dispose of contaminated soils and groundwater in accordance with the requirements described in the paragraph entitled "[Hazardous Waste](#)".

5-7.13.1 Contaminated Soil or Groundwater Field Investigations, Surveys, and Sampling.

When the construction site is known to contain contaminated soil or groundwater and no determination actions have been started, perform a site inspection. Note: The ANG utilizes US EPA Method 1633, Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS. Before field investigation and sampling, obtain all available information regarding contaminated soil or groundwater from the Base Environmental Manager. Develop a soil and groundwater sampling and testing plan that contains, at a minimum, the procedure for collecting samples, the frequency of the sampling events, the test methods that will be employed, type of sampling design and sampling density, error Type, confidence level and procedure for handling samples. Follow EPA Soil Screening Guidance (SSG). The SSG presents a framework for developing risk-based, soil screening levels (SSL) for protection of human health. Screening levels are not national cleanup levels; instead, they are intended to streamline the evaluation and cleanup of site soils by helping site managers eliminate areas, pathways and chemicals of concern at National Priority List sites. See information required in the paragraph entitled "[Report - Contaminated Soil or Groundwater](#)".

5-7.13.2 Contaminated Soil or Groundwater Laboratory.

Use laboratories that are fully equipped and proficient in conducting analysis in accordance with EPA SW-846 Hazardous Waste Test Methods, EPA 540/R-99-008, EPA-540-R-04-004, USEPA Contract Laboratory Program National Functional Guidelines and certified by the NELAC (National Environmental Laboratories Accreditation Conference) to analyze potentially contaminated soils or groundwater.

5-7.14 Control and Management of Solid and Hazardous Waste.

Disposal or ultimate disposition of waste materials is performed on all projects. Waste reduction in the form of recycling or reuse is encouraged. Require the Contractor to develop a waste management and reduction plan to be used during construction.

Coordinate with the Base Environmental Manager (BEM) and identify materials suitable for recycling or reuse, taking into account the Installation's recycling program. If disposal or ultimate disposition of hazardous or contaminated materials, soils, or groundwater are part of the project a waste characterization is required. Consult regional, state, and local regulations for more stringent threshold levels. To determine whether a waste fails the toxicity characteristic, perform a TCLP analysis on the waste. Note the TCLP analysis differs from total constituent laboratory analysis; TCLP analysis is only for disposal needs. However, total analysis may also be needed. Solid or nonhazardous waste accumulation requirements can be found, if regulated, within state-specific regulations and should follow industry standard.

5-7.14.1 Hazardous Waste Accumulation.

Specify accumulation and storage of contaminated media and any debris according to applicable requirements while awaiting transportation and disposal. Specify coordination with the Base Environmental Manager to determine what quantity may be stored on-site. Accumulate and manage any hazardous waste generated in accordance with 40 CFR 262 Standards Applicable To Generators Of Hazardous Waste; 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; and 40 CFR 265 Interim Status Standards For Owners And Operators Of Hazardous Waste Treatment, Storage, And Disposal Facilities, Installation, state-specific and local requirements, whichever are more stringent.

5-7.14.1.1 Hazardous Waste.

Specify recycling and reuse of waste classified as hazardous, in accordance with the requirements in 40 CFR 261.6. Specify treatment of hazardous wastes in accordance with 40 CFR 268. Specify adherence to the requirements of 40 CFR 262, 40 CFR 264, and 40 CFR 265 when accumulating hazardous waste onsite. Coordinate with the Installation Environmental Manager for generator status of the Installation and applicability, including instances when an EPA identification (ID) number is required, accumulation requirements regarding quantities and time allowed, inspections, required documentation and labeling, reporting, training, and contingency planning. States may have more stringent requirements than Federal regulations provide. Determine state requirements to determine the most stringent requirement.

5-7.14.1.2 Universal Waste.

Specify compliance with the Federal universal waste regulations set forth in 40 CFR 273. States may modify the universal waste rule and add additional universal waste(s) in individual state regulations. Coordinate with the Base Environmental Manager staff and research the specific state for additional regulations that apply.

5-7.14.1.3 Beryllium.

Specify compliance with 29 CFR 1910.1024, 29 CFR 1915.1024 and 29 CFR 1926.1124.

5-7.14.1.4 Used Oil.

Specify compliance with EPA required practices in 40 CFR 270, called "management standards," developed for used oil. States may have more stringent requirements than Federal regulations provide. Determine state requirements to determine the most stringent requirement.

5-7.14.2 Solid and Hazardous Waste Field Investigation, Surveys, and Sampling

Specify a waste characterization study (including solid and liquids) before disposing of potentially unknown hazardous or contaminated wastes. In order to determine if anticipated construction waste (solid or liquid) is within regulatory limits for disposal and ultimate disposition as a nonhazardous material, analyze a representative sample of the waste stream in accordance with Federal regulations using the appropriate EPA analytical methods. Perform this sampling in accordance with RCRA procedures, state, and local regulations and with EPA and state guidelines for avoiding exposure to human health and the environment. Establish a health and safety program to be followed during the sample collection process, the statistical method to be followed, and the quality control procedure for the data collection in accordance with EPA 530-D-02-002 Resource Conservation and Recovery Act (RCRA) Waste Sampling Draft Technical Guidance. Collect a representative sample of the anticipated waste stream; it may be necessary to collect subsamples of various materials to collect an accurate heterogeneous waste stream sample. To accomplish the analysis of a heterogeneous waste stream, collect a composite sample that can be analyzed in accordance with Federal regulations, EPA protocols, and ASTM Standards. The representative composite sample should be prepared from samples of each of the different building material categories, and then mixed in proportion to the percentage by weight of the different components in the anticipated waste stream. Patch and repair sample locations with suitable materials. Consult a qualified laboratory for required sample quantities to obtain accurate analysis. Should other sampling methodologies be used, request coordination with onsite personnel before sample collection and analysis.

5-7.14.3 Solid and Hazardous Waste Laboratory.

Use laboratories that are fully equipped and proficient in conducting analysis in accordance with EPA SW-846, EPA 540/R-99-008, EPA-540-R-04-004, and NELAC certified to perform analysis for potential hazardous waste.

5-7.15 Other Environmental Requirements.

5-7.15.1 National Environmental Policy Act.

Prior to commencing design, verify that a NEPA analysis has been completed.

Obtain the NEPA documentation prepared for the project from the Base Environmental Manager. The NEPA documentation identifies any sensitive resources that exist within or adjacent to the site and any mitigation or avoidance measures that are required.

Comply with measures identified in the NEPA documentation and include them as contract requirements. If conditions change from what was analyzed in the NEPA document, such as a change in use, location on the site, the addition of or change in location of supporting facilities, or discovery of new information about the site, contact the Base Environmental Manager to determine if a modification to the NEPA document is required.

5-7.15.2 Cultural Resources.

Obtain documentation from the Base Environmental Manager regarding any known historic properties or the potential to discover historic properties within the project site and any mitigation required to avoid an adverse effect to historic properties. Comply with state and local preservation laws in addition to Section 106 of the National Historic Preservation Act (NHPA).

5-7.15.2.1 Archaeology.

Obtain from Base Environmental Manager any measures, such as buffer areas, that were agreed upon during the Section 106 process. Include these measures and the necessary language to ensure protection of any archaeological resources, as contract requirements.

5-7.15.2.2 Architectural.

Obtain information on historic architectural resources from the Base Environmental Manager and include any mitigation measures as contract requirements. Refer to UFC 3-101-01 Architecture for projects involving historic architectural resources.

5-7.15.2.3 Inadvertent Discoveries.

Specify procedures for the Contractor to follow should an archaeological site be discovered during construction. If any previously unidentified prehistoric- or historic-period archaeological sites (for example, human skeletal remains or burials and artifacts) are discovered during construction activities, specify suspension of all ground-disturbing activities and followed by notifying the Base Environmental Manager and Contracting Officer. Consult with SHPO, interested Native American tribes, and other interested parties as appropriate regarding the site's eligibility for listing in the NRHP, project impacts, necessary mitigation, and other treatment measures.

5-7.15.2.4 Tribal Consultation.

Obtain from the Installation Environmental Manager any measures, such as buffer areas that were agreed upon during tribal consultation. Include these measures as contract requirements.

5-7.15.3 Air Quality.

Specify compliance with the Clean Air Act (CAA) requirements and state and local

regulations. Coordinate with the Base Environmental Manager and provide the necessary information and specify equipment meets the necessary regulations. The National Ambient Air Quality Standards (NAAQS) include air quality standards that are implemented at the state level in the State Implementation Plan required under Section 110 of the CAA. Verify whether the project is located in an EPA nonattainment area for criteria pollutants and identify in the construction documents how this affects the project construction schedule and cost. Provide the Base Environmental Manager with the information necessary for obtaining a new or updating the existing air permits. Verify whether asphalt pavement plants in the project area have production limitations due to “summer ozone season” and design accordingly. These limitations will affect the Contractor’s schedule and construction phasing. Permanent equipment such as new boilers and emergency power generators must be added to the Installation’s air permit as required by applicable regulations. Coordinate with the Base Environmental Manager staff to determine conditions that require adding emission sources used during construction to the air permit, and specify the Contractor to comply with these requirements.

5-7.15.4 Wetlands/Waters.

Specify compliance with Section 404 of the Clean Water Act. Obtain documentation from the Base Environmental Manager to identify the location of wetlands or other waters of the United States on or adjacent to the project area. Avoid impacts to jurisdictional wetlands or waters of the United States to the maximum extent practicable or minimize impacts if they are unavoidable. Coordinate with the NGB/A4I Project Manager to determine if alternative sites may be explored to minimize wetland impacts. Notify the Installation Environmental Manager to determine if the NEPA documentation requires an amendment. If impacts to the jurisdictional wetlands or waters of the United States cannot be avoided, obtain all Federal and state permits before initiating any land-disturbance activities. Require the Contractor to comply with all wetland permit conditions. Coordinate with the Installation Environmental Manager to determine suitable mitigation options.

5-7.15.5 Natural Resources.

Obtain documentation from the Base Environmental Manager to identify what natural resources are located on or within the project area.

5-7.15.5.1 Threatened and Endangered Species/Critical Habitat.

Specify compliance with the Endangered Species Act and protect threatened and endangered species and the habitat upon which these species rely. Obtain the documentation from Base Environmental Manager, to include mitigation measures, as contract requirements, to protect threatened and endangered species and critical habitat that could be located on or in the vicinity of the project area. Specify implementation and monitoring of mitigation measures. Specify providing implementation or monitoring reports, as necessary, to the Base Environmental Manager.

5-7.15.5.2 Migratory Bird Treaty Act.

Design in compliance with the Migratory Bird Treaty Act (MBTA) between the United States, Canada, Japan, Mexico, and Russia. Specify implementation of measures identified by the Base Environmental Manager to ensure compliance with MBTA requirements.

5-7.15.5.3 Essential Fish Habitat.

Obtain the essential fish habitat (EFH) assessment from the Installation Environmental Manager and include the conservation recommendations made by the National Marine Fisheries Service as contract requirements.

5-7.15.5.4 Marine Mammal Protection Act.

Obtain the documentation from Base Environmental Manager and determine what mitigation measures are required as contract requirements to protect marine mammals.

5-7.15.5.5 Bald and Golden Eagle Protection Act.

Obtain the documentation from Base Environmental Manager to determine if bald or golden eagles are located on or in the vicinity of the project area and include the mitigation measures as contract requirements to ensure their protection.

5-7.15.5.6 Stormwater Management and Erosion and Sediment Control.

Projects with land disturbance activities greater than one acre require coverage under the National Pollutant Discharge Elimination System (NPDES) permit program. Most states are authorized to implement the NPDES permitting program. Refer to the EPA website for the list of states authorized to implement this permitting program: <http://water.epa.gov/polwaste/npdes/basics/State-and-Tribal-Program-Authorization-Status.cfm>

Obtain the NPDES permit through EPA for all other states. Obtain from the Base Environmental Manager the regional permitting requirements and copies of all existing stormwater and erosion and sediment control permits that affect or encompass the project site. Identify all permit conditions that affect the design and include them in the specifications or on the drawings. Design stormwater management facilities and erosion and sediment controls in accordance with UFC 3-201-01 Civil Engineering.

5-7.16 Chlordane.

Specification preparation must comply with the applicable requirements of 40 CFR 260 – 40 CFR 270, Resource Conservation and Recovery Act.

5-7.16.1 Chlordane Field Investigations, Surveys.

Prior to demolition of structures, it may be necessary to determine if chlordane was used to prevent termites. If adequate pesticide application records exist, it may be possible to confirm or rule out the use of chlordane or similar products. If adequate records do not exist, sample the soil around the foundation of a building scheduled for demolition. Sample and analyze the soil, as necessary, along the foundation of suspect buildings.

5-7.16.2 Chlordane Laboratory.

Laboratories performing analysis for chlordane in soil must be fully equipped and proficient in conducting analyses according to RCRA and SW-846, and accredited by a recognized DoD Environmental Laboratory Accreditation Program.

5-7.16.3 Chlordane Control.

Under RCRA regulations, as long as the soil remains undisturbed chlordane does not present a regulatory issue. It may even be acceptable to excavate chlordane contaminated soil to remove the foundation and place the soil back in the excavation site provided there is not subsequent disturbance or construction on the site. However, if the soil will be moved to another location or disturbed as part of new construction efforts, chlordane may present a hazardous waste disposal issue or costly environmental cleanup. It is very important that steps be taken prior to demolition to minimize the risk to the environment, site workers, or future users of the site.

5-8 COMMUNICATION REQUIREMENTS.

Design services must include surveys to obtain information about telecommunication spaces, pathways, outlets, connectors, cabling, grounding, bonding, and static protection.

CHAPTER 6 DELIVERABLE: BASIS OF DESIGN

6-1 GENERAL REQUIREMENTS.

The Basis of Design is a narrative presentation of facts, sufficiently complete, to demonstrate that the project concept is fully understood, and that subsequent design details, and their ultimate presentation in the final drawings and specifications, will be based on sound architectural and engineering decisions. For Design-Build RFP Development, the Basis of Design requirements are typically provided in the Project Program.

Submit the Basis of Design required at each design stage in accordance with the contract, the Core UFC's (outlined in UFC 1-200-01, DoD Building Code), and the additional Discipline requirements herein. If another UFC adequately describes the requirement for a Discipline's deliverable, a paragraph for that Discipline is not provided below. For each Discipline in the Core UFC and contract, provide a discussion and description of the design and describe the functional requirements of the project and the expectations of how it will be used and operated, including, but not limited to: system goals, measurable performance criteria, cost considerations, applicable benchmarks, additional success criteria required by the project, and supporting UFCs, Codes, and Standards referenced.

6-2 FORMAT.

Format the Basis of Design as an 8 ½ x 11 inch (216 x 279 mm) document, organized by Parts, Tabs, and Chapters.

6-3 PART I – DESIGN INTENT

The Design Intent is developed prior to the Construction Documents Development Phase of the facility (i.e., prior to Type B, Design Services) and establishes baseline criteria for the facility functions, performance and maintainability and any other information required to define the project requirements. It is used to establish the goals for the facility design, performance, and operations.

Part I includes six distinct sections. **Tab A**, defines the requirements for any buildings and structures needed. **Tab B** defines any site development requirements. **Tab C**, "ANG Design Objectives and Procedures" is included, which defines the ANG design process and the requirements of the A-E contracted to develop the design documents. **Tab D**, "ANG Design Policy" provides the general technical requirements that are applicable to the whole range of facilities required by the ANG. **Tab E** contains the Project Approval Package Documents to include, as a minimum, the DD Form 1391, "Military Construction Project Data", which describes the basic need for the project and defines the authorized scope and total funding requested from Congress for the project; MCP or FSRM Certificate of Compliance; MCP or FSRM Checklist; and AF Form 813, Request for Environmental Impact Analysis. **Tab F**, Various appendices as appropriate for the particular project which may include the Environmental Restoration Program

(ERP) Appendix, Real Estate Appendix, Asbestos Appendix, etc.

6-3.1 Cover Sheet.

Provide a cover sheet identifying the document as the Basis of Design, and include the following:

- Places for the signatures of the Installation Commander, BCE, Base Using Activity (User), Base Environmental Manager, Fire Chief, Security Chief, Safety Officer, Communications Chief, and Site Security Manager. The BCE will obtain these signatures **prior to** submission to NGB/A4I.
- Submittal stage;
- Project title;
- Location;
- A-E Contract or Construction Contract number (Post-Award DB Contracts only);
- Contract Task Order Number (if Indefinite Quantity contract)
- Contract Type (Design-Build or Design-Bid-Build)
- Project Number
- Firm's name;
- Contractor name (if Design-Build); and
- Date.

6-3.2 Tab A.

This Tab will fully develop the project requirements. Information required to complete the Project Number and Title, Scope, Maximum Construction Cost, ANG/Definitives/Facility Design Guides, Floor Plan, Number of Occupants, and Hours of Operation described below will be provided by the BCE at the Criteria Review Conference (CRC). The functional requirements for each space, as described below, will be developed by the A-E based on information gathered by interviewing key staff members of the Design Working Group (DWG). Paragraphs required in Tab A are described as follows:

Project Number (PN) and Title.

Overview. Provide a brief overview of the functions performed at the facility.

Scope. Include a synopsis of the scope and intent of the project. Scope shall match that identified on the DD form 1391.

Maximum Construction Cost. The MCC is the sum of both the estimated base and the options/additive bid items provided by the design.

Planned Modifications: Planned modifications are changes to the contract that the Government can only award after the initial award of the contract, due to the nature of the work. Award time of a planned modification is measured from construction completion date (usually 6 months prior to completion), rather than the award date. This differentiates them from options and additive bid items.

ANG Definitives/Facility Design Guides. These will be utilized when available provided that the applicable Definitive/Facility Design Guide adequately describes the proposed facility.

Core UFCs, Other UFCs, Building Codes. List the Core UFCs, Other UFCs, Building Codes, etc. and date of issuance.

Per MIL-STD-3007G dated 1 November 2019, UFCs are effective upon issuance for ongoing projects as follows:

Design-Bid-Build projects that have not proceeded beyond 35% design completion.

Design-Build projects that have not proceeded beyond the date of RFP issuance. When an RFP is issued in multiple phases or steps use the date of the last phase of the RFP issuance.

Floor Plan. Provide existing floor plan for alteration project.

Number of Occupants. Reference the DD Form 1390S and provide the personnel strength authorized for both permanent and guard/reserve. These numbers are used to adequately size the lavatories, parking lots, administrative spaces, common areas, etc.

Hours of Operation. Provide weekday, weekend (Regularly Scheduled Drill (RSD)) and night hours. These hours are useful to a mechanical engineer to provide a design energy budget calculation when required.

Space Title, Function and Special Requirements. This paragraph and all subsequent paragraphs are used to describe each space in the facility. List each space, with the title and descriptions, starting on a separate page. Space titles will reflect room function. Provide a brief functional description of each space. Subparagraphs (a) through (h) for each space are used to list special space or technical requirements. If another UFC adequately describes the requirement for a discipline's deliverable, a subparagraph for that discipline is not provided below. For each discipline in the Core UFC and contract, provide a discussion and description of the design and describe the functional requirements of the project and the expectations of how it will be used and operated, including, but not limited to: system goals, measurable performance criteria, cost considerations,

applicable benchmarks, additional success criteria required by the project, and supporting UFCs, Codes, and Standards referenced. If the requirements of a space are of standard construction or are defined in Tab D, state No Special Requirement (NSR). The subparagraphs are:

(a) Architectural:

Examples are special wall, floor or ceiling treatment; special ceiling height; special fenestration; special door types or sizes; security requirements; daily and RSD room occupancy numbers.

(b) Structural:

Examples of special floor loadings, vaults (include class), hoists, and lifts.

(c) Mechanical:

List requirements for design temperature and humidity; special plumbing, heating, ventilations, air conditioning; compressed air; stripping or cleaning vats; exhaust hoods or fans; eye wash, floor drains; or oil-water separators, neutralizers, process tanks, dust collectors and hazardous waste.

(d) Electrical:

Examples are special lighting and power requirements, special grounding, lightning protection, hazardous area classification, special security requirements, stand-by power, and ground fault interrupters.

(e) Communications:

Examples are pre-wiring for telephone, intercom, public address, data automation and Closed-Circuit Television (CCTV) requirements. Include all requirements for limited compromising emanations (TEMPEST).

(f) Fire Protection: List additional special requirements beyond those required by UFC and Tab D.

(g) Equipment:

Reference the DD Form 1390S and provide the major equipment and aircraft authorized. In addition, identify equipment that is Government-Furnished (GFE), such as lathers or table saws, that must be considered when sizing a space (room) and providing supporting utilities.

(h) Technical Order (TO):

Refer to specific TOs.

6-3.3 Tab B.

This Tab will fully develop the project site requirements. All information required to complete items described below will be provided by the BCE at the Criteria Review Conference (CRC). Each paragraph of Tab B is described as follows:

Project Number (PN) and Title.

Summary. Provide a brief summary of the major exterior work items needed that are described in further detail in subsequent paragraphs, such as access roads, parking lots and fencing.

Location of Project. Describe the location of the facility on the installation and any special relationship the facility may have with other facilities. Refer to any plan provided by the Government that shows the location of the facility on the installation and indicates the construction haul route and staging area. The proposed location of the facility must be in conformance with the approved master plan. Any other location must be supported with an approval from NGB/A4I.

Site Plan. Describe the project site area. Refer to any plan provided by the Government that outlines the property area to be used for the project site. On many ANG installations, the Base has electronic files on existing site features. The outlined area will define the area to be considered for a topographic survey. Identify existing site features such as whether the site is treed or cleared, has building to be demolished, or has pavements. Indicate the availability of existing soil boring data that may be useful to the design. Include a narrative of the requirements that a design must provide to accommodate pedestrian and vehicle traffic, privately owned vehicle and organic parking, fencing, area lighting, storage areas, etc. Include any existing Antiterrorism studies or information provided by the BCE.

Utility Plans. Describe what is known about each of the existing utilities needed to service the facility. Refer to the simple utility plan attached to the Basis of Design that shows the facility site plan and the location of all existing utilities including water, sanitary sewer, storm drain, gas, electric and communication lines, and fire hydrants. BCE will coordinate with the installation's communications office to determine how communications cable will be provided to the building site.

Architecture. Describe the architectural treatment and types of construction of the surrounding existing permanent facilities. New facilities shall harmonize and be compatible with existing permanent construction. Include Base policy statement on color scheme or other architectural policy, if such policy exists.

Special Siting Criteria. Describe the constraints on locating the facility in the

vicinity of adjacent structures, base property lines, runways, taxiways, aircraft parking facilities, Quantity-Distance (QD) requirements, security requirements of fences, gates, etc. Refer to the Unified Facility Criteria, Air Force Manual, or Air Force Instruction paragraphs furnished by the Government that provide the special siting criteria for the design.

Environmental Requirements. Describe environmental and permit requirements. Permit applications will be prepared during design by the A-E for BCE's signature by the completion of the Type B, Contract Documents Development Meeting.

6-3.4 Tab C.

This Tab consists of the ANG Design Objective and Procedures. It includes a complete description of each phase of the design, submittal requirements and responsibilities for the design review process. It also provides formats for ANG facility design data, a design schedule, review comments, and CRC addendum items as well as submittal checklists. This Tab is formulated by NGB/A4I and periodically updated as an ANGETL. Submit only the cover sheet of Tab C in use, unless the requirements in the published Tab C have been modified for this project. In that case provide a full copy of the document.

6-3.5 Tab D.

This Tab consists of the ANG Design Policy. It contains design guidance affecting various aspects of an A-E's design. Design policy is also formulated by NGB/A4I and periodically updated and issued as an ANGETL. Submit only the cover sheet of Tab D in use, unless the requirements in the published Tab D have been modified for this project. In that case provide a full copy of the document.

6-3.6 Tab E.

This Tab contains the Project Approval Package, to be provided by the BCE, to include, as a minimum, the Project DD Form 1391, Military Construction Project Data (latest version available), the MCP or SRM Certificate of Compliance, the MCP or SRM Checklist, and AF Form 813, Request for Environmental Impact Analysis.

6-3.7 Tab F.

This Tab contains various appendices, as appropriate for the particular project.

Real Estate Appendix. This is to ensure that all land requirements have been met to support the construction of this project. It is particularly important for a MCP project to ensure that we have no less than 25 years remaining at the time of construction. Upon receipt of the Design Intent, the NGB/A4I PM will provide a copy of this Appendix to NGB/A4FIR to verify the currency of the information submitted.

Asbestos Appendix. The purpose of this appendix is to determine the likelihood of encountering Asbestos Containing Materials (ACMs) during the construction of this project. This may need to be addressed when projects involve the disturbance of existing construction. In this appendix, the BCE will provide available information regarding the presence and condition of ACM in the facilities impacted by this project. If ACM is anticipated to be encountered, the project design shall include provisions for appropriate asbestos abatement measures.

Environmental Restoration Program (ERP) Appendix. The purpose of this appendix is to ensure that the proposed construction does not conflict with an ERP site. ERP sites include Installation Restoration Program (IRP) and Military Munitions Response Program (MMRP) sites. In this appendix, the BCE will provide available information on the location and status of ERP sites in the vicinity of the project. Upon receipt of the Design Intent, the NGB/A4I PM will provide a copy of this Appendix to NGB/A4FIR to verify the currency of the information submitted.

Geotechnical Report Appendix.

Sustainability Appendix. Provide the ANG High Performance Sustainable Building (HPSB) Checklist and Third Party Certification (TPC) Checklist, as applicable.

Antiterrorism Appendix. Provide DoD Minimum Antiterrorism Construction Standards Checklist.

Permit Appendix.

Calculations Appendix. Provide net and gross floor area calculations to confirm scope and code/criteria compliance. Refer to [Chapter 7](#).

Misc. Appendix. Provide the following: A-E Statement of Work; Meeting Minutes (i.e., CRC); Design Schedule; FSRM or MILCON Checklist; FSRM or MILCON Certification Form; Disposition of Review Comments; DD1354 Transfer and Acceptance of DoD Real Property; DD Form 1390S, Guard and Reserve Military Construction; and Economic Analysis.

6-4 PART II – DESIGN NARRATIVE

The Basis of Design, Part II, Design Narrative, describes the systems, components, conditions, and methods chosen to meet the Design Intent. It is a narrative and analytical document prepared by the design A-E along with design submissions to explain how the Government's project requirements are met by the proposed design. It describes the technical approach used for systems selections, integration, and sequence of operations, focusing on design features critical to overall building performance. Some reiterating of the design intent may be included. Include expansions of the statements given in **Part I, Design Intent**, and additional information collected from the A-E's fact-finding investigations with the Users. For all building systems denote loads and demands placed on the systems and the capacities provided in the design.

6-4.1 SUSTAINABILITY.

Provide a comprehensive Sustainability Chapter that summarizes how the design will achieve the requirements of UFC 1-200-02 and Third Party Certification (TPC) (where applicable). Address all disciplines in the summary, elaborate on the various requirements, and where full compliance is not possible, include proper justification. Provide the following:

- ANG High Performance Sustainable Building (HPSB) Checklist for each applicable building in the project
- Third Party Certification (TPC) Checklist (where applicable) for each applicable building in the project, and
- Justification for each missed or partially-met requirement (where applicable)

No variations or substitutions to the Checklist(s) are allowed without NGB/A4I approval.

Include the ANG HPSB Checklist and TPC Checklist as an appendix in BOD, Part I, Tab F.

6-4.1.1 Guiding Principles Validation.

The DOR is responsible to verify Guiding Principles Validation requirements, by including design requirements in the contract documents and verifying construction submittals when required by the contract.

6-4.1.2 Pre-Construction Award Commissioning Services.

When the project requires pre-construction award Commissioning services, incorporate all comments, reports, Owner Project Requirements (OPR) where required by third party certification program, and any other documentation related to commissioning effort.

6-4.2 ANTITERRORISM (AT).

Provide an Antiterrorism (AT) Chapter that summarizes how the design complies with the DoD minimum AT standards in UFC 4-010-01. As a minimum, include the following in the summary:

- Facility description including occupancy (low occupancy or inhabited)
- Narratives of how each applicable standard is met
- Site plan dimensioning standoff distances
- Protective measures above the minimum
 - Level of Protection

Note: Do not identify explosive weights to avoid disclosure of FOUO information.

6-4.3 GEOTECHNICAL.

Provide a Geotechnical Chapter that describes the geotechnical investigation program, the recommendations for the site preparation, and the recommendations for the building foundation and pavement design. Reference UFC 3-220-01, Geotechnical Engineering.

Include the geotechnical report in the BOD as an appendix in BOD, Part I, Tab F.

6-4.4 CIVIL.

Provide a Civil Chapter that summarizes how the design complies with the standards in UFC 3-201-01.

Identify the governing codes and criteria including federal and military handbooks being used for the design. References may be noted in the related sections listed below. Include reference titles and date of publications. Provide BOD with adequate narrative to describe design logic and assumptions. Show adherence to scope of work.

6-4.4.1 Existing Conditions.

