ARMY RESERVE

Design Process
And
Submittal Requirements

PART C
DESIGN/BUILD - DESIGN SUBMITTAL REQUIREMENTS AFTER AWARD

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TABLE OF CONTENTS

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Chapter 1.0 – ALL DISCIPLINES

1.1 GENERAL

This portion of the Army Reserve Design Process and Submittal Requirements manual describes development of project detailed designs - the working drawings, specifications and other documents comprising the completed project design documents. It applies to the design performed by the successful Design/Build (D/B) contractor after project award.

Note: This portion of the manual is called Part C. It is specific to Design Build projects, and for use by the successful D/B contractor. There are two other Parts, described below for general information only.

- DPSR manual **Part A - Project Inception and Project Definition** provides background information. It describes the Inception and Project Definition steps of Army Reserve projects. It begins with the Budget Process and ends with Project Definition (Phase I) wherein the project is sufficiently defined to allow detailed design. While Part A may be of some general interest to the Design Build Contractor, it has no requirements concerning D/B and is not a part of this Part C.
- DPSR manual **Part B - Detailed Design (Phase II**) describes detailed design for Design/Bid/Build (D/B/B) acquisitions. It does not address and has no requirements concerning D/B and is not a part of this Part C.
- DPSR manual **Part C - Design/Build - Design Submittal Requirements after Award** focuses on the design-after-award requirements for Army Reserve projects that use the Design/Build (D/B) method. The requirements covered begin with the successful D/B Contractor's design submittal requirements after D/B Contract award, then the various milestones as Contractor's design progresses. ‘A-E’ in this document refers to the Contractor A-E Designers of Record (DOR).

1.2 REFERENCE DOCUMENTS

Army Reserve D/B project design and construction are to comply with the Government criteria documents listed in Section 01 02 00.00 48 Statement of Work, Chapter 2.

The Army Reserve's approach to D/B projects is also more prescriptive than some other Federal agencies, and most private-sector clients. The Army Reserve has developed required or preferred design and construction solutions over its history, and much of this is incorporated into the USAR Design Guide, and the standard Section 01 02 00.00 48 Statement of Work.

Where there are references in this document to Army Reserve website, refer to following Louisville District website: https://www.lrd.usace.army.mil/Mission/Military-Construction-Reserve/Design-Guides/

1.3 ENERGY CONSERVATION

Provide energy conservation analyses on all buildings as required to ensure compliance with UFC 1-200-02 by validating the direction given in the RFP. Provide a summary of the information provided to state the percentage reduction in energy usage over ASHRAE 90.1, the improvements over the minimum building, describing systems and equipment compared, and calculation summary. This summary, also called the Energy Compliance Analysis (ECA), is a cooperative narrative and is not the responsibility of one discipline, overall responsibility of this narrative is that of the entire A-E team. Include the ECA in the Design Analysis at each design phase submittal. Refer to ECA requirements at each design phase submittal, as noted in the chapters below.

1.4 LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED)

Currently LEED certification is normally required in the solicitation. Refer to the D/B RFP solicitation for LEED requirements. If LEED certification and/or compliance documentation is not required in the solicitation, the LEED notations in the document do not apply.

1.5 CYBERSECURITY

Provide cybersecurity analysis on all Facility Related Control Systems (FRCS) as required to ensure compliance with UFC 4-010-06. Analyze the Confidentiality, Integrity, and Availability (CIA) impacts of that direction and design systems in compliance with it.

1.6 BUILDING INFORMATION MODELING (BIM) / CIVIL INFORMATION MODELING (CIM)

Refer to the Louisville District Military Design Guide (LDMDG) CADD/BIM chapter which at the time of this document is titled "Chapter 15 - Advanced Modeling and Digital Document Submittals" (located at https://www.lrd.usace.army.mil/Mission/Military-Construction-Reserve/Design-Guides/) for CADD/BIM/CIM requirements.

1.7 GENERAL SUBMITTAL REQUIREMENTS

Charrette Design Submittal, Revised Charrette Design Submittal, Interim Design Submittal, Final Design Submittal, Corrected Final Design Submittal, and Certified Final Design Submittals shall be provided in the formats indicated below, unless otherwise indicated in the RFP Specifications.

1.7.1 Hard Copies.

1.7.1.1 All hard copy document sets shall include printed plans, specifications, and Design Analyses (DA), as well as CDs, as indicated in RFP Specification Section 01 03 00.00 48.

1.7.2 Digital Copies

1.7.2.1 CDs shall contain all design submittal files, in electronic format. Drawing Set in full-size PDF format. DA in PDF format. Specifications (when applicable) in PDF format. CID (FF&E and SID) documents/binders (when applicable) shall be another PDF file. In addition to the CD/DVDs, also distribute the digital content of the CDs to all listed on the distribution list, via government file transfer website (confirm site with the USACE PE/A).

a. Drawing Set – Each drawing sheet shall be bookmarked with sheet number and name.
b. Design Analysis (DA) - The beginning of each section, and each appendix (attachment) of the DA, shall be bookmarked.
    1) DA Appendices - Minimum of 10 pages between bookmarks, maximum of 100 pages between bookmarks.
    2) For DA Appendices for calculations with a significant number of pages, like HVAC and energy modeling, provide bookmarks to separate calculations for easy navigation of the file.
c. Specifications - The start of each section shall be bookmarked.
    1) The Certified Final CD shall contain a folder with native specification section files.
d. CAD/BIM/CIM native drawing files as required by other sections of this document and criteria.

1.8 DESIGN PROCESS

1.8.1 Design Phases

1.8.1.1 The design phases shall consist of six design submittals, as further described in this document, below. The submittals are:

a. Charrette Design Submittal
b. Revised Charrette Design Submittal
c. Interim Design Submittal
d. Final Design Submittal
e. Corrected Final Design Submittal
f. Certified Final Design Submittal

1.8.2 Design Meetings

1.8.2.1 Refer to RFP Specification Section 01 03 00.00 48 for meeting accommodations and related requirements.

1.8.2.2 Post-Award and Pre-Work (Pre-Design) Meeting.

a. This meeting is an opportunity for the Government Project Engineer/Architect and the D/B Work design team to review the project requirements. A review of RFP Specification Sections 01 02 00.00 48,

01 03 00.00 48, and 01 04 00.00 48 would assure the designers understand the requirements and expectations of the design process. This is also an opportunity for the contractor, USACE's construction personnel, and the Project Manager to meet and go over project requirements. The design schedule should be discussed, and the first few design meeting dates need to be established.

1.9 CHARRETTE DESIGN PROCESS, MEETING, AND SUBMITTAL; REVISED CHARRETTE DOCUMENT AND SUBMITTAL

1.9.1 General

A Design Charrette will be part of the project design process. In the Charrette, the Contractor's designers provide the site and building design concepts for Government review and consideration. The Charrette is an opportunity to accommodate minor revisions to the Contractor's proposal site and building plans at no increased cost, and should be considered part of the design development process. For example, there may be areas in the building that could be rotated/shifted/move walls which would greatly improve the functionality of the facility. The Charrette process will culminate in agreed upon site and building design concepts accepted by the Government for development into the final project design and documents.

1.9.2 Pre-Charrette Actions

1.9.2.1 The Contractor's design team will prepare for the Charrette Design Meeting. One week prior to the meeting, Designer shall send the Charrette documents in pdf format to the Charrette Design Meeting participants. Electronic submissions via ftp, government file transfer website, or email (size permitting); discuss with the Louisville District PE/A. Design team shall prepare and send out the following documents ahead of the Charrette Design Meeting:

a. Site plan and floor plan reflecting the accepted plans.
b. Floor plan shall be color coded by Reserve Unit occupying the building. Provide annotation of the units occupying the building for each drill weekend.
c. Design Narrative.
    1) A narrative description of the major systems, including roof material, exterior skin, windows, doors, mechanical units, electrical, structure, finishes, fire protection, mass notification, IT, sustainability, and any special systems.
    2) A narrative description of site characteristics, and any special site considerations, site utilities, permits, and foundations, to the extent known. Discuss how the site will comply with EISA Section 438 and UFC 3-210-10 Low Impact Development.
    3) Provide historical and present-day site aerial images, for possible reference
    4) Space Allocation Table (Area Tabulation). Provide in the same format as the Functional Space Details Worksheet, which is part of the project program documentation (provided by USACE PM after award). Indicate the facilities' 'approved' (by project program requirements)

square footages, the 'placed' (as designed) square footages, and the resulting area ‘differences’ in square feet. Format to follow the Functional Space Details Worksheet indicated program functional categories and space (room) listings.

d. Drawings.
   1) Site plan and floor plan reflecting the accepted proposal plans.
   2) Floor plan shall be color coded by Reserve Unit occupying the building. Provide annotation of the units occupying the building for each drill weekend.
e. Value Engineering Change Proposals (VECP), if any. Refer to Section 00 80 00.00 06, the paragraph "VALUE ENGINEERING AFTER AWARD", or similar title.

1.9.2.2 Via email, provide a draft Charrette Design Meeting agenda to the USACE PE/A and PM, for USARC G-3/5/7 approval. Agenda should include breakout sessions by discipline. Provide approximately one month prior to the meeting, coordinate with the PE/A and the construction field office.

1.9.3 Charrette Design Meeting

The Charrette Design Meeting takes place on or near the site and uses a Charrette process to arrive at a mutually acceptable design solution. This process is characterized by a free exchange of information and ideas between Users and designers that establish project design direction. Charrette Design Meeting participants are encouraged to bring their ideas to the meeting, with no formal comment collection and response required or desired beforehand.

1.9.3.1 Process. All decisions at this meeting are intended to result in a thought-through solution, suitable for development as the Final design. The USACE PM and Project Officer should emphasize this to all team members. Attendees must be decision-makers. See further description of the Charrette objectives in Section 01 02 00.00 48 Statement of Work, Part 01, under subparagraph Design Objectives.

1.9.3.2 Color Scheme. The design team shall bring for discussion color images of interior and exterior finishes of the selected color scheme.

1.9.3.3 Facilities and Attendees. Administrative support is crucial to this type of process. The facility meeting room and location requirements are described in Section 01 03 00.00 48 DESIGN SUBMISSIONS AFTER AWARD, paragraph "Submission of Design Documents", the subparagraph describing predesign, partnering and Charrette Review Meeting locations and arrangements.

1.9.3.4 Presentation. The design team will present the Charrette documents and review and further refine the proposed design.

a. Site layouts and floor plans. The Contractor’s designers shall develop and refine the conceptual site and building design in their completion of the design and construction documents. Such development shall be consistent with the criteria and acceptable to the Government.
b. This meeting shall include a very brief review of the project design criteria. This includes baseline requirements, energy and water use reduction, and renewable energy systems.

c. The design team reviews the planned LEED Checklist, how it relates to the RFP requirements, including any possible difficulties or project specific impacts.

1.9.3.5 Design Iteration. The DOR is to visit the project site and existing building (if one exists) to validate information before the meeting. After the initial Charrette Review Meeting session, the designers are to coordinate with local utility providers and regulatory agencies, and start revising site and space layout schemes based on discussions during the Charrette Review Meeting. Breakout sessions of all disciplines should occur. Other members of the PDT remain available for consultation. When the designer is ready, the other participants reconvene to hear and discuss the clarifications and possible minor revisions, and provide additional guidance. The group adjourns again, while the designer refines the design to incorporate the latest comments. This is an iterative process, which continues until the design is acceptable.

1.9.3.6 Breakout Meetings. The Designers of Record are also required to hold the following individual meetings with the Users on their respective areas of responsibility.

a. The Architect and Interior Designer are required to hold a furniture meeting with the Users on site after the Charrette. This meeting is usually held the day after the general Charrette Design Meeting. They shall discuss each room and the furniture requirements involved. The discussions from this meeting shall be reflected in the future FF&E and SID submittals. Meeting minutes will be provided to the entire project delivery team.
b. For projects on an Installation, the ICT Designer is required to hold a separate meeting with the Users and personnel from the Army Reserve telecommunications office (usually the Installation's NEC). For projects on an Installation, a separate meeting with USARC G6 is not typically needed. The ICT Designer shall discuss the telecommunications requirements of the project. The discussions from this meeting shall be reflected in the Interim Design Submittal. Meeting minutes will be provided to the entire project delivery team.

1.9.3.7 The end result of the Charrette phase is an agreement on the following:

a. The scheme reflecting the accepted changes to the proposed design, and to be developed.
b. Site Plan. Plan will show building footprints, AT/FP setbacks/clear zones, Privately Owned Vehicle (POV) parking, Military Equipment Parking (MEP), access roads, and general site layout and circulation. Indicate the general location of new buildings, paved areas, structures, fences, ramps and curbs. Locate the building from a known point of reference. Show areas for stormwater management/low impact development best management practices. A preliminary grading flow plan may be developed, depicting anticipated flow directions of stormwater runoff.
    1) A preliminary site grading flow concept plan, depicting anticipated flow directions of stormwater runoff.
    2) A preliminary site utility plan(s), including telecommunications and power, depicting anticipated utility connection points and planned routings to provide service for the project.

c. Floor Plan/Space Layout. Floor plans, provided for each building. Agreement on plan adjustments, room configurations, room adjacencies, and adjusted room areas.
d. Wall and roof construction type, and insulation.
e. The color scheme and finishes.
f. MEP Systems, sustainability measures, and renewable energy technologies being incorporated into the project.
g. Wrap-up, including:
    1) Design summary.
    2) Schedule, including scheduling the Revised Charrette Conference Call.
    3) Action items, also referred to as Taskers, including any discussion of possible pending project cost changes.
    4) If applicable, a written plan describing any portions of the design that will be fast-tracked. In the written plan, be sure to include a description of fast-track items which will be in the fast-track package. Each fast-track package must be a separate and complete package submitted, reviewed, and approved independent of all other packages. This plan must be approved by USACE.
    5) Any design issues which arise which are not addressed in the RFP shall be identified by the Contractor and brought to the attention of the USACE Project Manager and the USACE Project Engineer/Architect. A response will be furnished by the USACE COR, and if necessary, a change order will be issued.

1.9.3.8 Deliverables: The Contractor provides participants with electronic outline draft meeting minutes, a list of participants, electronic copies of the draft design files (PDF format), sufficient to define the results of the meeting.

The Design Project Manager is responsible for preparing and distributing meeting minutes for all meetings and conference calls during design. The meeting minutes will be distributed to the entire project delivery team and meeting attendees within 10 business days of a meeting and within 5 business days of a conference call, and shall include clearly designated and assigned Taskers (Action Items).

1.9.4 Revised Charrette Design Submittal Requirements

1.9.4.1 Revised Charrette Document: The Revised Charrette document will be submitted to the Government after the Charrette Design Meeting, in the time frame called for in the schedule. It consists of meeting minutes, updated narrative, and image files. Note that this is not an opportunity to revise functional space. Provide the following:

Design Narrative: This narrative will supplement meeting minutes that provide a thorough record of discussions, iterations, and decisions from the Charrette Design Meeting. Provide an update/elaboration of the information previously provided as part of the Charrette package. Also include the following:
1) List of sustainable systems, energy use reduction systems/features, water conservation measures, and technologies which will be implemented into the project, including any applicable ECA.
2) Description of the HVAC system and related components.

