US Army Corps of Engineers
Tulsa District

DELIVERABLES

SUPPLEMENT TO THE ARCHITECT-ENGINEER'S SCOPE OF WORK

Revised April 2013

SUPPLEMENT TO THE ARCHITECT-ENGINEER'S SCOPE OF WORK DELIVERABLES

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DELIVERABLES

1.0 GENERAL

The purpose of this document is to provide additional guidance for deliverables (plans, specifications, design analysis, CADD files, cost estimates) required by the Scope of Work (SOW). Use this as a tool to eliminate problems associated with deliverables. This document and is a result of frequently asked questions and common problems associated with review, solicitation and contract documents.

1.1 References

ER 715-1-21	Electronic Contract Solicitations (1 Oct 03)
	MILCON Transformation MT Model RFP Implementation Guide (20 Sep 10 or later edition)
	Tulsa District CADD Standards

2.0 BEGINNING A PROJECT

2.1 Units of Measure

As soon as possible, determine whether the project will be in English or metric units. (Note: Military ranges are likely to use metric units; 99.9% of all other projects will be in English units.) It is essential to know this to determine which drawing border to use. The border sheets are different sizes (metric: 841mm x 594mm; English: 30"x42") and the title blocks are configured differently. The border sheets are available for English and metric size sheets in AutoCad and MicroStation formats at the IP address shown in Appendix A of the Tulsa District CADD Standards.

Occasionally a project will start out in metric units then change to English (or vice versa). Changing border sheets while in production presents the following problems:

a. The site or buildings could no longer fit on the sheet(s) (if going from English to metric).
b. Using English units on a metric border sheet and increasing the sheet size to 30"x42" creates problems printing the job. The normal size (841mm x 594mm) metric sheet size is often ordered resulting in an out-of-scale printing job. (Avoid increasing the dimensions of the border sheet, please.)

2.2 CADD Format

2.2.1 General. Tulsa District's customers use two different CADD systems - Bentley Systems' MicroStation (also marketed through Intergraph Corporation) and AutoDesk's AutoCad.

Following is a breakdown of CADD systems by customer:

AutoCad Users: Altus AFB, OK; Vance AFB, OK, Sheppard AFB, TX, and Tinker AFB, OK; some municipal governments (for civil projects).

MicroStation Users: Ft. Sill, OK; McAlester Army Ammunition Plant, OK. Double check final version for drawings.); Tulsa District (for civil works projects where TD is the using agency).

If you are working on a project NOT within the traditional boundaries of the Tulsa District, please verify the CADD version for the contract drawings with the using agency as soon as possible.

2.2.2 The CADD format for the project will be listed in the Scope of Work for traditional Design-Bid-Build projects. Verify this information at the pre-design conference.

2.2.3 Design-Build projects. The CADD format for the RFP will be listed in the Scope of Work. It is extremely important, as the preparer of the RFP, to verify the final CADD format of the contract drawings and as-built drawings with the User. This information must be incorporated into the RFP.

2.2.4 Cover Sheets for Drawings. Please use the Tulsa District's standard cover sheets for the drawings. In addition to the information currently on the sheet, the A/E may add their company name and logo above the line for the IFB No./ RFP No.

The cover sheets are available for English and metric size sheets and are available in AutoCad and MicroStation formats at the IP address shown in Appendix A of the Tulsa District CADD Standards.

Please note that covers and title blocks shall NOT contain your A/E contract number. The "CONTRACT No." space on the cover and in the title block is reserved for the construction contract number; this is **not** your A/E contract number**.**

Identify the submittal stage (e.g., 35%, 60%, 95%, Phase 1 or 2 Draft, etc.) on all covers BUT remove this indicator for the solicitation and contract drawings.

2.2.5 Building Information Management (BIM)

Verify that your project will require BIM. All Wizard projects will require BIM. (See Section 01 33 16 DESIGN AFTER AWARD in the Wizard project.)

If BIM is required, verify the software to be used for BIM. See Appendix F for BIM information.

2.3 Drawings

2.3.1 Drafting standards, drawing file naming conventions, layering, numbering, etc. shall be in accordance with the Scope of Work, A/E/C CADD Standards, and the Tulsa District CADD Standards (TDCS).

2.3.2 Please note that the Government does not use "ALTERNATES"; the Government uses "OPTIONS" or "ADDITIVES". See paragraph entitled "Options and Additives" below. If Options or Additives are used, it is very important to adequately define (show the limits of; quantify) the Options or Additives on the drawings. As a test, look at the project from a Bidder's/Proposer's point of view. Can he/she bid the job with the information that is shown on the drawings or from the descriptions of the options provided?

2.3.3 Title block information should be obtained as soon as possible. Most of the project information can be obtained from the Form 1391 for MILCON projects. The official project name, the fiscal year, project number or PDC number will be shown as well as part of the drawing code. Form 1391 is not applicable to Non-appropriated Funds (NAF), Operations & Maintenance (O&M), or civil works projects. Get the title block information from the Government Project Engineer. Also, call him/her if there are any questions concerning this information.