Include the following:

- a) Describe general site topography and vegetation type (grass, lightly wooded, brush). Describe existing site features.
- b) Identify whether existing underground features, such as footings, foundations, or steam pits, exist, and describe.
- c) Describe existing soil conditions.
- d) Describe existing utilities, including size, type, and general location. Discuss impact that this, and future projects, will have on utility systems.
- e) Identify predominant drainage features, including any required downstream improvements. State whether field survey has been coordinated with delineation. Indicate the parties that have been notified of the presence of wetlands and are actively involved in this issue.
- f) Identify and describe if endangered species inhabit area.
- g) Identify and describe existing traffic patterns on and around site.
- h) Provide horizontal and vertical datum and other pertinent survey information.

6-4.4.2 Demolition.

Discuss demolition relating to Civil issues only, typically 5 feet (1.5 m) outside of building line. Identify all buildings slated to be demolished by building number. Generally describe structure types (examples: 1-story frame, 2-story block); include building specifics under the Architectural BOD. Describe pavement to be demolished, including

existing pavement section. Describe underground and overhead utility demolition, relocation, and abandonment. Describe other features to be removed (examples: play equipment or fencing).

6-4.4.3 New Site Work.

Describe new building and its function with respect to civil issues, such as vehicle ingress/egress and pedestrian movement. Address internal functions under Architectural BOD. Describe pedestrian access. Identify number of parking spaces; include stall and aisle widths. Describe handicap access in and around site, number and size of handicap parking spaces. Identify physical security requirements, such as intrusion detection provisions, fencing type and height, and lighting requirements. Also identify antiterrorism standoff distance requirements for the specific site conditions.

Identify vehicle type expected on project site; note non-standard vehicle sizes and weights. Identify design wheel loading. Define projected traffic volume. Define new pavement types and sections. For airfield pavement, discuss design parameters, including pavement use, loadings, design life adopted in design, design methodology to be used, and availability of materials anticipated for construction, and possible impacts construction may have on airfield operations, such as haul routes and closures. For railroads and crane rail, state type of service for which rail track will be provided; anticipated volume and type of traffic; the ruling grade and the maximum curvature. Describe proposed type, source and thickness of ballast, weight of rail and source, treatment and dimensions of ties. For small arms ranges, list expected weapons and ammunition including the most powerful weapons/ammunition combination that the design is based on. Discuss critical features such as impact berms (including height and slope), side berms, firing lines, firing directions, target locations, bravo flag poles, road gates, fencing, access roads, supporting facilities, and any other prominent feature. Do not include the surface danger zone (SDZ).

6-4.4.4 Water Supply.

State design parameters such as domestic flow, fire flow, residual pressure, and recent flow test data.) State anticipated demand. Coordinate with the QFPE to establish fire flow requirements. Describe water main and supply line sizes, capacities, and water velocities. Identify connection points. Identify connection methods. Identify whether existing infrastructure has capacity to support project. Identify requirements for backflow protection and freeze protection. Identify needs for metering. Identify need for booster pumps or pressure reducing valves. State the number of new fire hydrants. Provide number of wells and proposed pump rates.

6-4.4.5 Sanitary Sewer.

Describe waste stream and whether it is from domestic or industrial source. Include sources of any hazardous substances. Identify design population, peak and average flows. State whether sewer will be gravity or force main. Identify pre-treatment requirements and solutions. State minimum pipe slopes and velocities. Identify special

installation requirements. State new pipe sizes and capacities. Identify pump station type, wet/dry well, types of pumps, pump capacity and total dynamic head, horsepower, telemetry requirements and compatibility with existing on-base systems, backup power requirements, and assumed response time by Activity personnel. Consult Activity as to whether existing system is operating at or near capacity. Discuss adequacy of existing system to handle current and future flows.

6-4.4.6 Wastewater Treatment.

Identify completed treatability studies. Briefly describe recommended process noting deviations from the treatability study. Define impact of stream condensation and cooling water discharges on sewer piping and treatment plants and the estimated cost of distribution and treatment of this additional loading.

6-4.4.7 Storm Drainage System.

Identify factors such as receiving waters, classification (if applicable), storm frequency, and C factors. Discuss adequacy of existing storm system and its effects on downstream facilities and systems. Discuss whether existing system will require upgrades. Identify use of collection system versus sheet flow. Describe materials and pipe sizes. Describe how upstream flows that impact site will be handled.

6-4.4.8 Stormwater Management.

Identify Integrated Management Practices (IMP's) and approach to stormwater management. Discuss compliance with UFC 3-210-10, Low Impact Development, State, and local requirements.

6-4.4.9 Erosion & Sediment Control.

Identify total disturbed area acreage. Discuss erodibility of soil, devices or methods to be used to control erosion and sediment losses, and protection devices at outfalls. Discuss compliance with Activity, State, and local requirements.

6-4.4.10 Permits.

Identify the permits and fees necessary for environmental, construction and operation of facilities.

6-4.5 STRUCTURAL.

Provide a Structural Chapter that summarizes how the design complies with the standards in UFC 3-301-01, Structural Engineering; satisfies the customer's requirements; and is cost effective. Include statements on the following:

- List a summary of the criteria upon which the structural design is based. Including a statement of all loads: dead, live, wind, snow, earthquake and any

other significant load.

- List all assumptions required for the structural design where the design criteria is undefined, unclear, conflicting or unknown. State the basis of the assumption made.
- Describe the structural floor and roof systems. Include a discussion of both the gravity and lateral force resisting systems. Clearly describe the gravity and lateral load paths providing all pertinent information such as, capacity, size, dimensions, materials and design strengths. Define how foundations and slabs on grade are used to distribute lateral forces between the structure and the ground.
- Provide a narrative summary of the foundation system, including method for determination of the bearing capacity, maximum allowable bearing capacity, and lateral force capacity of the foundation, as well as other soil parameters used in the design. Provide all pertinent information, such as capacity, size, dimensions and a list of materials with design strengths.
- When appropriate, provide a statement of any special considerations that affect the design (such as/3/ “superflat floors” for high stack warehouses, special corrosion resistance requirements, fire-resistive requirements, or crane or monorails). Describe applicable special inspections, testing, and observations required in accordance with IBC Chapter 17, \1\as modified by UFC 3-301-01, and IEBC, as modified by UFC 3-301-01. The generic schedule of special inspections is maintained on the WBDG as referenced in paragraph 17-10 “Statement of Special Inspections.”/1/
- When using U.S. Geological Survey seismic information, provide a map showing the Latitude and Longitude of the project site.
- Provide a narrative summary of the Serviceability limits for the structure. Include the lateral drift limit for the primary lateral load resisting system for wind or seismic, roof framing deflection limit for DL + LL and LL only, floor framing deflection limit for DL + LL and LL only, and composite floor framing deflection limit for DL + LL and LL only.

6-4.6 FIRE PROTECTION.

Projects requiring the services of a Qualified Fire Protection Engineer (QFPE) must include a Fire Protection Basis of Design that includes the following information. Identify both the requirement and the actual design provided. See also Chapter 1-7.2 of UFC 3-600-01, Fire Protection Engineering for Facilities.

6-4.6.1 Project Summary.

Provide a brief summary of the project and scope of work. General information can be obtained from the DD Form 1391. Identify the purpose and use of the facility, including the following:

6-4.6.1.1 Specific Hazards.

Identify all hazardous areas (such as chemicals, fuels, ordnance), processes, and special hazards or features requiring special fire protection considerations, such as Radio Frequency (R-F) Shielded Rooms, Secured Rooms, Computer Rooms, commercial kitchen appliances. Provide any relevant information pertaining to the hazards and how they are protected.

6-4.6.1.2 Summary of Fire Protection Features.

Provide a brief summary of the active and passive features of fire protection. Provide a description and identify the location of all new and existing fire extinguishing systems, detection systems, fire alarm systems, or fire pumps to be provided or existing systems to remain or be modified.

6-4.6.1.3 Summary of Existing Conditions.

Provide a brief summary of existing conditions impacting the project, such as existing detection/suppression systems or existing building construction features.

6-4.6.1.4 Summary of Design Enhancements.

Specifically identify items in excess of the contract, criteria, or code requirements.

6-4.6.1.5 Summary of Other Design Features.

Provide a brief summary of the other features of the design relevant to the fire protection of the project.

6-4.6.2 Building Code Analysis.

Include the following information: occupancy classification; height and area calculations (area per floor & total); type of construction; required building separation or exposure protection; rating of structural components; classification of interior finishes; location of fire-rated walls and partitions; description of construction; whether rated floor and roof assemblies are restrained or unrestrained; interior fire or smoke rated wall/partition requirements, fire rating of each floor, ceiling system, roofing system when applicable. Discuss if and how the proximity to, and classification of, adjacent structures factors into the analysis.

6-4.6.3 Life Safety Code Analysis.

Base the life safety code analysis on NFPA 101, Life Safety Code. Identify occupancy classification, number of exits, type of exits, exit travel distance, total exit width, total occupant load, common path of travel, and all other applicable provisions of NFPA 101.

6-4.6.4 Water Supply Analysis.

Provide a summary of the data obtained from the water flow test (refer to Chapter 5) and provide a determination of the adequacy of the water supply (even for facilities without sprinkler protection), along with sketches of the water distribution system. If fire flow demands cannot be met, cite the deficiencies and recommend design alternatives/solutions to correct the problem of an insufficient water supply (such as fire pump(s), or water storage tank(s).)

6-4.6.5 Hydraulic Demand Analysis.

6-4.6.5.1 Analysis.

Using computer program generated hydraulic calculations, calculate the “anticipated” demand of a facility to validate the adequacy of the available water supply, or to establish the minimum water supply required. Refer to UFC 3-600-01, Fire Protection Engineering for Facilities for hazard classifications and design criteria determination. Proposed piping layout must accompany the hydraulic sprinkler calculations included with the Fire Protection Calculations submittals.

6-4.6.5.2 Plot.

Plot the available water supply versus the hydraulic demand on the Q1.85 Hydraulic Graph Paper. Present hydraulic information in graphical format as discussed in the FM Global Property Loss Prevention Data Sheet 3-0.

6-4.6.5.3 Adequacy of Water Supply for Fire Protection.

If the water supply analysis determines that the water supply cannot support the anticipated hydraulic fire flow or fire sprinkler demand, provide appropriate supporting calculations and propose design options or alternatives for consideration.

6-4.6.6 Active Fire Protection Features.

Provide the following information as applicable:

6-4.6.6.1 Description of Fire Suppression System(s).

- The area(s) that will be protected, the hazard classification of these area(s) and the type of system protecting these area(s).
- For sprinkler systems, the design density, demand area and hose stream allowance to be specified for each different area.
- The method for connecting the suppression system to the fire alarm system, as well as the method of annunciating the systems, and a description of any power disconnects, pre-alarms, etc. that are required.

6-4.6.6.2 Sketches.

Where appropriate, provide sketches representing the water distribution system, sprinkler demand areas, and show hydraulic reference points for the hydraulic sprinkler calculations.

6-4.6.6.3 Description of Fire Alarm/Mass Notification System(s).

6-4.6.6.3.1 Description.

- Provide information for all areas of the facility and what type of initiation devices and notification appliances will be provided.
- Identify any areas that may have challenging features that will make it difficult to achieve intelligibility requirements.
- Provide information for connecting to the base-wide fire reporting system and the base-wide mass notification system.
- Provide drawings or sketches s necessary.

6-4.6.6.3.2 Existing Conditions.

Provide detailed information on existing fire detection and suppression systems for existing buildings (examples: type of systems; area of coverage; make and model of all equipment; why system is or is not being replaced). For fire alarm systems, provide the following information (at a minimum): number of spare zones and spare spaces for modules, capacity of control panel(s), list of existing fire alarm zones, list of outputs, number of audio/visual circuits, and standby battery capacity. Indicate the working order of each system (condition or status).

6-4.7 CYBERSECURITY.

Provide cybersecurity design in accordance with the contract and UFC 4-010-06, Cybersecurity of Facility-Related Control Systems. As a minimum, include the following in the Cybersecurity Chapter:

- Facility description generally describing facility's mission.
- Confidentiality-Integrity-Availability (C-I-A) ratings for each facility-related control system.
- List of cybersecurity controls for each facility-related control system that can be satisfied within the design.
- Narrative of how each applicable cybersecurity control is met for each facility-related control system.

6-4.8 TELECOMMUNICATIONS.

Provide a Telecommunications Chapter that summarizes how the design complies with

the standards in Chapter 2 of UFC 3-580-01, Telecommunications Interior Infrastructure Planning and Design.

6-4.9 ARCHITECTURE.

Provide an Architecture Chapter that complies with Chapter 5-2.3 of UFC 3-101-01, Architecture.

6-4.10 ELECTRICAL.

Provide an Electrical Design Analysis Chapter that complies with the Chapter 3 of UFC 3-501-01, Electrical Engineering.

6-4.11 MECHANICAL.

Provide a Mechanical Design Analysis Chapter that complies with Chapter 3 of UFC 3-401-01, Mechanical Engineering.

CHAPTER 7 DELIVERABLE: CALCULATIONS

7-1 GENERAL REQUIREMENTS.

Submit design calculations required at each design stage in accordance with the contract, the Core UFC's, and the additional Discipline requirements listed herein. If another UFC adequately describes the requirement for a Discipline's deliverable, a paragraph for that Discipline is not provided below.

Prepare calculations in metric units when metric design is required. Provide reference to the source to produce the calculations.

7-2 COMPUTER GENERATED CALCULATIONS.

Provide the software program name, version and source used to produce each computer output or report.

7-3 FORMAT.

Format calculations as an 8 1/2 by 11 inch (216 by 279 mm) document. Provide a cover sheet with the title "Calculations;" the stage of the submittal; the project title and location; the A-E Contract or Construction Contract number; the Project Number; the Firm's name, or Contractor's name; and the date. Organize calculations by Discipline, in the same order as the drawings, and in a manner appropriate for the number of sheets provided. Number all sheets. Provide an index, following the title sheet, with sub-indexes for disciplines having a very large number of sheets, and include Discipline name and page numbers.

7-4 SUSTAINABILITY.

Provide calculations in accordance with UFC 1-200-02, High Performance and Sustainability Building Requirements for life cycle cost analysis.

7-5 GEOTECHNICAL REQUIREMENTS.

The geotechnical calculations normally appear in the geotechnical report; however, they may be in a separate package if another consultant other than the geotechnical consultant prepares the calculations for foundations or pavement. The calculations must indicate the loadings, capacities, the safety factors, and the text from which the calculations were based for the foundation and pavements. Graphs and formulae must be clearly indicated along with the derivation of curve slopes and data derived from the laboratory testing.

7-6 CIVIL.

Provide design calculations for erosion and sediment control, stormwater drainage system, stormwater management, pavement and utility systems. Calculations must be legible, orderly and easily understood and checked by a registered practicing civil

engineer.

7-6.1 Low Impact Development (LID).

Comply with UFC 3-210-10, Low Impact Development.

7-7 STRUCTURAL REQUIREMENTS.

Provide calculations to support all items and details outlined on the drawings and specifications. Include calculations for the main framing systems and all beams, columns, walls, foundations, bracing, diaphragms, equipment supports, and component inter-connections to provide a safe, stable efficient and cost-effective structural system, considering all design loads and criteria. They must be legible, orderly and easily understood and checked by a registered practicing structural engineer.

Also include the following:

- A cover sheet indicating the project title, location, contract number and names of the persons originating and checking the calculations.
- Table of contents.
- A brief statement describing the structural system, significant design parameters and any restrictions that may affect the design.
- Applicable design criteria.
- Loads: Include all loadings, forces, temperature changes, induced settlements, and other internal and external actions that may affect the design of the structure. The list must include the orientation and location, magnitude and units of measure for each load.
- Restrictions: Include all limiting factors such as horizontal and vertical deflections limits, height restrictions, installation or operating tolerances for equipment or building components and any other limits to the structural system.
- Materials: Include all materials used and their allowable stress limits, yield strengths, type, grade, class or other applicable material properties.
- References: Include all criteria, accepted standards, manuals, codes, texts, papers, or other references used in the analysis and design that are accepted in a public domain. Appropriately identify all references; abbreviations such as AISC, ASTM, and ACI are acceptable. Document the origin of all customer specific criteria in the calculations.
- Sketches with sufficient detail and clarity to communicate design intent. Note assumptions and references to codes, standards, criteria drawings and computer output.

7-7.1 Calculations and Test Reports for Antiterrorism.

When in project, provide calculations or test reports for the following systems demonstrating compliance with applicable Antiterrorism (AT) requirements:

- Blast resistant window systems
- Structural analysis of building elements where stand-off distances are less than the conventional stand-off distance
- Progressive collapse calculations

Note – Do not identify explosive weights as explosive weights to avoid disclosure of FOUO information.

7-7.2 Design for Lateral Forces.

Design for lateral forces must include design calculations for wind, seismic, and other potential loadings. The construction drawings must depict the governing design elements base on both seismic and wind design requirements.

7-7.3 Computer Generated Calculations.

Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, elements/members, materials/properties, and all loadings, induced settlements/deflections, and a list of load combinations. Results must include an output listing for maximum/minimum stresses/forces and deflections for each element, and the restrictions for each loading case and combination. If required, submit narratives. In addition, provide the following:

- Submit graphical plots of structural models which must include, but not be limited to, main structural elements, boundary conditions, loading diagrams, and deflected shapes. Submit graphical plots with each deliverable at each submittal stage. Provide in both native, editable format and in PDF.
- If a modal analysis is performed, submit plots of mode shapes and a listing of the dominant natural frequencies.
- If blast or progressive collapse analysis is performed, submit comparison tables of computed rotations/residual strength ratios and response limits listed in UFC 3-340-01 and UFC 4-023-03.

If software not commonly commercially available, or widely accepted in the structural community, is used, submit validation documentation of the software (such as hand verification of the software solution of a significant, representative portion of the structure).

7-8 FIRE PROTECTION CALCULATIONS.

Provide calculations at the earliest possible stage in design, but no later than the Concept Development Submittal, Type A-2 (35%) and as further required by [Chapter 14](#) of this document.

7-8.1 Hydraulic Demand Analysis.

Calculate the fire flow demand for the facility. Provide calculations showing that the anticipated suppression systems and hose stream demands can be designed to the available water supply. For hydraulic calculations, deduct the hose stream requirement at the point of connection to the existing distribution systems or the closest fire hydrant; whichever is closer to the sprinkler riser and building.

7-8.1.1 New Sprinkler Systems.

All buildings requiring sprinkler systems must be hydraulically designed. Include a floor plan with the calculated piping layout.

7-8.1.2 Existing Sprinkler Systems.

Provide hydraulic calculations for additions to, or modifications of existing sprinkler systems to ensure the system demand can meet the hazard it is protecting. Establish if the existing system is hydraulically designed or a pipe schedule system. Contact the Base Civil Engineer or Installation Fire Department for information on an existing system.

7-8.1.2.1 Hydraulically Designed Systems.

Indicate the size and location of all cross and feed main piping from the point of connection to the existing system back to the sprinkler riser. Indicate all grid branch line piping for grid systems. Do not assume the available water supply will be that identified with the existing design. Obtain current information.

7-8.1.2.2 Pipe Schedule Systems.

When the project modifies an existing pipe schedule system, determine the hazard classification and whether the existing cross and feed mains, and the riser pipe sizes can support the new piping and sprinklers. Identify the size of the pipe at the point of connection. Identify all existing piping requiring replacement. Small renovations to existing pipe schedule systems may be designed by the pipe schedule method as permitted by NFPA 13 and upon approval of the QFPE.

7-8.2. Fire Pumps.

Provide the following calculations verifying pump selection:

- Calculations supporting selected rated capacity and pressure.
- Power calculations for motor driven pumps.
- Fuel supply calculations for engine driven pumps.
- Calculations for suction supply tanks when applicable.

7-8.3. Fire Alarm/Detection and Reporting Systems.

7-8.3.1 Modifications to Existing Systems.

- Provide a power supply analysis. Submit calculations for power supply and standby battery capacity requirements of existing system and new devices. Ensure the power supply is capable of supporting the electrical load of the new devices.
- Provide a circuit analysis. Ensure the panel has the initiating and signaling expansion capabilities.

7-9 ARCHITECTURE.

Provide the building area calculations in accordance with Chapter 4-2 of UFC 3-101-01, Architecture.

7-10 ELECTRICAL.

Provide electrical calculations in accordance with Chapter 3 of UFC 3-501-01, Electrical Engineering.

7-11 MECHANICAL.

Provide a Mechanical Design Analysis Chapter that complies with Chapter 3 of UFC 3-401-01, Mechanical Engineering.

CHAPTER 8 DELIVERABLE: DRAWINGS

8-1 GENERAL REQUIREMENTS.

Provide drawings in accordance with the Core UFCs, the contract, [Chapter 12](#), Electronic Design Deliverable (EDD) Format, and the additional Discipline requirements herein, for every stage of design. If another UFC adequately describes the requirement for a Discipline's deliverable, a paragraph for that Discipline is not provided below.

8-2 PRESENTATION.

Drawings must be consistent in presentation and format. If one discipline shows material selections directly on the details, other disciplines must conform to that format, and not use numbers to refer to a numerical legend elsewhere on the drawings.

8-3 PROPER USE OF NOTES ON DRAWINGS.

- Be consistent with grammar used in notes on drawings. Wherever possible use imperative statements to describe work to be accomplished by Contractor. For example, instead of using "Contractor must provide," use "provide." It is understood that the notes are written for the Contractor's action.
- Do not use "to be" for describing work that will be accomplished by the Contractor. "To be" implies that someone will accomplish the work other than the Contractor, such as the Government or another Contractor. If work is to be accomplished by Government, for example, say "Government will remove storage building prior to start of construction."
- Do not use "install" for work that is to be accomplished by the Contractor. "Install" means Government or others will furnish equipment or materials and Contractor will install. "Furnish" means Contractor must only furnish; Government or others will install. Use "provide" when the Contractor is to furnish and install equipment and materials.
- Do not use "proposed" for new construction. "Proposed" means future work by others or work not in this contract.
- Do not use "new" for work in the contract. All work shown on the drawings is considered new, unless indicated otherwise. Inconsistent use of "new" throughout the drawings could mean that only some of the work is required.
- Do not use ambiguous statements that cannot be enforced by the inspector during construction. For example: "grade to drain;" "hand excavate carefully;" "provide materials in good condition."
- Be careful with statements like "remove and replace," which means to remove old item or material and replace that item or material when work is completed. This statement would be appropriate for work in a pump station where pumps were removed prior to the work and those same pumps replaced after the work is completed. On the contrary, if a portion of a concrete walk is cracked and requires

replacement, say “remove and provide concrete walk.”

- When referring to requirement for coordination between Contractor and Government agency, for example, use “coordinate utility connection with Contracting Officer;” do not use words such as “Owner,” “COR,” or “Government” for Government Agency.
- Do not indicate “see specifications” or “per spec” on the drawings. The drawings and the specifications form a complete construction package. If unavoidable, provide reference to the specification section in the project (for example, “...IN ACCORDANCE WITH SPECIFICATION SECTION 09 25 13.13.”)
- Do not use “all” or “any.”
- Do not use words that have multiple meanings, requiring opinions, or judgmental decisions, such as “timely,” “nearly,” “good-condition,” “suitable,” “well-balanced,” “suitable for intended use,” “reasonable,” “approximately,” “reliable,” “proper,” “usable,” “appropriate,” “adequate,” or “qualified.”
- Do not use terms that are not biddable by the Contractor nor enforceable by the Government, such as “recondition,” “as directed,” “equal to,” “as required,” “similar to,” “as necessary,” “as close as possible,” “repair,” “match existing,” or “refurbish.”
- Some terms are only enforceable if quantities are shown on the drawings or included in the specifications, such as “as indicated,” “as shown,” “specified herein,” and “as noted.”
- Be careful when using the word, “typical,” especially if there are exceptions to the detail.
- Use “must” rather than “shall.”

8-4 CODE COMPLIANCE SUMMARY SHEET(S).

The Code Compliance Summary Sheet(s) must be prepared by the QFPE and must be included as “General Sheets” immediately following the title sheets. At a minimum, include the following information:

8-4.1 Building Code Site Plan.

Identify all of the following elements on the Building Code Site Plan:

- Line of encroachment identifying minimum separation distances from adjacent buildings and assumed property lines of the new construction and of the adjacent structures.
- Building perimeter used for frontage increases.
- Exit discharge paths.
- Fire Department vehicle access to building.

- Fire lane width, marking and locations, approach roads and turn radius and location.
- Intended fire department main entrance to building.
- Location of fire department connections.
- Fire hydrants, post indicator valve or valves and their connected water distribution mains serving building.
- Fire pump room.
- Water storage tanks.
- Hazardous material spill containment tanks.
- Backflow prevention assembly or assemblies serving water-based fire protection systems (if located outside of building).

8-4.2 Building Code Summary.

Identify all of the following elements in the Building Code Summary:

- Classification of occupancy.
- Allowed vs. provided type of construction.
- Basic allowable heights & areas vs. actual heights & areas.
- Allowable vs. provided height or area increases per floor and total.
- Calculations supporting height and area modifications/increases.
- Required vs. provided exterior exposure protection.
- Required vs. provided interior fire rated occupancy separations.
- Required vs. provided internal fire area separations.

8-4.3 Life Safety Code Summary.

Identify all of the following elements in the Life Safety Code Summary:

- Classification of occupancy of each room, area or compartment (on the drawings or in tabular form);
- Occupant load factor(s) and total calculated load;
- Required vs. provided number of exits;
- Required vs. provided capacity of means of egress;
- Required vs. provided arrangement of means of egress including remoteness of exits, horizontal exits, travel distance, common path of travel, dead-end corridor lengths. When suites are used, indicate type, location, area and arrangement;
- Required vs. provided accessible means of egress;

- Required vs. provided discharge from exits;
- Required vs. provided fire rated separation of exits and exit access;
- Required vs. provided fire rated separation of hazardous areas;
- Flame spread/smoke development ratings of interior finishes;
- Requirements (if any) for smoke control systems based on the specific occupancy chapter and building design considerations;
- Requirements for any special locking arrangements such as delayed egress locks or access-controlled egress doors. Specify the rooms/area.
- Identify any and all Life Safety Code Exceptions Taken (e.g., equivalent protection).

8-4.4 Life Safety Plans.

The Life Safety Plans must be prepared by the QFPE and must be included as “General Sheets” immediately following the title sheets and code compliance summary sheets. Scale the floor plans so the entire footprint fits on a single sheet provided that all information is clearly legible and the scale is no smaller than 1/16-inch (1:200). At a minimum, include the following information:

- Location and rating of all fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions (both horizontal and vertical). Barriers requiring fire resistance rated supporting construction must be specifically identified for coordination with the structural design partition locations with fire rated partitions and horizontal exits identified.
- Building areas having different occupancy and hazard classifications.
- Room numbers, corresponding occupancy classification and calculated occupant load. Include occupant load of each room, area or compartment (on the drawings or in tabular form). Similar occupancies can be grouped together for occupant load calculations.
- Capacity and number of occupants using each major means of egress component (such as stairs, stair doors, exterior doors, assembly exit doors.)
- Rooms or areas requiring special life safety or fire protection features.
- Location of hazardous materials storage, handling and use that exceed the maximum allowable quantities.
- Egress travel requirements (such as travel distances, common paths of travel, dead-end corridors.)
- Structural fireproofing locations and associated ratings.
- When required, fire extinguisher cabinet and surface-mounted fire extinguisher locations.
- When required, fire extinguisher type/quantity table identifying the total number

and type of extinguishers required.

- Location of primary fire alarm/mass notification control panel.

8-5 CIVIL DRAWINGS.

8-5.1 Cover Sheet, Drawing Index, Vicinity Map, Location Plan, Abbreviations, Legend, and Notes, or First Civil Sheet.

If project is not a Civil Engineering lead, assure that the following items are coordinated with the lead discipline responsible for creating cover sheet:

- a) If General Development Maps (GDM) are used for the Vicinity and Location Maps, edit for the specific project being designed. Ensure street names, main gates, and the BCE office of the base are identified. Ensure that text is legible at the plotted scale and remove extraneous lines.
- b) The Vicinity Map must have enough main highway names and street names to allow an out-of-town contractor to locate the work.
- c) The Location Plan must allow the contractor to find the project on the base. This is generally a good place to show laydown areas, haul routes, any construction traffic routing restrictions, and off-site benchmark locations. Provide an adequate amount of street names to allow coordination between the Vicinity Map and the construction plans.
- d) In general, it is desirable to show the Vicinity Map and the location Plan on the Cover Sheet along with the project title.
- e) Coordinate with Contracting Officer for laydown area.
- f) Edit standard details, abbreviations, legends, and general notes for the specific project being designed.
- g) Provide a single Civil legend on one sheet (preferably sheet C-001).
- h) Datum must be securely tied between project datum and local datum. Datum should be current within 6 months.

For projects near tidal waters, show datum sketch indicating project vertical datum and relationship to range of tide and other important datum.

8-5.2 Demolition Plan.