3) List the wall and roof construction type and insulation.
4) List special equipment with unusually large electrical or cooling loads.
5) Document and confirm any Government provided equipment lists; i.e. vehicle lists, weapons lists, unique requirements for Unit Storage, etc.
6) Provide information on any known utility conflicts or capacity upgrades that are required for the project.
7) Information Needed to Complete Design. Each discipline is to provide a listing of additional information or material required to complete the design and the source needed for that information, including dates the information is needed to be provided, or state that additional information is not necessary.
8) In the hard copy submittal, the drawings required below may be properly scaled to fit in the back of the Design Narrative as foldouts, or provided separately.
9) Provide cybersecurity analysis in accordance with UFC 4-010-06.

b. Drawings.
   1) Site Plan. As determined agreed and developed in the Charrette Review Meeting. Include at a minimum:
      (a) Indicate the general location of new buildings, paved areas, structures, fences.
      (b) Privately Owned Vehicle (POV) parking, Military Equipment Parking (MEP), access roads, and general site layout and circulation
      (c) Accessible parking as required.
      (d) Dumpster location and screen walls as required.
      (e) Show the work area limits.
      (f) Show the building orientation, footprint, and facility expansion areas.
      (g) AT/FP setbacks/clear zones.
      (h) Locations for renewable energy equipment, or planned future location.
      (i) Show areas for stormwater management/low-impact development (LID) strategies and best management practices (BMP) infiltration areas.
      (j) A preliminary grading flow plan may be developed, depicting anticipated flow directions of stormwater runoff.
      (k) Preliminary site grading flow concept plan(s), and preliminary site utility plan(s).
   2) Architectural Floor Plans. Complete the floor plans showing the correct room names and numbers, wall locations, toilet fixtures, lockers, folding partitions, storage cages, doors, and the common administration area workstations and benching systems.

1.9.5 Review

The Revised Charrette Design Submittal is sent to the Charrette Design Meeting participants to document agreements made at the Charrette Design Meeting. There is usually no review meeting, however a Revised Charrette Conference Call (virtual meeting) is typical. The purpose of the conference call is to verify the submitted floor plan and other submitted documents are as agreed. Any decisions and new changes to the Revised Charrette documents must be approved by the Project Officer and will be incorporated in the Interim Design Submittal.

1.10 INTERIM DESIGN SUBMITTAL

1.10.1 General

Interim Design Submittal is for technical review of the design. It is not a functional review.

The Interim phase consists of:

1.10.1.1 Interim (50%) Design for architecture, structural, interior design, civil, mechanical, electrical, telecommunications systems.

1.10.1.2 Refer to RFP Specification Section 01 03 00.00 48 for the determination of permissibility of a project specific fast-track approach. For projects employing fast-track, provide (100%) design for site design to include: building/site area layout, final grade elevations, site utilities including electrical and telecommunications, permits. All elements required for Final Design Submittal under the Civil chapter below are to be included in this fast-track package. If structural elements (i.e. foundations/footings) are allowed by the RFP to be included in the fast-track package, those elements shall be provided in a Final Design Submittal level of development.

1.10.2 Submittal Requirements

1.10.2.1 As listed below, plus see the discipline chapters for additional specific submittal requirements.

1.10.2.2 Drawings. Depicting major components of the civil, architectural, interior design, structural, mechanical, electrical, fire protection, and ICT design as well as complete building elevations. Interim Design Submittal drawings also include ramps, curbs, and any LEED site features, such as vehicle parking signs, designated smoking areas, and bicycle storage/rack locations, etc.

a. Fire Protection/Life Safety Plan. Provide fire protection/life safety drawings that indicate fire suppression information, exit signs, pull stations, exit devices, exit distance, emergency lights, detectors, alarm locations and fire panel locations. Provide the same review code text from the Fire Protection and Life Safety Form on the Fire Protection/Life Safety and Accessibility Drawing(s).

1.10.2.3 Design Analysis. Provide a narrative that is an expansion and elaboration, with updates, by each discipline from that provided at the Revised Charrette design. Contains a narrative by each discipline, and preliminary calculations and product selections for each discipline. Include attachments as appendixed material. Provide the Interim Design Analysis as a new document, not as addenda to the Charrette document. Include the following items:

a. Minutes of prior meetings.
b. Space Allocation Table (Area Tabulation).
c. A description of the major systems, including roof material, exterior skin, windows, doors, mechanical units, electrical, structure, finishes, fire protection, mass notification, ICT systems, and any special systems.
d. List of required permits for the project; including requirements and status of permit filing/acquisition.

e. Include a draft of the Louisville District (LRL) ATFP Standards Review Checklist (with a header label of “DoD Minimum Antiterrorism Construction Standards”) for the project to demonstrate compliance. The form is available on Army Reserve website; link labeled ‘LRL ATFP Standards Review Checklist’.
f. Contractor provided geotechnical investigation and design report, as required by the D/B RFP solicitation.
g. Completed draft version of the “Fire Protection / Life Safety / Accessibility Code Review” form. The form is available on the Army Reserve website; link labeled ‘Fire Protection/Life Safety Code Submittal’.
h. Provide a draft version of the Energy and Sustainability Record Card, available on the Army Reserve website; verify most current version of the form with the PE/A.
i. LEED spreadsheet with anticipated credits noted.
j. A list of proposed project specification sections.
k. Information Needed to Complete Design. Each discipline is to provide a listing of additional information or material required to complete the design and the source needed for that information, including dates the information is needed to be provided, or state that additional information is not necessary.
l. Provide cybersecurity analysis in accordance with UFC 4-010-06.

The design effort continues during the review process.

1.10.3 Checking

All drawings and calculations are checked as required by the Design Quality Control Plan.

1.10.4 Review

1.10.4.1 All review comments will be submitted in DrChecks, completed no less than one week prior to the review meeting. The design team shall respond to the DrChecks comments before the review meeting, and bring 6 copies of the DrChecks comments for key players to the meeting. Email a PDF of the comments and draft responses to the USACE PE/A and PM. The USACE PE/A or PM will send the meeting invitation, the agreed upon meeting agenda, DrChecks and any other information to the invited meeting attendees. At the meeting, the design team is to use a projector/large format television for reviewing the comments with the entire team to reduce the number of printed copies. It is anticipated that those DrChecks comments not yet evaluated and those whose evaluation is not “Concur” (Non-Concur, Check and Resolve, and For Information Only) will be discussed at the review meeting. Comments with a "Concur" response that is acceptable to the Government may not receive further discussion at the meeting, unless otherwise requested by USARC G-3/5/7.

1.10.4.2 There will be an Interim Design Review Meeting to discuss review comments and other issues. Design team personnel shall attend in person, as indicated in the solicitation. Disciplines not in attendance shall be available for attendance via conference or video call.

1.11 FINAL DESIGN SUBMITTAL

1.11.1 General

The Final Design Submittal consists of a complete (100%) design required to build the project. It includes all completed drawings, fully edited specifications, and Design Analysis.

1.11.2 Comments

Incorporate all approved Interim Design Submittal comments into the design.

1.11.3 Submittal Requirements

(See also the discipline chapters for specific submittal requirements.)

1.11.3.1 Design Analysis

a. Provide a narrative that is an expansion and elaboration, with updates, by each discipline from that provided at Interim design. Include required and missing information that was not included in prior submittal phases. Address all previous review comments and incorporate into submittal. The Final DA shall be a complete document with all content, not issued as an amendment to previously submitted Design Analysis. Also provide the following items.
b. Provide design calculations and supporting documentation to support the major technical design considerations. Calculations shall be computed and checked by separate individuals, one of which must be a licensed professional in the associated discipline. Supporting documentation shall be clear, and formulas and references shall be identified. Assumptions and conclusions shall be explained, and cross-referencing shall be clear. Provide as called for in the various discipline chapters.
c. Checking.
    1) All drawings and calculations are checked as required by the Design Quality Control Plan.
d. Meeting Minutes from all previous meetings.
e. Copy of the Interim DrChecks; current at the time of the submittal.
f. Cut sheets, product selections forming the basis of design: Clearly mark the selected product type or model intended to apply to the project. If the cut sheets or brochures are standard printouts from manufacturer showing several variations, either mark/mark out to indicate just the selected product or accompany the cut sheet with a cover sheet showing the applicable product.
    1) Cut sheets provided at the design stages are intended only to show the basis of design, and are not shop drawings as called for in Specification Section 01 33 00.10 06 SUBMITTAL PROCEDURES FOR DESIGN/BUILD.
g. Include as appendices material all project-specific documentation such as existing condition hazardous materials (asbestos, lead, etc.) reports and other hazmat reports.

h. Provide a refined energy model which incorporates all strategies selected during the Charrette phase, and refined through Interim and Final phases. Include an estimated project energy use index (EUI) kbtu/sf/yr resulting from combined strategies. Include a typical range of similar buildings in the same climate zone for comparison.
i. Provide sustainability/LEED credit checklist (Yes/No form), all applicable LEED template forms, and LEED template supporting documentation, or other applicable documentation indicated in the solicitation.
    1) The LEED content is preferred to be a separate volume of the DA due to sheet count.
j. Provide a completed Energy and Sustainability Record Card.
k. Completed and signed Louisville District “DoD Minimum Antiterrorism Construction Standards Checklist”.
l. Completed and signed Louisville District “Fire Protection / Life Safety / Accessibility Code Review” form.
m. Completed and signed ‘Arms Vault Security Checklist’ (available on the Army Reserve website).
    1) This form is completed by the Contractor A-E, to confirm the design documents meet the requirements. The Contractor A-E is to provide additional signature lines with the Contactor A-Es responsible for design listed and named, with discipline indicated.
    2) The Contractor A-E version of the form will not be directly used to certify the vault.
    3) The USACE Construction District will have a blank version of the form coordinated with the Contractor, and completed by USACE and the Contractor during the construction phase as part of the vault certification process.
n. Special Contract Requirements. Provide a special contract requirements section that is developed per the Scope of Work (RFP) requirements for the project.
o. Provide cybersecurity analysis in accordance with UFC 4-010-06.

1.11.3.2 Drawings. Provide complete drawing set covering all disciplines including all plans, components, details, and schedules.

a. The fire protection engineer shall place their registered professional engineer stamp on all Fire Protection/Life Safety Plans prior to submittal to the Government.
    1) Fire Protection/Life Safety Plan: Provide fire protection/life safety drawings that indicate fire suppression information, exit signs, pull stations, exit devices, exit distance, emergency lights, detectors, alarm locations and fire panel locations. Provide the same review code text on the fire protection and life safety form on the fire protection/life safety and accessibility drawings.

1.11.3.3 Specifications. Provide complete project specifications covering all disciplines and aspects of the project.

a. Required specifications origin and technical content shall be as called for in the solicitation.
b. The digital versions of the Final specifications shall be provided in two bookmarked PDF versions; one showing all additions and deletions (with graphical differentiation between original UFGS text and the additions and

deletions), and the other being a version with all edits incorporated (no deletions shown and no graphical differentiation between original text and additions). These two versions will enable reviewers to understand the scope of editing. The printed version of the specifications will only be the version with all edits incorporated.

c. Provide independent page numbering for each specification section. The page number shall incorporate the specification section number (e.g. 08 11 13.00 06-1).
d. Submitted hard copy documents must be printed directly from the electronic file.
e. Provide submittal checklist also in PDF format.
f. Division 00 and Division 01 specifications shall not be edited or reproduced and shall not be included with the technical specifications. Divisions 00 and 01 are contract requirements; therefore, can only be changed by contract modification
g. Submittal Register. Provide a separate file of the completed submittal register (ENG Form 4288). Refer to Specification Section 01 03 00.00 48.

1.11.3.4 DD Form 1354. Provide draft DD Form 1354 (Transfer of Real Property). A blank PDF form can be found here:

https://www.esd.whs.mil/Directives/forms/

Refer to UFC 1-300-08 “Criteria For Transfer and Acceptance of DoD Real Property” for information on the DD Form 1354 and form completion guidance.

The 1354 form itemizes the types, quantities and costs of various equipment and systems that make up the project, for the purpose of transferring the new construction project from the USACE Construction Division to the Readiness Division/Installation's inventory of real property. Contact the Readiness Division or Installation’s Real Property POC and obtain the specific category codes used to report key utilities for O&M funds, and to align the DD Form 1354 document with the identical category codes.

a. Contractor provides draft DD Form 1354, and associated equipment lists, for Government approval, and assists the Government in finalizing the Form.
b. A draft DD Form 1354 is prepared by the Designer of Record, and submitted with the Final design. The draft is updated per the Final design comments and resubmitted with the Certified Final design. This document is used by USACE construction personnel to complete the final DD 1354 upon completion of construction.

1.11.3.5 Final Design Checklist. Provide a completed and signed checklist to the PE/A. The form is available on Army Reserve website; link labeled ‘Design Build Checklist’. Verify current form with the PE/A prior to submission.

1.11.4 Review

1.11.4.1 All review comments will be submitted in DrChecks, completed no less than one week prior to the review meeting. The design team shall respond to the DrChecks comments before the review meeting, and bring 6 copies of the latest DrChecks comment report key players at the meeting. Email a PDF of the comments and draft responses to the invited meeting attendees. At the meeting, the design team is to use a projector/large format television for reviewing the comments with the entire team to reduce the number of printed copies.

1.11.4.2 The PE/A should direct the PDT to review the Final Submittal against their Interim DrChecks comments, and close those comments that have been addressed. Any comments still open or outstanding should be discussed at the Final Design Review Meeting.

1.11.4.3 A Final Design Review Meeting is held at the project location per the date in the agreed project schedule, to discuss the review comments and other issues. Design team personnel shall attend in person, as indicated in the solicitation. Disciplines not in attendance shall be available for attendance via conference or video call.

1.11.4.4 At the Final Design Review Meeting, discuss review comments and other issues. It is anticipated that those DrChecks comments which have not evaluated, and those whose evaluation is not “Concur”, will be discussed at the review meeting. Comments with a "Concur" response that is acceptable to Government may not receive further discussion at the meeting, unless otherwise requested by the USARC G-3/5/7 Project Officer. Interim DrChecks comments that have not been closed or are still outstanding should also be reviewed for closure at the meeting.

1.12 CORRECTED FINAL DESIGN SUBMITTAL

1.12.1 Comments incorporation.

Corrected Final Design Submittal will incorporate all approved Final Submittal review comments into the design and other issues arising at the Final Design Review Meeting and as agreed.

1.12.1.1 Contractor shall provide response to all DrChecks comments, with further response as needed to satisfy backcheck follow-up by USACE. Upon satisfactory comment resolution as described above, USACE may then close all comments.