2.3.4 Due to legal issues, Tulsa District cannot use only numeric scales on drawings. Drawings must contain graphic bar scales. If you choose to use numeric scales along with bar scales, you must place a prominent warning on each sheet to use the bar scales on less than full-size drawings and give the full-size dimensions of the sheet.

2.3.5 A checklist for drawings is enclosed as Appendix A.

2.4 Specifications Format

2.4.1 Specifications for Design-Bid-Build projects shall be created using UFGS guide specifications (for Divisions 02-48) and Tulsa District's Division 01 sections utilizing SpecsIntact software. UFGS guide specifications are available at the TECHINFO website: http://www.hnd.usace.army.mil/techinfo/gspec.htm or the Whole Building Design Guide (WBDG) website: http://www.wbdg.org/ccb/. Tulsa District's Division 01 sections are available on Tulsa District's homepage @ http://www.swt.usace.army.mil or by by calling the SWT specifications personnel: 918-669-7055 for Military construction and 918-669-7567 for Civil Works projects. A completed submittal register (from SpecsIntact) is required. Units of measure in specifications shall correspond to those of drawings.

2.4.2 Design-Build Projects

2.4.2.1 MILCON Transformation Projects (Army) require the use of the Wizard program to develop RFPs. This program is available at the following web site: http://rpfwizard.cecer.army.mil. Early coordination with SWT specifications personnel is required for project set up. Call the Military Spec writer at 918-669-7055.

2.4.2.2 Other Design-Build Request for Proposals (RFPs): Determine during the "Draft RFP" stage whether the Using agency will allow UFGS guide specifications generated through SpecsIntact to be used or if commercially available specs systems (e.g., AIA, Masterspecs, etc.) are acceptable. In either case, Tulsa District's Division 01 sections (available at the website shown above) shall be used and included in the RFP. These sections shall be incorporated into the construction contract by the Design-Build contractor. The Design-Build contractor shall be required to provide a completed submittal register with his design submittals. If specifications other than UFGS sections generated through SpecsIntact are to be used, the contractor shall be required to input the submittal information into the Resident Management System (RMS). The Design-Build contractor must be aware of this effort. Include this requirement in the RFP. Units of measure in specifications shall correspond to those of drawings.

Note: Inputting information into RMS is a labor intensive task that is eliminated if using SpecsIntact because the submittal register is an automatic report generated from SpecsIntact that can be imported into RMS (if it has NOT been manually altered using DOS).

2.4.3 Projects that are full-design, best-value or lowest-price technically acceptable selections generally will use UFGS guide specifications and SpecsIntact software. A completed submittal register (from SpecsIntact) is required. Units of measure in specifications shall correspond to those of drawings.

2.4.4 A checklist for specifications is enclosed as Appendix B.

3.0 REVIEW DOCUMENTS

3.1 General

Review documents consist of text documents (specs, design analysis, or draft RFPs) and drawings (in most cases). Please identify the submittal stage on the covers of the drawings, specs, design analysis, or RFP documents (e.g., 35%, 60%, 95%; Phase 1 Draft, Phase 2 Draft, etc.).

3.2 Bidding and Pricing (Proposal) Schedules

Bidding/Pricing (Proposal) Schedules are placed after the Table of Contents in the first volume of specs or the RFP document. For Design-Bid-Build project, the page number begins with "00 11 00 - 3". Tulsa District will add pages 00 11 00 - 1 & 00 11 00 - 2 (Standard Form 1442). Note: Task Orders generally will not include an SF1442, so the Pricing Schedule page number will begin with “00 11 00 – 1”.

3.2.1 Bidding Schedule. Bidding Schedules are used for Design-Bid-Build projects (sample format enclosed; see Appendix C). Include the Bidding Schedule for review in the 60% Submittal. If there is no 60% Submittal scheduled for your project, please insure that it is included complete at the 95% Submittal. If there are questions on the Bidding Schedule, please get with the Government's Project Engineer and

the specifications writer to coordinate as soon as possible to avoid problems with designations on drawings, etc.

3.2.2 Pricing (Proposal) Schedule. Proposal Schedules are used for Design-Build projects and full-design, best-value RFPs (sample formats enclosed; see Appendix C). Include the Proposal Schedule for review in the 60% Submittal. If there is no 60% Submittal scheduled for your project, please insure that it is included complete at the 95% Submittal. Please note that the Proposal Schedule for a Design-Build project is different than a full-design, best-value RFP (which is basically the same format as a Bidding Schedule). If there are questions on the Proposal Schedule, please get with the Government's Project Engineer to coordinate.

3.3 Options and Additives

Please note that the Government does **not** use "ALTERNATES"; the Government uses "OPTIONS" or "ADDITIVES". For the past few years, the Government has used "Options" much more frequently than "Additives". Options allow more flexibility; they may or may not be awarded. If the Government chooses to award, then award of an option or any combination of options may occur after award of the construction contract and Notice to Proceed is issued up to however many days stated in the Bidding/Pricing Schedule Notes (generally 90 days - check this with the Government's Project Engineer). Additives must be awarded at the same time as the construction contract and they must be awarded in the order shown on the Bidding/Pricing Schedule.