Include the following:

- a) Clearly show what is to be demolished at an appropriate scale. Coordinate/edit the legend to match the demolition plans.
- b) Indicate the beginning and ending points of utility removals and methods of plugging pipes (such as cap, brick & mortar). Show locations of valves to be used for isolating work.
- c) Show limit of pavement removal and pavement thickness.
- d) Describe the existing items in detail with supplemental descriptions if necessary. Indicate depth of pavements/bases to allow uniform contractor bids.
- e) Provide a sequence of demolition if necessary. Include any known requirement for continuous operation and limited shutdown requirements. These must be identified in the special scheduling paragraphs of the specification.
- f) Do not show any items that are being demolished with the current project on subsequent Civil plan sheets.
- g) Show locations of all erosion and sediment (E&S) control items and add E&S notes. Show erosion control details on drawings or refer to applicable details in the State Erosion and Sediment Control Handbook or manual. Verify that the erosion control legend is edited, clear and coordinated with the drawings.
- h) Provide a Tree Protection Detail for existing trees, which are to be preserved during construction. All trees are not amenable to the same barrier fence application. Consult a Registered Landscape Architect or State Certified Arborist. As a minimum, show a 4 foot (1.2 m)- high safety-orange, plastic barrier fence with metal or 4 x 4 inch (101 x 101 mm) wood stakes at 8 foot (2.5 m) on center spacing, continuously located around the tree's drip-line, unless otherwise directed by a certified arborist. If trees are in a group or cluster, use only one fence to surround the entire cluster.

8-5.3 Site Plan.

Include the following:

- a) Show all new aboveground features including all features required by the BOD (examples: airfields, railroads, crane rail, small arms ranges) with adequate layout data and existing aboveground features, after demolition has occurred.
- b) Label baselines to be used for project layout as 'construction baseline' as opposed to survey baseline.
- c) Provide layout dimensions from the construction baseline, or another readily identified (and easily established) alignment in the field. Include horizontal control point locations and descriptions. Use of coordinates for layout purposes is discouraged, however their use may be considered on a case-by-case basis. Contact NGB/A4IC Civil Reviewer for approval of coordinate

layout prior to project submittal.

- d) Show areas requiring pavement patching, repairs and new pavement. Provide pavement jointing plans for rigid pavements. Include separate pavement marking plans for airfield projects.
- e) Eliminate extraneous items that may congest the drawing (such as contours, elevations) and detract from the layout information.
- f) Show locations of any additional E&S control items not already included on the Demolition Plan. Coordinate with E&S notes, details, and legend.
- g) Indicate all trees and plant material to remain.
- h) Provide statement concerning location of soil borings and soil information.

8-5.4 Water and Sanitary Sewer Plan.

Include the following:

- a) Indicate whether new connections will be made by wet tap (tapping sleeve/valve) or by dry connection. Show nearest valve(s) for system isolation if the latter is the case. Indicate known scheduling issues in the special scheduling paragraphs of the specification.
- b) Indicate surface materials (such as grass, bituminous, or concrete).
- c) Provide numbers (or letters) for each sanitary structure and water fitting so that plans and profiles are easily coordinated. This labeling system must be clearly distinct from that used for the storm drainage system and preferably distinct from labels used by other utility systems, (such as electrical).
- d) Provide manhole rim and invert elevations, pipe slopes, pipe diameters and pipe materials. If profiles are provided, indicate slopes on the profile sheets and do not provide on the plan sheets.
- e) For water treatment plants, provide details process and instrumentation diagram (P&ID).
- f) Provide reference to drawings and specifications for cathodic protection of fire protection water storage tanks, piping or water lines, including metallic components of non-metallic lines (for example, PIVs, fire hydrants, change of direction devices, and valves).

8-5.5 Water, Storm, and Sanitary Sewer Profiles.

- a) Show profiles where needed for clarity and to avoid potential conflicts. Discuss profile requirements with NGB/A4IC's Civil Reviewer.
- b) Indicate structure tops, pipe invert elevations, slopes, lengths, and diameters

- of all new gravity lines.
- c) Coordinate structure numbers with plan sheets.
 - d) Reference the plan sheets where pipes/structures are shown.
 - e) Show and label existing and new surface materials, such as concrete pads, curbs, and roads, traversed by the new lines. Accurately show depth of existing pavements.
 - f) Show and label all crossing utility lines, both existing and new.
 - g) If depths of existing utilities are unknown, indicate the horizontal location of the utility and indicate the vertical location with a line representing the anticipated range of elevations where the utility will be found in the field. Indicate the method of new utility installation routing above or below conflicts (such as concrete encasement or pressure pipe).

8-5.6 Grading and Drainage Plan.

Include the following information:

- a) Provide existing spot elevations and existing contours at intervals to clearly indicate existing drainage patterns.
- b) Provide new spot elevations and new contours when appropriate to clearly indicate new grading and drainage patterns. New spot elevations/contours must be easily distinguished (bolder font) from existing.
- c) Indicate where new grading ties to existing grading (limits) and verify that new work will not block existing adjacent drainage.
- d) Show all benchmarks, temporary benchmarks (tbm's), other vertical control, and datum notes on this plan.
- e) Show finish floor elevations on grading plans. Do not show finish floor elevations on the architectural or structural plans in order to avoid conflicts. Coordinate adjacent exterior grading with the architectural/structural plans to ensure positive drainage patterns away from the building.
- f) Verify that the slopes indicated on the plans are suitable for the surface material involved (such as earth slopes, bituminous pavements, and concrete pavements). Consider if these slopes are maintainable for the service life of the facility.
- g) Coordinate with the Landscaping Plans (L sheets) to prevent new plantings from blocking site drainage.
- h) Provide numbers (or letters) for each drainage structure so that plans and profiles are easily coordinated.
- i) Provide erosion and sediment control details.

8-5.7 Site / Utility Details.

Incorporate details as follows:

- a) Details of items shown in the construction standards of the Department of Transportation, or other agencies of the state in which the project will be constructed or other appropriate local/commercial standards are required on the plans.
- b) Pavement Sections.

8-6 LANDSCAPE ARCHITECTURAL DRAWINGS.

8-6.1 Landscape Demolition Plan.

Coordinate existing site improvements and existing trees or other plant materials to be demolished with Civil Engineer. If a Civil Engineer is not involved with the project, conform to the requirements listed in Civil Drawings section under Demolition Plan.

8-6.2 Landscape Site Plan.

Coordinate site improvements with Civil Engineer. For projects with detailed Landscape Architectural features provide a Landscape Site Plan. Include the following:

- a) Show all new aboveground features including all features required by the Basis of Design (examples: buildings, existing site features to remain, utilities and other infrastructure improvements, vehicular and pedestrian circulation, parking, hardscape, fire lanes, Indicate hardscape, plazas, courtyards, child play equipment, monuments, memorials, site furniture, fences, walls, trash enclosure, signage, landscape drainage, and other site structures, streetscapes, LID and other bio-retention features, and AT standoff distances) and unobstructed space with adequate layout data and existing aboveground features, after demolition has occurred. Provide enlargement plans to delineate appropriate detail in plan view.
- b) Label baselines to be used for detailed Landscape Architectural features layout as 'construction baseline' as opposed to survey baseline.
- c) Provide layout dimensions from the construction baseline, or another readily identified (and easily established) alignment in the field. Include horizontal control point locations and descriptions. Use of coordinates for layout purposes is discouraged, however their use may be considered on a case-by-case basis. Contact Contracting Officer for approval of coordinate layout prior to project submittal.
- d) Eliminate extraneous items that may congest the drawing (such as contours, elevations) and detract from the layout information.

8-6.3 Landscape Construction Details.

Provide details, sections, and elevations for all site improvements as required for construction.

8-6.4 Landscape Planting Plan.

Show locations of all facilities (such as buildings, parking areas, roads, sidewalks, plazas or patios, existing vegetation to remain, and other surface improvements) and new plantings (such as trees, shrubs, ground cover), LID features, and bio-retention treatments.

8-6.5 Plant Material Schedule Details.

Include the following:

- Provide a schedule for plant material showing as a minimum: botanical name, common name, quantity of plants, tree trunk caliper, minimum height and spread at time of planting, root condition (for example, balled and burlapped, containerized, and boxed), and a keyed reference to a planting detail.
- Provide separate details for plant types (such as trees, shrubs, ground covers) and other elements (such as root barrier, headers or edging, mulching).

8-6.6 Landscape Irrigation Plan.

When a Landscape Irrigation Plan is required by the Statement of Work, show locations of all facilities (such as buildings, parking areas, roads, sidewalks, plazas and patios, existing vegetation to remain, and other surface improvements). Show all pressure pipe and lateral lines, sprinkler heads, drip tubing and emitters, valves, backflow preventers, water source connections, wells, rain sensors, automatic controllers, rainwater harvesting (and other sustainable design features), and similar items.

8-6.7 Irrigation Equipment Schedule and Detail.

When a Landscape Irrigation Plan is required by the Statement of Work, include the following:

- Provide an Irrigation Equipment Schedule showing at a minimum: graphic symbol, description of the item, manufacturer, model number, irrigation nozzle type (for example, full, half, quarter, or bubbler), optimum nozzle pressure (PSI), nozzle radius, and nozzle flow (GPM).
- Provide separate details for irrigation equipment (such as sprinkler heads, automatic controller, backflow preventer, valves, and other accessories).
- Provide pressure loss calculations.
- Provide water budget watering schedule, and equipment manufacturer's specifications, operations, and other information.

8-7 GEOTECHNICAL DRAWINGS.

Include subsurface investigation results on the drawings for record-keeping purposes. As a minimum, the drawings must include the logs as they appear in the Geotechnical Report, a summary table of the laboratory testing, notes concerning the drilling, logs and testing, groundwater observations/conclusions, and any site preparation notes or details, such as undercutting and surcharging.

8-8 STRUCTURAL DRAWINGS AND NOTES.

Provide structural drawings that sufficiently detail all structural work. The drawings must contain a set of "Structural Notes" in accordance with UFC 1-200-01, DoD Building Code and which provide critical reference information for future building modifications or evaluations. As a minimum, note Design Criteria, Design Standard References, General Construction requirements, and the following:

- **Loads:** Provide loading information and identify source for all listed loads.
- **Foundation Conditions:** Fully describe the foundation conditions and list the type of foundation system and method employed to determine allowable soil bearing values. Indicate the minimum allowable bearing capacity for shallow foundations, or the pile or pier capacity in both tension and compression for deep foundations. Indicate passive, active and at rest design pressures, the coefficient of friction and the sub-grade modulus. Indicate if a site specific design spectrum is to be used in the design and give the site class in accordance with the seismic design criteria used.
- **Materials:** Clearly define the types, grades and properties of materials for each structural element and system.
- **Quality Assurance:** Provide a summary of the quality assurance requirements.
- **Ammunition and Explosive Facilities:** Drawings that include a standard approved for Ammunition and Explosive storage facilities must include a note clearly identifying the source, name and date of the standard design.

8-9 FIRE PROTECTION.

Provide floor plans showing the following information. Scale the floor plan so the entire footprint fits on a single sheet provided that all information is clearly legible and the scale is no smaller than 1:200 or 1/16-inch. Where a building has multiple hazard classifications or areas protected with special fire suppression systems, differentiate each area by border or hatching.

Information pertaining to electronic control/release systems may be shown on the Fire Alarm/Mass Notification Systems drawings specified below.

8-9.1 Fire Sprinkler System.

Provide the following information:

- Location of sprinkler riser room.
- Fire department connections.
- Post indicator valves.
- Isolation control valves.
- Sprinkler branch lines or feed main piping if a specific routing is required, such as single feed to computer room or elevator equipment room and hoistway.
- Location of control panels used for release of pre-action or deluge systems.
- Fire pump and associated equipment.
- Location of the inspectors test location (system drain).

8-9.2 Fire Suppression Detail Sheets.

Provide fire suppression detail sheets showing the following information:

8-9.2.1 Fire Sprinkler Systems.

- Enlarged plan view of sprinkler riser room showing sprinkler risers, control valves, backflow prevention device and service entrance (supply) manifold drawn to scale.
- Cross-sectional elevations of sprinkler and standpipe risers.
- Enlarged plan view of fire pumps and piping arrangement, jockey pump, and associated controllers and equipment drawn to scale.
- Cross-sectional elevations of fire pump supply and discharge piping arrangement.
- Releasing system riser diagram for pre-action or deluge sprinkler systems. Identify all zones, circuit inputs and circuit outputs necessary for controls, including interconnection with building fire alarm control panel.

8-9.3 Fire Alarm / Mass Notification System Plans.

Provide floor plans identifying location of field installed components and interconnected devices. Plans may identify fire suppression control/release system information identified above. At a minimum, identify the location of the following information:

- Control panel(s).
- Notification appliance circuit extender panels.
- Radio transmitter or master box.

- Line and low voltage surge arrestors.
- All initiating devices (including duct smoke detectors). In lieu of locating devices on the plans, and as authorized by the QFPE, provide the following information on the plans:
 - Ambient sound pressure levels and audible design sound pressure levels,
 - Area borders or other means to identify differing distinguishable spaces (ADS)
 - Area borders to indicate the type of detection system, initiating devices, notification appliances and releasing service
 - Area borders for detection and notification zones
 - Rooms and spaces that will have visible notification and those where visible notification will not be provided
 - Rooms and spaces that will have initiating devices and the design performance requirements for those devices
- Supplemental equipment interfaced with the fire alarm system such as voice evacuation panels, electromagnetic door holders, delayed-egress or access-controlled doors, elevator system components.
- Supplemental fire suppression equipment control panels such as fire pump controllers, Fire suppression control/release panels.

8-9.4 Fire Alarm / Mass Notification Detail Sheets.

Detail sheets may identify fire suppression control/release system information identified above.

8-9.4.1 Riser Diagram.

Provide a riser diagram showing hierarchy, arrangement and zoning of the system. Identify all typical circuits, interconnections and interlocks necessary for associated controls. Do not identify every field device individually, such as smoke and heat detectors. Identify required line and low voltage surge arrestors. Interface with security systems for required delayed-egress or access-controlled doors. Identify interface with fire suppression control/release panels.

8-9.4.2 Sequence of Operation Matrix.

See NFPA 72 for sample.

CHAPTER 9 DELIVERABLE: SPECIFICATIONS

9-1 GENERAL REQUIREMENTS.

Provide specifications in accordance with UFC 1-200-01 DoD Building Code, the Core UFCs, UFC 1-300-02 Unified Facilities Guide Specifications, and [Chapter 12](#). Provide specifications that are as brief as possible, definitive, and free of ambiguities and omissions that may result in controversy and contractor claims for additional compensation.

9-2 GUIDE SPECIFICATIONS.

Specifications offer criteria for materials, equipment, and test methods. Guide specifications are documents that describe products and materials and the work necessary to incorporate them into a construction project. A guide specification facilitates the preparation of project specifications by standardizing products and processes, and their order of presentation. DoD uses the Unified Facilities Guide Specifications (UFGS) database, provided on the Whole Building Design Guide website (<http://www.wbdg.org>), which is updated quarterly. Edit guide specifications to specific project requirements for incorporation into the contract documents. Guide specification and project specification sections describe the following in detail:

- Product or system to be provided,
- Salient design features or performance requirements of the product or system,
- Quality of that product or system and methods used to ensure the quality, including on-site and off-site testing,
- Method to be used to incorporate the product or system into the project, and
- Other features and functions necessary.

Guide specification section numbers, up to 10 digits, in CSI MasterFormat 2004, are grouped in pairs. Each of these groupings is referred to as a “level,” from one to five. Refer to the CSI MasterFormat website at <http://www.csinet.org/mfnumber> for further explanation.

9-2.1 Unified Facilities Guide Specifications (UFGS).

Use Unified Facilities Guide Specifications (UFGS) for all projects, including DesignBuild. UFGS are available at the Whole Building Design Guide website at <http://dod.wbdg.org/>. Tailor and modify the UFGS as necessary to suit the work required by the specific project, including editing for metric or inch-pound. In addition, modify and edit to reflect the latest proven technology, materials, and methods, for the project.

There is only one current version of a guide specification at any time. The guide specification with the latest revision date and change number automatically cancels

specifications of the same number with a previous date and change number.

9-2.2 Other Guide Specifications.

Other guide specifications are only allowed as a basis for information when not available in the UFGS. These developed specifications must be provided in UFGS format and modified to meet requirements of UFC 1-300-02, Unified Facilities Guide Specifications.

9-2.3 UFGS Selection Order of Precedence.

Unless specified otherwise in the contract, the order of precedence for selecting which UFGS to start from, for CONUS jobs that require the use of the UFGS, is as follows:

- 1) UFGS, Air Force only (UFGS with a “30” at the fifth level in CSI MasterFormat).
- 2) UFGS (unified, no designator at the fifth level).
- 3) Other DoD UFGS (Army UFGS with .00 10 designation and modified for Air National Guard job)
- 4) Other Guide Specifications.

9-2.4 Design-Build Performance Technical Specifications.

Design-Build Performance Technical Specifications. Develop Performance Technical Specification (PTS) sections in accordance with requirements of [Chapter 11](#).

9-3 PROJECT PREPARATIONS POLICIES AND GUIDANCE.

Prepare specifications in Format and Styles required by UFC 1-300-02, Unified Facilities Guide Specifications.

9-3.1 UFGS Version Date.

Download, use, and edit the most current UFGS database available from the Whole Building Design Guide website, <http://dod.wbdg.org/>. Unless otherwise specified by the contract, the version that is current at the official start of the Pre-Final design phase must be used, and continue to be used, through Final design. Coordinate the version of the UFGS database used with the NGB/A4I Project Manager, and report this date to him/her.

9-3.2 Editing of Specifications for Project.

Modify and edit the guide specification to fit the project and to meet UFC requirements. Follow the Notes to the Designer to make selections in the UFGS. Use language and format in accordance with UFC 1-300-02, Unified Facilities Guide Specifications. Delete portions of the guide specification not included in the project design and scope. Use

guide specifications only as source documents, and do not reference them in project specifications. Do not combine work covered by various UFGSs into one section unless the project is small and work is of a minor nature, and the NGB/A4I Project Manager concurs.

9-3.2.1 Geotechnical and Civil Specifications.

Do not edit outside of the guide specification's bracketed selections for Geotechnical and Civil UFGS sections in Divisions 31 and 32, without prior approval of the Base Civil Engineer.

9-3.3 Standard Plates, Sketches, and Details.

Provide plates, sketches, boring logs, and details on the drawings, and not in the specifications.

9-3.4 Salient Characteristics.

Provide only the actual minimum needs of the Government in the specifications, and describe the salient characteristics of materials and installation so as to encourage maximum competition. Eliminate, insofar as possible, any restrictive features that might limit acceptable offers to one supplier's product, or to the products of a relatively few suppliers, and as required further by UFC 1-300-02, Unified Facilities Guide Specifications. Do not list manufacturers unless Contracting Officer approval is received. Master UFGSs that list manufacturers must have a class justification on file.

9-3.5 Contract Parties.

Do not designate part of the work to be performed by a particular subcontractor (such as the plumbing contractor) in constructing the project, except for some specific instances. The Government recognizes only one Contractor (the prime or general contractor), and it is the Contractor's responsibility to divide up the work.

9-4 COORDINATION OF SPECIFICATIONS AND DRAWINGS.

FAR 52-236-21, Specifications and Drawings for Construction states: "Where 'as shown', 'as indicated', 'as detailed', or words of similar import are used, the reference is made to the drawings accompanying this contract unless stated otherwise."

9-4.1 DBB Contract Order of Precedence.

For Design-Bid-Build contracts, the Contract Order of Precedence is defined in FAR 52-236-21. In general, treat anything mentioned in the specifications but not shown on the drawings or shown on the drawings but not included in the specifications, as if shown or mentioned in both. In the case of discrepancies between the drawings and specifications, the specifications take precedence.

9-4.2 DB Contract Order of Precedence.

In the event of conflict or inconsistency between any of the below described portions of the conformed contract, precedence shall be given in the following order:

- a. Any portions of the proposal or final design that exceed the requirements of the solicitation.
 - (1) Any portion of the proposal that exceeds the final design.
 - (2) Any portion of the final design that exceeds the proposal.
 - (3) Where portions within either the proposal or the final design conflict, the portion that most exceeds the requirements of the solicitation has precedence.

- b. The requirements of the solicitation, in descending order of precedence:
 - (1) Standard Form 1442, Price Schedule, and Davis Bacon Wage Rates.
 - (2) Part 1 – Contract Clause.
 - (3) Part 2 – General Requirements.
 - (4) Part 3 – Project Program Requirements.
 - (5) Part 6 – Attachments (excluding Concept Drawings).
 - (6) Part 5 – Prescriptive Specifications exclusive of performance specifications.
 - (7) Part 4 – Performance Specifications exclusive of prescriptive specifications.
 - (8) Part 6 – Attachments (Concept Drawings).

9-4.3 Coordination.

Coordinate the drawings and the specifications to ensure that all items depicted in the drawings are covered by an appropriate specification section and that all specification sections relate to items in the drawings.

9-5 USE OF UFGS AND SPECSINTACT.

Edit and provide UFGS sections in accordance with UFC 1-300-02, using SpecsIntact software and UFGS format. SpecsIntact is the word processing software used to edit the UFGS database. SpecsIntact software is available for download, free of charge, at the SpecsIntact web site (<http://specsintact.ksc.nasa.gov/>).

9-6 SPECIFICATIONS PACKAGE ORGANIZING STRUCTURE.

9-6.1 Coversheet.

Include an overall cover sheet, for signature, with project specification package. Type in

the name and title of the principle DOR, who must sign in the “Submitted By” location.

9-6.2 Contract Documents.

The DOR prepares and provides the following documents.

9-6.2.1 Document 00 22 13.00 20.

Provide UFGS Document 00 22 13.00 20, *Supplemental Instructions to Offerors* separately. Do not combine with the specifications package or include in the Table of Contents. Convert the final UFGS document to Word or PDF, and submit in that format.

9-6.2.2 Project Synopsis.

The scope in the project synopsis is taken from the Description of Work located in UFGS section 01 11 00. This description of work must be concise, and summarize the location, facilities, and type of work involved. Provide the scope of work for the Synopsis with the Pre-Final and Final submittal.

9-6.3 Format.

Provide specifications in UFGS format in accordance with UFC 1-300-02, Unified Facilities Guide Specifications. Print job headers with the job title, exactly as it appears on the drawings, justified to the left, and with the Project Number justified to the right. For Prefinal submittals, follow the job title with “(Prefinal).”

9-6.4 General Requirements (Division 00 and 01) Specifications.

Edit the UFGS Division 00 and 01, General Requirements Divisions to describe the general project requirements of the project. Provide any additional requirements, of a general nature, rather than of a technical nature, in General Requirements.

The UFGS sections in Table 9-1 are typically used in a Design-Bid-Build project. Use other Division One sections as required, depending on the scope of the project, or as required by the Contract. Provide UFGS Document 00 01 15, List of Drawings as part of the specifications package, or separately, in accordance with Contract requirements.

Table 9-1 Commonly Used DBB UFGS Division 00 and 01 Sections

UFGS Number	TITLE
00 01 15	LIST OF DRAWINGS (sometimes not provided in TOC)
01 11 00	SUMMARY OF WORK
01 14 00	WORK RESTRICTIONS
01 20 00.00	PRICE AND PAYMENT PROCEDURES
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 33 00	SUBMITTAL PROCEDURES (attach Submittal Register)

01 33 29	SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 26	GOVERNMENTAL SAFETY REQUIREMENTS
01 42 00	SOURCES FOR REFERENCE PUBLICATION
01 45 00	QUALITY CONTROL
01 45 35	SPECIAL INSPECTIONS
01 50 00	TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00	PROJECT IDENTIFICATION (attach Project Signboards)
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 78 00	CLOSEOUT SUBMITTALS
01 78 23	OPERATION AND MAINTENANCE DATA

9-6.5 Design-Build RFP.

Table 9-2 shows commonly used Design-Build RFP Part Two UFGS section.

Table 9-2 Commonly Used DB RFP PART Two UFGS Division 01 Sections

UFGS Number	TITLE
01 14 00.05 20	WORK RESTRICTIONS FOR DESIGN-BUILD
01 20 00	PRICE AND PAYMENT PROCEDURES
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 31 19.05 20	POST AWARD MEETINGS
01 32 17.05 20	COST-LOADED NETWORK ANALYSIS SCHEDULES (NAS) FOR DESIGN-BUILD
01 33 00.05 20	CONSTRUCTION SUBMITTAL PROCEDURES
01 33 10.05 20	DESIGN SUBMITTAL PROCEDURES
01 33 29	SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 13	SPECIAL PROJECT PROCEDURES
01 35 26.05 20	GOVERNMENTAL SAFETY REQUIREMENTS FOR DESIGN-BUILD
01 45 00.05 20	DESIGN AND CONSTRUCTION QUALITY CONTROLS
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 57 19.01 20	SUPPLEMENTAL TEMPORARY ENVIRONMENTAL CONTROLS
01 74 19.05 20	CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT FOR DESIGN-BUILD
01 78 23	OPERATION AND MAINTENANCE DATA

Include within Division 01, a section instructing the project team and stakeholders to use an integrated design process throughout the planning, design and delivery stages. The MOU Technical Guidance for the integrated design process is available from the WBDG web site (<http://www.wbdg.org/references/mou.php>). Include applicable references to the MOU Technical Guidance throughout project documentation.

9-6.6 Project Reports.

Many projects include special requirements due to the presence of environmentally sensitive materials, such as asbestos, lead containing paint, PCBs, or other hazardous materials. Typically, as part of the Design or RFP Development contract, investigations are conducted to determine the presence, levels, and limits of sensitive materials. The investigative firm then provides reports, from which the information is used to design the project, or provided in the DB RFP. The Government provides this information to the Contractor as part of the contract documents.

9-6.6.1 Design-Bid-Build.

Provide and attach reports to the end of the appropriate UFGS specification section.

9-6.6.2 Design-Build

For DB, provide project reports in Part 6 of the RFP.

9-6.7 Combining Multiple Projects into One Solicitation Package.

Occasionally, several projects, that have been independently prepared, or need to be easily separated, will be combined into one solicitation package. One solution is to combine the packages into at least three Parts.

9-6.7.1 Design-Bid-Build Parts.

In Part A, provide one General Requirements (Division 01) specification for the entire package. This Division 01 must be edited and accurate for all of the combined projects. The header in Part A must list the titles of each project, justified to the left, and the corresponding Project Number for each project, justified to the right. Example is provided in Figure 9-1.

Part B consists of the technical specifications (Divisions 02-49) for the first project, and Part C consists of the technical specifications for the second project. Add additional parts depending on the number of projects being combined. Provide a Divider, a Table of Contents, and the technical specification sections. The header in each part must contain only the title of that Project, and the corresponding Project Number, for that project. An example is provided in Figure 9-1.

9-6.7.2 Design-Build Parts.

Part A consists of the General Requirements Division (Division 01), Part B consists of the RFP (Parts 3-6) for the first project, and Part C consists of the RFP for the second project. Add additional parts depending on the number of projects being combined. Provide a Divider, a Table of Contents, and the RFP sections (Parts 3-6). The header in each part must contain only the title of that Project, and the corresponding Project Number, for that project.

For RFP's in which Parts are shared, such as Part 2, Part 4, and Part 5, projects may be combined by simply using a Part 3 for each project, distinguished by the cover page and title, and inserted in Part 3; and a Part 6 for each project, distinguished by the title, and inserted in Part 6. In this case, parts A, B, and C dividers may not be required. Reflect the layout in the overall Table of Contents.

9-6.7.3 DB and DBB Hybrid.

For contracts where a Design-Build RFP is combined with a Design-Bid-Build project, provide one project, complete, in Part A, and the other project, complete, in Part B; do not combine the General Requirements (Division 01) of these two different types of projects. An example is provided in Figure 9-2.

9-6.7.4 Coversheet.

Provide one overall coversheet for signature. The coversheet must contain all of the Project Numbers. Contact the Contracting Officer for which Project Number to use first as the primary. Also include all project titles, and if different Designers of Record prepared the RFP or specification, the information of each DOR firm or agency. Be careful not to change the location of the electronic signature portlets when adding information to the coversheet.

9-6.7.5 List of Drawings.

Provide UFGS 00 01 15, List of Drawings, listing all of the drawings in the entire package. Group drawing lists by Project.

9-6.7.6 Table of Contents.

Provide a single, overall Table of Contents, listing each Part and the sections or documents in each Part. Note that SpecsIntact uses Courier New (10 pt) as the default font. Use this font to generate the Table of Contents and any other documents in Word. A sample Table of Contents is provided in Figure 9-1 and Figure 9-2.

9-6.7.7 Submittal Registers.

Provide submittal registers for each Part at the end of UFGS 01 33 00, Submittal Procedures. Separate the submittal register for each part with a Divider; for example, bookmark "Part A: Submittal Register" (for Division 01 only), "Part B: Submittal Register," and "Part C Submittal Register," within the PDF package.