1.12.1.2 Provide an electronic PDF complete set of the Drawings, Specifications, and Design Analysis incorporating Final review comments. The Specification is to be issued (digital and hard copy) with all edits incorporated, with no graphical differentiation between original text and additions. The documents shall include red-lined mark-ups with a red cloud circling the change related to the applicable comment, and marking each comment affected edit with the Commenter's name and the DrChecks comment number. Electronic files to be submitted via CD/DVD to those listed in the distribution list in the RFP. Verify with the PE/A if the files may be submitted via other electronic methods (i.e. DoD SAFE).

1.12.1.3 Any further corrections made to the Corrected Final shall be sent to the PE/A and reviewer directly via email or fax, or with a PDF file attached to the DrChecks comment, so the outstanding comment can be closed.

1.12.1.4 Refer to RFP Specification Section 01 03 00.00 48 for the determination of permissibility of a project specific fast-track approach. For projects employing fast-track, the Corrected Final Design Submittal for the fast-track package may be issued prior to the Final Design Submittal of the remainder of the project. Refer to RFP Specification Section 01 04 00.00 48 for project design phase sample schedule.

1.13 CERTIFIED FINAL DESIGN COMPLETION PROCESS

1.13.1 General

1.13.1.1 The Corrected Final Documents shall reflect all comment responses. The A-E's Project Manager is responsible to ensure that ALL comments have been addressed. All comments must be responded to and closed before the PE/A will provide concurrence that the project is ready for compiling, printing, and distributing the Certified Final Design Submittal documents.

a. For the PE/A to provide concurrence that design is complete, all comments must be closed in Dr Checks.

1.13.1.2 The PE/A shall download the current forms, located on the Louisville District's Qualtrax System website. The PE/A shall provide three forms to the A-E PM. The forms will be rejected and will need to be resubmitted if the current forms are not used. As called for in the RFP, the A-E is responsible to provide two Internal Technical Review (ITR) Forms and the Final Design & Certified Final Design Checklist. These forms shall be completed and signed.

a. The Contractor Statement of Technical Review requires all signatures by the ITR team. It documents that an ITR was conducted for the project.
b. The Certification of Independent Technical Review requires signatures by a principal of the firm and Design team leader, ITR team leader and other management level reviewers. It certifies that the ITR comments have been considered, concerns identified, and their resolution will be included in the Certified Final documents.
c. The Final Design & Certified Final Design Checklist requires completion and a signature by the A-E PM. It certifies that all design requirements in the RFP have been addressed.
d. The A-E PM will also provide the Submittal Register .txt file at this time.

1.13.1.3 The PE/A shall provide the Statement of Technical Review Completion of Quality Assurance Review form to each appropriate design discipline reviewer in Engineering Division for signature.

1.13.1.4 In order for the PE/A to provide design concurrence that the project is ready for Certified Final design printing and distribution, there must be no outstanding issues, and the PE/A must have the following documents to provide to the LRL PM, the Geographic District Construction Division Resident Engineer, the Geographic District Construction Division Project Engineer, the LRL AR Resident Engineer, the Contractor, and the A-E PM.

a. The following documents should be included in this email:
   1) Signed Statement of Technical Review Completion of Quality Assurance Review form PDF.
   2) The Contractor Statement of Technical Review form.
   3) The Certification of Independent Technical Review form.
   4) The Final Design & Certified Final Design Checklist.
   5) Engineering Considerations and Instructions to Field Personnel (ECIFP) PDF. (The AE should have this located in the Design Analysis).
   6) Submittal Register .txt file.
   7) DrChecks PDF of the Project front page (showing all comments are closed by having all 0's in the pending and open columns) proving all comments have been closed.

1.13.1.5 After the PE/A sends the email for Certified Final design concurrence, the A-E is to provide the Certified Final documents.

1.14 CERTIFIED FINAL DESIGN SUBMITTAL

The Certified Final Design Submittal is when ALL review comments have been addressed, incorporated into the design, and the Final design (including the Corrected Final Design Submittal) has been approved, and ready for construction. This determination will be made by the Government and communicated with the Contractor.

These documents will be complete and will be the documents used For Construction.

It shall include full size stamped and signed set of drawings with signatures on each sheet and professional stamps from each Designer of Record.

Refer to RFP Specification Section 01 03 00.00 48 for a description of the Certified Final process, and hard copy requirements and quantities.

Upon approval by the Government, the A-E shall provide Certified Final Design Submittal hard copy drawing set(s), specification(s), and Design Analyses updated to include Final Design Review Meeting Minutes and closed Final DrChecks comments.

The Certified Final Design Analysis is to include narrative and attachments that are an expansion and elaboration, with updates, by each discipline from that provided at Final design, all Interim and Final DrChecks comments, and all meeting minutes including from the Final Design Review Meeting.

The Certified Final Design Submittal shall include a plotted full size stamped and signed set of drawings.

Each sheet of the Certified Final drawing set shall include signed professional stamps from each Designer of Record (all engineers, LA, Architect, RCDD, etc.).

The drawings shall also include the original Project Number (located on the DD Form 1391 document), the Drawing Code, and the P2 Number (which is a USACE six-digit

number for project funding). The PE/A or the PM can provide the P2 Number, and the PE/A can provide the Drawing Code.

The electronic drawings shall have the names of the designer and checker typed in the title block.

At completion of this phase the Contractor shall provide CD(s) containing the following, or as additionally required in the RFP:

- Native format project files -- drawings and specification files.
- Contract document files formatted for general use with respect to the project -- drawings, specifications, and Design Analysis converted to PDF files. Each shall be contained in a separate file folder. The drawing set shall be formatted into one large PDF document, with each sheet bookmarked with sheet number and sheet name. The specifications shall be formatted into one large PDF document, bookmarked appropriately. Design Analysis shall be similarly formatted.

1.15 RENDERINGS

If renderings are required per the Statement of Work, then designer shall submit one or more samples of renderings (which can be from another project), showing the quality and style of the proposed final rendering.

Once the USARC G-3/5/7 Project Officer approves the submitted style, designer shall develop three sample draft view angle sketches (black and white from the BIM model is acceptable) for the project. Submit the three sketches electronically in PDF format to the USACE PE/A, who will distribute to the USACE PM and Project Officer. These will be used by the USARC G-3/5/7 Project Officer to determine the best view/angle for the particular project. Designers shall wait until a selection and approval is given by the USACE PE/A before further developing the selected sketch into the final rendering. Reproduce the rendering according to the Statement of Work.

Renderings shall have the facility/complex as the main focal point. The project name from the DD Form 1391 is usually centered as a title, with the project location. It is acceptable for the design firm to include its name and logo on the rendering.

Chapter 2.0 – CIVIL

2.1 GENERAL

2.1.1 Scope

This chapter provides guidance for the preparation and development for each of the different required submittal stages, as they relate to civil engineering. Including how civil interfaces with survey, geotechnical, and environmental disciplines. Electrical and telecommunications utilities are found in their respective chapters.

2.1.2 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

2.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

2.2 CHARRETTE DESIGN

2.2.1 Submittal Requirements.

2.2.1.1 Provide draft Contractor provided survey and geotechnical report, if available.

2.2.1.2 Discuss how the site will comply with EISA Section 438 and UFC 3-210-10 Low Impact Development.

2.3 INTERIM DESIGN

2.3.1 Survey and Geotechnical Data

2.3.1.1 Submit contractor provided survey and geotechnical data as called for in RFP Specification Sections 01 02 00.00 48 STATEMENT OF WORK and 01 03 00.00 48 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD.

2.3.1.2 Once the proposed building(s), parking locations, and stormwater management areas are finalized after the Charrette Design Review Meeting, perform a complete geotechnical investigation. Provide boring logs and locations in the required CADD format.

2.3.2 Design Analysis.

2.3.2.1 Site Design. Provide a complete explanation of the site design.

a. Describe any required site demolition.
b. Provide a section on the utility design including metering, backflow prevention, easements, connection fees, design coordination/approval process, and any other utility provider requirements.
c. Describe the setbacks and separations of parking and buildings required by UFC 4-010-01 DoD Minimum Antiterrorism Standards.

d. Describe new site grading, including anticipated maximum cut and fill on the site, as well as disposition of excess materials or source of borrow material.
e. Describe management of site stormwater runoff; including both volume and quality of runoff. Describe compliance methods related to meeting the requirements of UFC 3-210-10 Low Impact Development.
f. Provide truck turning diagrams and vehicle circulation information based on project-specific design vehicles coordinated with Users.

2.3.2.2 Geotechnical Report. Provide a complete geotechnical report with the Interim design.

2.3.3 Drawings.

2.3.3.1 Site Location Map. Include a drawing showing site and area location maps indicating the location of the site in relation to the state, city/county, and local areas.

2.3.3.2 Survey Control Drawing. Show the baseline reference points on a site plan, together with detailed information for each reference point (location from known features, horizontal coordinates, elevation, and reference datum).

2.3.3.3 Aerial Photograph. Obtain recent aerial photography, which reflects current site conditions, typically available by using Google Earth or other aerial websites, and include a drawing showing the proposed site overlaid on an aerial photograph. The date and copyright of the aerial photography shall be noted on the drawings. Mark this sheet “For Information Only”.

2.3.3.4 Site Photographs. Include drawing(s) showing photographs of the existing site conditions to be encountered by the Contractor. Approximately eight photographs are to be provided, along with a key plan showing location and orientation of the photographs. Provide additional photos if more site-specific conditions need to be shown. Provide the date that the photographs were obtained and mark this sheet “For Information Only”.

2.3.3.5 Demolition Plan. Complete the demolition plan.

2.3.3.6 Code Compliance Site Plan. Include a drawing as required by UFC 3-600-01 Fire Protection Engineering for Facilities.

2.3.3.7 Site Plans. Complete the site plan, as a development of the Charrette site plan requirements (see Chapter 1 above).

a. Dimension all significant features of the site plan including ATFP setbacks, easements, and Right of Way limits/setbacks.
b. Identify the work limits for the project with coordinates including the area used by the Contractor for material staging.
c. Identify reserved area(s) for future expansion on the site and minimize future site impacts with current design, if possible.

2.3.3.8 Grading and Drainage Plan. Provide proposed contours and drainage structure locations superimposed on the proposed new site plan with the existing contours in the background. Grading plan may be incomplete at Interim review.

a. Label structure types and show piping between structures.

b. Indicate the new building(s), pavement, drainage inlets, structures, swales and/or detention areas along with the existing and proposed new piping.
c. Indicate existing contours with a light line proposed new contours with a darker line. Locate spot elevations and slope labels to describe the design intent.
d. Indicate finished floor elevations (FFE) of any buildings.
e. Show locations of soil borings with symbols and numbers as defined in the geotechnical investigation.

2.3.3.9 Storm and Sanitary Site Plan. Provide storm and sanitary sewer layouts superimposed on the proposed site plan. Label sewer structures. Pipe sizes and elevations may be estimated. Sanitary utilities may be shown with the overall utility plan instead, if the information can be displayed clearly.

2.3.3.10 Utility Plans. Initiate the creation of the overall utility plan for other disciplines and coordinate this with other disciplines. Create utility plans for the sanitary sewer, storm sewer, natural gas, domestic water, and fire protection water systems. Create enlarged plans as required to clearly depict all requirements.

a. To help facilitate coordination and understanding of all utility relationships; on the civil utility plans reference and show electrical, telecommunications, and any mechanical site utility plans from other disciplines and refer to those plan sheet locations for additional information.
b. Facilities not on a military Installation require coordination with the local utility and typically involve separate submittals and permits.
c. Facilities in military installations that have some or all utilities privatized typically involve separate submittals and compliance with the standards of those utilities.
d. This sheet shall show the building and pavement locations with the connection of new utilities from the building to the existing utilities. Indicate the pipe sizes and/or capacities for electricity, gas, water and sewer. Indicate the adequacy of the water system for providing water for fire protection, including flow test data if available. Also indicate the above ground utility structures such as power poles and fire hydrants. Show estimated size for new project demand.

2.3.3.11 Road and Parking Area Profiles. Grading profiles should be completed for the Interim Submittal. Provide profiles of proposed roadway and parking lot facilities. Label vertical alignment, proposed profile grade, existing ground and utility crossings.

2.3.3.12 Typical Sections. Provide typical roadway and parking lot sections.

2.3.3.13 Boring Locations and Logs. Provide a drawing showing the location of the borings taken in the geotechnical investigation. Also provide boring logs that show graphically the types of soils encountered in the geotechnical investigation. Typically, six letter sized boring logs per drawing sheet display legibly when printed at half-size; verify legibility when printed. Coordinate these sheets with the geotechnical engineer.

2.3.3.14 Right of Way Plans. If the project is located adjacent to private property, provide a separate “Right of Way” plan as required. Provide reference drawings showing all land required for construction of the project.

2.3.4 Specifications.

Provide a listing of specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

2.4 FINAL DESIGN

2.4.1 Design Analysis.

2.4.1.1 Site Design. Update and continue development of the Design Analysis submitted for the Interim design, providing additional details as needed to describe the complete site design including decisions made on the project. Provide information regarding site demolition. Provide a section on the utility design.

2.4.1.2 Civil Calculations. Provide calculations for stormwater management as required by utility agencies, ASHRAE, EISA Section 438 Low Impact Development, and LEED. Provide PCASE calculations for pavement designs. Provide utility calculations for sanitary sewer piping, grease traps, and oil/water separators if used.

2.4.1.3 Permits. Provide documentation of coordination/approvals with all utility agency permits required for construction. Provide list of all fees to be paid by the Contractor and any other action items required by others after award.

2.4.2 Drawings.

Complete previously submitted Interim drawings, and additional drawings for a complete design package.

2.4.2.1 Sanitary Sewer Profiles. Provide profile sections of the sanitary sewer system showing the manhole locations, pipe sizes and grades and other utility crossings.

2.4.2.2 Storm Sewer Profiles. Provide pipe profiles of the storm system when necessary showing manhole locations, pipe sizes and grades and other utility crossings.

2.4.2.3 Erosion Control Plan. Provide an erosion control plan with details that show the critical areas that are being protected while the project is under construction. Coordinate the details of this sheet with state and local authorities as required. Obtain the necessary permits such as NPDES, 401 and/or 404 and develop the Storm Water Pollution Prevention Plan (SWPPP) associated with NPDES.

a. Coordinate the NPDES permit associated with construction activities, including obtaining forms and supporting data. Obtain the permit and abide by the terms of the permit.

b. The permit usually requires the signature of the "owner" of the facility and will require coordination with the local installation. Coordinate with the PE/A.

2.4.2.4 Details. Provide complete details of stormwater BMPs, pavement joints, concrete, fences, manholes, catch basins, other site structures and any other details necessary to show all aspects of the design.

2.4.2.5 Exterior Facility Signage. Provide location of facility signage with complete design and installation details. This signage may be shown on the Site Plan or Landscape drawings. A note referencing the signage schedule and any other facility signage information found in the architectural drawings will be included.

2.4.3 Specifications.

Provide a complete set of fully edited specifications.

Chapter 3.0 – LANDSCAPE ARCHITECTURE

3.1 GENERAL

3.1.1 Scope

This chapter provides guidance for preparation and development for each of the different required submittal stages, as they relate to landscape architecture.