Options or Additives shown on the Bidding//Pricing Schedule must be carefully coordinated with designations on plans and in specifications.

3.4 Division 01 Specifications

3.4.1 Non-Wizard Projects: Division 01 specs need to be edited and submitted with the 60% submittal as red-lined sections or RFP Draft (for single-phase) or Phase 2 Draft (two-phase RFP). Tulsa District has a specific set of Division 01 specs for use on projects within our district boundaries. These are available as shown in paragraph 2.4.1 (above). There are several UFGS Division 01 sections that you will need to download from the UFGS guide specs web site: 01 45 00.00 10 QUAILITY CONROL; 01 45 00.10 10 QUALITY CONTROL SYSTEM (QSC); 01 62 35 RECYCLED/RECOVERED MATERIALS; 01 74 19 CONSTRUCTION & DEMOLITION WASTE MANGEMENT, 01 78 23 OPERATION & MAINTENANCE DATA. Use the following UFGS guide if applicable to your project: 01 33 29 LEED DOCUMENTATION; 01 35 29 13 HEALTH, SAFETY & EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES. These sections are found on UFGS guides specs can be downloaded at the following web site: http://www.wbdg.org/ccb.

3.4.2 Projects Using the Wizard Program: Division 01 sections in the Wizard will be different than the SWT guide above. Call SWT specifications writer at 918-669-7055 if there are questions.

3.5 Design Analysis

The Design Analysis must follow the SWD-AEIM format unless otherwise stated in the Scope of Work or directed otherwise by the Government Project Engineer. Include the CESA (if required) at the appropriate design stage. The Design Analysis shall be provided for each stage of review unless directed otherwise by the Government's Project Engineer. A final design analysis, incorporating all comments, shall be issued to document the final design. Note: The Design Analysis does not become part of the solicitation documents; so if the D.A. contains information that bidders/offerors need, that information must be included as part of the plans and specifications or RFP.

3.6 Cost Estimate

Provide the cost estimate in M-CACES as directed by the SOW unless directed otherwise by the Government's Project Engineer.

4.0 SOLICITATION DOCUMENTS

4.1 General

Solicitation documents consist of plans and specifications for traditional Design-Bid-Build projects and full-design, best-value or lowest-price technically acceptable selections and the Request for Proposal Documents (Section 01 10 00 STATEMENT OF WORK, specifications, plans, and guidance documents, appendices, attachments, etc.) for Design-Build projects. All of Tulsa District's solicitations are accomplished through the use of electronic contract solicitations (ECS) posted to FedBizOpps at https://www.fbo.gov. The exceptions are Task Orders to MATOCS/SATOCS or non-competitive solicitations. All solicitation documents must be provided to SWT in electronic format.

4.2 Text Documents (Specs and/or RFP Sections)

Text documents (specs and RFP sections for non-Wizard solicitations) need to be printed into .pdf through the use of Adobe Acrobat. Specintact has this feature built into the program. Please do not scan these documents into .pdf because the "search" feature within Abode will not work on a scanned text file. Provide each spec and/or RFP section as a separate .pdf file; do not link them together. In addition to the .pdf files, provide the SpecsIntact or Word file for the Table of Contents and the Bidding/Pricing Schedule. Tulsa District needs to edit this file to add the contracting sections at the beginning (Div 00). Print any hard copies of these documents required by the SOW from the .pdf files. Note: The page layout will differ from the SpecsIntact and/or Word file to the .pdf file. It is absolutely necessary for the hardcopies pages to match the EBS pages exactly.

For Wizard projects, contact the Military specifications writer at 918-669-7055.

4.3 Attachments and/or Appendices

Ensure that all attachments and/or appendices files are included on the solicitation CD. Attachments may be added to the end of the appropriate section or they may be furnished as separate files. If furnished as separate files, please name these attachments so they can be readily identified as to location in the document (e.g., 01 58 00.00 10 add.pdf, 01 30 50attach.tiff, append A.pdf, etc.). If there are several (or many) files in the attachment or appendix, provide documentation to show the sequence of the documents (by file name) within the attachment or appendix.

4.3.1 Forms that are attachments to spec sections should be furnished as .pdf files.

4.3.2 Photographs and cut sheets from catalogs that are attachments or appendices to an RFP must be furnished in .pdf, .tiff or .jpg format.

4.3.3 Completed submittal registers files (from SpecsIntact) must be furnished for all Design-Bid-Build and full-design, best-value or lowest-price technically acceptable selection projects. This is an automatic report generated through SpecsIntact. A blank ENG FORM 4288 SUBMITTAL REGISTER shall be provided at the end of Section 01 33 00 SUBMITTAL PROCEDURES for all Design-Build projects. In addition, all projects shall have ENG FORM 4025 TRANSMITTAL OF SHOP DRAWINGS included at the end of Section 01 33 00 SUBMITTAL PROCEDURES Note: Do NOT put your A/E contract number in the "Contract No." block in the submittal register. This is reserved for the construction contract number.