Figure 9-1 Sample Table of Contents for Combined DBB Projects

GATE 5 SECURITY IMPROVEMENTS ABCD123456
SECURITY IMPROVEMENTS, GATE 10 ABCD789123

PROJECT TABLE OF CONTENTS

PART A: GENERAL REQUIREMENTS

DIVISION 00

00 010 15 LIST OF DRAWINGS

PART B LIST OF DRAWINGS

PART C LIST OF DRAWINGS

DIVISION 01 – GENERAL REQUIRMENTS

01 11 00 SUMMARY OF WORK
01 14 00 WORK RESTRICTIONS
01 20 00 PRICE AND PAYMENT PROCEDURES
01 30 00 ADMINISTRATIVE REQUIREMENTS
01 33 00 SUBMITTAL PROCEDURES
SUBMITTAL REGISTER PART A
SUBMITTAL REGISTER PART B
SUBMITTAL REGISTER PART C
01 33 29 SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS
01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00 PROJECT IDENTIFICATION
01 78 00 CLOSEOUT SUBMITTALS
01 78 23 OPERATION AND MAINTENANCE DATA

--End of Part A--

PART B: GATE 5 SECURITY IMPROVEMENTS, (PN: ABCD123456)

02 41 00 DEMOLITION

DIVISION 26 – ELECTRICAL

26 08 00 APPARATUS INSEPCTION AND TESTING

DIVISION 31 – EARTHWORK

31 00 00 EARTHWORK

DIVISION 34 – TRANSPORTATION

34 71 13.19 ACTIVE VEHICE BARRIERS

--End of Part B--

PART C: SECURITY IMPROVEMENTS GATE 10, (PN: ABCD789123)

DIVISION 02 – SITE WORK

02 41 00 DEMOLITION

DIVISION 08 – OPENINGS

08 11 13 STEEL DOORS AND FRAMES

08 71 00 DOOR HARDWARE

--End of Part C--

Figure 9-2 Sample Combined DB and DBB Projects

PART A: GATE 5 SECURITY IMPROVEMENTS

ABCD123456

DIVISION 01 – GENERAL REQUIRMENTS

01 11 00 SUMMARY OF WORK
01 14 00 WORK RESTRICTIONS
01 20 00 PRICE AND PAYMENT PROCEDURES
01 30 00 ADMINISTRATIVE REQUIREMENTS
01 32 17.00 20 NETWORK ANALYSIS SCHEDULES (NAS)
01 33 00 SUBMITTAL PROCEDURES
01 33 29 SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS
01 45 00 QUALITY CONTROL
01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00 PROJECT IDENTIFICATION
01 78 00 CLOSOUT SUBMITTALS
01 78 23 OPERATION AND MAINTENANCE DATA

DIVISION 02 – SITE WORK

02 41 00 DEMOLITION

DIVISION 26 – ELECTRICAL

26 08 00 APPARATUS INSPECTION AND TESTING

DIVISION 31 – EARTHWORK

31 00 00 EARTHWORK

DIVISION 34 – TRANSPORATION

34 71 13.19 ACTIVE VEHICLE BARRIERS

--End of Part A--

PART B: GATE 2 SECURITY IMPROVEMENTS, (PN: ABCD789123)

PART 1 – CONTRACT DOCUMENTS
(Included under separate attachment)
PART 2 – CONTRACT REQUIREMENTS
PAR 3 – PROJECT PROGRAM
PART 4 – PERFORMANCE TECHNICAL SPECIFICATIONS (PTS)
PART 5 – PRESCRIPTIVE TECHNICAL SPECIFICATIONS
PART 6 - ATTACHMENTS

--End of Part B--

**CHAPTER 10 COST ESTIMATES, RISK ANALYSIS, CONSTRUCTION SCHEDULES,
AND VALUE ENGINEERING**

10-1 GENERAL REQUIREMENTS.

Provide cost estimates for each project phase and at each submittal stage in accordance with the applicable provisions of UFC 3-701-01, DoD Facilities Pricing Guide; UFC 3-730-01, Programming Cost Estimates for Military Construction; and UFC 3-740-05, Construction Cost Estimating unless specifically indicated otherwise in this chapter or in the contract documents.

Provide Cost and Schedule Risk Analysis (CSRA) when required by the scope of services and in support of the cost estimate. Provide construction schedules in support of the cost estimate. Provide Value Engineering (VE) services when required by the scope of services.

10-2 ESTIMATE CLASS STANDARDS AND REQUIREMENTS.

Estimate classifications based on the maturity of the project.

Table 10-1 indicates the appropriate AACE RP 56R-08, (the Association for the Advancement of Cost Engineering's *Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Building and General Construction Industries*) estimate class with the commensurate project phase.

Table 10-1 Estimate Classification by Project Phase

Project Phase	Estimate Class
Type B-3, 100% Final Design Type B-2, 100%, Pre-Final Design	1
Type B-1, 65% Design	2
Design-Build RFP – Final	3
Design-Build RFP – Draft	4
Type A-2, 35% Concept Development	3
Type A-1, 15% Concept Proposal Studies	4
Installation Level DD1391 Rough order of magnitude, comparison or screening; square-foot (square meter)	5

10-3 ESTIMATE DEVELOPMENT AND SUBMITTAL REQUIREMENTS.

Prepare all estimates using MII software (Micro-Computer Aided Cost Estimating System). Where the level of design development in an early phase design submittal does not support a quantity takeoff, the PACES software (Parametric Cost Estimating System) may be used. The resulting PACES estimate is to be exported to MII and updated to the latest MII Cost Book prior to submitting. Submit the native MII project file. Use the latest version of the Cost Book for MII. Obtain local pricing for major cost items reflecting the pricing data at the time the estimate is developed.

10-3.1 User Generated Items.

Provide user generated costs for unusual tasks, for items requiring vendor quotes, for allowances, and for developing assemblies in MII. The user generated costs must provide sufficient explanation in the item note field for the reader to understand how the item was developed and what it includes.

10-3.2 Level of Detail.

The detail for each cost estimate must be commensurate with the level of the development of the project definition deliverables provided for each submittal. Estimates may be started using PACES. Whether the detail quantity items are developed from a quantity takeoff or from a PACES estimate, the details are to appear at the appropriate locations and levels in the work breakdown structure.

Segregate MILCON (Fund Type 321 or 341), Repair (Fund Type 522), Sustainment (Fund Type 521 or 524), Minor Construction (Fund Type 529), ABIs or Options, and FF&E costs. To accommodate undefined scope items for specific features, use clearly identified user items to indicate allowances for undeveloped design, or other items of uncertain scope. The costs for such items are to include material, labor, and equipment costs and must be assigned to the appropriate contractor in the cost estimate.

10-3.3 Basis of Estimate.

Base the cost estimate on the defined process as described in AACE RP34-R-05. For each submittal, provide a narrative Basis of Estimate (BOE). As a minimum the BOE must include the following information:

10-3.3.1 Method Used for the Cost Estimate Development.

- 1) State whether the cost estimate was based on a quantity take-off (QTO) or on some other method(s) or combinations thereof.
- 2) For each submittal provide the design basis for the estimate and whether or not the design deliverables are sufficient to support the estimate class required in Table 10-1 above.

- a) Describe all of the design deliverables used as the design basis for the estimate. This includes drawings, specifications, basis of design, studies, reports, and site engineering investigation.
 - b) Discuss the classification and the basis of the classification relative to the maturity level of the design at the time of submission. The design maturity discussion is to include general project data and the design deliverables indicated in this document, including the referenced AACE RP 56R-08. Indicate specifically which of the minimum design deliverables need to be completed in order to achieve the required estimate class. Describe the overall maturity of the design deliverables as a whole and the resulting expected accuracy range expressed as a high and low value around the 50% confidence level (P50).
 - c) Provide a qualitative analysis of the current construction market and any expectation for changes through the planned construction period at the project location. This is to include availability of labor and materials and market drivers. Indicate the sources of information used in the market analysis.
 - d) Include a specific statement indicating whether or not the estimate is based on the final design.
- 3) Discuss the use of Contract Line Items within the estimate.

10-3.3.2 Cost Estimate Details.

- 1) Describe the anticipated acquisition strategy and expected level of competition.
- 2) Include the assumed minimum number of offerors.
- 3) Include how much work is being self-performed by the Prime and how much and what type of work is being subcontracted out.
- 4) Provide a summary of key assumptions.
- 5) Include other execution factors that may impact costs such as:
 - a) Phasing
 - b) Access restrictions
 - c) Working hours

- d) Overtime
- 6) Describe how the estimate accounts for the current construction market, including mark-ups applied.
 - 7) Contractor markups used: Include detailed discussion backed up by industry data and/or calculations justifying percentages used for Home Office Overhead, Job Office Overhead, Profit, Bond, Taxes, Competition Premium, and any markup on sub-contractors. Provide this information for the prime contractor and all subcontractors. Do not make broad statements such as “based on historical data.”
 - 8) List and explain the use of other markups such as design allowances (including allowances to address any assumptions made pertaining to any studies/reports), bonds, gross receipts tax (GRT), and other taxes.
 - 9) Address costs for underdeveloped design or other items of uncertain scope through the use of clearly defined user cost items in the form of allowances. These allowances are to include costs for labor, material and equipment and are to be assigned to the appropriate contractor in the estimate. Prepare a table listing each allowance, the associated contractor, the location(s) in the estimate and the contract cost for each allowance item. Provide the total contract cost of all allowances.
 - 10) List and explain the General Requirements (Job Office Overhead) and Home Office Overhead rates used in the estimate. The duration of field overhead costs is to be informed by the general construction schedule. Prime JOOH and General requirements cost items must be included in the detailed estimate and represented as a calculated contractor mark-up.
 - 11) Provide a summary of key risks associated with the cost estimate itself as well as any other items which could directly or indirectly impact the overall cost.
 - 12) Discuss the value of the point estimate (the current working estimate, CWE or the Independent Government Estimate, IGE prior to contingencies being applied) as well as the range of probable values of the estimate. Include in this discussion the application of contingency applied to arrive at the CWE or the final IGE.
 - a) If a formal Cost and Schedule Risk Analysis (CSRA) is prepared as part of the project requirements, indicate where the point estimate falls in the range of probable values as determined by the CSRA. Identify the effective

date of the CSRA with each submittal. Incorporate the following information from the CSRA into the BOE:

- i. Provide summary discussion of the CSRA that includes the key cost and schedule risk items driving contingencies in the cost and schedule. Present key recommendations that may assist in mitigating risks.
 - ii. Provide a Frequency View chart (Probability Density Function). Include markers for the mean and median values of the distribution.
 - iii. Provide a Cumulative Frequency Chart (Cumulative Distribution Function). Include markers for the mean and median values of the distribution.
 - iv. Provide the Statistics Table from the simulation.
 - v. Provide the Percentiles Table from the simulation.
- b) If a formal CSRA is not prepared as part of the project requirement, the estimator should provide a defensible discussion on how any contingencies were developed and where the original point estimate falls within the range of probable values.
- c) Identify the estimating software tools used - versions of PACES and MII.

10-3.3.3 Estimating Tools.

Provide information on the software tools and associated databases used in the development of the cost estimate.

10-3.3.4 Sources of Information.

- 1) Provide the basis for localized costing.
 - a) Detailed explanation of the source(s) of material and equipment unit costs used.
 - b) Basis of labor unit rates and burdens used (such as Construction Wage Rate Requirements Statute) including explanation for additional labor adjustments such as productivity, overtime, and shift work. For projects in remote location (or in Guam) indicate if burdened unit rates assume use of non-local (or off-island) labor (for example, H-2B workers) and if so, indicate the percentages of local and non-local (or off-island) labor.
 - c) UFC 3-701-01, DoD Facilities Pricing Guide, precludes the use of Area Cost Factors to modify parametric cost estimates, detailed quantity take-off estimates, unit price book line items, commercial cost data, or user generated unit costs.

- 2) Provide escalation calculations and source of escalation factor used. Estimate cost items from the source date to the midpoint of construction.
- 3) Indicate the midpoint of construction developed at each submittal and provide an explanation of how the construction must be developed from the Project Schedule.
- 4) Inform and incorporate dates of the construction schedule into the cost estimate. Discuss the reasonableness of the project construction schedule to meet the contract award within the authorization year.

10-3.3.5 Estimate Progression.

At each submittal, compare the project cost to the Certified Final DD1391 Block 9 costs. Evaluate and discuss the causes of variances exceeding 10% of any cost line items, subtotals, or totals.

After the first submittal, compare subsequent cost estimate submittals to the previously submitted cost estimate. Evaluate and discuss the causes of variances exceeding 10% of any UNIFORMAT II Level 1 and Level 2 cost elements, sub-totals, or totals.

10-4 COST AND SCHEDULE RISK ANALYSIS (CSRA).

When required by the scope of services, perform the Cost and Schedule Risk Analysis (CSRA) in accordance with UFC 3-740-05, Construction Cost Estimating, and with U.S. Army Corps of Engineers (USACE) "Cost and Schedule Risk Analysis (CSRA) Guidance located at <http://www.nww.usace.army.mil/Missions/Cost-Engineering>. Provide the native Excel macro-enabled CSRA model file. Develop CSRA models using the Crystal Ball add-in to MS Excel. Base the default contingency on a 50% Confidence Level. Include this contingency in the baseline estimate as the Risk Contingency owner markup. Incorporate the key findings from the CSRA process in the BOE. In addition, provide a copy of the risk register.

Update the CSRA and submit for review with each design submittal. Use the CSRA output and report to arrive at the range of possible costs and discuss the current value of the cost estimate relative to that range. Indicate the level of design development and the effective date of the cost estimate and construction schedule used in each CSRA submittal.

10-5 CONSTRUCTION SCHEDULE.

Provide a construction schedule in support of the cost estimate and CSRA. Use the duration, crew hours, and labor hours in the estimate to develop the construction schedule. In turn, the estimate must include itemized job overhead costs based on the results of the construction schedule. Running job overhead percentages may be permitted on Class 4 and Class 5 estimates, but must not be used on Class 1, Class 2

or Class 3 estimates. The schedule is to be roughly equivalent to a Level 3 Estimate as defined in AACE Recommended Practice 91R-16 *Schedule Development*. It must define critical activities but is not required to be resource loaded. It must follow the UNIFORMAT II Work Breakdown Structure (WBS) used in the estimate. The WBS is to be displayed at least to Level 3 of UNIFORMAT II but is not required to be displayed any lower than Level 3. This schedule is part of the cost estimate supporting documentation and will not be shared with the Contractor.

10-6 VALUE ENGINEERING STUDIES (VES).

Provide the service of a Value Engineering (VE)/Value Analysis (VA) team led by a Value Study Team Leader (VSTL) to conduct a Value Engineering Study (VES) to include a Value Engineering Workshop (VEW). The VEW may be combined with other meetings or workshops associated with the project. The VES must follow the methodology advocated by SAVE International and will be documented in a report. Each of the alternatives evaluated as part of the VES must be achievable with the project's construction award amount.

The following industry standards apply to the extent feasible in accordance with the level of design development:

- SAVE Methodology Standard 2015
- ASTM E1699 *Standard Practice for Value Engineering (VE)/Value Analysis (VA) of Projects, Products, and Processes* (Latest Revision)
- ASTM E2013 *Standard Practice for Constructing FAST Diagrams and Performing Function Analysis During Value Analysis Study* (Latest Revision)

10-6.1 VE/VA Team Requirements.

Value Study Team Leader (VSTL): Provide a VSTL certified by SAVE International as a Certified Value Specialist, with experience in preparing Value Studies and conducting VES workshops for projects related to the construction of buildings and other engineered systems. The VSTL will be responsible for leading the VE/VA team, resolving issues to the maximum extent possible, documenting meetings, organizing the study materials for on-site use/approval, and providing the VES Report.

The Designer of Record (DOR) will provide the VE/VA Technical Team.

10-6.2 VES Kick Off Meeting.

Conduct the VES meeting via teleconference and review workshop preparations, scope, expectations, roles and responsibilities, schedules and documentation requirements. This meeting will generally last one hour and must be attended by the VSTL and the Project Manager (PM) and Design Manager (DM) from the DOR.

10-6.3 Value Engineering Workshop (VEW).

The VEW must be attended by the VSTL as well as the key members of the DOR's design team. This is to include the DOR's PM, DM, Architect, Structural Engineer, Mechanical Engineer, Electrical Engineer, Civil Engineer, Landscape Architect, Cost Engineer, Fire Protection Engineer, Interior Designer, and Geotechnical Engineer. Other technical disciplines may be included if approved by the NGB/A4I PM, or DM. The VSTL will lead the VEW following the six-step job plan consistent with the SAVE International Value Standard, ASTM E1699 (Standard Practice for Value Engineering (VE)/Value Analysis (VA) of Projects, Products and Processes) and ASTM E2013 (Standard Practice for Developing Functions, Constructing FAST Diagrams, and Performing Function Analysis During Value Engineering (VE)/Value Analysis (VA) Study). A comprehensive VEW will establish all six steps during the on-workshop. An abbreviated VEW will accomplish the first three steps during the workshop and the remaining three steps after the workshop. The six phases of the Value Methodology Job Plan are:

- 1) Information Phase
- 2) Function Analysis Phase (including FAST Diagrams as per ASTM E2013)
- 3) Creative Phase
- 4) Evaluation Phase
- 5) Development Phase
- 6) Presentation Phase

10-6.4 VEW Preparations.

Complete the following items prior to the start of the VEW:

- a) As a minimum, review the available documentation. This includes but is not limited to:
 - All information included or cited in the project's scope of services
 - Design authorization and programming documents
 - Studies, cost estimates, and other information.
- b) The VSTL is to prepare a sample presentation format for the use of the DOR's VE/VA Technical Team.

- c) Arrange for a site visit prior to the workshop to allow the VSTL and the VE/VA Technical Team to become familiar with the project site. Coordinate this effort with the Contracting Officer.
- d) Prepare a presentation handout for the anticipated number of participants including:
 - A discussion of the overall VES methodology
 - A discussion of the scope of work as currently developed
 - A discussion of the current program amount allocated for the project
 - A discussion of the current estimated construction cost estimate
 - A capital cost model as indicated in ASTM E1699, 7.28
 - A discussion of the project documentation provided for this study, noting that copies are available during the workshop
 - A discussion of the performance and acceptance requirements for evaluating alternatives in accordance with ASTM E1699, 7.2.5

10-6.5 VEW Process.

- a) The DOR's design team members will explain how the current scope/design accomplishes the stakeholder objectives.
- b) The workshop participants will generate a list of ideas for project improvement followed by an evaluation of those ideas. The evaluation will include input from key stakeholder decision makers before proceeding with development recommendations.
- c) The VE/VA Technical Team will develop selected ideas into alternatives with enough documentation to allow decision makers to determine if the alternative should be implemented.
- d) The VSTL, with input from NAVFAC, will evaluate each alternative in accordance with the pre-determined performance and acceptance requirements.
- e) The VSTL will present the alternatives to the key stakeholder decision makers on the final day of the workshop.

10-6.6 VES Report.

Provide a report documenting the VES process and its application to this project by capturing the process and the alternatives considered or recommended.

Include the following in the report:

- Project Objectives

- Project Description
- Scope Analysis
- VES Procedure
- VES Alternatives and associated savings/improvements considered
- VES Alternatives and associated savings/improvements recommended
- Copy of the original Study Team Presentation Handout

10-6.6.1 Comprehensive Workshop VES Report.

- a) Preliminary VES Report: Include a collection of the findings of all (6) phases of the Value Methodology Job Plan at the conclusion of the workshop.
- b) Draft Final VES Report: Incorporate all revisions from previous submittal comments and include a list of final recommendations.
- c) Final VES Report: Incorporate revisions from previous submittal comments and the implementation decisions captured during the Decision/Implementation Meeting.

10-6.6.2 Abbreviated Workshop VES Report.

- a) Preliminary VES Report: Include a collection of draft/summaries of the findings at the conclusion of the workshop. As a minimum address the first (3) phases of the Value Methodology Job Plan covered during the workshop.
- b) Interim VES Report: Include revisions of the Preliminary VES Report and include draft/summaries of the last (3) phases of the Value Methodology Job Plan.
- c) Draft Final VES Report: Incorporate all revisions from previous submittal comments and include a list of final recommendations.
- d) Final VES Report: Incorporate revisions from previous submittal comments and the implementation decisions captured during the Decision/Implementation Meeting.

10-6.6.3 VES Decision/Implementation Meeting.

The VSTL must conduct a four-hour Decision/Implementation Meeting via teleconference. This meeting is to assist key project stakeholders in the selection of which of the developed alternatives to implement. The VES Decision/Implementation

Meeting must be attended by the DOR's design team who will be working on this project. This is to include the DOR's PM, DM, Architect, Structural Engineer, Mechanical Engineer, Electrical Engineer, Civil Engineer, Landscape Architect, Cost Engineer, Fire Protection Engineer, Interior Designer, and Geotechnical Engineer. Other technical disciplines may be included if approved by the NGB/A4I PM or DM.

CHAPTER 11 DELIVERABLE: DESIGN-BUILD REQUEST FOR PROPOSAL

11-1 GENERAL REQUIREMENTS.

Requirements for preparation of Request For Proposal (RFP) are also provided in Chapter 12, Electronic Design Deliverables (EDD) Format.

11-2 DESIGN-BUILD REQUEST FOR PROPOSAL INTRODUCTION.

ANG Design-Build (DB) RFPs are developed by organizing project requirements into the ANG DB Six Part Format. Requirements included in the RFP are driven by the need to control the design and the construction of the facility. Because the Contractor is designing and constructing the facility, design issues are just as important as construction issues and must be given equal consideration. The RFP information may be gathered from many sources such as:

- DD Form 1391 Documentation
- Funding Documents
- Site Conditions and Restraints
- User Requirements
- Local and Regional Requirements
- Applicable Standards and Codes
- Applicable AF, ANG, and DoD Criteria and Clauses
- Performance and Prescriptive Product, Material, and System Requirements

RFPs are a combination of performance and prescriptive requirements, but give preference to performance requirements for DB. However, many times prescriptive requirements are necessary to define a minimum acceptable solution or expected level of quality. Therefore, mold the type of information included in the RFP to meet the anticipated level of quality and needs of the Using Activity (i.e., User). Create performance and prescriptive requirements that comply with the following characteristics of each.

- Performance requirements state the function, desired results, and durability to control the Contractor's design and selection of products, materials, and systems.
- Prescriptive requirements define the products, materials, and system or their characteristics to control the facility function, performance, and quality.

11-3 DESIGN-BUILD REQUEST FOR PRPOSAL FORMAT AND DOCUMENTS.

11-3.1 RFP Format.

The RFP must include all six RFP Parts indicated below unless they are not applicable

to the project. The typical facility project will have information in every RFP Part, with the possible exception of RFP Part Five, “Prescriptive Specifications.” Typically, Part One is not prepared by the RFP developer, but is provided by the Acquisition Office after RFP Parts Two through Six have been completed by the RFP developer. The RFP developer is required to provide certain information for the Contracting Officer to properly prepare the RFP Part One. Verify with the Contracting Officer, what provisions are necessary to allow for the RFP Part One to be integrated into the RFP.

The following list indicates the type of information and information structures used in the RFP Parts:

- **Part One** includes the Proposal Form and Documents and specifies the contractual requirements.
 - This Part uses the Standard Procurement System documents that are organized using the CSI Masterformat.
- **Part Two** contains the General Requirements Specification Sections.
 - This Part uses specification sections organized using CSI Masterformat.
- **Part Three** contains the Project Program for the project.
 - This Part predominately uses a paragraph format; Chapter Six of Part 3, the Engineering Systems Requirements uses Uniformat.
- **Part Four** contains the Performance Technical Specifications.
 - This Part uses Uniformat.
- **Part Five** contains any Prescriptive Specifications required for the Design-Build RFP.
 - This Part uses CSI Masterformat.
- **Part Six** includes attachments to define existing conditions and design requirements (such as Boring Logs, reference drawings).
 - This Part is a combination of various attachments that have no predominate format.

11-4 DESIGN-BUILD REQUEST FOR PROPOSAL DOCUMENT PREPARATION.

11-4.1 Combining Multiple RFPs into One Bid Package.

Refer to [Chapter 9](#) for guidance, when multiple RFPs are combined into one solicitation

package.

11-5 RFP ELECTRONIC DELIVERABLES.

Provide RFP electronically in accordance with [Chapter 12](#), Electronic Design Deliverables (EDD) Format. Organize the RFP into one or two PDF files, with order shown in the following Table of Contents. Bookmark each item below, and the additional items indicated.

- 1) RFP Coversheet
- 2) RFP PART 1 Divider (when directed by the Contracting Officer)
- 3) Overall, RFP Table of Contents (Parts 2-6)
- 4) RFP PART 2 Divider
 - a. RFP Part 2 Table of Contents
 - b. RFP Part 2 Specification Sections (bookmark first page of each section)
- 5) RFP PART 3 Divider
 - a. RFP Part 3 Project Program Coversheet
 - b. RFP Part 3 Table of Contents
 - c. RFP Part 3 Project Program
 - d. Each Chapter of RFP Part 3 (bookmark first page)
 - e. Each Engineering Systems Requirements (ESR) in Chapter 6 (bookmark first page)
- 6) RFP PART 4 Divider
 - a. RFP Part 4 Table of Contents
 - b. RFP Part 4 Performance Technical Specifications (PTS) (bookmark first page of each PTS)
- 7) RFP PART 5 Divider (if prescriptive specifications are included in the RFP)
 - a. RFP Part 5 Table of Contents
 - b. RFP Part 5 Specification Sections (bookmark first page of each section)
- 8) RFP PART 6 Divider
 - a. RFP Part 6 Table of Contents
 - i. Attachments (bookmark first page of each attachment)

11-6 DB DESIGN SUBMITTALS.

Provide design submittals electronically in accordance with [Chapter 12](#), Electronic Design Deliverables (EDD) Format. Include information and organize DB design submittals in accordance with this document.

11-7 DESIGN AND CONSTRUCTION SUBMITTAL REQUIREMENTS.

Because the DB projects require design and construction submittals, the submittals are more complex than Design-Bid-Build. The DB process utilizes the RFP and the UFCs to define design submittals and the RFP and the UFGS to define construction submittals.

11-7.1 Locations of DB Submittal Requirements.

Because the DB submittals are spread into different documents, the preparers of DB submittals are required to refer to multiple locations to obtain the complete submittal requirement. The design and construction requirements are found in the six major locations designated in the following table:

Table 11-1 Design and Construction Submittal Summary

DESIGN-BUILD DESIGN and CONSTRUCTION SUBMITTAL SUMMARY			
NO	DOCUMENT	LOCATION	SUBMITTAL REQUIREMENT
1	RFP Part Two UFGS Specs		
	A. Most RFP Part Two	RFP Part Two	Lists <i>Project Specific</i> Administrative Submittals for Government Approval
	B. UFGS 01 33 00	RFP Part Two	Lists <i>Project Specific</i> Government Reserved Construction Submittals for Approval or Surveillance
	C. UFGS 01 33 10	RFP Part Two	Lists <i>Project Specific</i> Design Submittals
2	Engineering System Requirements (ESR)	RFP Part Three	Lists <i>Project Specific</i> Design Requirements
3	Performance Technical Specification (PTS)	RFP Part Four	Lists <i>PTS Specific</i> Critical Construction Submittals for DOR approval and Construction Submittal requirements
4	Unified Facility Guide Specifications (UFGS)	Whole Building Design Guide Website	Edited UFGS specification required by RFP Part Two for Contractor's Design Submittal and Compliance to UFGS technical requirements
5	Design Procedures	Whole Building Design Guide Website	Lists <i>Discipline Specific</i> Design Submittals for ANG to supplement Core UFCs
6	Discipline Specific UFCs (Arch, Struct, Civil, Geotech, Mech, Elect, Fire Protection, Force Protection Anti-Terrorism)	Whole Building Design Guide Website	Lists <i>Discipline Specific</i> Design Requirements and Explanation design submittals identified in this document (ANG Design Objectives and Procedures) and the ANG Design Policy.

11-7.2 Government Approval and Surveillance of DB Submittals.

The RFP DB submittals are organized to allow the RFP editor the flexibility to evaluate the project needs, determine the availability of Government resources to review submittals, and modify the submittal approval requirements to suite the project.

- a. RFP Part Two, UFGS 01 33 00.05 20 *Submittals Reserved for Government Approval* – all RFP Part Two UFGS section submittals denoted with “G” submittal action code.
- b. RFP Part Two, UFGS 01 33 10.05 20, *Government Approving Authority* – Government approves all design submittals.
- c. RFP Part Two, UFGS 01 33 10.05.20, *Exception to Contractor Construction Actions* – Identifies certain Government design submittals approvals that have to be accomplished before construction related to that design submittal can begin.
- d. RFP Part Two, UFGS 01 33 10.05.20, *Design Documents*, and UFGS 01 33 00.05.20, *Contractor Reviewing, Certifying, Approving Authority* – Government identified construction submittals required to be incorporated in the design submittals. DOR approval of identified construction submittals precedes Government approval of associated design submittals.
- e. RFP Part Two, UFGS 01 33 00.05.20, *Submittals Reserved for Government Approval* – Construction submittals reserved for Government approval. The approval of these identified construction submittals prevents the contractor from beginning construction on that portion of the work until Government approval is obtained.

11-7.2.1 Surveillance Submittals.

The Government requires the Contractor’s Designer of Record (DOR) to approve most of the construction submittals; however, the RFP identifies certain construction submittals for Government surveillance. Government surveillance does not prevent the contractor from proceeding with construction but allows the Government a chance to confirm the submittal approvals of the DOR. Surveillance of construction submittals are built into the following:

RFP Part Two, UFGS 01 33 00.05.20, *Submittals Reserved for Government Surveillance* – Construction Submittals Reserved for Government surveillance.

11-7.2.2 Critical Path Submittals.

Contractor submittals in Design-Build may be designated as Critical Path Submittals of the RFP. In this situation, the submittal may only contain the design of one or a few disciplines, for example, civil and structural. Follow the submittal requirements as applicable for the disciplines pertaining to that critical path submittal. Ensure that work is

included and coordinated with the other disciplines that are affected by that critical path work; for example, electrical and mechanical site work is included and shown on the civil site work critical path submittal, and provisions are made for the utility service entrances through foundation and for major pieces of equipment for the foundation work critical path submittal.