3.1.2 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

3.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

3.2 CHARRETTE DESIGN

Refer to Chapter 1 "All Disciplines" above, paragraph: Phase II - Charrette Design, Process, Meeting, and Submittals.

3.3 INTERIM DESIGN

3.3.1 Design Analysis

The Charrette phase Design Narrative forms the basis of the Interim and Final Design Analysis. Depending on submittal requirements, include the following in narrative form:

3.3.1.1 Overview. State the purpose, function, and capacities in sufficient detail to characterize the functional features and the desired image or visual appearance of the project site.

3.3.1.2 Security and Protection Requirements. Describe how the landscape elements meet safety and protection requirements.

3.3.1.3 Enhancement of Proposed Architecture. Describe how the landscape architecture relates to the architecture of the building(s) and the surrounding environment.

3.3.1.4 Exterior Pedestrian Spaces. Define how pedestrian spaces are incorporated on the site.

3.3.1.5 Screening. Describe the methods utilized to screen undesirable views and objects and site privacy, if required.

3.3.1.6 Maintenance Reduction and Sustainable Design. Quantify features of the design that minimize maintenance related activities. Describe strategies incorporated to promote sustainable design.

3.3.1.7 Existing Design Vernacular. Provide a statement that addresses how the design continues the existing context of the surrounding site. Indicate if master plan design criteria (or Installation Design Guide) must be followed and list the features and materials must be included.

3.3.1.8 Site Circulation. Describe how pedestrian and vehicular circulation is coordinated to provide safe, non-conflicting functionality.

3.3.1.9 Tree Mitigation. If required, define methods for providing mitigation for tree removal.

3.3.1.10 Anti-Terrorism Force Protect (ATFP). Provide description of how the landscape design meets ATFP requirements.

3.3.1.11 Other Requirements. Provide a list of items for which additional criteria, clarification, or guidance is required.

3.3.2 Drawings

Provide drawings in sufficient detail and annotated for the local User to visualize precisely how the landscape architect has interpreted the Users' site functional, operational and aesthetic requirements. Provide as a minimum the following drawings:

3.3.2.1 Landscape Notes and Schedules. Provide a planting schedule, landscape site materials and site furniture legend with descriptions and landscape and site notes that include general notes, planting notes, irrigation notes, and project specific notes.

3.3.2.2 Landscape Plans. Provide a landscape plan that indicates and locates site features, plantings, groundcovers, and building maintenance strips (coordinated with civil and architecture).

3.3.2.3 Landscape Details. Provide planting details and site feature details.

Show in the same scale and matchline areas as other site work drawings.

3.3.3 Specifications.

Provide a listing of specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

3.4 FINAL DESIGN

3.4.1 Design Analysis.

Update the Final Design Analysis from the Interim design to include descriptions of all design revisions and/or developments. Provide Final DA as a new document, not as addenda to the Interim document.

3.4.2 Drawings.

Complete previously submitted Interim drawings, and additional drawings for a complete design package.

3.4.2.1 Final plans are complete, with all necessary details, layout drawings, section views, plan views, and schedules.

3.4.2.2 Provide details of sufficient scale to allow construction and installation of the work without additional design work by the construction contractor.

3.4.3 Specifications.

Provide a complete set of fully edited specifications.

Chapter 4.0 – ARCHITECTURAL

4.1 GENERAL.

This chapter provides guidance for the preparation and development for each of the different required submittal stages, as they relate to architecture.

4.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

4.1.2 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

4.2 CHARRETTE DESIGN

4.2.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above, paragraph: Charrette Design, Process, Meeting, And Submittals.

4.3 INTERIM DESIGN

4.3.1 Design Analysis.

Update the Charrette phase Design Narrative to include description of all design revisions and/or developments. Provide Interim DA as a new document, not as addenda to the Charrette document.

4.3.1.1 State the purpose, function, and capacities in sufficient detail to delineate and characterize functional features and the desired image or visual appearance of this project.

4.3.1.2 Describe the architecture of the existing facilities near the site and how the project relates to these facilities.

4.3.1.3 Provide a brief statement of the interior and exterior finish materials to be used in the project. Include an interior design statement that indicates the coordination of the structural finishes and features with the selected furnishings' function, styling, detailing and finishes.

4.3.1.4 If the project has a kitchen, include kitchen equipment cut sheets (model number specific manufacturers' product literature).

4.3.1.5 Provide results of vapor transmission analysis per UFC 3-101-01; reflecting the vapor retarder/barrier planned course of action for the project specific assemblies.

4.3.1.6 Provide plumbing fixture quantity calculation that lists quantity and type of fixtures.

4.3.2 Drawings.

Provide drawings in sufficient detail and annotated for the local User to visualize precisely how the architect has interpreted the using activity's functional and operational requirements. Provide as a minimum the following drawings:

4.3.2.1 Show North Arrow on all plan drawings for solar orientation.

4.3.2.2 Composite Floor Plan. If the main floor plans must be shown in segments in order to comply with the requirements of the proper scale, provide a smaller scale floor plan showing exterior wall, interior partitions, circulation elements, and cross referencing for enlarged floor plans and sections. Show overall dimensions on the floor plan and gross building areas tabulation on the drawing.

4.3.2.3 Floor Plans. Provide floor plans at 1/8"=1'-0" or 1/4" = 1'-0" (1:100 or 1:50) scale. Show gross floor area tabulations if no composite sheet is included.

a. Building Entrances. Show all stoops, steps, or similar access features pertaining to the building entrance, which will normally be built by the building construction contractor as differentiated from sidewalks, driveways, etc., which are normally constructed by a sitework contractor. Stoops are typically detailed on Structural drawings. Show sufficient sidewalk and pavement graphics on floor plans, to show relationships of those items to building entrances, service doors, and points of egress.
b. Floor Drains and Slopes. Show floor drains and shower heads on the architectural drawings as well as on the plumbing drawings and closely coordinate with other disciplines. All floors in areas requiring drains are to slope toward the drains. Coordinate floor drain locations with structural elements.

4.3.2.4 Building Elevations. Provide building elevations showing grading, openings, exterior materials, gutters and downspouts, major roof mounted equipment visible in elevation drawings, equipment enclosures connecting to the building, and profiles of the building (scale shall be the same as the floor plans).

4.3.2.5 Roof Plan. Provide a roof plan showing the roof configuration and methods by which rain is directed to the building perimeter.

4.3.2.6 Wall Sections. Provide typical wall and stair/elevator sections (1/2" = 1'-0", or 1:20 minimum scale) that indicate major elements. Wall sections shall be unbroken where practical and indicate materials and floor-to-floor heights. At a minimum, two exterior wall sections, one section at stairs, and one section at the elevator shaft will be provided.

4.3.2.7 Roof and Wall Insulation. Indicate roof and wall insulation types and R-value minimums. At cavity walls or other conditions in which the insulation thickness is critical to maintain an air space or to accommodate other adjacent construction elements, the maximum insulation thickness and minimum R-values are to be indicated.

4.3.2.8 Schedules. Provide a door schedule and room finish schedules indicating the materials and finishes used in the design. Also a special item schedule and/or notes shall be provided indicating any special items that will be required for the design.

4.3.2.9 Reflected Ceiling Plan. Provide a ceiling plan that indicates ceiling material and open ceiling areas. Indicate room numbers, light locations, registers, and all ceiling mounted items such as exit signs.

4.3.2.10 Provide drawings for: enlarged plans (stairs, lobby, kitchen, miscellaneous plans), wall types, bathroom plans and details, vault plan and details (coordinated with structural), and radon plan and details (if required based on site location). Provide significant project details (roof & elevator) and primary exterior door and window details to establish detailing approach (all exterior roof and fenestration details are to be provided at Final).

4.3.3 Specifications.

Provide a listing of specification sections in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

4.4 FINAL DESIGN

4.4.1 Design Analysis.

Update the Final Design Analysis from the Interim Design Analysis to include descriptions of all design revisions and/or developments. Provide Final DA as a new document, not as addenda to the Interim document.

4.4.2 Drawings.

Complete the Final drawings to present a complete description of all the construction elements required and fully coordinate with other disciplines. Complete previously submitted Interim drawings, and additional drawings for a complete design package.

4.4.2.1 Signage Plan. Provide an interior and exterior signage plan, schedules and details indicating the color, location and types of signs used on the project. Include the location and mounting information for the interior and exterior Army Reserve Minuteman plaques. Include the location and mounting information for the LEED plaque, if applicable.

4.4.2.2 Air Barrier Drawings. Refer to UFC 3-101-01 Architecture. In addition to the air barrier components being shown in all applicable details, provide separate Air Barrier drawings. At a minimum the air barrier drawings shall include a plan of the building indicating the desired perimeter boundary of the air barrier system(s), and building sections reflecting the same boundaries. The details are to clearly demonstrate the critical interfaces and locations of how the air barrier components are to be lapped and constructed.

4.4.3 Specifications.

Provide a complete set of fully edited specifications.

Chapter 5.0 – INTERIOR DESIGN

5.1 GENERAL.

5.1.1 Scope

This chapter provides guidance for preparation and development for each of the different required submittal stages, as they relate to interior design.

5.1.2 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

5.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

5.1.4 Comprehensive Interior Design (CID)

Below is a description of the overall package - the CID and its subparts the FF&E and the SID - that form the Interiors Submittals.

5.1.4.1 Comprehensive Interior Design (CID). A CID package in the contract for all Army Reserve projects includes the Furniture, Fixtures and Equipment (FF&E) design and the Structural Interior Design (SID). The two types of services cover different aspects of the interior environment. The FF&E includes selecting and developing interior building furnishings for an integrated visual design theme, which reflects the interior atmosphere desired by the customer. The Structural Interior Design (SID) includes exterior finishes, interior finishes, and special item selections; and is included as a separate binder submittal. Currently, there are four pre-established Army Reserve interior color schemes: Blue, Green, Rust, and Red. Refer to the RFP for the selected color scheme for this project, which is to be used as a visual reference concept. The CID package must be developed concurrently with the design of the facility and submitted for review.

- The FF&E submittal includes:

    a. FF&E Table of Contents
    b. Statement of Design Objective
    c. Furniture Room Layouts
    d. Room Contents List
    e. Item Installation List
    f. Specification List by Tag
    g. Manufacturer POC List
    h. Furniture Illustration Sheets
    i. Furniture Procurement Sheets
    j. Presentation Color Boards (with physical samples included)
    k. Site Plan
    l. Architectural Floor Plans

m. Electrical Plans
n. ICT Plans
o. Composite Furniture Floor Plans
p. Enlarged Furniture Floor Plans
q. Furniture Key Code Plan
r. Enlarged Furniture Typical Details

- The SID submittal includes:

a. SID Table of Contents
b. Statement of Design Objective
c. Finish Schedule and Special Items Schedule
d. Presentation Color Boards with physical samples of all applied finishes including material, color, texture and patterns necessary to complete the exterior and interior finishes and special items.

5.1.4.2 Furniture, Fixtures and Equipment (FF&E). Furniture, Fixtures and Equipment (FF&E) includes selecting and developing interior building furnishings for an integrated visual design theme which reflects the interior atmosphere desired by the U.S. Army Reserve. This information shall be submitted in 4" (maximum) D-ring binder(s), 8-1/2" x 11" format with only one foldout per page. The maximum foldout width shall be approximately 25". Each binder shall be labeled on the outside spine and front cover with the following information: Project title and number, date, project location, design firm and type of submittal (Interim, Final, etc.). Material and finish samples shall indicate true pattern, color and texture, labeled with manufacturer, name, model number, and finish schedule tag reference. Each sample board is to be inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out. The FF&E must be developed concurrently with the design of the facility. With each new submittal, the Interior Designer of Record shall create new FF&E binder(s) to satisfy review comments until the Government approves the completed CID package. At the time of the furniture procurement (approximately six months prior to the Furniture BOD), the Interior Designer of Record is required to update the FF&E to correct any deficiencies, errors, or furniture product updates after the technical furniture review by Louisville District prior to the actual procurement of the furniture.

5.1.4.3 Structural Interior Design (SID). The Structural Interior Design (SID) includes the selection and sampling of all applied finishes including material, color, texture and patterns necessary to complete the building's interior architectural features. Items include, but are not limited to: wall and floor finish materials, window and door finishes, glazing and trim materials, ceiling materials and finishes, millwork materials and finishes, paint and stain finishes, as well as specialty items. Since exterior colors, materials and finishes influence interior selections, include exterior materials as a separate section of the SID Items include, but are not limited to, roofing materials and finishes, gutter and downspout, soffit and fascia panels, brick and mortar, window and door frames, as well as specialty items. This information shall be submitted in 3" D-ring binder(s), 8-1/2" x 11" format with only one foldout per page. The maximum foldout width shall be approximately 25". Each binder shall be labeled on the outside spine and front cover with the following information:

Project title and number, date, project location, design firm and type of submittal (Interim, Final, etc.). Material and finish samples shall indicate true pattern, color and texture, labeled with manufacturer, name, model number, and finish schedule tag reference. Each sample board is to be inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out. With each new submittal, the Interior Designer of Record shall create new SID binder(s) to satisfy review comments until the Government approves the completed SID package.

5.2 CHARRETTE DESIGN

Refer to Chapter 1 "All Disciplines" above, paragraph: Phase II –Charrette Design, Process, Meeting, And Submittals.

The Charrette Submittal shall include:

- A narrative description of the interior design features and furnishings intent.
- Discuss the color scheme as defined in the RFP specifications at the Charrette meeting, to validate the path forward for the forthcoming Interim Submittal.

5.3 INTERIM DESIGN

The Interim Submittal shall include the Design Analysis, construction drawings and CID package consisting of the FF&E and SID material and finish samples.

5.3.1 Design Analysis

5.3.1.1 Statement of Design Objective. Provide a narrative explaining the interior design concept of the facility. Where applicable, include desired psychological impact of the interior environment on its inhabitants and proposed method of accomplishing same by using space planning, shapes, forms, color, patterns, textures, fabrics and furnishings. Include which of the four Army Reserve color schemes was the starting point for the project. Explanations of unusual conditions shall be included, such as the coordination of special laminates and fabrics between various product lines and manufacturers to provide a consistent overall environment. Explanations of deviations or unusual conditions required by the Army Reserve Unit of the furnishings layout and/or items used from the information included in the USAR Design Guide, shall also be included.

5.3.2 Drawings

5.3.2.1 Furniture Floor Plans. Provide as part of the construction drawings, furniture floor plans showing the furnishings required for the various functions that are to be housed in the facility, indicating the adequacy of the size and shape of each space and the spatial relationship between the furnishings and doors, windows, light switches, thermostats, electrical/communication connections/outlets, bulletin boards, projection screens and other building features. Basic furniture plans shall be provided as a minimum with any additional furnishings items known at this stage of design included. Any areas that may pose “furniture fit” or other problems should be highlighted or annotated by notes on the furniture drawings to ensure that they are addressed at the Interim Design Review Meeting. Drawings shall include

Composite Furniture Floor Plans, Systems Furniture Plans, and Systems Furniture Panel Plans (if systems furniture is included in the project). Other plans shall be provided as the project requires i.e., Systems Furniture Component Plans for complex panel systems projects. Furniture Floor Plans shall include the room names and numbers. If the furnishings and room names and numbers overlap each other on the drawings, the room names and numbers should be relocated to provide legible information. Where furnishings are to be "Government Furnished, Government Installed" (GFGI), include a statement on the furniture drawings indicating that the furniture drawings are "For Information Only", are to be used to coordinate furnishings locations with other disciplines, and that the furnishings are not part of the construction contract.