4.4 Drawings

Add the Solicitation or RFP number to the cover and title block of each drawing. Drawings shall be furnished in .pdf format. DO NOT SCAN THE DRAWINGS INTO .PDF FORMAT. Ensure that .pdf files are provided as full-size files. File names (.pdf) should be the same as the drawing number (e.g., A101.dgn = A101.pdf). Print any hard copies of these documents required by the SOW from the .pdf files.

4.5 CDs Containing Solicitation Documents

Provide CD(s) containing solicitation documents to the Government Project Engineer as stated in the SOW. Place drawings and text files into separate directories. Provide each drawing (.pdf file), spec and/or RFP section (.pdf) as separate files; do not link them together. Ensure that all attachments, etc. are also included.

4.6 Hard Copy Cover and Index Sheet for Solicitation

In addition to the CD, provide a 1/2-size (for 30"x42" sheets) or full-size (for 841mm x 594mm sheets) vellum cover sheet and index sheet containing the authorization block) or as directed by your A/E Scope of Work. Make sure the cover contains your professional seal(s). These two sheets shall be reprinted, stamped, etc. for the final mylar or vellum (see Scope of Work***)*** set of drawings sent in with the contract set of drawings.

4.7 Request for Information (RFI)

After the solicitation documents are issued (advertised), bidder/offerors will submit questions (RFIs) in regard to the solicitation. RFIs are handled in one of two ways:

a. The bidders/offerors submit questions in writing to SWT's Contract Specialist. RFIs will be forwarded to the A/E asap by the Technical Manager. The Technical Manager will point out any questions that will be answered by the Government.
b. The bidders/offerors enter questions into the Bidders Inquiry system in DrChecks. This is the preferred method for RFIs.

Regardless of the manner in which RFIs are submitted to the Government, the A/E is responsible for providing responses to RFIs asap so they can be returned/released to the bidders/offerors.

Refer to Appendix E for additional information and RFI procedures; the RFI procedures are a critical step in the solicitation process.

4.8 Amendments

After the project is advertised, it may be necessary to add to or revise the solicitation documents. The Government does this by AMENDMENT (not Addendum). The A/E shall be responsible to prepare amendments. Please note that **any change, however minor**, must be documented in an Amendment.

Amendments must be given a very high priority. Before proceeding with any amendment, contract the spec writer to coordinate the amendment number.

Instructions for preparing Amendments are attached as Appendix D. Contact the specifications writer at 918-669-7055 for amendment instructions for Wizard projects.

4.9 Bid/Proposal Opening Cost Estimate

A bid/proposal opening cost estimate is required 10 days prior to bid opening or proposal due date.

5.0 CONTRACT DOCUMENTS

5.1 General

Contract documents consist of all the solicitation documents with all amendments incorporated and the contract number added to the cover sheet(s) and each title block of the drawings. **Only the amendment changes can be made to the documents. You may NOT change anything else, however minor, on**

the drawings. Final contract documents shall be submitted to the Government's Project Engineer as stated in the SOW. Final documents shall be on CD and in hardcopy format. It is important that this be done as soon as possible after contract award.

5.2 Text Documents

5.2.1 Non-Wizard Projects

Incorporate all amendments into the documents. Text documents (specs and RFP sections) shall be furnished in two formats, .pdf and SpecIntact (.sgml) (Word, .doc, files are acceptable for any RFP sections not in Specsintact). Provide the each spec and/or RFP section as a separate .pdf, .sgml or .doc file; do not link them together. Ensure that all attachments are included. It would be helpful to have the .pdf files and .sgml files in separate directories on the CD.

Print any hard copies of these documents required by the SOW from the .pdf files. Note: The page layout will differ from the SpecsIntact and/or Word file to the .pdf file. It is absolutely necessary for the hardcopies pages to match the electronic pages exactly.

5.2.2 Wizard Projects

Contact the military specifications writer at 918-669-7055.

5.3 Drawings

5.3.1 Non-Wizard Projects

Incorporate all amendments into the documents and add the contract number to the cover and each drawing title block. Final contract drawings shall be furnished in two formats: .pdf format (full-size) and MicroStation (.dgn) or AutoCad (.dwg) as required by the SOW. File names (.pdf) should be the same as the drawing number (e.g., A101.dgn = A101.pdf). Please double check to ensure that all files are submitted.

Print the final full-size set of drawings on the media specified in the SOW from the final .pdf files. (Final .pdf files shall be printed/generated/created from final CADD file format - CADD files that will be used to produce as-built drawings.) This is a particularly sensitive issue when translating CADD files from Autocad to Microstation. In many instances, the translation does not contain all the contract drawing information or the line styles, line weights, and text fonts do not translate correctly. It is essential to check every file to ensure that information translates accurately and completely.

Provide professional seal(s).

5.3.2 Wizard Projects

Contact the Military specifications writer at 918-669-7055.

5.4 BIM Files

If required for the project, BIM files must be provided to SWT. See Appendix F for BIM information.

APPENDIX A
DRAWING CHECKLIST

APPENDIX A
DRAWING CHECKLIST

1. Covers:

☐ Have you used Tulsa District's standard cover sheet?

☐ Project name & location (for MILCON) from 1391 on the sheet? OR Project name & location from Government's Project Engineer on sheet?

☐ Have you put the project number & FY (for MILCON) on the cover?