CHAPTER 12 ELECTRONIC DESIGN DELIVERABLES (EDD) FORMAT

12-1 SUMMARY.

This Chapter sets the policy for compliance with DoD policy for paperless acquisition systems. The DoD requires implementation of electronic solicitation for all ANG components for all construction projects. These Electronic Design Deliverables (EDD) requirements provide ANG specific format guidance. Regardless of acquisition method, all projects must follow these EDD requirements. DB RFP submittals follow the requirements for the phase of design in the following paragraphs.

12-2 ELECTRONIC DESIGN DELIVERABLES (EDD).

The following electronic deliverables are required for all projects:

- Contract Drawing source files
- Contract Drawings
- Input and output source files for structural calculations
- Specifications or RFP
- RFP source files
- Specification source files
- Calculations
- Cost Estimate
- All Reports, Surveys and Studies
- Basis of Design
- Record Drawings source files
- Record Drawings
- Shop Drawings/transmittals
- Architectural Color Boards (photos) (where applicable)
- Submittal Register
- Other (such as Photos or Project background/support files)
- High Performance and Sustainable Building Checklist (where applicable)
- Third Party Certification Checklist (where applicable)

12-3 EDD FORMAT REQUIREMENTS.

12-3.1 Specifications.

Develop Project Specifications in accordance with the requirements of this document and UFC 1-300-02, using SpecsIntact software. Organization of PDF for Specifications

is described in [Chapter 9](#). Organization of PDF for RFP is described in [Chapter 11](#).

12-3.1.1 Specification Source Files.

From the SpecsIntact Job File, provide the following source files: “Pulldata” and “Submittal Register.” “Printdata” does not have to be provided.

12-3.1.2 DB RFP Part 2 Source Files.

Develop RFP and Part 2 specifications in accordance with [Chapter 11](#) of this document.

All original source data must be provided as follows:

- The native authoring application file format.
- A PDF format print of the original authoring data. No scans, copied images or third party reproductions of paper prints will be accepted.

12-3.2 Drawings.

12-3.2.1 Drawing Definitions.

12-3.2.2 Drawing Source Files.

Produce all source drawings using vector based Computer Aided Design (CAD) software and ESRI ArcGIS. Provide all source drawing files in native DWG format meeting the following requirements.

12-3.2.2.1 Contract Drawing Source Files.

The native DWG CAD and ESRI ArcGIS files (such as plans, elevations, sections, details) created by the DOR for the project. The Contract Drawing Source Files are not the legal record of the project Design.

12-3.2.2.2 Contract Drawings.

The DWG and PDF files created from the Contract Drawing Source Files that represent the scope of the projects. The Contract Drawings are the legal record of project Design which are awarded to the construction contractor (KTR) which includes amendments.

12-3.2.2.3 As-Built Drawings.

The Contract Drawings marked up by the KTR (as required by the project specifications) to represent approved changes to the Contract Drawings.

12-3.2.2.4 Record Drawing Source Files.

The Contract Drawing Source Files edited by the KTR or DOR (depending on contract requirements) to reflect the changes shown on the approved As-Built Drawings. Prepare

Record Drawing Source Files as described in this Chapter, Record Drawing Preparation. Record Drawing Source Files are not a legal record of the Project.

12-3.2.2.5 Record Drawings.

The PDF files created from the Record Drawing Source Files that represent the final installed condition of the project. Prepare the project Record Drawings as described in this Chapter, Record Drawing Preparation. The Record Drawings are the legal record of the completed project.

12-3.2.3 Arc1354 Standards.

The ANG utilizes the following software application and standardized templates to create, edit, and manage GIS data. All GIS deliverables created for the ANG shall be delivered in a format consistent with the standards listed below:

Functional Area	Software Application
Enterprise GIS	ESRI ArcGIS (current USAF and ANG approved version*)
ANG Data Standard	Version
SDSFIE	SDSFIE 4.0.3*
Metadata	FGDC Content Standard for Geospatial Metadata (CSDGM) Version 2

*contact the ANG GIO for current version at geohelp@ang.af.mil

12-3.2.3.1 Geospatial Data Format.

Geographic data must be provided in a format that does not require post-production work before being loaded to the ANG Enterprise System. The A-E shall validate any deviation from this technical letter in writing with the ANG/A4I Division Chief (reference [Chapter 1-5](#)). GIS data and related datasets shall be developed and delivered in an ESRI personal geodatabase or an ESRI file geodatabase format.

12-3.2.3.2 Geospatial Data Standards.

The A-E shall develop all geographic information utilizing Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE).

The A-E shall refer to the Statement of Work (SOW) for any required attribution related to OSD, USAF, ANG and Federal requirements. For additional reference, a copy of the SDSFIE guidelines may be obtained by visiting the SDSFIE website at <http://www.sdsfieonline.org>.

The A-E shall submit a written request for approval of any deviations from the Government’s established GIS standard. No deviations from the Government’s

established GIS standard will be accepted unless prior written approval of such deviation has been received from the ANG/A4I Division Chief (reference Chapter 1-5).

12-3.2.3.3 Map Documents.

All Geospatial data delivered shall have an associated ESRI ArcMap document (.mxd). The ESRI ArcMap document shall be saved with reference to the date delivered. All reference data shall be stored as a relative path.

12-3.2.3.4 Geospatial Data Projection.

All geospatial data shall be developed in the applicable zone of the Universal Transverse Mercator (UTM) Coordinate System, using the World Geodetic System of 1984 (WGS 84) as the earth datum, and units of meters. The projections requirement applies to all GIS data layer deliverables.

12-3.2.3.5 Accuracy Standards.

Map or drawing scales shall be determined by the Government and in accordance with those specifications outlined in a publication by the Federal Geographic Data Committee (FGDC) entitled “Geospatial Accuracy Standards Part 4: Standards for Architecture, Engineering, Construction (A/E/C) and Facility Management”. Documentation on these standards may be obtained at <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part4/FGDCendorsed-standard>.

Mapping accuracy for the agreed scales shall conform to the FGDC’s “Geospatial Positioning Accuracy Standards Part 3: National Standard for Spatial Data Accuracy”. Copies of the FGDC Accuracy Standards may be obtained online at <http://www.fgdc.gov/standards/projects/FGDCstandards-projects/accuracy/part3/chapter3>.

12-3.2.3.6 Metadata.

For each digital file delivered containing geographic information, the A-E shall provide documentation consistent with the FGDC Content Standards for Digital Geospatial Metadata (CSDGM). Both ‘Mandatory’ and ‘Mandatory as Applicable’ fields shall be completed for each geographic dataset. The documentation shall include, but not be limited to, the following:

CSDGM Element Number	CSDGM Element Name
Section 1-	
1.1 Citation	
1.1	Data Set Originator
1.1	Data Set Publication Date
1.1	Data Set Title

1.2 Description	
1.2.1	Description, Abstract
1.2.2	Description, Purpose
1.3 Time Period of Content	
1.3	Time Period of Content
1.3.1	Time Period of Content, Currentness Reference
1.4 Status	
1.4.1	Status, Progress
1.4.2	Maintenance and Update Frequency

CSDGM Element Number	CSDGM Element Name
1.7 Access Constraints	
1.7	Access Constraints
1.8 Use Constraints	
1.8	Use Constraints
1.9 Point of Contact	
1.9	Contact Organization
1.9	Contact Person
1.9	Contact Position
1.9	Contact Address
1.9	Address Type
1.9	Address
1.9	City
1.9	State or Province
1.9	Postal Code
1.9	Country
1.9	Contact Voice Telephone
1.9	Contact Electronic Mail Address
1.9	Hours of Service
1.12 Security Information	
1.12.2	Security Classification
Section 2- Attribute Accuracy	
2.3 Completeness	
2.3	Completeness Report
2.4 Positional Accuracy	
2.4.1.1	Horizontal Positional Accuracy Report
2.5 Lineage	
2.5.1.1	Source Originator
2.5.1.1	Source Publication Date
2.5.1.1	Source Title
2.5.1.1	Geospatial Data Presentation Format

2.5.2.1	Process Description
Section 5- Entity and Attribute	
5.2 Overview Description	
5.2.1	Entity and Attribute Overview
Section 6- Distribution Information	
6.2 Resource Description	
6.2	Resource Description
6.4 Standard Order Process	
6.4.2.1.1	Format Name
6.4.2.1.7	Transfer Size
Section 7- Metadata Reference	
7.1-7.4 Metadata Date	
7.1	Metadata Date
7.4	Contact Organization
7.4	Contact Person
7.4	Contact Position
CSDGM Element Number	CSDGM Element Name
7.4	Contact Address
7.4	Address Type
7.4	Address
7.4	City
7.4	State or Province
7.4	Country
7.4	Contact Voice Telephone
7.4	Contact Electronic Mail Address
7.4	Hours of Service

Metadata generation tools included in the ArcGIS suite of software shall be used in the production of the required metadata in XML format. The A-E shall ensure that the metadata is delivered in SML format and can be easily imported into the AGN geospatial enterprise system. Copies of the FGDC metadata standard can be obtained online at <http://www.fgdc.gov>

The metadata should be formatted from the installation perspective, not the A-E perspective. For example, Point of Contact should be the installation POC currently associated with the data and NOT the A-E's Project Manager.

12-3.2.4 CAD Standards.

Comply with the DoD A/E/C CAD Standard latest version except as noted below. The A/E/C CAD standard is available at <https://cadbimcenter.erd.dren.mil/aeccadstandard> or <https://www.wbdg.org/ffc/armycoe/cad-bim-technology-center> . In cases where the DoD A/E/C CAD Standard version changes after a project has commenced, the NGB/A4I Project Manager must be consulted prior to adoption and integration of the

newer standard into the drawing source files.

In cases where the DoD A/E/C CAD Standard does not provide guidance for (or reference to) a specific CAD Standard element, refer to the referenced National CAD Standards (NCS) document identified in the DoD A/E/C CAD Standard for guidance. In all cases, the project NGB/A4I Project Manager must be consulted.

12-3.2.4.1 Text Font and Size.

Use standard text heights for a plotted full-size drawing of 1/8 inch (3 mm) for typical text, 1/4 inch (6 mm) for titles, and 1 inch (25mm) maximum for project titles on cover sheets. For existing features on plotted full-size civil drawings, a minimum text height of 0.1 inch (2.5 mm) and an oblique angle of 12 degrees are allowed. Use a width factor of 0.8 for all fonts that are not a part of the border sheet.

- Use the ROMANS.SHX font file for all 1/8 inch (3 mm) or smaller text.
- Use SWISS.TTF (Swis721 BT) font file for all 1/4 inch (6 mm) or larger text.

In cases where a CAD program (see the paragraph in this chapter entitled, “CAD Standards”) does not support the specified font styles/format, use ARIAL text font. Notify the NGB/A4I Project Manager prior to commencement of drawing development with the following information:

- Name, Version, File format and Vendor of CAD application being used
- Name of font(s) being substituted and name of substitute font(s)
- Copy of substitution font(s).

NGB/A4I Project Manager confirmation of substitution is required to ensure font styles are acceptable.

12-3.2.4.2 File Naming Conventions.

Use File Naming Convention for all CAD Files as specified in the DoD AEC CAD Standard.

12-3.3 Drawing Support Files.

Support files necessary for initializing, editing and plotting drawing files must be a standard DWG or Microsoft Windows ® component (or they must be an integral and standard component within the drawing file that require no third party custom utility or program to use). Support files include, but are not limited to, line types, hatch patterns, font styles, layer filters, display configurations and object styles. DWG files containing objects, styles, or definitions that require any external files (such as SHX, LIN or LAY) to initialize, operate and display properly will be rejected.

12-3.4 Cost Estimates.

Submit the contract cost estimate electronically in PDF and MII (MCACES Second

Generation) native format with each submittal. Submit these files as separate, stand-alone files.

12-3.5 Preliminary Design Documents.

Preliminary design includes all phases of Design except for the Final Design phase. All source drawings and their associated PDFs must maintain a “PRELIMINARY Not For Construction” stamp across the signature areas of the title block, until the actual final design submittal. Except for the final submittal, indicate the submittal phase designation, such as “Prefinal”, after the project title in the header and on the coversheet of the specifications or the RFP. Combine all drawings into a single PDF file to facilitate ease of use, unless file size requires a multi-file submission.

12-3.6 Final Design Documents.

12-3.6.1 General

Convert source drawings to PDF format directly from their authoring software. Any drawing (DWG) files larger than 8 GB must be broken into smaller files. Drawing PDF file sizes must be a maximum of 8 GB with digital signatures. The file size limit for specifications or RFPs is 8 GB.

12-3.6.2 Format of Final Design Drawings.

Combine all drawings into a single PDF file to facilitate ease of use, unless file size requires a multi-file submission. Bookmark PDF files and create visual “thumbnails.” Create a bookmark for the beginning of each drawing discipline. Create a sub-bookmark for individual drawing sheets. Bookmark wording must be as descriptive as practical (such as S-101 Foundation Plan). When complete, the files must open to the “bookmarks” view as the default view with the drawing sheets visible in “fit to page” magnification. Before submission, the professional must electronically sign and seal all sheets and appropriate locations. The seal should include the expiration date of the design professional’s current license.

12-3.6.2.1 Multi-File Drawings.

If the PDF drawing set must be broken into several PDF sets due to the file size restrictions given in the paragraph in this chapter entitled, “General”, every attempt should be made to package complete discipline sets (do not break-up discipline specific sheets).

12-3.6.3 Format of Final Design Specifications.

Convert all specifications to PDF format directly from their authoring software. Combine specification sections into a single PDF file to facilitate ease of use. Insert PDF of attachments, such as Submittal Register and Environmental Forms, following the respective UFGS section and Bookmark.

12-3.6.3.1 Preparation of PDF for Final Design Specification.

- 1) Merge PDF files for each section into one PDF file.
- 2) Combine the PDF files of the Coversheet, Table of Contents, and other project specific files including the Submittal Register. Insert blank pages where needed so that sections, graphics, and reports begin on an odd number page. Blank pages must include the following statement: "This Page Intentionally Left Blank." Create "thumbnail" images of each page.
- 3) Bookmark the Coversheet, Table of Contents, each Division, Section, and inserted graphics, including the submittal register. Each Division bookmark must read "DIVISION XX - DIVISION TITLE", each Section bookmark must read "XX XX.XX XX - SECTION TITLE", and is a subbookmark of its corresponding division. SpecsIntact allows printing of the PDF in this format automatically; however, the coversheet and graphics must be inserted at the appropriate location.
- 4) Set the Document Properties of the PDF such that it opens to the first page and to the "bookmarks" view as the default view with the specification or RFP pages visible in "fit page" magnification.
- 5) Before submission, the principle design professional must electronically sign and seal the documents. Include the expiration date of the design professional's current license.

12-3.6.4 Format of PDF for Final DB RFP.

Provide PDF of RFP. Add a bookmark for each Part. If the RFP contains drawings, provide a separate PDF for the RFP and the drawings. Typically, reference drawings are provided in Part 6. This should be a separate file because of the sheet size (11 x 17 inches (279 mm x 432 mm) or 22 x 34 inches (558.6 mm x 863.6 mm)), and will facilitate printing of this file separately by the Contractor.

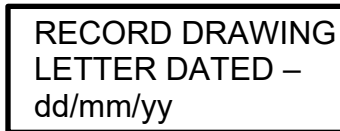
12-3.7 Record Documents.

12-3.7.1 Record Drawing Preparation.

Make all drawing changes in native Drawing (*.DWG) format incorporating modifications and as-built conditions. Use the CAD standards used for the Contract Drawings Source Files for as-built modifications and the following guidelines:

- Make revisions on the original layer of the object being changed. Draw a "cloud" around the changed portion and place it on a layer. Place revision symbols and notes, including those placed in each drawing's revision block, on this same layer.

- Place a “Record Drawing Stamp” on each drawing sheet, as illustrated below, for maximum visibility without conflicting with other pertinent data. Place the stamp on layer identified above.



Provide the following information on the revision block of Record Drawings:

- Sheets with No Changes ◊ “As-Built”
 - Sheets with revisions to match final field conditions “As-Built Conditions Shown”
 - Cover Sheet ◊ “RECORD DRAWINGS INCLUDE AS-BUILT CONDITIONS AND MAY NOT MATCH THE ORIGINAL CONTRACT DRAWING SHEETS.”
- Type in the signatures, initials, and dates in the title block area on the contract drawings, as text on the record drawings. The record drawings are not signed again by the DOR. The record drawings do not have to be sealed, and the seal from the DOR is not transferred.
- Provide extra sheets as required to accommodate sketches, amendments, and field changes. Typically, use the previous sheet designation followed by “A,” “B,” and so on for inserted sheets. Update the sheet index to reflect the final record drawing titles and sheet numbers.
- Upon completion of the drawing modifications, save all drawing files named as specified in this chapter.
- Produce a PDF file of each individual record drawing using a PDF page size that corresponds to the original document sheet size. Provide a PDF print resolution that results in clear detail of all drawing features. Electronic signatures are not required.
- For Design-Build Contractor provided drawings, the RFP reference or definitive drawings are not required for inclusion in the Record set of drawings.

12-3.7.2 Source Documents.

In addition to the drawings, provide the specifications, design analysis, reports, surveys, calculations, and any other contract documents utilized in creating the design package (drawings, specifications, and cost estimate) as specified in this chapter, in paragraph, “Minimum Record Drawing Submittal Requirements”. Provide the cost estimate and cost estimate backup (such as, quantity take-off or material or equipment quotes) on separate media.

12-4 EDD MEDIA AND ORGANIZATION.

12-4.1 General.

Provide official submittals as directed. Submit all CAD files in native Drawing (*.DWG) format in the NGB supported version. Drawing files must be uncompressed and unzipped. Purge files of all unused items (blocks, layers, line types, and nested items). Do not bind cross referenced parent and child drawings. If the submitted native DWG files are not the native file format for the authoring software, provide all native design data in the original authored format in addition to the native DWG compliant format.

12-4.2 Minimum Final Submittal Requirements.

Provide the following as a minimum at final design submittal.

Final Design or RFP for Government Signature

Drawing PDF file(s) electronically signed by the Professional(s) in Responsible Charge

Drawing DWF

RFP or Specification PDF file electronically signed by the Professional in responsible charge in the "Submitted By:" Section

Source Files

All Native CAD and ArcGIS Files for all disciplines; include all X-refs, image, or other external reference files.

Specifications folder - All Specification source files

PullData folder (-.sec files)

RFP folder - **All** source files of RFP package, further divided by subfolders into Parts, except for specification section files, CAD files, or ArcGIS files.

Calculations folder (pdf and input/source files)

Support folder

Reports-Surveys- Studies folder

Basis of Design folder

Other folder (such as Photos, Project background/support files)

Cost Data

12-4.3 Minimum Record Drawing Submittal Requirements.

Record Drawings

ArcGIS

CAD - All record CAD files and X-refs for all disciplines must be stored in the same folder (directory).

PDF

Specs

Calcs

Cost

Basis of Design

Other

CHAPTER 13 PHASE: PRELIMINARY DESIGN (TYPE A-1, 15%, CONCEPT PROPOSAL)

SUBMITTALS

13-1 GENERAL REQUIREMENTS.

The Type A-1 Concept Proposal Submittal is intended to convey the extent of work in a preliminary conceptual manner. Deliverables are 15% complete at this stage. In addition to the requirements of the Core UFCs and the contract, include the deliverables described herein, as a minimum.

13-2 DESIGN-BUILD CONCEPT PROPOSAL SUBMITTAL.

For Design-Build, if defined by the RFP, the Concept Proposal may be the Contractor's technical response to the RFP, including the layout, functional drawings, and design. When this is used, any exceptions to the UFC requirements must be outlined in the RFP solicitation.

13-3 BASIS OF DESIGN.

The A-E, working with the Design Working Group (DWG), shall prepare the BOD, Part I-Design Intent, as described in the contract, the Core UFCs, [Attachment 1](#), [Chapter 6](#), and as follows.

The discipline-specific BOD needs to provide sufficient definition to support the development of a Class 4 cost estimate for that discipline.

The BOD shall be completed and approved by the BCE before the A-E proceeds to developing the Concept Proposal.

13-3.1 Geotechnical.

Include the Geotechnical Report, if available, as an Appendix in Tab F. It is encouraged to have this report at this submittal to obtain any review comments at the earliest possible date.

13-3.2 Sustainability.

Provide completed HPSB Checklist(s) and TPC Checklist(s) (where applicable). Provide copy(ies) of the TPC registration information (where applicable), and a comprehensive Sustainability Chapter.

For TPC, the following Technical Guide relates to UFC 1-200-02 (01 December 2020, Change 02, 01 June 2022):

Version 1 New Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (01 December 2020 – Change O1, 03 Jan 2022).

This Technical Guide can be found on GBCI's website as the second bullet point under "Technical Guides" here: <https://guidingprinciples.gbci.org/resources>

Change 2 revisions (outlined on page 2 of UFC 1-200-02) should be incorporated into the documentation as required for the project, while utilizing the guidance included in the Technical Guide.

Identify the responsible party that will provide the required documentation for each Requirement for review. This can be detailed within the "Team Management" tab of the Project Information Form.

13-3.3 Cybersecurity.

Provide a single submittal indicating criteria and describing requirements for integrating cybersecurity into the design and construction of the facility-related control systems. The Basis of Design must describe specific guidance for control systems with the assigned Confidentiality, Integrity and Availability (C-I-A) impact ratings, and must list the security controls with recommendations and justifications for future tailoring of the security control set.

13-4 Type A-1 CONCEPT PROPOSAL MEETING and DEVELOPMENT.

Based on the approved Basis of Design (BOD), Part I-Design Intent, and other project information, the A-E shall develop several project concept proposals as required below.

- Provide a minimum of three single line site sketches (as the site allows – 1 primary and 2 alternates, may be free hand) to scale. Site sketches will be based on the A-E's site analysis and shall indicate, as a minimum, contours, prevailing winds, pedestrian and vehicular circulation and compliance with the Architectural Barriers Act (ABA), facility layout and orientation, relationship to adjacent facilities, Environmental Restoration Program (ERP) sites, airfield clearances, Explosive Quantity Distances, and all other setback or clearance requirements affecting the facility. One site sketch shall accompany each of the floor plan sketches referenced below. If locally available, the site sketch shall be shown over the existing topographic map.

The NGB/A4I PM has the authority to determine if a project does not require three site sketches and waive the requirement (through the Contracting Officer (KO)) via the Design Instruction (DI).

- Provide a minimum of three single line floor plan sketches (as the program allows – 1 primary and 2 alternates, may be freehand) drawn to scale reflecting the spatial relationships, as required. On each sketch, indicate the following: each floor space name; each Primary Function Area (PFA) as defined in the Architectural Barriers Act (ABA); the net area provided in each

floor space; approximate dimensions of each floor space; and the gross building area (not to exceed the project scope).

The NGB/A4I PM has the authority to determine if a project does not require three single floor plan sketches and can waive the requirement (through the Contracting Officer (KO)) via the Design Instruction (DI).

During the Concept Proposal Meeting, the A-E shall meet with the Design Working Group (DWG) to select a single scheme to investigate further, and perform the following.

13-4.1 DRAWINGS.

Provide drawings required by the contract, the Core UFCs, and herein as applicable to the project:

13-4.1.1 Architectural

- Floor Plans – Provide floor plans depicting functional utilization of spaces. Identify room names and basic dimensions. Incorporate collateral equipment and Furniture, Fixtures and Equipment (FF&E) into the design development and indicate on the building floor plan(s).

(**NOTE:** Planned funding for FF&E is from a different source than the Base contract. Therefore, the Contracting Officer will provide a separate Contract Line Item (CLIN) for the Construction Contractor to coordinate the purchasing and installation of all the FF&E in accordance with the design documents).

For renovation projects, provide separate drawings to identify existing conditions, demolition, and new construction elements.

Provide mechanical and plumbing floor plans to include utilities coming into the building and major pieces of equipment with clearances.

- Building Elevations – Provide all building elevations. Depict the building character and indicate the exterior materials.
- Building Section – Indicate heights of critical building elements.

13-4.1.2 Civil

- Concept Site Plan - Indicate above and below ground grade utility lines, vehicular and pedestrian circulation paths, buildings, parking, paved areas, and existing site features to remain.

13-4.1.3 Landscape Architecture.

- Site Inventory and Analysis Plan.
- Concept Landscape Site Plan – Indicate buildings, existing site features to remain, utility lines and improvements, vehicular and pedestrian circulation, hardscape, plazas and patios, walls, structures and other above ground

features, streetscapes, planting concept, Low Impact Development (LID) and other bio-retention areas.

- Provide types and purpose of plant materials used on the plan (for example, tall broadleaf evergreen shade tree or medium-sized flowering accent tree).
- Provide type of irrigation, water source, and how it is controlled.
- Provide additional information unique to the project.

13-4.1.4 Electrical.

Provide the following in accordance with UFC 3-501-01, Electrical Engineering. The drawings must be complete enough to thoroughly express the Designer's intentions:

- Existing Site and Demolition Plan.
- New Site Plan.
- Single Line Diagram.
- Preliminary floor plans with dedicated space clearly identified for electrical and telecommunications rooms.

13-4.1.5 Fire Protection.

Provide the following. The drawings must be complete enough to thoroughly express the Designer's intentions:

- Code Compliance Summary Sheets.
- Life Safety Floor Plan. At a minimum, identify building areas having different occupancy and hazard classifications and identify egress travel requirements.
- Fire Suppression Plans. At a minimum, provide floor plans identifying hazard classifications. Where a facility has multiple hazard classifications, differentiate each classification area by border or hatching. Identify areas to be protected with special fire protection systems.

13-4.1.6 Geotechnical.

Boring log drawings are encouraged, but not required.

13-4.1.7 Antiterrorism

- AT standoff distances

13-5 CALCULATIONS.

Provide calculations complete and in sufficient detail to support the items outlined in the preliminary Basis of Design, as indicated on the drawings, in accordance with the Core UFCs, [Chapter 7](#), and as follows:

13-6 SUSTAINABILITY.

13-6.1 ANG Sustainability Requirements Score Sheet High Performance Sustainable Building Compliance.

Provide completed ANG Sustainability Requirements Score Sheet HPSB Compliance.

13-6.2 Third Party Certification (TPC).

13-6.2.1 TPC Registration.

When TPC is required in accordance with UFC 1-200-02, High Performance and Sustainable Building Requirements, register each applicable building in the project with TPC organization within 30 days of the design kick-off meeting. Provide copy(ies) of TPC registration information (where applicable).

13-6.2.1.1 Format.

Use the following format to register TPC:

- Project Title First Line: National Guard Bureau, Building Name (if applicable)
- Project Title Second Line: PN: (#); (DD Form 1391 Project Name)
- Project Address First Line: UIC (Installation Code)
- Category Code: RPUID (Real Property Unique Identifier) Number
- Project Owner Organization: Air National Guard
- Primary Contact, Owner: NGB/A4I Project Manager
- Additional Contact, Bldg. Owner: BCE

13-6.2.1.2 Management and Documentation.

Provide TPC management and documentation all online (or offline, with secure facilities) throughout the design of the project. Maintain TPC Checklist and obtain TPC Design Review.

13-6.2.2 TPC Checklist(s)

Provide TPC Checklist(s) (where applicable).

13-7 CONSTRUCTION COST ESTIMATE.

Provide a construction cost estimate in .pdf format following Chapter 2-3 and Chapter 10 of this document. Show details and subtotals for each major element and a grand total for the project. Provide a listing of the Additive Bid Items (ABIs) or Options and

Furniture, Fixtures and Equipment (FF&E), where applicable. The cost estimate will detail the Base plus ABIs or Options and FF&E. The Maximum Construction Cost (MCC) will be stipulated in the Design Instruction (DI). The Base cost will total a maximum of 90% of the MCC. ABIs or Options will total a minimum of 10% of the total MCC. The Base cost plus the ABIs or Options shall not exceed the MCC.

13-8 CONCEPT PROPOSAL (Type A-1, 15%) CERTIFICATION FORM.

A-E prepares Type A-1 (15%, Concept Proposal) Certification (see [Attachment 4](#) or [Attachment 5](#)) for BCE review and completion. ([See Chapter 4, Steps 5 thru 7](#)). This form provides the NGB/A4I PM with confirmation that the submittal meets all budget and scope requirements without further reprogramming.

13-9 CONCEPT PROPOSAL (Type A-1, 15%) CONCEPT DEVELOPMENT MEETING CHECKLIST.

A-E prepares Type A-1 (15%, Concept Proposal) Checklist (see [Attachment 6](#)) for BCE review. This checklist is completed by the A-E and included with the submittal. The BCE reviews the submittal against the completed checklist to ensure completeness of the submittal. ([See Chapter 4, Steps 5 thru 7](#)).

CHAPTER 14 PHASE: SCHEMATIC DESIGN (TYPE A-2, 35%) SUBMITTALS

14-1 GENERAL REQUIREMENTS.

The Concept Development Submittal is intended to convey the extent of work in a preliminary conceptual manner. Deliverables are 35% complete at this stage. In addition to the requirements of the Core UFCs and the contract, include the deliverables described herein, as a minimum.

14-2 CONCEPT DEVELOPMENT (Type A-2, 35%) MEETING.