5.3.2.2 Additional Plans, Enlarged Plans, Elevations and Details. Provide as necessary any plans, enlarged plans, elevations and details indicating location and identification of accent walls, graphics, wall hangings, wall patterns/finishes, floor patterns/finishes, wall and corner protection and special items known at this stage of design.

5.3.2.3 Exterior and Interior Color, and Special Item Schedules. Provide an Exterior Color Schedule, an Interior Color Schedule, a Special Item Schedule (or notes) for those items known at this stage of design. The Exterior Color Schedule may be indicated in the Architectural drawing sheets or in the Interior drawing sheets, as long as the correct references are made to the location of the schedules. The Interior Color Schedule and Special Item Schedule shall be in the Interior Design sheets (I-Sheets). The Exterior Color Schedule, Interior Color Schedule, and Special Item Schedule may be a single combined schedule in the Interior Design sheets (I-Sheets). These finishes include, but are not limited to, exterior and interior wall finish materials, window and door frames, doors, glazing, roofing materials, trim materials, floor and ceiling finishes, signage colors and styles, casegoods, toilet partitions, lockers and other visible materials affecting visual design aesthetics. Include a general non-proprietary disclaimer to indicate that naming the commercial product does not restrict the construction contractor to the particular product identified. (Example: "Manufacturers referenced are intended to establish color and finish only, and are not intended to limit selections from other manufacturers. When alternate selections are submitted, submittal shall include materials listed for comparison.") Each finish/item selected must be available from at least three manufacturers. (Exceptions to this must be discussed with Louisville District on a case by case basis with detailed explanations provided.)

5.3.3 CID - FF&E and SID

5.3.3.1 Finish Samples and Furnishing Illustrations. Finish Samples shall be mounted on color boards as part of the FF&E and SID binder(s), and a Finish/Special Item Key shall be included indicating the following information: manufacturer, finish model number and/or color number, where the finish is used, fabric content, finish schedule tag reference and any other pertinent information.

a. Illustrations of the major furnishing products or product lines may be presented at the Interim Design Review Meeting using manufacturers' product catalogs and pamphlets, or included in the FF&E binder.

b. The finish samples for the FF&E and SID may be presented in loose format at the Interim Design Review Meeting, or as mounted on color boards as part of the FF&E and SID binder(s). If presented loose, each sample shall be labeled with the following information: manufacturer, finish model number and/or color number, where the finish is used, fabric content, finish schedule tag reference and any other pertinent information.

5.3.3.2 Typical Furniture Layouts. Provide the “basic” typical room furniture layouts and typical workstations used in the project. It is not expected that every typical, every atypical and every workstation will be known at this stage of the design. The typicals included are to be representative only. Include the furniture “tags” in these typicals and the general project information. Drawings must be legible with a minimum drawing scale of 1/4" = 1' - 0". The typicals will include basic information on where they are used, such as “Full Time Private Offices”, “Unit Exclusive Shared Offices”, etc. They may also include the room numbers where the typicals are to be used. These tagged typicals may also be shown on the construction drawings as described in the Final Design Submittal paragraph.

5.3.3.3 Room Contents List. This report shall provide the furnishings specified for each room by furniture tag, description, manufacturer, model number and quantity. List all desk units and panel systems workstations by a group furniture tag. Desk units consist of the desk, credenza, bridge, overhead, etc. and are tagged as one unit. The report is to be sorted by building, floor, room and tag in alpha/numeric order.

5.3.4 Specifications

Provide a listing of specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

5.4 FINAL DESIGN

5.4.1 Design Analysis

The submittal shall have the Interim Submittal Design Analysis updated to include all design revisions and/or developments.

5.4.2 Drawings

Update and complete all information provided in previous submittals and approved review comments. Complete previously submitted Interim drawings, and additional drawings for a complete design package.

5.4.2.1 Furniture Floor Plans. Provide as part of the construction drawings Composite Furniture Floor Plans, Systems Furniture Plans, Systems Furniture Panel Plans and Enlarged Furniture Floor Plans. Other plans shall be provided as the project requires i.e., Systems Furniture Component Plans for complex panel systems projects. Plans shall reflect added or changed items since the previous submittal. Furniture Floor Plans will consist of the following:

a. Composite Furniture Floor Plans. For large facilities include room names and numbers but do not include furniture tags. Include a building footprint key plan in the lower right hand corner of the sheet indicating how the

floor plan has been divided between the larger scaled sheets (matchlined areas). For smaller facilities where the architectural floor plan does not require multiple plan drawings, the Composite Furniture Floor Plan shall include room names and numbers, and furniture tags but does not require a building footprint key since the facility is not split between two or more sheets. All furniture plans are to be labeled “FOR REFERENCE ONLY” or “NOT IN CONTRACT (NIC)”.

b. Enlarged Furniture Floor Plans and Enlarged Furniture Typical Details are to include all furniture, desk unit and panel systems workstation/panel tags, furniture legend representing the furniture tag with description, and building key plan in the lower right hand corner of the sheet indicating how the floor plan has been divided between the larger scaled sheets.
   1) Systems Furniture Panel Plan(s) are to include dimensions for placement within a room for accurate installation of the panel systems furniture and all walls, doors and window locations.
   2) 1/8” scale is acceptable for enlarged furniture floor plans, provided tagging and room numbers and names are legible. If not legible, utilize 1/4" scale enlarged furniture floor plans. Drawing scale must be large enough scale so that the furniture “footprints” are clearly discernible, and data is legible.
   3) Furniture tags - Every furniture item, desk unit and panel systems furniture workstation is to be tagged individually with alpha/numeric tags. The desk unit, consisting of the main desk components; i.e. desk, credenza, bridge, overheads, keyboard, etc. will be tagged as one unit D1, D2, D3, etc. All panel systems furniture workstations will be tagged as WS1, WS2, WS3, etc. with the panel systems pods only tagged as a P1, P2, P3, etc.
   4) Include enlarged views of each desk-based unit typical and each panel systems furniture workstation typical indicating all components.
   5) The enlarged Furniture Panel Systems only plan should be tagged listing all panels with sizes, powered and non-powered, power end feed locations, and duplex/data locations.
   6) All furniture plans are to be labeled “FOR REFERENCE ONLY” or “NOT IN CONTRACT (NIC)”.

c. Structural related built in equipment (such as marker boards, projection screen and map rails) or cabinets (items to be provided with the construction contract) shall be shown and identified on the furniture plans as well as on the architectural plans, and on any enlarged plans of those areas where such items are placed in the facility. These items shall be shown and identified by name and/or SID finish or Special Item code.

5.4.2.2 Additional Plans, Enlarged Plans, Elevations and Details. Provide as necessary any plans, enlarged plans, elevations and details indicating location and identification of accent walls, graphics, wall patterns/finishes, floor patterns/finishes, wall and corner protection and special feature items.

5.4.2.3 Electrical/ICT Plans. Provide as necessary electrical/data floor box and wall power feed locations with dimensions to coordinate with the furniture layouts for all areas receiving furniture.

5.4.3 Specifications

Provide a complete set of fully edited specifications.

5.4.4 FF&E and SID Binders

Separate FF&E and SID binders are included at Final Design Submittal to illustrate the designer's intended interior and exterior color schemes, material finishes, colors for the furnishings, and detailed furnishing layouts. The FF&E contains the furnishings procurement and installation information needed to purchase and install the furnishings that are usually procured under a separate contract and are provided with the construction documents for information only. Furnishings presentation color boards are also included in the FF&E binder. The presentation color boards and Finish/Special Item Key for the structural finishes are included in the SID binder. Maximum binder thickness shall be four inches. Binders shall indicate project information on the cover and on the spine for easy identification (see General Interior Design paragraph). The FF&E and SID binders shall include the following as a minimum.

5.4.4.1 FF&E Binder with Presentation Color Boards. Provide the following in the FF&E binder:

a. Table of Contents. Provide a Table of Contents for the FF&E binder.
b. Statement of Design Objective. Provide the narrative included in the Design Analysis explaining the interior design concept of the facility. Edit/expand the previous submittal narrative as needed to convey the design intent as it relates to FF&E and the structural finishes.
c. Room Contents List. This document shall provide the furnishings specified for each room by furniture tag, description, manufacturer, model number and quantity. List all desk units and panel systems furniture pods by a group furniture tag. Do not list individual components and panel systems furniture parts required to build the units. The report is to be sorted by building, floor, room and tag in alpha/numeric order.
d. Item Installation List. This document provides the location by room for each item included in the furniture package. List all desk units and panel systems furniture pods by a group furniture tag. Do not list individual components and panel systems furniture parts required to build the units. The report is to be sorted by furniture tag, description, manufacturer, model number, room number and quantity listed in alpha/numeric order by the furniture tag.
e. Specification List by Tag. This document is to define the furniture requirements for the project. It shall list all pertinent information for each furniture item specified in the furniture package including the tag, description, manufacturer, model number, size, finishes and total quantity per installation phase, floor, and building. The report is to be sorted by manufacturer, phase, floor, building and furniture tag listed in alpha/numeric order by the manufacturer first and furniture tag second.
f. Manufacturer POC List. This document is to list the furniture manufacturers specified for the project with address, telephone, fax, and e-mail address: Contact's name, address, telephone, fax, and e-mail address.
g. Furniture Illustration Sheets. Provide furniture illustration sheets for all products specified in the furniture package. Illustrations are to be represented by black and white or color photographs. Information on the

furniture illustration sheets shall include furniture tag, description, model number, finishes, size and manufacturer. A product photo or brochure of the desk units and panel systems workstations may be included or .jpg or .bmp file format photos may be used. It is not necessary to include individual photos of the parts and pieces that make up the desk units and panel systems furniture workstations.

h. Furniture Procurement Sheets. Provide an individual furniture procurement sheet for each manufacturer specified in the furniture package. Information on these sheets shall include manufacturer's name, address, telephone, fax and e-mail address; Contractor's name, address, telephone, fax and email address; Contact's name address, telephone, fax and e-mail address. List GSA Contract number and contract expiration date if applicable. List Open Market if product in not on a GSA Contract.

i. Presentation Color Boards. Provide presentation color boards in an 8 ½" x 11" binder format. The presentation color boards shall depict all materials and finishes for each proposed furniture item. Label the material and finish sample with specific color names with references to the specified furniture tag. The material and color samples provided must be large enough to indicate true patterns, colors and textures. Each sample board is to be inserted into a heavy-duty clear page protector that is sturdy enough to keep the pages from tearing out. COLORED COPIES OF FINISHES ARE NOT ACCEPTABLE.

j. Drawing Set Plans. Provide 11" x 17" plots (to scale) with the FF&E binder of the following:
   1) Site Plan – A site plan and vicinity map shall be provided showing the location of the building or buildings in which the subject furniture is to be installed and site conditions/restrictions as provided in the construction contract.
   2) Architectural Floor Plans – Architectural floor plans shall be provided showing relationships and dimensions of all areas receiving furniture. Include the locations of any special items i.e., trophy cases, projection screens, marker boards, building directories and map rails as provided in the construction contract.
   3) Electrical/Data/Communications Plans – Plans shall be provided showing electrical receptacles, power feeds, switches, thermostats, fire alarm annunciators, telephone, and computer locations for areas receiving furniture. Place all dimensions for floor boxes on the electrical/data/communications plans as provided in the construction contract. This would include all floor junction boxes for panel power feeds and any floor boxes located in classrooms, conference rooms, training center rooms, etc.
   4) Composite Furniture Floor Plans – Include composite furniture floor plans as described in paragraph "Drawings" above.
   5) Enlarged Furniture Floor Plans – Include enlarged furniture floor plans as described in paragraph "Drawings" above.
   6) Enlarged Furniture Typical Details – Include enlarged furniture typical plans described in paragraph "Drawings" above.
   7) Furniture Key Code Plan – Provide a key code plan per manufacturer's key code requirements listing all furniture to be keyed alike and random.

5.4.4.2 SID Binder with Presentation Color Boards. Provide the following in the SID binder:

a. Table of Contents. Provide a Table of Contents for the SID binder
b. Statement of Design Objectives. Provide the narrative included in the Design Analysis explaining the interior design concept of the facility. Edit/expand the previous narrative submittal as needed to convey the design intent as it relates to the structural finishes.
c. SID Presentation Color Boards. Provide in the SID binder presentation color boards. Code and coordinate samples with the exterior finish, interior finish and special items schedules in the project contract documents. Provide a Finish/Special Item Key or legend that includes what each sample is used for, the manufacturer, style name and/or number, pattern name and/or number, color name and/or number, finish schedule tag reference, and any remarks or notes needed to describe what the boards are illustrating. Samples shall be large enough to show full patterns, colors, and textures. Securely mount samples to the presentation boards to withstand long periods of use. PHOTOGRAPHS OR COLOR XEROX COPIES OF FINISHES, MATERIALS AND COLORS ARE NOT ACCEPTABLE. Finish Materials shall be mounted on presentation boards in an 8 ½" x 11" binder format and inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out of the binder.

5.4.5 Certified Final Submittal

5.4.5.1 Provide Certified Final DA, Drawings, and Specifications, based on the requirements above. In addition, the Interior Designer of Record shall create and submit final FF&E and SID binder(s) to satisfy all review comments from previous submittals. These binders shall be submitted concurrently with the Certified Final Submittal.

Chapter 6.0 – STRUCTURAL

6.1 GENERAL

6.1.1 Scope

This chapter provides guidance for preparation and development for each of the different required submittal stages, as they relate to structural engineering.

6.1.2 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

6.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

6.2 CHARRETTE DESIGN

6.2.1 Design Analysis

6.2.1.1 General. Provide a general description of the scope of the project and all the major structures. Give overall building dimensions and a description of the principal features such as wall and roof construction. If the building is irregularly shaped, explain where seismic joints will be placed to create regular shapes or provide a statement that dynamic analysis of the building will be performed.

a. Note: Seismic joints are preferred in areas of high seismic activity for all structures of an irregular shape. For buildings in areas of low seismic activity, building joints are recommended only as needed for expansion and contraction purposes.

6.2.1.2 Criteria. Include a listing of the required technical manuals, UFCs, building codes, standards and specifications in the Design Analysis.

6.2.1.3 Loading. Describe all loading to be used in the structural calculations. Include dead loads, live loads, wind, snow, seismic, ATFP, risk category, Seismic Design Category, and any other special loading conditions.

6.2.1.4 Framing System.

a. Provide a brief structural narrative on the gravity load resisting framing system chosen and the reasons why.
b. Provide a brief narrative on the lateral load resisting system and how these loads will be transmitted to the foundations.