☐ Have you put your company logo & ID above the INVITATION NO. or RFP NO.?

☐ Have you filled in the INVITATION NO or RFP NO.? (This will be supplied by the Government's Project Engineer prior to advertisement.)

☐ Have you identified the submittal stage (i.e., 35%, 65%, 95%, Phase 2 Draft, etc.) on the cover? NOTE: Applicable to review submittals only.

☐ Have you removed the submittal stage notation for the solicitation drawings?

2. Index Sheet (1st sheet after cover):

☐ Do the drawing titles shown on the Index Sheet exactly match the titles on the drawings?

☐ Have you put the Authentication Block on this sheet?

3. Title blocks:

☐ Project name (for MILCON) from 1391 on the sheet? OR Project name from Government's Project Engineer on sheet?

☐ For MILCON Projects: Project number on sheet along with FY?

☐ Are all DESIGNED BY, REVIEWED BY, CHECKED BY, and SUBMITTED BY blocks filled in with the complete names of the appropriate individuals? Note: Initials are NOT acceptable; as a minimum, include the person's first initial and complete last name. These blocks need to be completed by the 95% review submittal.

☐ For MILCON Projects: Is the Drawing Code on each drawing?

☐ Have you included the CADD file name of each drawing in the DESIGN FILE or FILE NAME block?

4. General:

☐ Have you used the appropriate border sheet (English or metric) for the project?

☐ Have you provided the appropriate professional seal(s) on the drawings? Note: Required on final drawings (not review submittals).

- ☐ Have you provided graphic bars scales on each drawing? Note: If you have used numeric scale AND provided bar scales, you must also provide a warning on each drawing to use the bar scales when working with less than full-size drawings (state the full-size drawing dimensions).

- ☐ Are all section cuts, detail bubbles, references, etc. complete?

5. Solicitation Drawings

- ☐ Have you incorporated all comments?

- ☐ Have you put the solicitation number on the drawing cover and each drawing?

- ☐ Have you printed all drawings to .pdf format?

- ☐ Do you have a separate .pdf file for each drawing?

- ☐ Have you double-checked the CD to ensure that ALL files are included?

- ☐ Have you printed/generated/created a hard copy of the dwgs (if required by the SOW) from the .pdf files?

6. Contract Drawings

- ☐ Have you incorporated all amendments?

- ☐ Have you put the contract number on the drawing cover and each drawing?

- ☐ Have you printed all drawings to full-size .pdf format from the final* required CADD/BIM file format? *CADD/BIM file format that will be used to produce as-built drawings.

- ☐ Have you checked prints from .pdf files for accurate line styles, fonts, line weights, etc.?

- ☐ If files were translated, has all information translated correctly and is all the information present in the translated file?

- ☐ Do you have a separate .pdf file for each drawing?

- ☐ Have you printed the final mylar or vellum (see Scope of Work) drawings from the final .pdf files? (If files were translated, mylars/vellums must be created from the TRANSLATED files.)

- ☐ Have you included all BIM files (including any documentation) in the required format?

- ☐ Have you double-checked the CD to ensure that ALL files are included?

APPENDIX B
SPECIFICATIONS CHECKLIST

APPENDIX B
SPECIFICATIONS CHECKLIST

1. Covers:

☐ Project name & location (for MILCON) from 1391 on the sheet? OR Project name & location from Government's Project Engineer on sheet?

☐ Have you put the project number & FY (for MILCON) on the cover?

☐ Does the project name & location, project number and FY match what is on the drawing cover?

☐ Is the INVITATION or RFP NO. in the upper right (at solicitation stage)?

☐ Have you identified the submittal stage (i.e., 35%, 65%, 95%, Phase 2 Draft, etc.) on the cover? NOTE: Applicable to review submittals only.

☐ Have you removed the submittal stage notation for the solicitation documents?

2. Bidding Schedule (Design-Bid-Build) or Pricing (Proposal) Schedule (Full-Design, Best Value or Lowest-Price Technically Acceptable):

☐ Have you provided the Bidding or Pricing (Proposal) Schedule with the 60% review submittal?

☐ Have you identified the different diameters of drilled piers as separate line items on the Bidding or Pricing (Proposal) Schedule, if applicable?

☐ Have you provided quantities (vertical linear feet or meters) for drilled piers (if applicable)?

☐ Are all Options or Additives (if applicable) identified on the Bidding or Pricing (Proposal) Schedule?

☐ If this project has Additives, are they shown in the order of user's preference? (Note: Additives can only be awarded in the order shown on the Bidding or Pricing (Proposal) Schedule; the user cannot pick and choose from the Additives.)

☐ Do all bid items correspond to the items shown in Section 01 27 00 MEASUREMENT AND PAYMENT? (For Civil Works Projects only)

☐ Are all the Bidding Schedule or Pricing (Proposal) Schedule Notes applicable to this project?

☐ Have you verified the number of days to award options (if applicable). This is shown in the notes. (Note: This note is not applicable to projects with Additives. Additives must be awarded at the time the construction contract is awarded.)

☐ Do you have separate line items for parts of the project funded by different types of funding (e.g., MILCON construction funds vs. equipment funds)?