A-E shall provide the Notice of the Meeting to the BCE. The BCE shall forward the Notice to the NGB/A4I PM.

The A-E shall meet with the DWG to present further investigative development of the selected concept.

14-3 BASIS OF DESIGN.

The discipline-specific BOD needs to provide sufficient definition to support the development of a Class 3 cost estimate for that discipline. Update and submit a complete Basis of Design addressing items defined in the contract, the Core UFCs, [Attachment 1](#), [Chapter 6](#), and as follows.

14-3.1 Sustainability.

Provide updated HPSB Checklist(s) and TPC Checklist(s) (where applicable) for each applicable building in the project. Provide an updated Sustainability Chapter.

For TPC, the following Technical Guide relates to UFC 1-200-02 (01 December 2020, Change 02, 01 June 2022):

Version 1 New Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (01 December 2020 – Change O1, 03 Jan 2022).

This Technical Guide can be found on GBCI's website as the second bullet point under "Technical Guides" here: <https://guidingprinciples.gbci.org/resources>

Change 2 revisions (outlined on page 2 of UFC 1-200-02) should be incorporated into the documentation as required for the project, while utilizing the guidance included in the Technical Guide.

Identify the responsible party that will provide the required documentation for each Requirement for review. This can be detailed within the "Team Management" tab of the Project Information Form.

In accordance with 2-2.2 Commissioning, *Step 2. Step 3. Step 2, the*

Commissioning Provider (CxP) reviews the OPR (Owner's Project Requirements) and BOD (Basis of Design). NOTE: GBCI requires a third party (not the A-E) review the 35% concept design. The CxP develops the commission plan.

14-4 DRAWINGS.

Provide updated drawings from the previous submittal and additional drawings required by the contract, the Core UFCs, and herein as applicable to the project. All Plan views, including enlargements, and excluding Site Plans, must include all vertical and horizontal column lines within the range of view.

14-4.1 Architectural.

- Legend and Abbreviations
- Floor Plans – Provide all floor plans, new and demolition, indicating room names and dimensions
- Building Elevations – Provide all building elevations indicating all exterior materials
- Roof Plan – Provide a plan of all roof areas, indicating direction of slope and method of drainage
- Building Section- Include heights
- Typical Wall Sections – Provide sufficient wall section(s) to indicate all materials and different conditions
- Finish Schedule – Indicate all proposed finishes

14-4.2 Interior Design.

Provide Structural Interior Design (SID) to include the following:

- FF&E Plan indicating built-in and moveable items
- FF&E Summary List corresponding to the FFE& Plan with estimated item costs

14-4.3 Landscape Architecture.

- Overall Landscape Site Plan. Provide an overall landscape site plan with matchlines (if site plan is divided into multiple sheets), and specific sheet references, general notes, and options (if applicable).
- Landscape Site Plan. Provide enlargement plans as required to delineate appropriate detail.
- Landscape Construction Details.
- Landscape Planting Plan.
- Plant Material Schedule and Details.

- Landscape Irrigation Plan. When a Landscape Irrigation Plan is required by the Statement of Work, provide a sprinkler head layout, remote control valves, automatic controller, pressure pipe and lateral lines, backflow prevention device, and point of connection.
- Landscape Irrigation Equipment Schedule and Details. When a site irrigation plan is required by the Statement of Work, provide an irrigation equipment schedule.

Drawings indicated above can be combined.

14-4.4 Geotechnical.

- Results of subsurface investigation – such as boring logs, test pit logs.

14-4.5 Civil.

- Cover sheet, Drawing Index, Vicinity Map, Location Plan, Abbreviations, Legend and Notes.
- Existing Conditions / Demolition Plan.
- Site Plan.
- Water and Sanitary Sewer Plan.
- Grading and Drainage Plan.

Drawings indicated above can be combined.

14-4.6 Structural.

- Foundation Plans. Include for all structures, showing dimensions, arrangements, elevations, locations referred to a column line grid system, type of foundation and foundation obstructions. Include the layout of all parts, including but not limited to, slabs, footings, piers, grade beams, and piles, showing all foundation features of the design.
- Framing Plans. Include a framing plan for each structural level of the facility, showing dimensions, elevations, and column locations and numbering referenced to a column line grid system, and overall sizes of major members and components. Show the layout of system, including, but not limited to, beams, joists, and stringers.
- Structural Details. Show typical details of construction, indicating the connection and relationship between major components of the structural system.
- Structural Elevations. Show general sizes, location and arrangement of all significant features of the vertical framing system, such as columns, walls, and beams.
- Structural General Notes.

14-4.7 Mechanical.

- Plumbing Floor Plan. Show plumbing fixtures, floor drains and equipment locations.
- Site Plan. Show connections, such as to base steam distribution, location of propane and oil tanks, and layout of ground coupled heat pump well fields.
- HVAC Floor Plan. Show equipment locations, one or two-line duct layout and preliminary piping runs.
- Mechanical Room Plan. Show major equipment and maintenance access space. Provide section view(s) to clarify layout and supports.

14-4.8 Electrical.

- Existing Site and Demolition Plan.
- Site Plan.
- Single Line Diagram.
- Preliminary floor plans with dedicated space clearly identified for electrical and telecommunications rooms.
- Legend and Abbreviations.
- Lighting Plan(s).
- Power Plan(s).
- Lightning Protection Plan.
- Cathodic Protection Plan.
- Communications Plans.
- Special Systems Plans.
- Additional Plans/Risers.

14-4.9 Fire Protection.

- Code Compliance Summary Sheets (Updated from Preliminary Design, Type A-1, 15%, Concept Proposal Submittal).
- Life Safety plan (Updated from Preliminary Design, Type A-1, 15%, Concept Proposal Submittal) Identify locations of fire rated partitions and any horizontal exits).
- Fire Suppression plans. (Updated from Preliminary Design, Type A-1, 15%, Concept Proposal Submittal). Identify locations of fire rated partitions and any horizontal exits).
- Fire Alarm and Mass Notification System Plans. (Updated from Preliminary Design, Type A-1, 15%, Concept Proposal Submittal. Refer to Chapter 8-9.4)
- Detail Sheets. (Updated from Preliminary Design, Type A-1, 15%, Concept Proposal Submittal. Refer to Chapter 8-9.3.)

14-5 OUTLINE SPECIFICATIONS.

Provide outline specifications, in the form of a list of specification sections the DOR intends to use in the job. Use Unified Facilities Guide Specifications, as required in [Chapter 9](#). Provide a listing of the UFGS used in the job by Section Number, Title, and Section Date. Follow the Order of Precedence for choosing UFGS master guide specifications in [Chapter 9](#), unless required otherwise by the contract.

14-6 CALCULATIONS.

Provide calculations complete, and in sufficient detail to substantiate the design level in this preliminary Basis of Design, as indicated on the drawings, in accordance with the Core UFCs, [Chapter 7](#), and herein, and any update from the previous design phase.

14-6.1 Structural and Geotechnical.

Provide Structural and Geotechnical calculations in sufficient detail to support the items outlined in the Basis of Design and indicated on the drawings.

14-6.2 Civil.

Provide calculations in sufficient detail to indicate compliance with LID criteria and state or local stormwater regulations. Provide calculations for utility systems and pavements in sufficient detail to support items outlined in the Basis of Design and indicated in the drawings and specifications.

14-6.3 Architectural.

Provide acoustical calculations in accordance with UFC 3-101-01, Architecture.

14-6.4 Mechanical.

Provide a bookmarked Adobe PDF of all input and output data, and summary sheets for Energy Analysis, Life Cycle Cost Analysis, Building Heating and Cooling Loads, and ASHRAE 90.1 Compliance Calculations as required by UFC 3-410-01, Heating, Ventilating, and Air Conditioning Systems.

14-6.4.1 Energy Analysis.

Provide an Adobe PDF copy of the computerized energy analysis that includes input and output data in their entirety.

14-6.4.2 Life Cycle Cost Analysis.

Submit the computerized LCC analysis utilizing the latest edition of the National Institute of Standards and Technology (NIST) NIST Building Life-Cycle Cost Program.

14-6.4.3 Building Heating and Cooling Load.

Provide an Adobe PDF copy of the computerized load calculations with input and output data in their entirety.

14-6.4.4 ASHRAE 90.1 Compliance Calculations.

Submit calculations and compliance forms indicated in the Basis of Design.

14-6.4.5 Plumbing Calculations.

Provide Design Basis as required by UFC 3-420-01, Plumbing Systems.

14-6.5 Electrical.

Provided calculations required by Core UFCs and also include:

- Load Analysis.
- Service size.
- Feeder size.
- Larger special circuit sizes.
- Lightning Risk Assessment.

14-6.6 Fire Protection.

Submit all calculations supporting all fire suppression and fire alarm/detection systems for the project. Verify fire flow capacities of water supply in the vicinity of the project per UFC requirements. Note: Per ANGETL 15-01-03, paragraph 7.3 “In no case shall the A-E use any source data (fire department, water purveyor, or BCE) for water supply information other than an actual test witnessed and accepted by the A-E representative.” Calculations for systems, features, or elements other than fire suppression or detection will be required as applicable. Fire suppression system calculations must be prepared using commercially available computer software.

14-7 REPORTS.

Provide the following environmental reports, as required:

14-7.1 Report – Asbestos Containing Materials.

Provide an asbestos report when asbestos field investigation work has occurred or when a prior asbestos report has been used to identify ACM and include the following information: a narrative summary of the work that identifies the project description, location, previous survey data, and additional ACM identified. List the areas, types, locations, and quantities of ACM and any contamination that will affect the project.

Provide sample descriptions, results, locations, location maps, and photographic documentation. Obtain a copy of the Asbestos Survey Data Template located at http://www.wbdg.org/references/pa_dod_ntools.php . Include copies of the EPA asbestos inspector and the laboratory accreditation that performed the work.

14-7.2 Report – Paint.

Provide a paint report and include a narrative summary of the work that identifies the project description, location, previous survey data, additional lead, cadmium or chromium paint identified, sample descriptions, results, locations, location maps, and photographic documentation. Include a description and full characterization of all waste streams (that is, hazardous, to include all waste codes, or nonhazardous). List the areas, types, and locations of paint and any contamination that will affect the project, including soil and dust. Include copies of all accreditation certificates, licenses, certificates, sampling plans, and analyses and test reports identified above.

14-7.3 Report – Beryllium.

Provide a beryllium report and include a narrative summary of the work that identifies project description, location and location of beryllium identified. Provide sample descriptions including test results, locations, location maps, and photographic documentation of each sample taken. List the areas and locations of any beryllium that will affect the project, including airborne particles and dust. Include copies of laboratory accreditation certificate, sampling plans, method of analyses and test reports.

14-7.4 Report – Radon.

Provide a radon report and include a narrative summary of the work that identifies the project description, location, and test results provided by onsite personnel. Provide research on potential radon in the area in the report. Briefly summarize precautions that need to be taken to address radon. Refer to EPA Radon Mitigation Standards (RMS) and radon-resistant new construction techniques.

14-7.5 Report – Polychlorinated Biphenyls.

Provide a PCB report and include a narrative summary of the work that identifies the project description, location, previous survey data, and additional PCB identified. List the areas, types, and location of PCB-containing lighting ballasts and all other PCB-containing equipment and any contamination that will affect the project. Summarize state or local laws that affect PCB removal and disposal and ultimate disposition for the project, such as project size, limitations on removal methods, and monitoring requirements. Include notification requirements, permit fees, licensing, or other specialized requirements.

14-7.6 Report – Low-Level Radioactive Components.

Provide a LLR components report and include a list of the areas surveyed, types of LLR

components, location of LLR components, method of disposal and any additional information that may impact the project. Provide photographic documentation of LLR components.

14-7.7 Report – Animal Droppings.

Provide animal droppings report and include a narrative summary of the work that identifies the project description, location, and conditions found at the site. Provide photographic documentation of contaminated areas. Briefly summarize precautions that need to be taken to protect workers, building occupants, and the environment.

14-7.8 Report – Mold and Spores.

Provide a mold (microbial) assessment survey report and include a narrative summary of the work that identifies the project description, location, previous survey data, and additional mold identified. Determine the quantities, classification, and location of mold and any contamination that will impact the project. Briefly summarize precautions that need to be taken to protect workers, building occupants, and the environment. Provide copies of laboratory testing and classification reports and laboratory certifications.

14-7.9 Report – Tanks.

Provide a tank report and include the following information: contents of tank, size of tank, approximate location of tank, associated pipelines (including construction, size, and linear footage per diameter), existing soil conditions associated with tank, age of tank, and tank construction material. Document the quantity of remaining hazardous or toxic waste products in AST and UST. Coordinate with Base Environmental Manager to determine all requirements associated with removal, disposal, and ultimate disposition of the remaining product in a tank. Provide copies of laboratory certification and state or local accreditation certificates with the report. Include copies of all certificates of analyses or test reports with the report, including but not limited to NELAC certification under EPA program.

14-7.10 Report – Contaminated Soil or Groundwater.

Provide a contaminated soil or groundwater report and include the following information: type of hazardous constituents, approximate location of the contamination on the site, approximate depth of contamination, existing soil and site conditions, approximate quantities of contaminated soil or groundwater, and calculations with assumptions made in determining the estimated quantities. Include copies of all certificates of analyses or test reports with the report, including but not limited to NELAC certification under EPA program.

14-7.11 Report – Waste Characterization.

Provide a waste characterization report and include the following information: sample methodology, descriptions, results, locations, location maps, and photographic

documentation. Specifically itemize anticipated waste materials to be generated during construction and provide the method of disposal and ultimate disposition for hazardous and nonhazardous wastes. Provide copies of laboratory certification and state and local accreditation certificates with the report. Include copies of all certificates of analyses or test reports with the report, including but not limited to NELAC certification under EPA program.

14-7.12 Report – Chlordane.

Provide a chlordane report when chlordane field investigation work has occurred or when a prior chlordane report has been used to identify contaminated soil and include the following information: a narrative summary of the work that identifies the project description, location, previous survey data, and additional contaminated areas identified. List the areas, types, locations, and quantities of contaminated soil that will affect the project. Provide sample descriptions, results, locations, location maps, and photographic documentation.

14-8 QUALITY CONTROL (QC) REVIEW AND DOCUMENTATION.

14-8.1 Review.

Provide a quality control review by a third-party not involved in the design of the project. Evaluate both technical accuracy and discipline coordination. The QC review must include, but is not limited to, the following:

- Eliminate errors, omissions, interferences, and inconsistencies among design disciplines and among drawings, specifications, and cost estimates.
- Verify current criteria, lessons learned, and responses to approved review comments are incorporated.
- Ensure the constructability of the facility as detailed in the drawings, specifications and technical documents.

14-8.2 Documentation.

With the submittal, provide Design Quality Control (DQC) documentation that demonstrates that cross-checking of documents has taken place. Provide a single set of documents highlighted to validate that the review was performed, and that the corrections were made.

14-9 DESIGN ANALYSIS OF ANTITERRORISM PROVISIONS.

Provide a complete analysis of all applicable Antiterrorism provisions for this project according to the building occupancy classification in compliance with UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings.

(Note: Antiterrorism documentation must be in a separate submittal, to be removed before issuing construction documents (CDs).)

14-10 PERMIT APPLICATIONS.

Investigate and report on any permit applications that should be filed for the project to comply with any federal, state, and local requirements on the management of air, water, and waste. List each permit and the agency coordination information.

14-11 CONSTRUCTION COST ESTIMATE.

Develop and provide a construction cost estimate, following [Chapter 2-3](#) and Chapter 10, showing subtotals for each division and a grand total for the project. Provide a listing of ABIs or Options, as applicable. The cost estimate will detail the Base plus ABIs or Options. The Base cost will total a maximum of 90% of the MCC. ABIs/Options will total a minimum of 10% of the total MCC. The Base cost plus the ABIs or Options shall not exceed the MCC.

Include a Cost Estimate Executive Summary

Electronically submit the construction cost estimate with the Cost Estimate Executive Summary as a separate file.

14-12 HPSB CHECKLIST(S) AND TPC CHECKLIST(S).

14-12.1 ANG Sustainability Requirements Score Sheet High Performance Sustainable Building Compliance.

Provide completed ANG Sustainability Requirements Score Sheet HPSB Compliance.

14-12.2 TPC Checklist.

Provide TPC Checklist(s) (where applicable).

14-13 PROJECT DESIGN SCHEDULE.

Provide an updated project design schedule showing expected DWG meeting dates and design submittals through Type B-3, 100% Final Design (see [Attachment 2](#)).

14-14 CONCEPT DEVELOPMENT (Type A-2, 35%) CERTIFICATION FORM.

A-E prepares Type A-2 (35%, Concept Development) Certification (see [Attachment 7](#) or [Attachment 8](#)) for BCE review and completion. This form provides the NGB/A4I PM with confirmation that the submittal meets all budget and scope requirements without further reprogramming.

14-15 CONCEPT DEVELOPMENT (Type A-2, 35%) SUBMITTAL CHECKLIST.

A-E prepares Type A-2 (35%, Concept Development) Checklist (see [Attachment 9](#)) for BCE review. This checklist is completed by the A-E and included with the submittal.

The BCE reviews the submittal against the completed checklist to ensure completeness of the submittal.

14-16 CONCEPT DEVELOPMENT (Type A-2, 35%) PRESENTATION.

A-E prepares the Type A-2 Presentation for BCE review and completion. Reference ANGETL 16-03, Attachment 9.

CHAPTER 15 PHASE: TYPE B-1 (65% DESIGN) SUBMITTALS

15-1 GENERAL REQUIREMENTS.

Deliverables are 65% complete at this stage. In addition to the requirements of the Core UFCs and the contract, include the deliverables described herein, as a minimum.

15-2 TYPE B-1 (65% DESIGN) CONTRACT DOCUMENTS DEVELOPMENT MEETING (CDDM).

Based on the approved Type A services, the A-E shall develop and provide the documents required below for the Contract Documents Development Meeting (CDDM). The A-E shall meet with the DWG to conduct an "on-board" progress meeting at approximately the midpoint of design services. The Commissioning Agent (CA) review must be incorporated in this meeting and the Basis of Design, drawings, and specifications shall be evaluated by the CA.

15-3 BASIS OF DESIGN.

The discipline-specific BOD needs to provide sufficient definition to support the development of a Class 2 cost estimate for that discipline. Update and submit a complete Basis of Design addressing items defined in the contract, the Core UFCs, [Attachment 1](#), [Chapter 6](#), and as follows.

15-3.1 Sustainability.

Provide an updated Sustainability Chapter.

15-4 DRAWINGS.

Provide updated drawings from the previous submittal and additional drawings required by the contract, the Core UFCs, and herein as applicable to the project. All Plan views, including enlargements, and excluding Site Plans, must include all vertical and horizontal column lines within the range of view.

15-4.1 Architectural.

- Legend and Abbreviations
- Floor Plans – Provide all floor plans, new and demolition, indicating room names and dimensions
- Building Elevations – Provide all building elevations indicating all exterior materials
- Roof Plan – Provide a plan of all roof areas, indicating direction of slope and method of drainage
- Building Section- Include heights

- Typical Wall Sections – Provide sufficient wall section(s) to indicate all materials and different conditions
- Finish Schedule – Indicate all proposed finishes

15-4.2 Interior Design.

Provide Structural Interior Design (SID) to include the following:

- Interior and Exterior Material and Finish samples in loose format
- FF&E Plan indicating built-in and moveable items
- FF&E Summary List corresponding to the FFE& Plan with estimated item costs

15-4.3 Landscape Architecture.

- Overall Landscape Site Plan. Provide an overall landscape site plan with matchlines (if site plan is divided into multiple sheets), and specific sheet references, general notes, and options (if applicable).
- Landscape Site Plan. Provide enlargement plans as required to delineate appropriate detail.
- Landscape Construction Details.
- Landscape Planting Plan.
- Plant Material Schedule and Details.
- Landscape Irrigation Plan. When a Landscape Irrigation Plan is required by the Statement of Work, provide a sprinkler head layout, remote control valves, automatic controller, pressure pipe and lateral lines, backflow prevention device, and point of connection.
- Landscape Irrigation Equipment Schedule and Details. When a site irrigation plan is required by the Statement of Work, provide an irrigation equipment schedule.

Drawings indicated above can be combined.

15-4.4 Civil.

- Cover sheet, Drawing Index, Vicinity Map, Location Plan, Abbreviations, Legend and Notes.
- Existing Conditions / Demolition Plan.
- Site Plan.
- Water and Sanitary Sewer Plan.
- Grading and Drainage Plan.

Drawings indicated above can be combined.

15-4.5 Structural.

- Foundation Plans. Include for all structures, showing dimensions, arrangements, elevations, locations referred to a column line grid system, type of foundation and foundation obstructions. Include the layout of all parts, including but not limited to, slabs, footings, piers, grade beams, and piles, showing all foundation features of the design.
- Framing Plans. Include a framing plan for each structural level of the facility, showing dimensions, elevations, and column locations and numbering referenced to a column line grid system, and overall sizes of major members and components. Show the layout of system, including, but not limited to, beams, joists, and stringers.
- Structural Details. Show typical details of construction, indicating the connection and relationship between major components of the structural system.
- Structural Elevations. Show general sizes, location and arrangement of all significant features of the vertical framing system, such as columns, walls, and beams.
- Structural General Notes.

15-4.6 Mechanical.

- Plumbing Floor Plan. Show plumbing fixtures, floor drains and equipment locations.
- Site Plan. Show connections, such as to base steam distribution, location of propane and oil tanks, and layout of ground coupled heat pump well fields.
- HVAC Floor Plan. Show equipment locations, one or two-line duct layout and preliminary piping runs.
- Mechanical Room Plan. Show major equipment and maintenance access space. Provide section view(s) to clarify layout and supports.

15-4.7 Electrical.

- Existing Site and Demolition Plan.
- Site Plan.
- Single Line Diagram.
- Preliminary floor plans with dedicated space clearly identified for electrical and telecommunications rooms.
- Legend and Abbreviations.
- Lighting Plan(s).

- Power Plan(s).
- Lightning Protection Plan.
- Cathodic Protection Plan.
- Communications Plans.
- Special Systems Plans.
- Additional Plans/Risers.

15-4.8 Fire Protection.

- Code Compliance Summary Sheets.
- Life Safety plan. Identify locations of fire rated partitions and any horizontal exits).
- Fire Suppression plans. Identify locations of fire rated partitions and any horizontal exits).
- Fire Alarm and Mass Notification System Plans.
- Detail Sheets.

15-5 SPECIFICATIONS.

Provide complete, edited draft technical division specifications. Use Unified Facilities Guide Specifications, as required in [Chapter 9](#).

Provide environmental specifications, as required. Edit UFGS 01 57 19 to include paragraphs for asbestos, lead-based paint, beryllium, polychlorinated biphenyls, or low-level radioactive components when those materials or components are part of the project. Specify disposal requirements based on project location. Review Federal, state and local disposal regulations before specifying disposal of any type of waste and comply with the most stringent requirement.

15-6 CALCULATIONS.

Provide calculations complete, and in sufficient detail to substantiate the design level in this Basis of Design, as indicated on the drawings, in accordance with the Core UFCs, [Chapter 7](#), and herein, and any updated from the previous design phase.

15-6.1 Structural and Geotechnical.

Provide Structural and Geotechnical calculations in sufficient detail to support the items outlined in the Basis of Design and indicated on the drawings.

15-6.2 Civil.

Provide calculations in sufficient detail to indicate compliance with LID criteria and state or local stormwater regulations. Provide calculations for utility systems and pavements in

sufficient detail to support items outlined in the Basis of Design and indicated in the drawings and specifications.

15-6.3 Architectural.

Provide acoustical calculations in accordance with UFC 3-101-01, Architecture.

15-6.4 Mechanical.

Provide a bookmarked Adobe PDF of all input and output data, and summary sheets for Energy Analysis, Life Cycle Cost Analysis, Building Heating and Cooling Loads, and ASHRAE 90.1 Compliance Calculations as required by UFC 3-410-01, Heating, Ventilating, and Air Conditioning Systems.

15-6.4.1 Energy Analysis.

Provide an Adobe PDF copy of the computerized energy analysis that includes input and output data in their entirety.

15-6.4.2 Life Cycle Cost Analysis.

Submit the computerized LCC analysis utilizing the latest edition of the NIST Building Life-Cycle Cost Program.

15-6.4.3 Building Heating and Cooling Load.

Provide an Adobe PDF copy of the computerized load calculations with input and output data in their entirety.

15-6.4.4 ASHRAE 90.1 Compliance Calculations.

Submit calculations and compliance forms indicated in the Basis of Design.

15-6.4.5 Plumbing Calculations.

Provide Design Basis as required by UFC 3-420-01, Plumbing Systems.

15-6.5 Electrical.

Provided calculations required by Core UFCs and also include:

- Load Analysis.
- Service size.
- Feeder size.
- Larger special circuit sizes.
- Lightning Risk Assessment.

15-7 QUALITY CONTROL (QC) REVIEW AND DOCUMENTATION.

15-7.1 Review.

Provide a quality control review by a third-party not involved in the design of the project. Evaluate both technical accuracy and discipline coordination. The QC review must include, but is not limited to, the following:

- Eliminate errors, omissions, interferences, and inconsistencies among design disciplines and among drawings, specifications, and cost estimates.
- Verify current criteria, lessons learned, and responses to approved review comments are incorporated.
- Ensure the constructability of the facility as detailed in the drawings, specifications and technical documents.

15-7.2 Documentation.

With the submittal, provide Design Quality Control (DQC) documentation that demonstrates that cross-checking of documents has taken place. Provide a single set of documents highlighted to validate that the review was performed, and that the corrections were made.

Additionally, submit all Type A-1 (15%, Concept Proposal) and Type A-2 (35%, Concept Development) review comments with annotations describing the disposition of each comment and the location within the contract documents where the comment was incorporated.

15-8 PERMIT APPLICATIONS.

Prepare for the BCE's signature and electronically submit completed permit applications required for the project to comply with applicable federal, state, and local air, water, and waste requirements.

15-9 CONSTRUCTION COST ESTIMATE.

Develop and provide a construction cost estimate, following [Chapter 2-3](#) and Chapter 10, showing subtotals for each division and a grand total for the project. Provide a listing of ABIs or Options and FF&E, as applicable. The cost estimate will detail the Base plus ABIs or Options and FF&E. The Base cost will total a maximum of 90% of the MCC. ABIs/Options will total a minimum of 10% of the total MCC. The Base cost plus the ABIs or Options shall not exceed the MCC.

Include a Cost Estimate Executive Summary.

Submit the construction cost estimate with the Cost Estimate Executive Summary as a separate file.

15-10 HPSB CHECKLIST(S) AND TPC CHECKLIST(S).

15-10.1 ANG Sustainability Requirements Score Sheet High Performance Sustainable Building Compliance.

Provide updated ANG Sustainability Requirements Score Sheet HPSB Compliance and Narrative.

The following Technical Guide relates to UFC 1-200-02 (01 December 2020, Change 02, 01 June 2022):

Version 1 New Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (01 December 2020 – Change O1, 03 Jan 2022).

This Technical Guide can be found on GBCI's website as the second bullet point under "Technical Guides" here: <https://guidingprinciples.gbci.org/resources>

Change 2 revisions (outlined on page 2 of UFC 1-200-02) should be incorporated into the documentation as required for the project, while utilizing the guidance included in the Technical Guide.

15-10.2 TPC Checklist.

Provide TPC Checklist(s) (where applicable).

15-11 PROJECT DESIGN SCHEDULE.

Provide an updated project design schedule showing expected DWG meeting dates and design submittals through Type B-3, 100% Final Design (see [Attachment 2](#)).

15-12 TYPE B-1 (65% DESIGN) CERTIFICATION FORM.

A-E prepares, with BCE, a Type B-1 (65% Design) Certification (see [Attachment 10](#) or [Attachment 11](#)) for BCE review and completion. This form provides the NGB/A4I PM with confirmation that the submittal meets all budget and scope requirements without further reprogramming.

15-13 TYPE B-1 (65% DESIGN) CDDM CHECKLIST.

A-E prepares the Type B-1 (65% Design) CDDM Checklist (see [Attachment 12](#)) for BCE review. This checklist is completed by the A-E and included with the submittal. The BCE reviews the submittal against the completed checklist to ensure completeness of the submittal.

15-14 CONTRACT DOCUMENT DEVELOPMENT MEETING MINUTES.

Provide minutes of the CDDM. Explain any deviation(s) from the approved Concept Submittal.

CHAPTER 16 PHASE: TYPE B-2 (100% PRE-FINAL DESIGN) SUBMITTALS

16-1 GENERAL REQUIREMENTS.

The intent of the Pre-Final submittal is to provide a complete set of design deliverables. The following are the minimum requirements of a Pre-Final submittal:

16-2 BASIS OF DESIGN.

The discipline-specific BOD needs to include updated information, incorporate responses from previous government review comments, and provide sufficient definition to support the development of a Class 1 cost estimate for that discipline. Update and submit a complete Basis of Design addressing items defined in the contract, the Core UFCs, [Attachment 1](#), [Chapter 6](#), and as follows.

16-2.1 Geotechnical.