6.2.1.5 Foundation. Give a brief description of the anticipated foundation type/system based on the geotechnical report. Reference the geotechnical report to state the allowable soil bearing capacity, modulus of subgrade reaction, minimum footing sizes, and minimum frost depth requirements. If a geotechnical report is not available at this stage, the designer may also refer to similar construction in the area if it is known.

6.2.1.6 Special. List special/unique design features.

6.2.1.7 Information Needed to Complete the Design. List any unknowns that the designer needs to complete the design. For instance, the designer may request from the User a list of the military vehicles and their weights for the purpose of designing slabs.

6.2.1.8 Calculations. No structural calculations are required in this phase.

6.2.2 Drawings

No structural drawing requirements at this phase. However, the structural engineer must have strong input in the creation of the column grid/layout and roof plan, which is carried out by the architectural discipline. The reason for this input is so the structural engineer ensures that the column grid lines and/or bearing wall locations are such that an adequate framing plan can be achieved.

6.3 INTERIM DESIGN

The structural portion of the Interim Design Submittal must outline for approval the proposed methods and materials of design and construction. Include the following:

6.3.1 Design Analysis

The Interim Design Analysis is a refinement of the prior Design Analysis and contains all the information called for in those sections of this chapter. Include required and missing information that was not included in prior submittal phases. Incorporate any changes required by comments on the Charrette Design Submittal.

6.3.1.1 Calculations. The following specific items shall be included to the extent they are complete:

a. Load Assumptions. State all loading used in design, include dead loads, live loads, wind, snow, seismic, ATFP, risk category, Seismic Design Category, and any other special loading conditions.
b. Serviceability Considerations. State member deflection limits, story drift limits, vibration criteria, Environmental Severity Classification, etc.
c. Calculate both main wind force resisting system pressures as well as component and cladding wind pressures. Tabulate/summarize results accordingly.
d. Calculate the basic seismic loading for the frame or lateral load resisting system and contrast them with the comparable wind loads. Note the controlling design loads. Detailed calculations for seismic loads on parts and portions are not required at this submittal level.
e. Material Properties. State the strength values, properties, and designations (ASTM, etc.) for the structural materials.
f. Calculations for primary structural members (roof, floor, columns, walls, braces, and foundations, etc.) shall be completed at this submittal.

6.3.2 Drawings

Furnish sufficient plans for foundations, and framing plans for roof and floors, as applicable, to indicate layout of principal members. Provide a Structural Notes sheet(s) which shall list all structural criteria, loading, and structural material properties/notes in accordance with design criteria/codes. Typical sections shall be furnished through roof, floor, and foundation indicating materials and type of construction proposed. Furnish a plan identifying the location of all seismic joints.

6.3.3 Specifications

Provide a listing of specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

6.4 FINAL DESIGN

6.4.1 Design Analysis

The Final Design Analysis is a refinement of the prior Design Analysis and contains all the information called for in those sections of this chapter. Furnish complete checked calculations for all structural members and connections. Incorporate any changes required by comments on Interim Design Submittal.

6.4.2 Drawings

Complete previously submitted Interim drawings, and additional drawings for a full design package. Furnish complete Final plans and details of all structural elements. Before this submittal, coordinate structural drawings with all other design disciplines. Always include the items listed below on the Final drawings if applicable:

6.4.2.1 Structural Notes sheet(s) which shall list all structural criteria, loading, etc., in accordance with “Construction Documents” requirements of design criteria/codes. List the material requirements for masonry, concrete, steel, etc.

6.4.2.2 Wind uplift diagrams and snow load diagrams.

6.4.2.3 Roof framing plan and details including details of any opening in the roof.

6.4.2.4 Intermediate floor framing plans and stair details on multiple story structures.

6.4.2.5 Stress or load diagrams of features which are part of a delegated design (e.g., connector plates on wood trusses that are part of the delegated design, based on member stress information shown by the Engineer on the structural drawings). The delegated design remains the responsibility of the Contractor.

6.4.2.6 Column schedule, beam schedules, and connection schedules.

6.4.2.7 Foundation plan including any notes relative to special foundation treatment required and cross-references to proper specification sections.

6.4.2.8 Foundation section and details.

6.4.2.9 Layout of expansion, construction, and contraction joints in floor slabs; horizontal and vertical joints in foundation walls; joints in footing; and layout of control joints in masonry walls.

6.4.2.10 Typical and special sections as required.

6.4.2.11 Details of expansion, construction, and contraction joints in concrete.

6.4.2.12 Layout and detail of exterior entrance pads and steps.

6.4.2.13 Lintel plan(s) and schedules.

6.4.2.14 Masonry wall elevations as required.

6.4.2.15 Braced frame elevations as required.

6.4.2.16 Lateral Force Resisting System details.

6.4.2.17 Details of any special items.

6.4.2.18 General and special notes as required.

6.4.3 Specifications

Provide a complete set of fully edited specifications.

Chapter 7.0 – FIRE PROTECTION

7.1 GENERAL

7.1.1 Scope

This chapter provides guidance for preparation and development for each of the different required submittal stages, as they relate to fire protection engineering.

7.1.2 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

7.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

7.2 CHARRETTE DESIGN

7.2.1 Design Narrative

7.2.1.1 Fire Protection

a. Discuss fire suppression design requirements, including any specifics regarding unit storage.
b. Discuss with the Fire Department (municipality or Installation) and review the design standard if available for any special requirement, such as the fire department connection type required.
c. Gather and confirm details on the types of commodities that will be used in storage areas on the project.
d. Obtain fire flow data relevant to the site at the earliest practicable time. (Note that UFC 3-600-01 requires the designer to perform or witness a flow test on hydrants near the site, not just receive fire flow data from others.)
e. Per UFC, and any other applicable criteria, the QFPE shall review all aspects of fire protection and life safety design requirements of the project.

7.2.1.2 Fire Alarm

a. Discuss smoke/fire detection and annunciation design requirements, including specific types of required devices.
b. Discuss Fire Department special requirements such as remote reporting connection type required and any compatibility issues.
c. If a remote reporting radio system is required, determine the make, model, operating frequency, and signal coding of existing equipment, and include sufficient information in the narrative to insure compatibility of the completed system.

7.2.1.3 Mass Notification

a. Discuss mass notification design requirements, including specific types of required devices. Verify that the mass notification system is to be combined with the fire alarm system.
b. Discuss Fire Department special requirements such as connection to base wide mass notification systems, including connection type required and any compatibility issues.
c. If a remote reporting radio system is required, determine the make, model, operating frequency, and signal coding of existing equipment, and include sufficient information in the narrative to insure compatibility of the completed system.

7.3 INTERIM DESIGN

7.3.1 Design Analysis

The Charrette phase Design Narrative forms the basis of the Interim and Final Design Analyses. Include the following in narrative form:

7.3.1.1 Fire Protection System.

a. List of Applicable Criteria - NFPA, UFC 3-600-01, handbooks, manuals, codes, standards, and other applicable governing criteria.
b. Listing of the hazard classifications for each space and discussion of protection requirements for specific hazards, including unit storage design assumptions.
c. For storage areas, discuss commodity type, maximum storage height, ceiling height, and storage arrangement.
d. Discussion of fire protection features for each building to reflect the types of systems considered with a description of the systems selected.
e. Provide a detailed description of the fire suppression system and its controls such as activation of the system, interlocks with the HVAC system, and connection to detection and alarm systems. Describe the fire detection and alarm system features that are used to actuate the suppression systems.
f. If water sprinkler systems are required, provide preliminary hydraulic calculations for the most hydraulically demanding area to ensure the flow and pressure requirements are met with current water supply. Provide results of flow test data with preliminary hydraulic calculations. Make recommendations about the plumbing requirements, the sprinkler system requirements, and backflow.
g. Identify the requirements for fire pumps and storage tanks based on preliminary calculations. Determine electric power reliability per UFC 3-600-01 to determine if an electric motor driven or diesel engine driven fire pump will be used.
h. Provide calculations for other fire protection systems or features, such as standpipes, deluge systems, or in-rack sprinkler systems. Include the source for calculation methodology.
i. List any special requirements requested by the local Fire Department.
j. Describe major items that deviate from the USAR Design Guide.

7.3.1.2 Fire Alarm

a. List of Applicable Criteria - NFPA, UFC, handbooks, manuals, codes, standards, and other applicable governing criteria.
b. Discussion of smoke/fire detection and annunciation features for each building to reflect the types of systems considered with a description of the systems selected and their interconnections.
c. Provide a detailed description of the fire alarm system and its controls such as activation of the system, interlocks with the HVAC system, and connection to other systems.
d. Describe the basis of design for the equipment chosen.
e. List any special requirements requested by the Installation or local Fire Department.

7.3.1.3 Mass Notification

a. List of Applicable Criteria - NFPA, UFC, handbooks, manuals, codes, standards, and other applicable governing criteria.
b. Discussion of mass notification features for each building to reflect the types of systems considered with a description of the systems selected and their interconnections.
c. Provide a detailed description of the mass notification system and its controls such as activation of the system, interlocks with the HVAC system, and connection to other systems.
d. Describe the basis of design for the equipment chosen.
e. List any special requirements requested by the Installation or local Fire Department.

7.3.2 Drawings

Provide plan views showing the features listed.

7.3.2.1 Fire Protection System. Prepare a plan for each floor of each building. Provide the following types of information:

a. Indicate all building areas, their sprinkler hazard classification, and extent of fire protection.
b. Provide the location of any major fire protection equipment or features such as; fire service line location, sprinkler risers, backflow preventers, standpipes, inspector test and drain, fire department connections, pump, etc.
c. Include Fire Protection equipment schedules.
d. Provide the location and hazard classification of any special fire suppression systems such as; Unit Storage protection, in-rack sprinkler systems, deluge systems, and hose racks.
e. Include sprinkler density (gpm/sf), area of operation, demand area, area of coverage/head (sf/head), sprinkler spacing, sprinkler design k-factor, k-factor height limitation, and flow test results.

7.3.2.2 Fire Alarm System. Prepare a plan for each floor of each building. Provide the following types of information:

a. Indicate all building areas, their classification, and extent of fire/smoke detection and annunciation.
b. Provide the location of fire/smoke detection equipment such as control panels, annunciator panels, sprinkler system supervisory locations, smoke detectors, elevator systems, kitchen hood suppression systems, etc.
c. Provide fire alarm and mass notification system riser diagram and sequence of operation matrix. Include in the riser diagram control panels, annunciator panels, sprinkler system supervisory locations, smoke detectors, elevator systems, kitchen hood suppression systems, etc.

7.3.2.3 Mass Notification System. Prepare a plan for each floor of each building. Provide the following types of information:

a. Indicate all building areas and extent of mass notification annunciation, including Military Equipment Parking area(s) if applicable.
b. Provide the location of mass notification equipment and such as control panels, Local Operator Consoles (LOC), annunciator panels, and connections to HVAC systems.
c. Provide mass notification system riser diagram and sequence of operation matrix. Include in the riser diagram control panels, LOC, annunciator panels, and connections to HVAC systems.

7.3.3 Specifications

Provide a listing of fire protection specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications. Where a departure or addition to a UFGS guide specification is required, include in the listing a brief description of the equipment or procedure constituting the change.

7.4 FINAL DESIGN

7.4.1 Design Analysis

The Final Design Analysis is a refinement of the prior Design Analysis and contains all the information called for in those sections of this chapter. Include required and missing information that was not included in prior submittal phases. Address all previous review comments and incorporate into submittal as required.

7.4.1.1 Fire Protection System.

a. For fire sprinkler system information, include hazard classification, zoning (if appropriate), and sizes of all riser pipes including wet and dry pipes, sprinkler valves, mains, and principle branches based on available water pressures by either computer-generated hydraulic analysis, or manual calculations.
b. Provide the results of the analysis for a fire pump. Determine electric power reliability per UFC 3-600-01 to determine if an electric motor driven or diesel engine driven fire pump will be used. When a fire pump is required, provide vendor information on the pump.

c. Provide computations for other applicable systems such as standpipe, deluge, or in-rack sprinkler systems.
d. Thoroughly detail any smoke evacuation, clean agent, or special hazard extinguisher systems when such systems are required.
e. Provide a certification letter from the project Fire Protection Engineer in accordance with UFC 3-600-01.

7.4.1.2 Fire Alarm

a. Discussion of smoke/fire detection and annunciation zoning and interconnections.
b. Provide an analysis of the fire alarm system overall loading and battery capacity requirements reflecting the basis of design.

7.4.1.3 Mass Notification

a. Discussion of mass notification system zoning and interconnections.
b. Provide an analysis of the mass notification system overall loading and battery capacity requirements reflecting the basis of design.

7.4.2 Drawings

7.4.2.1 General. Final drawings are complete when all necessary details, layout drawings, section views, plan views, and schedules are finished and include the incorporation of all review comments and resolutions. Complete previously submitted Interim drawings, and additional drawings for a complete design package.

7.4.2.2 Fire Protection Drawings. Provide a water flow test and results, sprinkler design densities, demand areas, specific areas protected, hazard classification of all areas, sprinkler head coverage, zoning requirements, pump sizing and locations, building entrances, exact control system locations (must include all locations if shown), and device locations. The fire protection engineer shall place their registered professional engineer stamp on all drawings prior to submittal to the Government. Shop drawings and calculations shall be prepared by the sprinkler system designer or fire protection specialist.

7.4.2.3 Fire Alarm System.

a. Provide the location of all fire/smoke detection equipment, devices, and notification appliances.
b. Include all equipment, devices, and notification appliances in the riser diagram.

7.4.2.4 Mass Notification System.

a. Provide the location of all mass notification equipment, devices, and notification appliances.
b. Include all equipment, devices, and notification appliances in the riser diagram.

7.4.3 Specifications

Provide a complete set of fully edited specifications.

Chapter 8.0 MECHANICAL – HVAC AND PLUMBING

8.1 GENERAL

8.1.1 Scope

This chapter provides guidance for preparation and development for each of the different required submittal stages, as they relate to mechanical and plumbing engineering.

8.1.2 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

8.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

8.2 CHARRETTE DESIGN

8.2.1 Design Narrative

8.2.1.1 Heating, Ventilating and Air-Conditioning (HVAC).

a. Discuss with the Users and Project Engineer/ Architect the HVAC requirements.
b. Discuss Installation/Readiness Division requirements to communicate with a base-wide EMCS. Determine if there is a preference in DDC protocol, LONWORKS or BACNET on the Installation/Readiness Division.

8.2.1.2 Site Utilities. Refer to Chapter "Civil".

8.2.1.3 Plumbing.

a. Include a discussion of special plumbing needs and requirements.