3. Pricing (Proposal) Schedules (Design-Build Request for Proposals)

☐ Have you provided the Pricing (Proposal) Schedule with the Draft RFP? (If it's a two-phase RFP, the Pricing (Proposal) Schedule needs to be submitted with the Phase 1 Draft RFP.) Note: The Pricing (Proposal) Schedule must be included in Volume 1 of the specifications, behind the Table of Contents.

- ☐ Do you have separate line items for the Design Phase (including lines for Design and Non-Design) and the Build Phase (Construction)?
- ☐ Do you have separate line items for parts of the project funded by different types of funding (e.g., MILCON construction funds vs. equipment funds)?
- ☐ Are all Options or Additives (if applicable) identified on the Pricing (Proposal) Schedule?
- ☐ If this project has Additives, are they shown in the order of user's preference? (Note: Additives can only be awarded in the order shown on the Proposal Schedule; the user cannot pick and choose from the Additives.)
- ☐ Do all proposal items correspond to the items shown in Section 01 27 00 MEASUREMENT AND PAYMENT? (For Civil Works Projects only)
- ☐ Are all the Pricing (Proposal) Schedule Notes applicable to this project?
- ☐ Have you verified the number of days to award options (if applicable)***?*** This is shown in the notes. (This note is not applicable to projects with Additives. Additives must be awarded at the time the construction contract is awarded.)

4. Division 01 Sections (Applies to Non-Wizard Projects)

- ☐ Have you used Tulsa District's Division 01 sections for all non-Wizard solicitations?
- ☐ Have you added UFGS guides 01 45 00.00 10 QUAILITY CONROL; 01 45 00.10 10 QUALITY CONTROL SYSTEM (QSC); 01 62 35 RECYCLED/RECOVERED MATERIALS; 01 74 19 CONSTRUCTION & DEMOLITION WASTE MANGEMENT, 01 78 23 OPERATION & MAINTENANCE DATA and (if applicable) Sections 01 33 29 LEED DOCUMENTATION and 01 35 29 13 HEALTH, SAFETY & EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES?
- ☐ Most projects will be designed using English (Imperial) units of measure; however, there are a few projects that require metric units (i.e., range projects or work outside CONUS). For metric projects, have you included UFGS Section 00 31 10 METRIC MEASUREMENTS (part of Division 00 specs)?
- ☐ Have you added a paragraph to Section 01 04 00 COORDINATION, FIELD ENGINEER, AND MEETINGS addressing any construction phasing (if applicable)?
- ☐ If your project is on Altus AFB, OK, have you added Section 01 30 50 SECURITY REQUIREMENTS, ALTUS AFB, OK (plus attached forms)?
- ☐ Have you included attachments to the following sections?
  - ☐ 01 33 00 (Submittal Register or blank ENG FORM 4288 for RFPs; and Form 4025)
  - ☐ 01 30 50 (forms for Altus AFB), if applicable
  - ☐ 01 58 00.00 10 (signs and fabrication & mounting)
  - ☐ 10 14 02 Interior Signage (if applicable)
  - ☐ Other _____
- ☐ Have you edited out all paragraphs that do NOT pertain to the military base or post where your project is located? (Use the "search" feature for other installation names.)
- ☐ If your project is at Ft Sill, have you changed references from "Base" to "Post"?

- ☐ If your project is at McAlester Army Ammunition Plant, have you changed "Base" to "Installation"?
- ☐ Section 01 70 00.00 10*:* Have you selected the correct format for the final as-built drawings (see editing notes)?
- ☐ Have you provided dollar values for O&M manuals (if applicable) and as-built drawings in Section 01 70 00.00 10?

5. General

- ☐ Are all shop drawing submittals coded correctly based on UFGS codes?
- ☐ Are all brackets eliminated by completing the needed information or by deleting unnecessary blanks? (Do a search for brackets in SpecsIntact prior to printing.)
- ☐ Have you coordinated all references (section, standards, etc.) within the spec sections?
- ☐ Have you run "spell check"?
- ☐ Is all editing complete?
- ☐ Have you used consistent terminology between drawings and specifications?

6. Solicitation Specs

- ☐ Have you incorporated all comments?
- ☐ Have you printed all spec sections to .pdf format?
- ☐ Do you have a separate .pdf file for each section?
- ☐ Are all attachments in acceptable formats for the electronic bid set?
- ☐ Have you double checked the CD to ensure that ALL files are included?
- ☐ Have you printed a hard copy of the specs (if required by the SOW) from the .pdf files?
- ☐ Have you included the Bidding or Proposal Schedule file on the CD?
- ☐ Have you included the SpecIntact or Word file for the Table of Contents in addition to the .pdf file?

7. Contract Specs

- ☐ Have you incorporated all amendments?
- ☐ Have you printed all spec sections to .pdf format?
- ☐ Do you have a separate .pdf file for each section?
- ☐ Are all attachments in acceptable formats for the contract CD?
- ☐ Have you double checked the CD to ensure that ALL files are included?
- ☐ Have you provided the Submittal Register file for Specsintact; file is named NAVY4288.TXT?