The Geotechnical DOR must validate that findings and design recommendations from the latest edition of the Geotechnical Report are valid, and construction and site preparation recommendations have been correctly incorporated into the pertinent drawings and specifications. Provide a draft verification letter from the Geotechnical DOR, certifying that a review of the Pre-Final drawings and specifications, as they relate to the Geotechnical Report, has been conducted and that these drawings and specifications comply with the Geotechnical Report findings and recommendations. The Geotechnical Report, if modified during the previous review, must be re-submitted as an appendix to the Basis of Design; otherwise, do not submit.

16-2.2 Sustainability.

Provide updated Sustainability Chapter.

16-3 DRAWINGS.

Drawings must be 100% complete, minus final signatures, and incorporate all responses to the previous review comments. The drawings must be complete to the extent that they may be released for solicitation or constructed as submitted. Provide a complete set of construction drawings organized by discipline as described in this document and the Core UFCs. For Design-Build projects, follow the requirements of the RFP when shop drawings are used as design drawings. Provide drawings updated from the previous submittal level, drawings specified in the Core UFCs, [Chapter 8](#), and the following, as a minimum:

16-3.1 Civil.

Provide updated drawings from the previous submittal and the following:

- Water, Storm and Sanitary Sewer Profiles

- Site/Utility Detail.

16-3.2 Landscape Architecture.

Provide updated drawings from the previous submittal to substantiate design level, and the following, in accordance with UFC 3-201-02, Landscape Architecture:

- Landscape Irrigation Plan. When a site irrigation plan is required by the Statement of Work, update irrigation system with pipe sizing and remaining associated requirements for a complete and operational system.
- Landscape Irrigation Equipment Schedule and Details. When a site irrigation plan is required by the Statement of Work, update irrigation equipment schedule. Provide irrigation details.

16-3.3 Electrical.

Provide updated drawings from the previous submittal to substantiate design level, and the following in accordance with UFC 3-501-01:

- Existing Site and Demolition Plan.
- Site Plan.
- Single Line Diagram.
- Legend and Abbreviations.
- Lighting Plan(s).
- Power Plan(s).
- Lightning Protection Plan.
- Cathodic Protection Plan.
- Special Systems Plans.
- Additional Plans/Risers.
- Lighting: Interior and Exterior Foot-candles.
- Load Analysis.
- Service size.
- Feeder size.
- Larger special circuit sizes.
- Lightning Risk Assessment.
- Communications Riser Diagram.

- Intercommunication Riser Diagram.
- Other Riser Diagrams for Television, Security, and similar systems.
- Panel Schedules.
- Switchboards and Motor Control Center Schedules.
- Lighting Fixture Details.

16-4 SPECIFICATIONS.

Provide edited, marked-up specification sections, using the SpecsIntact “Show Revisions” function when editing and printing, to show deletions from and additions to the UFGS master sections. Use the default settings in SpecsIntact that displays deletions lined out and additions underlined. Run all verification reports when printing. Print project specification sections, using the SpecsIntact “Show Section Dates” function, to display the official date of release of the master guide specification and version of the specification used. This date appears immediately below the specification section title.

Design submittal must be complete at this stage and require only minor corrections if any. Organize specifications in accordance with [Chapter 9](#). Provide a submittal register with the specifications.

For projects estimated to cost over \$1 million, include a requirement in the General Provisions of the Specifications for a contractor-prepared and contractor-maintained critical path method (CPM) construction schedule using the arrow diagramming method. State in the specifications that the CPM schedule can be used in place of the AF Form 3064, Contract Progress Schedule, providing a mechanism is in place to validate the percentage of completion for verifying payment vouchers.

16-4.1 Sustainability.

Attach completed HPSB Checklist(s) and TPC checklist(s) (where applicable) to UFGS 01 33 29, Sustainability Requirements and Reporting.

For this phase, all aspects of the Design Review should be complete for projects requiring TPC. Attach report provided by GBCI that indicates this phase of review is accepted.

The following Technical Guide relates to UFC 1-200-02 (01 December 2020, Change 02, 01 June 2022):

Version 1 New Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (01 December 2020 – Change O1, 03 Jan 2022).

This Technical Guide can be found on GBCI’s website as the second bullet point under “Technical Guides” here: <https://guidingprinciples.gbci.org/resources>

Change 2 revisions (outlined on page 2 of UFC 1-200-02) should be incorporated into the documentation as required for the project, while utilizing the guidance included in the Technical Guide.

16-4.2 Environmental.

Provide environmental specifications, as required.

Edit UFGS 01 57 19 to include paragraphs for asbestos, lead-based paint, beryllium, polychlorinated biphenyls, or low-level radioactive components when those materials or components are part of the project. Specify disposal requirements based on project location. Review Federal, state and local disposal regulations before specifying disposal of any type of waste and comply with the most stringent requirement.

16-5 INTERIOR DESIGN.

16-5.1 Structural Interior Design (SID).

Include the following:

- Signage plans and details.
- FF&E Plan indicating built-in and movable items.
- FF&E Summary List corresponding to the FF&E Plan with estimated item costs.

16-5.2 FF&E.

Provide Preliminary FF&E to include the following:

- Cover Title Page (project name, project #, submittal date, submittal title).
- FF&E list (Cost Summary).
- Furniture placement plans coded to the FF&E list and furnishings specifications.
- Specifications and procurement data sheets (such as furniture, furnishings), indicating final finish and fabric selections.
- Catalog cuts and finish samples for all specified items.
- Best Value Determination (BVD) Analysis including copy of the BVD Analysis cover letter, performance specifications, project specific typical, pricing spreadsheet and questionnaire.

16-6 CALCULATIONS.

Provide calculations, updated from previous submittal, to substantiate design level and to reflect resolution of all previous government review comments, and in accordance with the Core UFCs and [Chapter 7](#). Provide design analysis that is 100% complete. In addition, provide the following:

16-6.1 Mechanical.

Submit calculations to support the plumbing and mechanical systems and the major equipment comprising those systems. Submittals must include, but not be limited to, cooling loads, heating loads, air balance, and outside air calculations. Update the energy analysis, provided at the Design Development phase, with the equipment efficiencies scheduled on the drawings.

16-6.2 Electrical.

Provide updated and complete calculations required by Core UFCs, and include photometric calculations for interior and exterior lighting.

16-7 STATEMENT OF SPECIAL INSPECTIONS.

Prepare special inspections specification UFGS 01 45 35 (DBB). These specifications contain the DOD process for implementing the special inspections, testing, and observations required per IBC Chapter 17 as modified by UFC 3-301-01, Structural Engineering and the International Existing Building Code as modified by UFC 3-301-01. The generic schedule of special inspections is maintained on the WBDG at the following location: <https://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/ufgs-01-45-35>

16-8 DRAFT DD FORM 1354.

Provide a Draft DD Form 1354, Transfer and Acceptance of Military Real Property, in accordance with UFC 1-300-08, Criteria for Transfer and Acceptance of DoD Real Property. A blank, editable form is available for download at <https://www.esd.whs.mil/portals/54/documents/dd/forms/dd/dd1354.pdf>

Break out all assets by construction categories provided on the form. Coordinate the identification of appropriate asset construction categories with the Government's Real Property Clerk. Include all quantities and units of measure; however, cost breakdown is not required.

16-9 DB RFP DEVELOPMENT.

Provide edited, red-lined RFP. Follow Specifications requirements in Chapter 8 for prescriptive specifications provided in Part 5 of the RFP. RFP submittal must be complete at this stage and require only minor corrections if any. Organize Part 2 specifications in accordance with Chapter 11.

16-10 QUALITY CONTROL (QC) REVIEW AND DOCUMENTATION.

16-10.1 Review.

Provide a quality control review by a third-party not involved in the design of the project.

Evaluate both technical accuracy and discipline coordination. The QC review must include, but is not limited to, the following:

- Eliminate errors, omissions, interferences, and inconsistencies among design disciplines and among drawings, specifications, and cost estimates.
- Verify current criteria, lessons learned, and responses to approved review comments are incorporated.
- Ensure the constructability of the facility as detailed in the drawings, specifications and technical documents.
- Ensure documents are “biddable”.

16-10.2 Documentation.

With the submittal, provide Design Quality Control (DQC) documentation that demonstrates that cross-checking of documents has taken place. Provide a single set of documents highlighted to validate that the review was performed, and that the corrections were made.

16-11 CONSTRUCTION COST ESTIMATE.

Develop and provide a construction cost estimate, following [Chapter 2-3](#) and Chapter 10, showing subtotals for each division and a grand total for the project. Provide a listing of ABIs or Options and FF&E, as applicable. The cost estimate will detail the Base plus ABIs or Options and FF&E. The Base cost will total a maximum of 90% of the MCC. ABIs/Options will total a minimum of 10% of the total MCC. The Base cost plus the ABIs or Options shall not exceed the MCC.

Include a Cost Estimate Executive Summary

16-12 HPSB CHECKLIST(S) AND TPC CHECKLIST(S).

16-12.1 ANG Sustainability Requirements Score Sheet High Performance Sustainable Building Compliance.

Provide updated ANG Sustainability Requirements Score Sheet HPSB Compliance and Narrative.

16-12.2 TPC Checklist.

Provide TPC Checklist(s) (where applicable).

16-13 TYPE B-2 (100% PRE-FINAL DESIGN) CERTIFICATION FORM.

A-E prepares Type B-2 Certification form (see [Attachment 13](#) or [Attachment 14](#)) for BCE review and completion. The Type B-2 Certification form provides NGB/A4I with

confirmation that the Type B-2 submittal meets all budget and scope requirements without further reprogramming.

16-14 TYPE B-2 (100% PRE-FINAL DESIGN) SUBMITTAL CHECKLIST.

A-E prepares Type B-2 (100% Pre-Final) Checklist (see [Attachment 15](#)) for BCE review. This checklist is completed by the A-E and included with the submittal. The BCE reviews the submittal against the completed checklist to ensure completeness of the submittal.

16-15 TYPE B-2 (100% PRE-FINAL DESIGN) PRESENTATION

A-E prepares the Type B-2 Presentation for BCE review and completion. Reference ANGETL 16-03, Attachment 9.

CHAPTER 17 PHASE: TYPE B-3 (100% FINAL DESIGN) SUBMITTALS

17-1 GENERAL REQUIREMENTS.

The Final Submittal provides a complete and final set of contract documents ready for solicitation by the Government, or in the case of Design-Build, ready for construction by the Contractor. All previous government review comments must have been addressed. Unless specified otherwise by the Contract, provide final submittals in electronic format in accordance with [Chapter 12](#). Update deliverables from the previous submittal stages, and in addition to requirements from the Core UFCs, provide the following, as a minimum, for the Final Submittal:

17-2 BASIS OF DESIGN.

Submit Basis of Design for each of the core disciplines, including updated information and incorporating responses to previous government review comments.

17-2.1 Geotechnical.

The Geotechnical DOR must validate that findings and design recommendations from the latest edition of the Geotechnical Report are valid, and construction and site preparation recommendations have been correctly incorporated into the pertinent drawings and specifications. Provide a verification letter from the Geotechnical DOR, signed and sealed, certifying that a review of the Final drawings and specifications, as they relate to the Geotechnical Report, has been conducted and that these drawings and specifications comply with the Geotechnical Report findings and recommendations.

17-2.2 Sustainability.

Provide updated Sustainability Chapter.

17-3 DRAWINGS.

Provide complete construction drawings updated from the previous submittal level and organized by discipline in accordance with the Core UFCs and herein.

17-3.1 Plotstamp Record.

Provide a Plotstamp Record for each contract drawing. This history begins with the final design submittal and continues with subsequent submissions and modifications of that drawing. Maintain this record and make it available at the jobsite for review. Locate the Plotstamp Record on the lower left corner of the sheet, outside the border, and at the staple edge with the text rotated 90 degrees. Include the following:

- File Name: (Include the file location)
- Layout Name (if applicable)

- Plotted: Date and Time
- User: First name and last name of the person who printed the drawing.

17-3.1.1 Design-Build Plotstamp Records.

In addition, provide an updated Plotstamp Record at the following developmental stages of the contract drawings:

- a) DOR signed Final Critical Path Submittal or the Final Design Submittal.
- b) Government approved Final Critical Path Submittal or the Final Design Submittal. This development stage may be combined with "c." below, if issued at the same time.
- c) Incorporation of the Final Critical Path or Final Design drawings in the contract by modification.
- d) Submissions to Government and modifications of the Final Critical Path or Final Design drawings incorporating variations in the contract.

17-3.2 Design-Build Shop Drawings.

For Design-Build projects, follow the requirements of the RFP when shop drawings are used as design drawings.

17-4 SPECIFICATIONS.

Provide complete, final specifications with redlines executed. Organize and compile the package as detailed in [Chapter 9](#).

17-4.1 Sustainability.

Attach final HPSB Checklist(s) and TPC Checklist(s) (where applicable) to UFGS 01 33 29 Sustainability Requirements and Reporting.

17-4.2 Environmental.

Provide environmental specifications, as required.

Edit UFGS 01 57 19 to include paragraphs for asbestos, lead-based paint, beryllium, polychlorinated biphenyls, or low-level radioactive components when those materials or components are part of the project. Specify disposal requirements based on project location. Review Federal, state and local disposal regulations before specifying disposal of any type of waste and comply with the most stringent requirement.

17-4.3 Design-Build Design Submittal Specifications.

For Design-Build projects, follow the requirements of the RFP when manufacturer's

catalog data are used with the UFGS during design.

17-4.3.1 Fire Protection Specifications.

For Fire Protection systems, combine design and construction submittal information on the design documents. In addition to the UFGS specification, provide proprietary information, such as catalog cuts and manufacturers data that demonstrates compliance with the RFP. Fire protection systems include fire suppression systems, fire pumps, fire alarm and detection systems, fire-stopping, and spray-applied fireproofing.

17-4.4 Report Source File.

As part of the Final submittal of the specifications, provide the source files of Reports included in the specifications.

17-5 CONTRACTING DOCUMENTS.

Provide final scope for Project Synopsis.

17-6 INTERIOR DESIGN.

17-6.1 Structural Interior Design (SID).

Update deliverables for Interior Design from Pre-Final.

17-6.2 FF&E.

Provide the final FF&E submittal with final submittal package. Update FF&E deliverables from Pre-Final.

- Cover Title Page (project name, project #, submittal date, submittal title)
- Table of Contents and Manufacturer Contact List
- FF&E list (Cost Summary)
- Furniture placement plans coded to the FF&E list and furnishings specifications
- Specifications and procurement data sheets, such as for furniture and furnishings furnishing, indicating final finish and fabric selections.
- Catalog cuts and finish samples for all specified items.
- BVD Sheets signed by the Offeror's Interior Designer with required supporting information.

17-7 CALCULATIONS.

Revise design analysis and calculations as required to reflect resolution of all previous

government review comments and as required by this document and the core UFCs.

17-8 DRAFT FORM DD 1354.

Provide a completed Draft Form DD 1354.

17-9 STATEMENT OF SPECIAL INSPECTIONS.

Prepare special inspections specification Section 01 45 35 (DBB). These specifications contain the DOD process for implementing the special inspections, testing, and observations required in accordance with IBC Chapter 17 as modified by UFC 3-301-01, Structural Engineering and the International Existing Building Code as modified by UFC 3-301-01. The generic schedule of special inspections is maintained on the WBDG at the following location: <https://www.wbdg.org/ffc/dod/unified-facilities-guidespecifications-ufgs/ufgs-01-45-35>

17-10 RFP.

Provide complete, final RFP with redlines executed. Organize and compile the package as detailed in Chapter 11.

17-10.1 Report Source File.

As part of the Final submittal, provide source file of Reports included in the RFP, in either Word or SpecsIntact.

17-11 FIRE PROTECTION DESIGN COMPLIANCE DOCUMENT.

This design compliance document must be submitted with the final design submission as part of the design analysis and must bear the signature and professional seal of the QFPE. Refer to UFC 3-600-01, Fire Protection Engineering for Facilities.

17-12 QUALITY CONTROL (QC) REVIEW AND DOCUMENTATION.

17-12.1 Review.

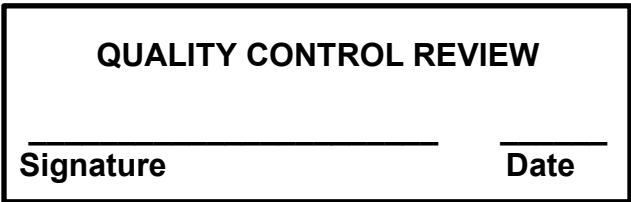
Provide a quality control review by a third-party not involved in the design of the project. Evaluate both technical accuracy and discipline coordination. The QC review must include, but is not limited to, the following:

- Eliminate errors, omissions, interferences, and inconsistencies among design disciplines and among drawings, specifications, and cost estimates.
- Verify current criteria, lessons learned, and responses to approved review comments are incorporated.
- Ensure the constructability of the facility as detailed in the drawings, specifications and technical documents.

17-12.2 Documentation.

With the submittal, provide Design Quality Control (DQC) documentation that demonstrates that cross-checking of documents has taken place. Provide a single set of documents highlighted to validate that the review was performed, and that the corrections were made. Provide a stamp on the cover page of the drawing set and specifications as shown in Figure 16-1.

Figure 16-1 Quality Review Block.



Reproduce Prefinal Submittal review comments with annotations describing the disposition of each comment and the location within the contract documents where the comment address was incorporated.

17-12.3 Design-Build Quality Control.

For Design-Build projects, this review must be a coordinated effort between the Contractor and their DOR.

17-13 CONSTRUCTION COST ESTIMATE.

Develop and provide a construction cost estimate, following [Chapter 2-3](#) and Chapter 10, showing subtotals for each division and a grand total for the project. Provide a listing of ABIs or Options and FF&E, as applicable. The cost estimate will detail the Base plus ABIs or Options and FF&E. The Base cost will total a maximum of 90% of the MCC. ABIs/Options will total a minimum of 10% of the total MCC. The Base cost plus the ABIs or Options shall not exceed the MCC.

Include a Cost Estimate Executive Summary

17-14 HPSB CHECKLIST(S) AND TPC CHECKLIST(S).

17-14.1 ANG Sustainability Requirements Score Sheet High Performance Sustainable Building Compliance.

Provide updated ANG Sustainability Requirements Score Sheet HPSB Compliance and Narrative.

17-14.2 TPC Checklist.

Provide TPC Checklist(s) (where applicable).

17-15 TYPE B-3 (100% FINAL DESIGN) CERTIFICATION FORM.

17-16 TYPE B-3 (100% FINAL DESIGN) SUBMITTAL CHECKLIST.

The A-E shall complete and provide the Type B-3 Final Submittal checklist (see Attachment XX). A-E is to complete the checklist and forward it to the BCE. The BCE shall review the checklist against the information furnished at the B-2 Submittal and include it in his/her submission to the NGB/A4I PM.

CHAPTER 18 PHASE: DESIGNER OF RECORD SUPPORT AND POST CONSTRUCTION AWARD SERVICES (TYPE C SERVICES)

18-1 GENERAL REQUIREMENTS.

Submissions after final design or RFP development include providing DOR and Government responses to Contractor Pre-Proposal Inquiries (PPI), Pre-Bid Inquiries (PBI), and Requests for Information (RFI), and providing amendments and contract modification documents.

Changes made to the drawings, specifications or RFP after the Final Submission are changes to the Contract Documents. Changes before contract award are amendments; changes after contract award are contract modifications.

18-2 PRE-PROPOSAL/PRE-BID INQUIRES (PPI/PBI)AND POST-AWARD REQUESTS FOR INFORMATION (RFI).

Responses to Pre-Proposal/Pre-Bid Inquiries and Requests for Information must be responded to as quickly as possible to prevent delays. It is expected that the DOR will provide response to a PPI/PBI or RFI no later than 3 working days after notification. Where the response to a PPI/PBI or RFI requires additional time, the DOR must notify the Contracting Officer as to the expected date of response. In any case, the DOR should indicate if an amendment is required in response to the PPI/PBI or contract modification is required in response to the RFI.

18-3 CHANGE NUMBERS.

The Contracting Officer for procurement assigns the Amendment or Contract Modification number. Numbers are assigned in numerical order as required. Amendment numbers are prefixed by three ciphers, for example, the first amendment is numbered "0001." The Contracting Officer prepares a cover sheet, Standard Form (SF) 30, Amendment of Solicitation/ Modification of Contract, for changes. Thus, the first page of the change's text starts on page two.

18-4 COST ESTIMATE CHANGES.

Accompany amendment or contract modification with detailed cost estimates to indicate all changes in construction cost of the project, or to substantiate a statement of no change in cost. Accompany contract modification with a detailed cost estimate that can be used in the negotiation of contract modification.

18-5 CHANGE FORMAT.

Provide a Continuation Sheet for an Amendment and a Proposed Change Sheet for a contract modification with an explanation of the changes. Where drawings, sketches, RFP sections, or specifications are replaced or added, attach the document PDF file

separately, and reference in the Continuation Sheet or Proposed Change Sheet in accordance with guidance below. When multiple drawing, sketch, RFP section, or specification files are replaced or added, combine the documents by type into a single file, and bookmark each document (example: combine the drawings into a single file and bookmark each drawing, and combine the specification sections into a single file and bookmark each section.) Follow file size limitations in accordance with [Chapter 12](#). Prior to submittal of an amendment or contract modification, contact the Contracting Officer for the number of the amendment or contract modification.

18-5.1 Language Format.

Use Table 18-1 "Specifications or RFP Changes Format" and Table 18-2 "Drawing Changes Format" for guidance on how to format the language for changes. Note that any additions, deletions, or replacement of complete specification sections should be done at the Table of Contents; do not list the section separately within the document by Section number and title with note to add, delete, or replace the section. Note that adding, deleting or replacing a drawing or sketch in its entirety is done at Section 00 01 15, List of Drawings; do not list each drawing or sketch separately with a note to add, delete, or revise the entire drawing.

18-5.2 Continuation Sheet.

Use the Continuation Sheet for Amendments. A sample Continuation Sheet is provided at Figure 18-1. Follow the specific guidance for drawing, specification, and RFP changes.

18-5.3 Proposed Change Sheet.

Use a Proposed Change Sheet for contract modifications. A sample sheet is provided at Figure 18-2. Use the guidance for amendments and changes for language and format.

Table 18-1 Specification or RFP Changes Format

Change	Change Format
<p>Adding a Specification Section</p>	<p>PROJECT TABLE OF CONTENTS</p> <p>Section 09 68 00, CARPET, is added to the Project Table of Contents.</p> <p>This Section accompanies this [Amendment] [Modification].</p>
<p>Replacing an Existing Specification</p>	<p>PROJECT TABLE OF CONTENTS</p> <p>Section 09 68 00, CARPETING, is deleted and Section 09 68 00, CARPETING, dated May 17, 2012, as shown in the footer, is added to the Project Table of Contents and accompanies this [Amendment] [Modification].</p> <p>NOTE: To change the date, for any subsequent replacements of the section, date must be manually typed into the footer on the printing screen, in SpecsIntact.</p>
<p>Adding Paragraphs or Sub-paragraphs</p>	<p>SECTION 03 33 00 CAST-IN-PLACE ARCHITECTURAL CONCRETE</p> <p>2.1 MATERIALS FOR FORMS After this paragraph, add the following: "</p> <p>2.1.1 Reuse of Forms</p> <p>Forms may be reused in subsequent parts of the project provided they are undamaged and continue to meet all specified requirements."</p> <p>PART 3 PROJECT PROGRAM</p> <p>1.2 REQUIREMENTS</p> <p>After this paragraph, add the following:</p> <p>"1.2.1"</p>
<p>Making Word Changes</p>	<p>SECTION 23 23 00 REFRIGERANT PIPING</p> <p>2.1.1.2 Copper Pipe and Fittings:</p> <p>In the second sentence, delete "bronze" and replace with "galvanized steel."</p> <p>PART 4 PERFORMANCE TECHNICAL SPECIFICATIONS</p> <p>D50 ELECTRICAL</p>

	D5010 Electrical Service and Distribution In the second sentence, delete “bronze” and replace with “galvanized steel.”
Omitting Paragraphs or Subparagraphs	<p>SECTION 32 12 16.16 ROAD-MIX ASPHALT PAVEMENT</p> <p>2.2 ASPHALT CEMENT</p> <p>Delete this Paragraph in its entirety and replace with the following: "</p> <p>2.2 NOT USED."</p> <p>PART 4 PERFORMANCE TECHNICAL SPECIFICATONS</p> <p>A10 FOUNDATIONS</p> <p>A1010 FOUNDATION RESTRICTIONS</p> <p>Delete this paragraph in its entirety</p>

18-5.4 Drawing Changes and Sketches.

Use Table 18-2, Drawing Changes Format, as a guide in preparing changes to the Drawings. When drawings are revised and replaced, use a cloud to highlight the change. For amendments, place a triangle with a sequential number in it, next to the cloud or the item(s) changing for each sheet. For modifications, use a triangle with a sequential letter instead of a number. Also provide this triangle with the number or the letter in the revisions block. Under description, describe what the change is; listing the amendment or contract modification number is not appropriate. Insert the date that the change was made. This date and revision block distinguishes the revised drawing from the original drawing. Do not change sheet numbers or sheet designations for revised drawings.

Table 18-2 Drawing Changes Format

Change	Change Format
Adding Drawings	<p>DOCUMENT 00 01 15 LIST OF DRAWINGS</p> <p>1.2 CONTRACT DRAWINGS</p> <p>Add the following to the list of drawings:</p> <p>DWG SHEET NO. Title Revised Floor Plan – Area A Lighting Fixture Details</p> <p>These Drawings accompany this [Amendment]</p>

	[Modification].
Revising Drawings	<p>DOCUMENT 00 01 15 LIST OF DRAWINGS</p> <p>1.2 CONTRACT DRAWINGS</p> <p>The following drawings are revised as of [Date]:</p> <p>DWG SHEET NO. Title Foundation Plan, Revised [Date] Floor Plan, Revised [Date]</p> <p>These revised Drawings accompany this [Amendment] [Modification].</p>
Making Text Changes to Drawings	<p>DOCUMENT 00 01 15 LIST OF DRAWINGS</p> <p>1.2 CONTRACT DRAWINGS</p> <p>On DWG SHEET NO. .</p> <p><u>Foundation Plan Notes</u>. In note number 3, delete “the bottom of the footing” and replace with “the top of the footing.”</p>

FIGURE 18-1 SAMPLE AMEDEMMENT

<p>CONTINUATION SHEET</p> <p>DOCUMENT 00 01 15 LIST OF DRAWINGS</p> <p>1.2 CONTRACT DRAWINGS</p> <p>Dwg. Sheet Nos. 14376950 and 14376951 are added to the list of drawings and accompany this amendment.</p> <p>Dwg. Sheet Nos. 14376308, 14376309, 14376310, 14376311, 14376312, 14376313, 14376314, 14376315, and 14376316 are revised as of March 17, 2012. These revised drawings accompany this amendment.</p> <p><u>General Notes:</u> Delete Note 1 in its entirety and replace with the following: “1. One lane of Williamsburg Road must remain open at all times.”</p> <p>PROJECT TABLE OF CONTENTS</p> <p>Section 03 37 13, SHOTCRETE, is added to the Table of Contents and accompanies this amendment.</p> <p>Delete sections 26 00 00.00 and 33 71 02.00 in their entirety and replace with Sections “26 00</p>
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00.00, BASIC ELECTRICAL MATERIALS AND METHODS, dated July 4, 2012“ and “33 71 02.00, UNDERGROUND ELECTRICAL WORK, dated July 4, 2012.” Sections 26 00 00.00 and 33 71 02.00, dated July 4, 2012, accompany this amendment.

SECTION 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
1.3

CONSTRUCTION SITE PLAN

Delete this paragraph in its entirety.

1.4 STORAGE AREAS

At the beginning of this paragraph add the following: “Contractor is responsible for security of their own property.”

1.4.1 Storage in Existing Buildings

Delete this paragraph in its entirety and replace with the following:

“1.4.1 Laydown Area

The enclosed site available for storage must be located at the North side of the building near the Lobby’s North entrance .

1.4.2 Material Storage

The Contractor will be working in and around an occupied building. The storage of materials, unless approved by the Contracting Officer, will not be allowed in the building.”

SECTION 26 20 00 INTERIOR DISTRIBUTION SYSTEM

2.2.1 Surface Non-metallic Raceway

After the text “snap cover type”, add “color must be white.”

3.1.3.1 Workmanship

After this paragraph, add the following:

“3.2 FIELD QUALITY CONTROL

Furnish test equipment and personnel, and submit written copies of test results. Give Contracting Officer five working days’ notice prior to each test.

3.2.1 Devices Subject to Manual Operation

Operate each device subject to manual operation at least five times, demonstrating satisfactory operation five out of five times.”

Figure 18-2 Sample Contract Modification

	WORK ORDER NUMBER 555555
	PROPOSED CONTRACT MODIFICATION
TACTICAL SUPPORT VAN PAD AT THE MARINE CORPS AIR STATION, NEW RIVER JACKSONVILLE, NORTH CAROLINA	
DOCUMENT 00 01 15	LIST OF DRAWINGS
1.2 CONTRACT DRAWINGS	
<u>Van Pad Pavement Detail A/C12/C12:</u> Delete “(5.2 Mpa FLEXURAL STRENGTH)” and replace with “(4481 kPa FLEXURAL STRENGTH)”.	
SECTION 03 30 00 CAST-IN-PLACE CONCRETE	
3.3.7 Dowel Assemblies	
Delete the first sentence of this paragraph.	
-- End of Proposed Contract Modification --	
555555 PROPOSED CONTRACT MODIFICATION	

18-6 PROJECT CLOSE-OUT.