8.3 INTERIM DESIGN

8.3.1 Design Analysis

The Charrette phase Design Narrative forms the basis of the Interim and Final Design Analyses. Include the following in narrative form:

8.3.1.1 Heating, Ventilating and Air-Conditioning (HVAC).

a. List of Criteria. Codes, UFCs, handbooks, standards and manuals applicable to the project.
b. Design conditions used in calculations – inside and outside temperatures/humidity, psychometric analysis, personnel load, equipment heat release (if any), energy sources, exhaust or ventilation requirements, U-factors, and other special conditions.
c. Include discussion and calculations for Special Considerations, when required, in the Design Analysis.

d. Detailed system heating and cooling load calculations. Use professionally recognized, nationally used computerized load calculating programs. The Design Analysis shall contain layout sketches that show how the building systems are zoned for the computer input. Include input and output reports only for the designed systems for the calculation. Input and output shall be organized such that each space, zone, system, item of equipment, building component, etc. is correlated with identifiers on design plans and easily identifiable. Examples: Conference Room #244 is identified as ConfRm #244 on input/output documents; AHU-2-4 on equipment schedule is identified as AHU-2-4 on input/output documents; Zone 3-4 on the input/output files is associated with VAV-3-4 on the schedules.
e. Energy Compliance Analyses (ECA) including: narrative describing systems and equipment being used and calculations. Include energy model input and outputs, calculation of associated water use (if applicable). The ECA is to be a separate chapter with narrative, and with the calculations and energy optimization report as distinct appendices. Provide PDF bookmarks for each separate input and output report with easy to understand labels to allow quick navigation of the reports.
f. Provide narrative descriptions of the systems, intended equipment, description of air distribution, zoning, HVAC controls description, and description for any connections to existing systems.
g. Describe the various equipment items including operating temperatures and capacities.
h. Include a brief description of miscellaneous systems such as vehicle exhaust, general exhaust, and makeup air strategies.
i. Provide capacity calculations for all major items of mechanical equipment such as air handling units and coils, variable air volume boxes and reheat, condensing units, water chillers, boilers, humidifiers, cooling towers, fans, and tanks. Show manufacturer's make and model number of equipment used for layout purposes, and show weights of major items of equipment. Provide determination of ventilation and exhaust quantities including a room-by-room inventory that includes the design number of occupants, room area, ventilation required per person and per floor area, ventilation effectiveness, and adjustments for intermittent or variable occupancy, multiple spaces, etc. Show determination of water quantities and temperature rise or drop for hot water, chilled water, and condenser water. Provide vendor information for equipment selected and mark specific items on the vendor’s literature indicating the intended features.
j. Provide calculations showing estimated pipe and duct sizes, flow quantities, pressure drops, initial/final pressures, etc.
k. When specifically required, provide Energy Monitoring and Control System (EMCS) or Utility Monitoring and Control Systems (UMCS) requirements narrative identifying existing EMCS/UMCS conditions, and requirements for providing new or future interface EMCS/UMCS on this project.
l. Provide HVAC controls data. Include sequences of control narratives sufficient to describe generally how systems will operate. Detailed sequences are not required for Interim Design. Example: Controls such as economizer, setpoint reset, occupancy modes, unoccupied bypass,

etc. shall be listed, but detailed written sequence is not necessary for Interim Design.

m. Provide a list of items for which any additional criteria, clarification, or guidance is required by the designer to complete the design.
n. Describe major items that deviate from the USAR Design Guide.

8.3.1.2 Plumbing.

a. List of Criteria. Codes, UFCs, handbooks, standards and manuals applicable to the project.
b. Plumbing unit calculations as necessary to determine number of fixture units, cold and hot water capacity requirements, sanitary and vent capacity requirements, and equipment or capacities of miscellaneous and special systems. Indicate male and female building populations. Describe backflow preventer requirements.
c. ECA: As part of the ECA documentation (refer to Chapter 1), include a narrative describing systems and equipment and calculations. Include energy model input and outputs, calculation of associated water use (if applicable).
d. Description of domestic water heating and storage equipment, including capacity, type (gas, electric, boiler, water), materials, and insulation. Provide narrative describing the systems and controls. Provide capacity calculations for water heaters, storage, and expansion tanks and show manufacturer's make and model number used for layout purposes. Provide natural gas/propane and compressed air calculations for service line and branch pipe sizing. Include sizing calculations for any other equipment such as; booster pumps, sump pumps, and air compressor. Include POL system sizing calculations when applicable.
e. Piping types, materials, locations (concealed or exposed), and insulation requirements. Show estimated pipe sizes and include calculations showing flow quantities, pressure drops, etc.
f. Include a brief description of miscellaneous systems such as compressed air (capacity, pressure, piping, location of air outlets, etc.), roof drainage, natural gas (pressure, quantity, and equipment served), and other special systems.
g. Include a brief description of radon system requirements and planned mitigation systems, if required.
h. Describe major items that deviate from the USAR Design Guide.
i. Provide a list of items for which additional criteria, clarification, or guidance is required.
j. List of information required to complete the design.

8.3.2 Drawings

Provide plan views showing the features listed.

8.3.2.1 Heating, Ventilating, and Air Conditioning (HVAC).

a. Include HVAC equipment layouts. Include locations of major pieces of mechanical equipment. Show unique equipment identifiers for each item of equipment.
b. Include the air distribution duct layouts for supply, return, ventilation and exhaust ducts (single line duct layouts are permissible in this submittal),

hoods, and other items of major equipment required for the facility. Include duct sizes on main duct runs.

c. Include chilled water, heating hot water, or other HVAC piping layout and sizes. HVAC piping plans shall be separate from ductwork plans.
d. Provide mechanical equipment schedules filled out with what is known; schedules are not required to be completed.

8.3.2.2 Plumbing.

a. Include plumbing fixture layout, floor and area drains, and plumbing equipment layouts (hot water generator, storage tanks, air compressors, etc.).
b. Include water, drainage and vent, gas, fuel, compressed air, and other system layouts and pipe sizes.
c. Include plumbing fixture schedule listing individual fixtures and pipe size connections (cold water, hot water, waste, and vent).
d. Provide plumbing equipment schedules filled out with what is known; schedules are not required to be complete for this phase.

8.3.2.3 Enlarged Mechanical Room Plan completed to a level that identifies all HVAC, plumbing, and fire protection equipment; piping and duct layouts; and access for maintenance. Indicate space for maintenance of equipment on plans.

8.3.2.4 Outside Utilities. Refer to Civil chapter.

8.3.3 Specifications

Provide a listing of mechanical, plumbing, and fire protection specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications. Where a departure or addition to a UFGS guide specification is required, include in the listing a brief description of the equipment or procedure constituting the change.

8.4 FINAL DESIGN

8.4.1 Design Analysis

The Final Design Analysis is a refinement of the prior Design Analysis and contains all the information called for in those sections of this chapter. Include required and missing information that was not included in prior submittal phases. Address all previous review comments and incorporate into submittal as required.

8.4.1.1 HVAC Equipment.

a. Provide equipment sizing calculations with summaries of all major items of mechanical equipment such as: air handling units and coils, condensing units, water chillers, boilers, pumps, humidifiers, cooling towers, fans, water heaters and tanks. For all computer-generated calculations (cooling loads, heating loads, pipe sizing, duct sizing, etc.), the Design Analysis shall contain layout sketches that show how the building or system was segmented for computer input. Show manufacturers' make and model number of equipment used for design purposes, and show weights of major items of equipment. Provide vendor information for equipment selected and mark the specific items on the vendor's literature.

b. Cut sheets, product selections forming the basis of design: Clearly mark the selected product type or model intended to apply to the project. If the cut sheets or brochures are standard printouts from manufacturer showing several variations, either mark/mark out to indicate just the selected product or accompany the cut sheet with a cover sheet or narrative showing the applicable product.

8.4.1.2 Piping.

a. Include all pipe-sizing computations.
b. Show design flow, pipe size, friction factors, slopes, lengths, and elevations (where applicable), quantity conducted, and velocity in the various mains and branches.
c. Include flow diagrams, or on the drawings.
d. Include pump capacity and head calculations and valve coefficient, Cv, calculations. Include expansion loop sizes for heat distribution and low temperature heating water systems.
e. Provide a plumbing piping analysis showing the main and branch loads in terms of fixture units as well as flow quantities.

8.4.1.3 Ducting.

a. Show all duct sizing calculations. Show friction loss and clearly indicate the air velocities encountered in the main ducts.
b. Provide flow rates and static pressure on fans and air handling units based upon complete takeoff of static losses. Include filter losses.
c. Provide air balance calculations addressing the relationship between supply, return, outside air, and exhaust air quantities and indicating pressurization. Show supply, return, relief, exhaust, ventilation, and transfer air flows through the system. Include flow arrows and label equipment rooms.
d. Special requirements for space pressurization shall be reflected and referenced in the air balance calculations.
e. Include flow diagrams.

8.4.2 Drawings

8.4.2.1 General. Final drawings are complete when all necessary details, layout drawings, section views, plan views, and schedules are finished and include the incorporation of all review comments and resolutions. Complete previously submitted Interim drawings, and additional drawings for a complete design package.

8.4.2.2 Sections and Elevations. Show sufficient sections and elevations to indicate clearly the exact location of the particular item in relation to other building or equipment items. Sections shall indicate critical interference between mechanical items and building features. Provide at a minimum one section at each mechanical room, showing walls, structure, ductwork, equipment, and piping. Provide additional sections at critical duct/piping crossovers.

8.4.2.3 Risers and Isometric View(s). Show isometric riser diagrams for domestic water, drainage and vent, gas, compressed air and other piping systems. Show all piping sizes, valves, water hammer arrestors, etc. When using BIM, provide an isometric view of the mechanical equipment rooms. Label all

equipment in the isometric; sizes and other notes not required for isometric. Indicate that isometric is “For Information Only”.

8.4.2.4 Details. Provide sufficient elevations and details to allow construction and installation of the work.

8.4.2.5 Accessories. Where equipment connection details are shown, indicate all required valves, gages, and fittings required and minimum sizes. Coordinate with specification requirements and make sure valves, fittings, etc., that are specified are included in the detail furnished with each piece of equipment.

8.4.2.6 Mechanical Room Plans. Include an enlarged plan of the mechanical room(s) indicating all equipment with the manufacturer’s recommended maintenance clearances between each item. Indicate adequate spacing for HVAC controls, electrical panels and other similar items. Indicate space required for placement of all such items as coils, filters, heat exchanger tubing, motors and belts on the plan. Show routing of hydronic piping, location of sprinkler riser, and location of plumbing items such as water heaters and air-compressors.

8.4.2.7 Plans.

a. Final plans must show all pipe and duct sizes. Draw ductwork to scale on plans and indicate pressure class. Indicate those duct systems to be leak tested and specify the test pressure for each.
b. Show all balancing dampers.
c. Show condensate drain lines, required depth of water traps, and slope.
d. Show location of sensors such as differential pressure, thermostats, humidistats, CO2 sensors, etc.
e. Show locations for HVAC emergency shutdown switch(es) and boiler emergency shutdown switch(es).
f. Show locations of control panels, variable frequency drives, etc.
g. Where critical, indicate on the drawings the air suction and discharge directions of such items as fans, air cooled condensers and cooling towers.
h. Provide sequences of operation for plumbing equipment such as water heaters, recirculating systems, solar hot water heating systems, pressure booster systems, etc. Coordinate with HVAC controls.
i. Provide details of catwalks, ladders, platforms, access panels, and doors necessary for operation and maintenance of equipment, valves, and accessories. Show all locations of turning vanes, and all volume, fire and smoke dampers.

8.4.2.8 Performance Characteristics. Place performance characteristics for all items of mechanical equipment in the equipment schedules.

8.4.2.9 Schedules. Verify that all schedules reflect the necessary equipment information so that the contractor can select all of the equipment without referring to a specific model/manufacturer’s product. The loads indicated on the schedules are the minimum demand requirements from the design calculations for the building features, instead of the sizing items from the vendor catalog information.

8.4.2.10 HVAC Controls. Include complete HVAC control plans. Provide DDC controls drawings as required by the design. Control logic ladder diagrams are optional. Include drawings for each system type. When required, provide details of EMCS and final EMCS input/output summaries. Sequence of control shall be placed on the drawings. Provide sequence of control for all HVAC equipment items. (Note, typical sequence of control is found on the USACE standard control drawings templates.)

8.4.3 Specifications

Provide a complete set of fully edited specifications.

Chapter 9.0 – ELECTRICAL

9.1 GENERAL

9.1.1 Scope

This chapter provides guidance for the preparation and development for each of the different required submittal stages, as they relate to electrical engineering.

9.1.2 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

9.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

9.2 CHARRETTE DESIGN

9.2.1 Design Narrative

Design Narrative shall include the following items:

9.2.1.1 Site Utilities. Describe the available electric power and general description of the existing system (voltage, wire size, wire and pole conditions, etc.). If the primary source is inadequate, state measures proposed to correct the deficiency in the design.

9.2.1.2 Electrical Service.

a. On a Military Installation. Document the Department of Public Works (DPW), Base Civil Engineer (BCE), or other appropriate authority's requirements for electric service and metering. Document coordination made with the authority.
b. Not on a Military Installation. Document the local electric service provider's requirements for electric service and metering. Document coordination made with the service provider.

9.2.1.3 Secondary Power. List voltages used for power distribution. State basis for selection of secondary distribution voltage. Include an estimated building load based on the criteria in the USAR Design Guide.

9.2.1.4 Metering. Describe metering requirements.

9.2.1.5 Lighting. Provide a basis of design description of the proposed interior and exterior lighting systems for the project.

9.2.1.6 Permits. Provide contact information for any permits that may be required.

9.2.1.7 Installation Design Guides. Document Installation Design Guide or municipality standards compliance where applicable for exterior lighting

9.2.1.8 Special Power Conditions. List requirements for UPS, generators, power filtering, or any other special requirements.

9.2.1.9 Hazardous Locations. List hazardous locations.

9.2.1.10 Lightning Protection. Provide a Lightning Risk Protection Assessment in accordance with NFPA 780.

9.2.1.11 Corrosion Protection. List requirements for Cathodic Protection if it is required as a substitute or addition to other means of corrosion protection. If other means are provided and are adequate, state as such.

9.2.1.12 Energy Conservation Design Narrative. Describe energy conservation measures considered for the project.

9.2.2 Drawings

Provide electrical site plan for existing conditions, demolition, and new utilities. Review the floor plan and ensure that adequate space exists for all electrical equipment including panels, motor control centers, fire alarms, and other equipment.

9.3 INTERIM DESIGN

9.3.1 Design Analysis

The Charrette phase Design Narrative forms the basis of the Interim and Final Design Analysis. Depending on submittal requirements, include the following:

9.3.1.1 List of Criteria. Codes, design technical instructions or manuals, pamphlets, technical references, and other design guidance or criteria used in the design.

9.3.1.2 Field Trip Report. Furnish a report on any site visits held for the project. The report will contain minutes of any meetings held with facility and/or utility personnel along with names, phone numbers and a summary of agreed to actions. Unforeseen site/building conditions will also be documented in the report.

9.3.1.3 Energy Compliance Analysis Narrative. As part of the ECA section (refer to Chapter 1), describe energy conservation measures and techniques that are proposed in the electrical design that will conserve energy. Provide analysis of ASHRAE 90.1 considerations and FEMP/Energy Star mandated energy efficiency considerations.