APPENDIX C
BIDDING/PRICING SCHEDULE SAMPLES

APPENDIX C
BIDDING/PRICING SCHEDULE SAMPLES

TABLE OF CONTENTS

Please note that these are sample formats only. Use the sample format that is appropriate for your project. Sample format selected for your project must be tailored to your specific project needs.

Appendix C – SAMPLE D-B-B MILCON PROJECT BIDDING SCHEDULE

PROJECT NAME INSTALLATION NAME, STATE

BIDDING SCHEDULE

CLIN No.	Description	Quantity	Unit	Unit Price	Amount
	BASE BID				
0001	All work unless listed	1	LS	XXX	$_____
0002	Drilled Piers for Shop Building, 24-Inch Dia.	320	VLF*	$_____	$_____
0003	Drilled Piers for Shop Building, 30-Inch Dia.	720	VLF*	$_____	$_____
0004	Drilled Piers for Shop Building, 36-Inch Dia.	40	VLF*	$_____	$_____
0005	Asphalt Paving per Dwg. C201 & Detail 1 on Dwg. C301	1	LS	XXX	$_____
	SUBTOTAL BASE BID (CLINS 001 – 0005)				$_____
	OPTIONAL BID ITEMS				
0006	Option 1 – Lightning Protection on the Shop & Warehouse Buildings	1	LS	XXX	$_____
0007	Option 2 – Mechanical Screen Wall	1	LS	XXX	$_____
	SUBTOTAL OPTIONAL ITEMS (CLINS 0006-0007)				$_____
	TOTAL BASE BID AND OPTIONS (CLINS 0001-0007)				$_____

* Vertical Linear Feet

Contract duration (see Note 6):_____

BIDDING SCHEDULE NOTES

1. The Offeror shall submit pricing data on the latest Pricing Schedule as published in the solicitation or the latest amendment thereto. In lieu of indicating additions/deductions to line items, all Offerors should state their revised prices for each item.

2. Offerors must insert a price on all numbered items of the Pricing Schedule. Failure to do so will disqualify the Offer.

3. All quantities are estimated except where the unit is given as Lump Sum (LS).

4. If a modification to a proposal is submitted and provides for a lump-sum adjustment to the total estimated cost, the application of the lump-sum adjustment to each unit price and/or lump-sum price, in the Pricing Schedule must be stated or, if it is not stated, the Offeror agrees that the lump-sum adjustment shall be applied on a prorated basis to every item in the Bidding Schedule.

5. All the extensions of the unit prices shown (if applicable) will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the offer.

6. The Offeror shall propose a total contract duration in number of calendar days after the Notice to Proceed (NTP) is received by the Contractor, whether via electronic means or hard copy, whichever is the earliest method of delivery. The total number of proposed calendar days for construction through completion, ready for turnover shall not exceed the days shown at, SCR: 52.211-10 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK. The proposed duration shall become the required contract duration. The Government may issue the NTP via e-mail or Facsimile (FAX) or by other means. Day number 1 is the day after the date of receipt of the NTP.

7. AWARD

Only one contract will be awarded under this solicitation.

8. OPTIONAL BID ITEM DESCRIPTIONS

a. Option 1 consists of [Include brief description of option].

b. Option 2 consists of [Include brief description of option].

9. EVALUATION OF OPTIONS

The Government will evaluate offers for award purposes by adding the total price for all options to the total price for the Base Bid. (Total Base Bid and Optional Bid Items.) Evaluation of options will not obligate the Government to exercise the options.

10. AWARD OF OPTIONAL BID ITEMS

Optional bid items as stated above may, at the option of the Government, be awarded at the time of contract award or may be exercised at any time from the date of contract award until 90 days after issue of the Notice to Proceed.

All options or any combination thereof may be exercised solely at the discretion of the Government.

[Notes to the editor:

1. Use notes 8, 9, and 10 only if the bidding schedule contains options.
2. Always check with the Government's Project Engineer on how many days after Notice to Proceed that the options may be awarded. Ninety (90) days may not be correct for your project.

3. You are not limited to these notes. Add notes as needed to clarify any bid item, etc.
4. Please note that the Bidding Schedule page number(s) begin with 00 11 00-3. The Government will add pages 00 11 00-1 & 2.]

Appendix C – SAMPLE DESIGN-BUILD PRICING SCHEDULE

PROJECT NAME NSTALLATION NAME, STATE

PRICING SCHEDULE

CLIN No.	Description	Quantity	Unit	Unit Price	Amount
	BASE PROPOSAL				
0001	Design Costs Site Work	1	LS	xxx	$_____
0002	Design Costs Facilities	1	LS	xxx	$_____
	Subtotal Design Costs (CLINS 0001 – 0002)				$_____
0003	Non-Design Costs Site Work	1	LS	xxx	$_____
0004	Non-Design Costs Facilities	1	LS	xxx	$_____
	Subtotal Non-Design Costs (CLINS 0003 – 0004)				$_____
0005	Construction Costs Site Work	1	LS	xxx	$_____
0006	Construction Costs Facilities	1	LS	xxx	$_____
	Subtotal Construction Costs (CLINS 0005 – 0006)				$_____
	SUBTOTAL BASE PROPOSAL ITEMS (CLINS 0001 – 0006)				$_____
	OPTIONS				
0007	Option 1 – Name of Option	1	LS	xxx	$_____
0008	Option 2 – Name of Option	1	LS	xxx	$_____
	SUBTOTAL OPTIONAL ITEMS (CLINS 0007-0008)				$_____
	TOTAL BASE BID AND OPTIONS (CLINS 0001-0008)				$_____

Contract duration (see Note 6):_____

PRICING SCHEDULE NOTES

1. The Offeror shall submit pricing data on the latest Pricing Schedule as published in the solicitation or the latest amendment thereto. In lieu of indicating additions/deductions to line items, all Offerors should state their revised prices for each item.