The DOR may be required to execute specific project tasks during project close-out. These tasks may include preparing DD Form 1354, "Real Property Record," for Government signature, attending project close-out meetings, or performing other tasks. Refer to the design contract (if a Design-Bid-Build project) or the Design-Build RFP for project close-out related tasks.

18-6.1 Interim Form DD 1354.

Update the Draft DD Form 1354 to include any additional assets, improvements or alterations that occurred during construction. Identify costs. Submit completed form for approval to the Contracting Officer. Attach to each DD Form 1354 updated HPSB Checklist(s) and TPC Checklist(s) for each applicable building in the project. For these DD1354s, ensure Block 14, "Sustainability Code" is marked with "1" for compliant.

18-6.2 Record Drawings.

Prepare record drawings in accordance with [Chapter 12](#).

18-6.3 Sustainability.

No later than 60 days after the Pre-Final Inspection and Completion Date, provide updated HPSB Checklist(s) for each applicable building in the project to the Government.

For this phase, both the Design and Construction Reviews shall be complete. Provide the GBCI third party assessment certificate.

The following Technical Guide relates to UFC 1-200-02 (01 December 2020, Change 02, 01 June 2022):

Version 1 New Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (01 December 2020 – Change O1, 03 Jan 2022).

This Technical Guide can be found on GBCI's website as the second bullet point under "Technical Guides" here: <https://guidingprinciples.gbci.org/resources>

Change 2 revisions (outlined on page 2 of UFC 1-200-02) should be incorporated into the documentation as required for the project, while utilizing the guidance included in the Technical Guide.

For projects with post occupancy sustainability or energy requirements (such as commissioning), provide updated HPSB Checklist to the Government. Ensure copies of the following are archived to the project's electronic sustainability folder:

- Copy of the Final Commissioning Report, and copy of the Updated Final Commissioning Report when applicable, for projects that use Government-hired Commissioning Provider.
- Copy of the Final report, validation, or certification for projects that apply sustainable third party certification.
- Contractor's completed submittal of the Sustainability eNotebook, and the Updated Sustainability eNotebook when applicable.

18-7 Cost Estimate

Projects that have a delay (either planned or unintended) of more than 3 months between design completion and solicitation of offers for construction should re-evaluate the cost estimate.

18-8 Code and Criteria Review.

In accordance with MIL-STD-3007G, projects that have a delay (either planned or unintended) of more than 18 months between design completion and the solicitation of offers for construction must be re-evaluated to determine if any design revision is necessary due to changes in criteria (including codes and standards) or site infrastructure (such as water supply for fire department vehicle access). The evaluation must also include retroactive requirements included in new editions of the criteria.

APPENDIX A REFERENCES

AACE INTERNATIONAL (AACE)

<https://web.aacei.org/>

AACE International 56R-08, *Cost Estimate Classification System - Building and General Construction*

AACE International 91R-16, *Schedule Development*

AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS

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

ASHRAE 90.1, *Energy Standards for Buildings, Except Low-Rise Residential Buildings*

ASTM

<http://www.astm.org>

ASTM D1452, *Standard Practice for Soil Exploration and Sampling by Auger Borings*

ASTM D1586, *Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils*

ASTM D2487, *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*

ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*

ASTM D3740, *Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction*

ASTM D5778, *Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils*

ASTM E1699, *Standard Practice for Value Engineering (VE)/Value Analysis (VA) of Projects, Products, and Processes*

ASTM E 2013, *Standard Practice for constructing FAST Diagrams and Performing Function Analysis During Value Analysis Study*

FM GLOBAL

<http://www.fmglobal.com>

Property Loss Prevention Data Sheet 3-0, *Hydraulics of Fire Protection Systems*

GENERAL SERVICES ADMINISTRATION

FAR 52-236-21, *Specifications and Drawings for Construction*,

https://acquisition.gov/far/part-52#FAR_52_236_21

FAR 52-236-25, *Requirements for Registration of Designers*,

<https://acquisition.gov/content/52236-25-requirements-registration-designers#i1049053>http://acquisition.gov/far/current/html/52_233_240.html#wp1113529

Standard Form (SF) 30, *Amendment of Solicitation/ Modification of Contract*,
<http://www.gsa.gov/portal/forms/download/116158>

INTERNATIONAL CODE COUNCIL

<http://www.iccsafe.org>

International Building Code (IBC)

International Existing Building Code (IEBC)

INTERNATIONAL CODE COUNCIL

SAVE Methodology Standard 2015

UNITED STATES DEPARTMENT OF DEFENSE

DFAR 227.71, *Rights in Technical Data*,

<http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>

DFAR 227.72, *Rights in Computer Software and Computer Software Documentation*,

<http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>

DFAR 252.227-7023, *Drawings and Other Data to Become Property of Government*,

<http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>

DoD 5200.2R, Personnel Security Program, January 1987,

<http://www.dtic.mil/whs/directives/corres/pdf/520002r.pdf>

DoD Directive 4270.5, Military Construction, 5 February 2005,

<http://www.dtic.mil/whs/directives/corres/pdf/427005p.pdf>

DODM 5200.01 Volume 4, DoD Information Security Program: Controlled Unclassified Information (CUI),

<https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/520048p.PDF>

MIL-STD-3007, *Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications*, <https://assist.dla.mil>

Public Law 106-229, *Electronic Signatures in Global and National Commerce Act*, <http://www.gpo.gov/fdsys/pkg/PLAW-106publ229/pdf/PLAW-106publ229.pdf>

Public Law 94-168, *Metric Conversion Act*, <http://www.gpo.gov/fdsys/pkg/STATUTE-89/pdf/STATUTE-89-Pg1007.pdf>

**UNITED STATES DEPARTMENT OF DEFENSE, UNIFIED FACILITIES
CRITERIA PROGRAM**

<https://www.wbdg.org/ffc/dod> unless otherwise noted.

UFC 1-200-01, *DoD Building Code (General Building Requirements)*

UFC 1-200-02 *High Performance and Sustainable Building Requirements*

UFC 1-300-02, *Unified Facilities Guide Specifications (UFGS) Format Standard*

UFC 3-101-01, *Architecture*

UFC 3-201-02, *Landscape Architecture*

UFC 3-210-10, *Low Impact Development*

UFC 3-220-01, *Geotechnical Engineering*

UFC 3-250-01FA, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas*

UFC 3-260-02, *Pavement Design for Airfields*

UFC 3-260-03, *Airfield Pavement Evaluation*

UFC 3-301-01, *Structural Engineering*

UFC 3-340-01, *Design and Analysis of Hardened Structures to Conventional Weapons Effects (FOUO)*

UFC 3-410-01, *Heating, Ventilating, and Air Conditioning Systems*

UFC 3-420-01, *Plumbing Systems*

UFC 3-501-01, *Electrical Engineering*

UFC 3-600-01,*Fire Protection for Facilities*

UFC 3-701-01,*DoD Facilities Pricing Guide*

UFC 3-730-01,*Programming Cost Estimates for Military Construction*

UFC 3-740-05,*Handbook: Construction Cost Estimating*

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

UFC 4-010-05,*Sensitive Compartmented Information Facilities Planning, Design, and Construction*

UFC 4-010-06, *Cybersecurity of Facility-Related Control Systems*

UFC 4-020-01,*Security Engineering Facilities Planning Manual*

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

UFC 4-023-03,*Design of Buildings to Resist Progressive Collapse*

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

UFC 4-610-01,*Administrative Facilities*

UFGS 00 01 15,*List of Drawing*

UFGS 01 11 00,*Summary of Work*

UFGS 01 33 00,*Submittal Procedures*

UFGS 01 33 29,*Sustainability Requirements and Reporting*

UFGS 01 45 35,*Special Inspections*

UNITED STATES NATIONAL CAD STANDARD

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

United States National CAD Standard for Architecture, Engineering, & Construction
(A/E/C)

WHOLE BUILDING DESIGN GUIDE (WBDG)

<http://www.wbdg.org>

APPENDIX B GLOSSARY

A-E	Architect and Engineer
A/E/C	Architect/Engineer/Contractor
BCE	Base Civil Engineer
CAD	Computer Aided Design and Drafting
CATEX	Categorical Exclusion
CETB	Civil Engineer Technical Service Center
CSI	Construction Specifications Institute
CONUS	Continental United States
CLIN	Contract Line Item Number
CSRA	Cost and Schedule Risk Analysis
DB	Design-Build
DBB	Design-Bid-Build
DWG	Design Working Group
DoD	Department of Defense
DOR	Designer of Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
FACP	Fire Alarm Control Panel
FF&E	Furniture, Fixtures, and Equipment
HPSB	High Performance and Sustainable Buildings
KO	Contracting Officer
KTR	Contractor
LCC	Life-Cycle-Cost
LID	Low Impact Development

NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NIST	National Institute of Science and Technology
OSHA	Occupational Safety and Health Administration
OCONUS	Outside the Continental United States
PCAS	Post-Construction Award Services
PDF	Portable Document File
PM	Project Manager
RAC	Risk Assessment Code
RFI	Request For Information
RFP	Request For Proposal
SCIF	Sensitive Compartmented Information Facilities
SHPO	State Historic Preservation Office
SI	System International (Metric)
TPC	Third Party Certification
UFC	Unified Facilities Criteria
UFGS	Unified Facilities Guide Specifications
VES	Value Engineering Study

APPENDIX C ATTACHMENTS

ATTACHMENT 1 BASIS OF DESIGN COVER SHEET

PROJECT TITLE
PROJECT LOCATION
PROJECT NUMBER

Prepared By:

A-E Contract number or Construction Contract number for Post-Award DB Contract
Firm name or Contractor name if DB
Contract Task Order Number (if Indefinite Quantity Contract)

Date

Contract Type (i.e., Design-Build or Design-Bid-Build)
Submittal stage

SIGNATURES

Installation Commander

Base Civil Engineer

Using Organization Representative

Base Environmental Manager

Fire Chief

Security Chief

Safety Officer

Communications Chief

Site Security Manager

State Agency Representative

Active-Duty, Air Force Reserve, Naval Air
Station, and/or Joint Reserve Base Host

Other

ATTACHMENT 2 PRELIMINARY DESIGN thru DESIGN SCHEDULE

DATE:		
BASE:		
STATE:		
PROJECT NUMBER:		
PROJECT TITLE:		
PROGRAMMED CONSTRUCTION YEAR:		
Approx. Date	No. of Days	Date
CRITERIA REVIEW CONFERENCE (CRC)		
A-E COST PROPOSAL		
A-E CONTRACT NEGOTIATIONS		
LEGAL REVIEW of CONTRACT		
A-E NOTICE TO PROCEED (NTP) to PRELIMINARY DESIGN (TYPE A-1, 15% CONCEPT PROPOSAL)		
PRELIMINARY DESIGN (TYPE A-1, 15%) CONCEPT PROPOSAL MEETING		
PRELIMINARY DESIGN (TYPE A-1, 15%) CONCEPT PROPOSAL SUBMITTAL		
PRELIMINARY DESIGN (TYPE A-1, 15% CONCEPT PROPOSAL) SUBMITTAL REVIEW at BCE		
PRELIMINARY DESIGN (TYPE A-1, 15% CONCEPT PROPOSAL) SUBMITTAL REVIEW at A4 A&O	21 required. This is non-negotiable.	
A-E NTP to SCHEMATIC DESIGN (TYPE A-2, 35%, CONCEPT DEVELOPMENT)		
SCHEMATIC DESIGN (TYPE A-2, 35% CONCEPT DEVELOPMENT) MEETING		
SCHEMATIC DESIGN (TYPE A-2, 35% CONCEPT DEVELOPMENT) SUBMITTAL		
SCHEMATIC DESIGN (TYPE A-2, 35% CONCEPT DEVELOPMENT) REVIEW at BCE		
SCHEMATIC DESIGN (TYPE A-2, 35% CONCEPT DEVELOPMENT) REVIEW at A4I	21 required. This is non-negotiable.	
NTP to DESIGN (TYPE B) SERVICES		
DESIGN (TYPE B-1, 65%) CONTRACT DOCUMENTS DEVELOPMENT MEETING		
DESIGN (TYPE B-1, 65%) SUBMITTAL REVIEW at BCE		
DESIGN (TYPE B-1, 65%) SUBMITTAL REVIEW at A4	21 required. This is non-negotiable.	

A-E ISSUED ACCEPTANCE OF TYPE B-1, 65% DESIGN SUBMITTAL		
DESIGN (TYPE B-2, 100% PRE-FINAL) SUBMITTAL		
DESIGN (TYPE B-2, 100% PRE-FINAL) SUBMITTAL REVIEW at BCE		
DESIGN (TYPE B-2, 100% PRE-FINAL) SUBMITTAL REVIEW at A4	21 required. This is non-negotiable.	
A-E ISSUED ACCEPTANCE OF TYPE B-2, 100% PRE-FINAL SUBMITTAL		
DESIGN (TYPE B-3, 100% FINAL) SUBMITTAL		
DESIGN (TYPE B-3, 100% FINAL) SUBMITTAL REVIEW at BCE		
DESIGN (TYPE B-3, 100% FINAL) SUBMITTAL REVIEW at A4	21 required. This is non-negotiable.	
A-E ISSUED ACCEPTANCE of TYPE B-3, 100% FINAL DESIGN *Note: This date should align with the Acquisition Plan for the construction contract.		

ATTACHMENT 3 CRITERIA REVIEW CONFERENCE

Sheet _____ of _____
CRC DATE:
PROJECT NUMBER:
PROJECT TITLE:
SCOPE:
MAXIMUM CONSTRUCTION COST:
PROGRAMMED CONSTRUCTION YEAR:
ITEM NUMBER:

**ATTACHMENT 4 PRELIMINARY DESIGN (Type A-1, 15%, Concept Proposal)
FSRM Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, NGB/A4F Programmer and NGB/A4IC at completion of A-1.

The purpose of this Certification is to confirm that project [Project Number and Project Title] can proceed without further reprogramming (i.e., adjustment to program scope or cost) to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (reference DD 1391)	\$		
MCC (reference DI)	\$		
90% of MCC =	\$		
Minor Construction (MC)	\$	Minor Construction (MC) Base	\$
		MC Options or ABIs, if applicable	\$
REPAIR	\$	REPAIR Base	\$
		REPAIR Options or ABIs, if applicable	\$
SIOH		SIOH	
Total		Total	

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

**ATTACHED PRELIMINARY DESIGN (Type A-1, 15%, Concept Proposal)
CHECKLIST**

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 5 PRELIMINARY DESIGN (Type A-1, 15%, Concept Proposal)
MILCON Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, NGB/A4F Programmer and NGB/A4IC at completion of A-1.

The purpose of this Certification is to confirm that project [Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
Base (90% of MCC)	\$	Base	\$
ABIs or Options (10% of MCC)	\$	ABIs or Options	\$
			\$
			\$
			\$
			\$
			\$
Total	\$	Total	\$

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

**ATTACHED PRELIMINARY DESIGN (Type A-1, 15%, Concept Proposal)
CHECKLIST**

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 6 PRELIMINARY DESIGN (Type A-1, 15%, Concept Proposal)
Checklist**

BASE _____ STATE _____ DATE _____

PROJECT NUMBER _____

TITLE _____

___ BASIS OF DESIGN, PART I. Reference UFC 3-101-01, Architecture, and Chapter 6, Chapter 13, and Attachment 1 of this document.

___ THREE SINGLE LINE SITE SKETCHES (NGB/A4I PM through the Contracting Officer may waive this requirement).

___ THREE SINGLE LINE FLOOR PLAN SKETCHES (NGB/A4I PM through the Contracting Officer may waive this requirement).

___ GENERIC LAYOUT OF PRE-WIRED WORKSTATIONS (For projects with floor plan areas containing at least 1,000sf of contiguous administrative area).

___ DRAWINGS.

___ CALCULATIONS

___ ANG SUSTAINABLE REQUIREMENTS SCORE SHEET HIGH PERFORMANCE SUSTAINABILITY COMPLIANCE

___ THIRD PARTY CERTIFICATION REGISTRATION.

___ THIRD PARTY CERTIFICATION CHECKLIST.

___ PARAMETRIC CONSTRUCTION COST ESTIMATE exported to MII and updated to the latest MII Cost Book. INCLUDE THE CONTROL RECORD, EXECUTIVE SUMMARY, PURPOSE, CONSTRUCTION SCOPE and ASSUMPTIONS, and ESTIMATED CONSTRUCTION SCHEDULE. Reference UFC 3-740-05, Construction Cost Estimating.

___ PRELIMINARY DESIGN (TYPE A-1, 15% CONCEPT PROPOSAL) CERTIFICATION.

**ATTACHMENT 7 SCHEMATIC DESIGN (Type A-2, 35%)
FSRM Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of A-2.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
90% of MCC =	\$		
Minor Construction (MC)	\$	Minor Construction (MC) Base	\$
		MC Options or ABIs, if applicable	\$
REPAIR	\$	REPAIR Base	\$
		REPAIR Options or ABIs, if applicable	\$
SIOH		SIOH	
Total		Total	

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED SCHEMATIC DESIGN (Type A-2, 35%) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 8 SCHEMATIC DESIGN (Type A-2, 35%)
MILCON Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of A-2.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
Base (90% of MCC)	\$	Base	\$
ABIs or Options (10% of MCC)	\$	ABIs or Options	\$
			\$
			\$
			\$
			\$
			\$
Total		Total	\$

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED SCHEMATIC DESIGN (Type A-2, 35%) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 9 SCHEMATIC DESIGN (Type A-2, 35%)
Checklist**

BASE _____ STATE _____ DATE _____

PROJECT NUMBER _____

TITLE _____

___ CONCEPT DEVELOPMENT MEETING NOTICE

___ BASIS OF DESIGN, PARTS I (as approved in previous submittal) and II.
Reference UFC 3-101-01, Architecture and Chapter 6, Chapter 14, and
Attachment 1 of this document.

___ DRAWINGS

___ OUTLINE SPECIFICATIONS

___ CALCULATIONS

___ REPORTS

___ ACM

___ Paint

___ Beryllium

___ Radon

___ PCBs

___ LLR components

___ Animal Droppings

___ Mold & Spores

___ Tanks

___ Contaminated Soil and Groundwater

___ Waste Characterization

___ Chlordane

___ DESIGN QUALITY CONTROL DOCUMENTATION

___ DESIGN ANALYSIS OF ANTITERRORISM

___ PERMIT APPLICATION REPORT

___ PARAMETRIC CONSTRUCTION COST ESTIMATE exported to MII and
updated to the latest MII Cost Book. INCLUDE THE CONTROL
RECORD, EXECUTIVE SUMMARY, PURPOSE, CONSTRUCTION SCOPE and
ASSUMPTIONS, and ESTIMATED CONSTRUCTION SCHEDULE. Reference

UFC 3-740-05, Construction Cost Estimating.

___ ANG SUSTAINABLE REQUIREMENTS SCORE SHEET HIGH PERFORMANCE
SUSTAINABILITY COMPLIANCE

___ THIRD PARTY CERTIFICATION CHECKLIST.

___ UPDATED PROJECT SCHEDULE. Reference Attachment 2 of this
ANGETL.

___ SCHEMATIC DESIGN (TYPE A-2, 35%) CERTIFICATION.

**ATTACHMENT 10 DESIGN (Type B-1, 65%)
FSRM Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-1.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
90% of MCC =	\$		
Minor Construction (MC)	\$	Minor Construction (MC) Base	\$
		MC Options or ABIs, if applicable	\$
REPAIR	S	REPAIR Base	\$
		REPAIR Options or ABIs, if applicable	\$
SIOH		SIOH	
Total		Total	

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-1, 65%) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 11 DESIGN (Type B-1, 65%)
MILCON Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-1.

The purpose of this Certification is to confirm that project [Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
Base (90% of MCC)	\$	Base	\$
ABIs or Options (10% of MCC)	\$	ABIs or Options	\$
			\$
			\$
			\$
			\$
			\$
Total		Total	\$

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-1, 65%) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 12 DESIGN (Type B-1, 65%)
Checklist**

BASE _____ STATE _____ DATE _____

PROJECT NUMBER _____

TITLE _____

___ EDITED DRAFT TECHNICAL SPECIFICATIONS. Reference UFC 1-300-02, Unified Facilities Guide Specifications (UFGS) Format Standard; UFC 3-101-01, Architecture; and ANGETL 15-01-00, ANG Design Policy.

___ DETAILED CONSTRUCTION COST ESTIMATE (in MCACES (MII) format), INCLUDING ABIs or OPTIONS. INCLUDE THE CONTROL RECORD, EXECUTIVE SUMMARY, PURPOSE, CONSTRUCTION SCOPE and ASSUMPTIONS, and ESTIMATED CONSTRUCTION SCHEDULE. Reference UFC 3-740-05, Construction Cost Estimating.

___ 65% DETAILED DRAWINGS FOR ALL DISCIPLINES. Reference UFC 3-101-01, Architecture and ANGETL 15-01-00, ANG Design Policy.

___ UPDATED ANG SUSTAINABLE DESIGN AND ENERGY CONSERVATION SCORE SHEET AND NARRATIVE.

___ UPDATED BASIS OF DESIGN, PARTS I AND II. Reference UFC 3-101-01, Architecture, Chapter 6, Chapter 15 and Attachment 1 of this ANGETL.

___ TWO PERSPECTIVE SKETCHES FOR EXTERIOR OF FACILITY (If authorized by NGB/A4I PM).

___ PERMIT APPLICATIONS FOR BCE SIGNATURE.

___ CALCULATIONS

___ UPDATED PROJECT SCHEDULE. Reference Attachment 2 of this ANGETL.

___ COPY OF TYPE A-2 REVIEW COMMENTS and DISPOSITIONS, MEETING MINUTES, QUALITY CONTROL REVIEW and DOCUMENTATION.

___ DESIGN (TYPE B-1, 65%) CERTIFICATION

**ATTACHMENT 13 DESIGN (Type B-2, 100% PREFINAL)
FSRM Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-2.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
90% of MCC =	\$		
Minor Construction (MC)	\$	Minor Construction (MC) Base	\$
		MC Options or ABIs, if applicable	\$
REPAIR	S	REPAIR Base	\$
		REPAIR Options or ABIs, if applicable	\$
SIOH		SIOH	
Total		Total	

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-2, 100% PREFINAL) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 14 DESIGN (Type B-2, 100% PREFINAL)
MILCON Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-2.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Current Working Estimate (CWE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
Base (90% of MCC)	\$	Base	\$
ABIs or Options (10% of MCC)	\$	ABIs or Options	\$
			\$
			\$
			\$
			\$
			\$
Total		Total	\$

Do not submit if the CWE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-2, 100% PREFINAL) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 15 DESIGN (Type B-2, 100% PREFINAL)
Checklist**

BASE _____ STATE _____ DATE _____

PROJECT NUMBER _____

TITLE _____

- ___ ENGINEERING CALCULATIONS AND ANALYSES.
- ___ 100% DETAILED DRAWINGS FOR ALL DISCIPLINES.
Reference UFC 3-101-01, Architecture and ANGETL 15-01-00, ANG Design Policy.
- ___ FINAL TECHNICAL SPECIFICATIONS INCLUDING DIVISION 1 – GENERAL PROVISIONS. Reference UFC 1-300-02, Unified Facilities Guide Specifications (UFGS) Format Standard; UFC 3-101-01, Architecture; and ANGETL 15-01-00, ANG Design Policy.
- ___ STATEMENT OF SPECIAL INSPECTIONS
- ___ DRAFT DD Form 1354
- ___ FINAL DETAILED CONSTRUCTION COST ESTIMATE (in MCACES (MII) format), INCLUDING ABIs or OPTIONS. INCLUDE THE CONTROL RECORD, EXECUTIVE SUMMARY, PURPOSE, CONSTRUCTION SCOPE and ASSUMPTIONS, and ESTIMATED CONSTRUCTION SCHEDULE. Reference UFC 3-740-05, Construction Cost Estimating.
- ___ UPDATED ANG SUSTAINABLE DESIGN AND ENERGY CONSERVATION SCORE SHEET AND NARRATIVE
- ___ UPDATED BASIS OF DESIGN, PARTS I AND II. Reference UFC 3-101-01, Architecture, Chapter 6, Chapter 16, and Attachment 1 of this ANGETL.
- ___ RENDERING (If authorized by NGB/A4I PM).
- ___ UPDATED PROJECT SCHEDULE. Reference Attachment 2 of this ANGETL.
- ___ COPY OF TYPE B-1 REVIEW COMMENTS and DISPOSITIONS, MEETING MINUTES, and QUALITY CONTROL (QC) REVIEW and DOCUMENTATION.

**ATTACHMENT 16 DESIGN (Type B-3, 100% FINAL)
FSRM Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-3.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Independent Government Estimate (IGE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
90% of MCC =	\$		
Minor Construction (MC)	\$	Minor Construction (MC) Base	\$
		MC Options or ABIs, if applicable	\$
REPAIR	S	REPAIR Base	\$
		REPAIR Options or ABIs, if applicable	\$
SIOH		SIOH	
Total		Total	

Do not submit if the IGE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-3, 100% FINAL) CHECKLIST

Base Civil Engineer – Sign Date

Mission Support Group Commander – Sign Date

**ATTACHMENT 17 DESIGN (Type B-3, 100% FINAL)
MILCON Certification**

Prepared by A-E and BCE.

BCE completes and attains signatures. BCE sends BCE submittal review comments, Certification, Checklist, and all documents identified on the Checklist to NGB/A4I PM, and NGB/A4IC at completion of B-3.

The purpose of this Certification is to confirm that project [insert Project Number] can proceed without further reprogramming (i.e., adjustment to program scope or cost) required to provide a complete and usable facility meeting the requirements established in the DD Form 1391. The total estimated Base plus Option Line Items (OLIs) or Additive Bid Items (ABIs) is at or below the Maximum Construction Cost (MCC).

Government Planned Scope		Designed Scope	
	sf		sf

Government Planned Cost		Independent Government Estimate (IGE)	
PA (ref DD 1391)	\$		
MCC (ref DI)	\$		
Base (90% of MCC)	\$	Base	\$
ABIs or Options (10% of MCC)	\$	ABIs or Options	\$
			\$
			\$
			\$
			\$
			\$
Total		Total	\$

Do not submit if the IGE exceeds the MCC and/or Scope is not met (ref DAFI 32-1020).
Contact NGB/A4I.

Check box

ATTACHED DESIGN (Type B-3, 100% FINAL) CHECKLIST

Base Civil Engineer – Sign

Date

Mission Support Group Commander – Sign

Date

**ATTACHMENT 18 DESIGN (Type B-3, 100% FINAL)
Checklist**

BASE _____ STATE _____ DATE _____

PROJECT NUMBER _____

TITLE _____

___ CORRECTED FINAL DRAWINGS FOR ALL DISCIPLINES. Reference UFC 3-101-01, Architecture and ANGETL 15-01-00, ANG Design Policy.

___ CORRECTED FINAL TECHNICAL SPECIFICATIONS INCLUDING DIVISION 1 – GENERAL PROVISIONS. Reference UFC 1-300-02, Unified Facilities Guide Specifications (UFGS) Format Standard; UFC 3-101-01, Architecture; and ANGETL 15-01-00, ANG Design Policy.

___ FINAL SCOPE FOR PROJECT SYNOPSIS

___ UPDATED SID and FINAL FF&E submittal

___ CALCULATIONS

___ DRAFT DD FORM 1354

___ FIRE PROTECTION DESIGN COMPLIANCE DOCUMENT

___ GEOTECH DOR VALIDATION

___ CORRECTED FINAL DETAILED CONSTRUCTION COST ESTIMATE (in MCACES (MII) format), INCLUDING ABIs or OPTIONS. INCLUDE THE CONTROL RECORD, EXECUTIVE SUMMARY, PURPOSE, CONSTRUCTION SCOPE and ASSUMPTIONS, and ESTIMATED CONSTRUCTION SCHEDULE. Reference UFC 3-740-05, Construction Cost Estimating.

___ FINAL ANG SUSTAINABLE DESIGN AND ENERGY CONSERVATION SCORE SHEET AND NARRATIVE.

___ UPDATED BASIS OF DESIGN, PARTS I AND II. Reference UFC 3-101-01, Architecture, Chapter 6, Chapter 17, and Attachment 1 of this ANGETL.

___ COPY OF TYPE B-2 REVIEW COMMENTS and DISPOSITIONS, MEETING MINUTES, and QUALITY CONTROL (QC) REVIEW and DOCUMENTATION.

**ATTACHMENT 19
REVIEW COMMENTS**

CETB ID: Click or tap here to enter text.			DATE: Click or tap to enter a date.		
PROJECT TITLE: Click or tap here to enter text.			LOCATION: Click or tap here to enter text.		
PROJECT #: Click or tap here to enter text.		REVIEWER INFO: Click or tap here to enter text.			
DESIGN PHASE: Choose an item.			DISCIPLINE: Choose an item.		
ITEM #	LOCATION	COMMENTS		REVIEW ACTION	

**ATTACHMENT 20
COST ESTIMATE EXECUTIVE SUMMARY**

SUBMITTAL STAGE

BASE STATE DATE

PROJECT NUMBER

TITLE

ASSUMED BID OPENING DATE

MCC

90% MCC

BASE BID (Exclude Contingency & SIOH)