9.3.1.4 Electrical System Characteristics. Indicate electrical system characteristics (including voltage, phase, number of wires). Provide a statement describing standards of design such as voltage selection and voltage drop. State short circuit current available at project site if it can be obtained from the utility. If not available, state as such.

9.3.1.5 Load Calculations. Provide preliminary load calculations based on building area and expected loads.

9.3.1.6 High Voltage Work. Describe physical characteristics of aerial or underground circuits and the basis for the selection of aerial or underground distribution.

9.3.1.7 Electric Service. Describe service entrance equipment selected.

9.3.1.8 Power Distribution Equipment. Describe characteristics of panelboards, protective devices, switchgear, motor control center, transformers, and other major equipment to be provided.

9.3.1.9 Grounding. Describe grounding system. If a counterpoise, grid, or other system is to be used, state the standards to be used in the design.

9.3.1.10 Metering. Describe specific electrical metering equipment to be provided.

9.3.1.11 Hazard Classes. Define any hazardous area by class, division and group and indicate type of equipment proposed for use in the area.

9.3.1.12 Lighting. Provide a description of the proposed interior and exterior lighting system(s). Include a concept lighting fixture schedule showing room name, room number, room type, lighting intensity, type of fixture, mounting method (wall or ceiling), mounting height, fixture efficacy, minimum lumen output at end of life, sequence of operation/control information, and any special conditions.

9.3.1.13 Emergency Lighting. Provide description of emergency lighting system, including emergency mode output information for each emergency fixture.

9.3.1.14 Wiring. State type of wiring system, including type of conduit (rigid conduit or intermediate conduit, electrical metallic tubing, nonmetallic sheathed cable, etc.), conductors and cables, etc., and where they will be used.

9.3.1.15 Special Provisions. Provide paragraph describing proposed addition and alterations of special items of design, such as, specialized equipment, special receptacles, seismic requirements, etc. Include description and location of special power outlets and circuits (volts, phase, and amps). Reference pertinent NEMA or other recognized standards to identify the type receptacles selected. Include documentation of the source of the criteria.

9.3.1.16 Lightning Protection. Describe lightning protection system; if none, state as such.

9.3.1.17 Security Systems. Describe the arrangement and functionality of IDS and PACS systems.

9.3.2 Drawings

9.3.2.1 Site Plan. Provide a site plan indicating existing and proposed electrical utility lines and equipment required to serve the project including electrical power lines, roads and driveways, parking areas, and other items necessary for functional and operating adequacy. Indicate the extent of any demolition to be done. If extensive, provide separate drawings with independent legend for new work.

9.3.2.2 Exterior Lighting. Indicate location, height, and type of proposed exterior lighting.

9.3.2.3 Interior Power. Provide floor plan drawings showing convenience, special and general purpose power receptacles and power distribution equipment. Since these portions of the electrical design cannot be completed until the mechanical and furniture layouts are completed only preliminary drawings should be submitted.

9.3.2.4 Interior Lighting. Provide floor plan drawings showing lighting fixtures and controls.

9.3.2.5 Emergency Lighting. Show the location of emergency lighting fixtures including exit signs and exterior path illumination. This information is also required to be shown on the Life Safety code drawings.

9.3.3 Specifications

Provide a listing of specifications in the Design Analysis. This is to be the Table of Contents intended for the Final specifications. Where a departure or addition to a UFGS guide specification is required, include in the listing a brief description of the equipment or procedure constituting the change.

9.4 FINAL DESIGN

9.4.1 Design Analysis

Provide a complete Design Analysis, updated to reflect changes from prior submittals.

9.4.1.1 Calculations. Provide design calculations and supporting documentation to support design considerations. Calculations shall be computed and checked by separate individuals, one of which must be a registered electrical engineer. Indicate the names or initials of these individuals on the page or insert carrying the calculations. Supporting documentation shall be clear, and formulas and references shall be identified. Assumptions and conclusions shall be explained, and cross-referencing shall be clear. When a computer program is used, name the program and describe and include a flow chart showing how the program reaches solution. Include calculations and data for the following in the Design Analysis:

a. Lighting. Provide tabulated calculations for normal and emergency egress light levels for each room, functional area, MEP, POV parking, walkways, roadways, and security areas. Provide emergency egress lighting calculations indicating minimum and average illuminance values and uniformity ratios that demonstrate compliance with the IBC and ASHRAE 90.1, NFPA 101.
b. Load Analysis. Provide calculations of all connected loads, demand factors, and estimated demand loads for each panel and switchboard. Separate loads by categories such as lighting, receptacles, HVAC, special equipment, etc. Provide calculations where connections are made to existing transformers or load centers including method determining the availability of sufficient capacity for the additional loads. This can be provided in the DA or on the Drawings.
c. Fault Current. Provide calculations in the DA and indicate results on the one-line diagram as well.
d. Voltage drop. Provide calculations that demonstrate compliance with ASHRAE 90.1.

e. Over-Current Protection Coordination. Provide data to verify proper overcurrent protection and selective overcurrent protection coordination is provided for the distribution system(s). Include transformer damage and conductor damage curves. Coordination calculations shall incorporate results of arc-flash calculations, to minimize arc-flash hazard while maintaining system coordination as much as possible.
f. Arc Flash Hazard Analysis. Provide arc flash hazard analysis in accordance with NFPA 70E. Provide calculations indicating the arc-flash energy level at each bus in the electrical system and the Personal Protective Equipment (PPE) level required. Provide arc flash hazard warning labels on all distribution equipment.
g. Corrosion Protection. Describe cathodic protection specification requirements.
h. CATV. Describe system requirements and infrastructure provided.

9.4.2 Drawings

Complete previously submitted Interim drawings, and additional drawings for a complete design package.

9.4.2.1 Details. Include all details for Final package on drawings. For congested areas that might interfere with various building systems, cable trays, piping, ducts, etc., thoroughly detail by expanded scale drawings.

9.4.2.2 Provide an enlarged floor plan for each electrical room, and show clearances.

9.4.3 Specifications

Provide a complete set of fully edited specifications. Include references to industry standards and criteria, and descriptions for items not adequately covered by the specifications.

Chapter 10.0 – INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

10.1 GENERAL

10.1.1 Scope

This chapter provides guidance for the preparation and development for each of the different required submittal stages, as they relate to telecommunications design.

10.1.2 Submittal Requirements

Refer to Chapter 1 “All Disciplines” above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

10.1.3 BIM Submittal Requirements

Refer to Chapter 1 for CAD/BIM requirements.

10.2 CHARRETTE DESIGN

10.2.1 Design Narrative

Design Narrative shall include the following items:

10.2.1.1 Site Telecommunications Services.

a. On a Military Installation. Describe the point of connection for telecommunication services. Describe the available telecommunications Outside Plant (OSP) distribution system. If the existing OSP system is inadequate to support the project, state measures proposed to correct the deficiency.
b. Not on a Military Installation. Describe existing Service Provider Point of Connection (SPPOC) and requirements for connecting to it.
c. Describe requirements for OSP pathways and cabling to other buildings (i.e. training building to VMS).

10.2.1.2 Security Requirements. List security requirements, including requirements for Intrusion Detection (IDS) and Physical Access Control Systems (PACS).

10.2.1.3 Cable TV (CATV). List if CATV is required and what provisions are required for it.

10.2.1.4 Permits. Provide contact information for any permits that may be required.

10.2.1.5 Installation Design Guides. Document Installation Design Guide or municipality standards compliance where applicable for telecommunications

10.2.2 Drawings

10.2.2.1 Site Plan. Provide telecommunications site plan showing existing conditions, demolition, and new OSP pathways. Refer to the sheet list in the Final Design section below for planned sheet organization.

10.2.2.2 Telecommunications Spaces (EF, TER, TR). Coordinate with the architectural floor plans to ensure proper locations, size, and access. No telecommunication-specific building plans are required for this phase.

10.3 INTERIM DESIGN

10.3.1 Design Analysis

The Charrette phase Design Narrative forms the basis of the Interim and Final Design Analysis. Depending on submittal requirements, include the following:

10.3.1.1 List of Criteria. List the codes, criteria, standards, and manuals used to create the design - design technical instructions or manuals, pamphlets, technical references, and other design guidance or criteria used in the design and their updates.

10.3.1.2 Field Trip Report. Furnish a report on any site visits required for the project. The report will contain minutes of any meetings held with facility and/or utility personnel along with names, phone numbers and a summary of agreed to actions. Unforeseen site/building conditions will also be documented in the report.

10.3.1.3 OSP. Describe extent of OSP infrastructure including ductbank characteristics, number or cables required, etc. Provide a statement describing standards of design such as ductbank sizing, manhole construction, exterior building penetration condition (e.g. below grade, through foundation, up through slab; or exterior surface mounted conduit (more typical on renovations)), etc.

10.3.1.4 Premises Distribution. Describe characteristics of pathways, cabling, and telecommunications outlets.

10.3.1.5 Telecommunication Rooms. Describe telecommunication room sizing, location, equipment, electrical requirements and environmental control to be provided.

10.3.1.6 Grounding and Bonding. Describe telecommunications bonding system. Provide a statement describing standards of design.

10.3.1.7 Other Systems (e.g. IDS, Access Control, CATV). Provide paragraph describing special items of design. Include documentation of the source of the criteria.

10.3.2 Drawings

10.3.2.1 Provide the drawing items for this phase (below), organized per the drawing list and organization in the Final Design section below.

10.3.2.2 Site Plan. Provide a site plan indicating existing and proposed telecommunications lines and equipment required to serve the project including overhead and underground lines, roads and driveways, parking areas, exterior building penetrations, and other items necessary for functional and operating adequacy. Indicate the extent of any demolition to be done. If extensive, provide separate drawings with independent legend for new work.

10.3.2.3 Building Drawings.

a. Symbols Legend.
b. Telecommunication Spaces. Provide floor plans showing EF, TR, and TER locations, sizes, and access.
c. Pathways and Cable Support. Show location and type of proposed cable support including cable trays, ladder racks, conduits and sleeves, and areas with non-continuous cable support.
d. Grounding and Bonding. Provide telecommunications grounding and bonding requirements for communications rooms (EF, TER, and TR).
e. Racks and Cabinets. Provide enlarged aerial (overhead) plans showing rack and cabinet locations and quantities.
f. Backbone Cabling. Provide a riser diagram showing backbone cable interconnections and cable counts.
g. Telecommunications Outlets. Provide floor plans showing locations and types of telecommunication outlets

10.3.3 Specifications

10.3.3.1 Provide a listing of specifications which are planned to be incorporated in the Final specifications, in the Design Analysis. This is to be the Table of Contents intended for the Final specifications.

10.4 FINAL DESIGN

10.4.1 Design Analysis

Provide a complete Design Analysis, updated to reflect changes from prior submittals. The Final DA shall be complete, not just amendments to previously submitted design analyses.

10.4.1.1 Calculations. Provide design calculations and supporting documentation to support design considerations. Calculations shall be computed and checked by separate individuals, one of which must be an RCDD. Indicate the names or initials of these individuals on the page or insert carrying the calculations. Supporting documentation shall be clear, and formulas and references shall be identified. Assumptions and conclusions shall be explained and cross-referencing shall be clear. When a computer program is used, state the name of the program and version used. Include calculations and data for the following in the DA:

a. Cable Fill. Provide calculations demonstrating compliance with ARNEC requirements for cable tray initial fill capacity.

10.4.2 Drawings

Complete previously submitted Interim drawings, and additional drawings for a complete design package.

10.4.2.1 At a minimum, provide the following Telecommunications-Site (TS series) drawings:

a. Site Plan.
   1) OSP pathways.
   2) Concrete encasement areas and details.

3) Maintenance holes and Hand holes.
4) SPPOC location and type (i.e. pedestal, pole, hand hole).

b. Enlarged Duct bank details.
1) Direct buried.
2) Concrete encased.

c. Enlarged Maintenance hole and Hand hole details.
1) Maintenance hole and Hand hole accessories.
2) Butterfly diagrams.

d. Enlarged Exterior Building Penetration detail.

10.4.2.2 At a minimum, provide the following Telecommunications building (T series) drawings:

a. General:
1) General Notes.
2) Symbols Legend (must use symbols from ARNEC and add other symbols as needed for the project).

b. Composite floor plan for each floor with serving area(s) indicated.

c. Building area floor plans. For each building area, include separate floor plans for:
1) Cable tray.
2) Telecommunications outlets.
3) Backbone cable distribution conduit.

d. Enlarged Telecommunications spaces.
1) Aerial (overhead) plan.
2) Wall elevations of each wall, including backboard elevations.
3) Rack and cabinet elevations (both front and rear of each rack).
(a) Provide detailed elevations of telecommunications racks and cabinets indicating arrangement, wire management, power, equipment provided by the project, and space allocated for GFGI equipment. Show termination of OSP cables, connection of OSP cables into the premises, and termination and connection of backbone cables.

e. Telecommunications Bonding.
1) Enlarged details for PBB, SBB, and RBB.
2) Bonding riser diagram, to include the following bonding conductors: TBC, TBB, BBC, SBC and the components bonded to these conductors.

f. Enlarged Faceplate(s).
1) Faceplate type.
2) Outlet type/color/termination type.
3) Blank inserts.

g. Enlarged floor-box and poke-through box plans and details.

h. Backbone riser diagram.
1) Cabling from the TER to EF.
2) Cabling from the TER to each TR.
3) Indicate cabling type, strand/pair count, termination type (fiber only).

10.4.2.3 Details. Include all details for Final package on drawings to include one-line diagrams for telecommunications backbone system and telecommunications grounding and bonding system, telecommunications floor, wall and ceiling outlet details, cable management details, labeling requirements of all telecom components, cable tray support, and audio/visual systems. For congested areas that might interfere with various building systems, thoroughly detail by expanded scale drawings. Provide an enlarged detail for all telecommunication spaces and show clearances.

10.4.3 Specifications

Provide a complete set of fully edited specifications. Be sure to utilize the telecommunications specifications (ending with '48' suffix) on the Army Reserve website. Include references to industry standards and criteria, and descriptions for items not adequately covered by base specification.

Chapter 11.0 – ENVIRONMENTAL

11.1 GENERAL.

11.1.1 REQUIREMENTS

Environmental requirements are project and location specific, and could include site asbestos survey and remediation planning, building asbestos survey and demolition, lead paint and environmental lead identification and remediation planning, radon assessment, reporting and abatement design, and a variety of other site and building environmental concerns,

Refer to SECTION 01 02 00.00 48 – STATEMENT OF WORK, the Outline Specifications, and other portions of the Solicitation for the particular project environmental conditions and requirements.

11.1.2 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above for the general requirements and requirements at each design stage. Additional requirements specific to this discipline are listed in this chapter.

11.2 CHARRETTE DESIGN, INTERIM DESIGN, AND FINAL DESIGN

11.2.1 Submittal Requirements

Refer to Chapter 1 "All Disciplines" above, paragraphs concerning the requirements at each submittal state.

11.2.2 Environmental Reports

The D/B DOR is to include in the Design Analysis the environmental reports received as part of the D/B RFP solicitation, and any environmental reports created or received during the D/B design process.