2. Offerors must insert a price on all numbered items of the Pricing Schedule. Failure to do so will disqualify the Offer.

3. All quantities are estimated except where the unit is given as Lump Sum (LS).

4. If a modification to a proposal is submitted and provides for a lump-sum adjustment to the total estimated cost, the application of the lump-sum adjustment to each unit price and/or lump-sum price, in the Pricing Schedule must be stated or, if it is not stated, the Offeror agrees that the lump-sum adjustment shall be applied on a prorated basis to every item in the Bidding Schedule.

5. All the extensions of the unit prices shown (if applicable) will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the offer.

6. The Offeror shall propose a total contract duration in number of calendar days after the Notice to Proceed (NTP) is received by the Contractor, whether via electronic means or hard copy, whichever is the earliest method of delivery. The total number of proposed calendar days for construction through completion, ready for turnover shall not exceed the days shown at, SCR: 52.211-10 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK. The proposed duration shall become the required contract duration. The Government may issue the NTP via e-mail or Facsimile (FAX) or by other means. Day number 1 is the day after the date of receipt of the NTP.

7. DESIGN COSTS DEFINITION

Design costs shall consist of preparation of designs, plans, drawings, and specifications.

8. NON-DESIGN COSTS DEFINITION

Non-design costs shall include the following: initial site visits; field, topographic, property, boundary, utility; subsurface explorations and borings; feasibility, functional, and economic studies and other nvestigations; preparation or verification of as-built drawings;preparation of general and development criteria; services of consultants where not specifically applied to the preparation of working drawings or specifications; preparation of environmental impact assessments, statements, and supporting data, engineering services during construction; renderings, or photographs of completed designs; reproduction of designs for review purposes; and travel and per diem allowances in connection with the above excludable services.

9. AWARD

Only one contract will be awarded under this solicitation.

10. OPTIONAL BID ITEM DESCRIPTIONS

a. Option 1 consists of [Include brief description of option].

b. Option 2 consists of [Include brief description of option].

11. EVALUATION OF OPTIONS

The Government will evaluate offers for award purposes by adding the total price for all options to the total price for the Base Bid. (Total Base Bid and Optional Bid Items.) Evaluation of options will not obligate the Government to exercise the options.

12. AWARD OF OPTIONAL BID ITEMS

Optional bid items as stated above may, at the option of the Government, be awarded at the time of contract award or may be exercised at any time from the date of contract award until 90 days after issue of the Notice to Proceed.

All options or any combination thereof may be exercised solely at the discretion of the Government.

[Notes to the editor:

1. Use notes 10, 11, and 12 only if the Pricing Schedule contains options.
2. Always check with the Government's Project Engineer on how many days after Notice to Proceed that the options may be awarded. Ninety (90) days may not be correct for your project.
3. You are not limited to these notes. Add notes as needed to clarify any bid item, etc.
4. Please note that the Pricing Schedule page number(s) begin with 00 11 00-3. The Government will add pages 00 11 00-1 & 2. Exception to this is a Task Order which will begin with 00 11 00-1.]

Appendix C – SAMPLE FULL-DESIGN, BEST VALUE OR LOWEST-PRICE TECHNICALLY ACCEPTABLE PRICING SCHEDULE

PROJECT NAME INSTALLATION NAME, STATE

PRICING SCHEDULE

CLIN No.	Description	Quantity	Unit	Unit Price	Amount
	BASE PROPOSAL				
0001	All work unless listed separately	1	Lump Sum	xxx	$_____
0002	Lime-Modified Subgrade (See Note 7)	37,360	SY	$____	$_____
0003	Aggregate Base Course	37,900	SY	$____	$_____
0004	Hot-Mix Asphalt (See Note 7)	3,790	Tons	$____	$_____
0005	Milled Pavement	12,180	SY	$____	$_____
0006	Drilled Piers, 36-inch Dia.	400	VLF*	$____	$_____
0007	Drilled Piers, 40-inch Dia.	200	VLF*	$____	$_____
	TOTAL BASE PROPOSAL (CLINS 0001 – 0007)				$_____
	OPTIONAL PROPOSAL ITEMS				
0008	Option 1 - Hazardous Waste Soil	1,920	Tons	$____	$_____
0009	Option 2 - Hazardous Waste Groundwater	248,620	Gal.	$____	$_____
0010	Option 3 - New Trees	1	Lump Sum	xxx	$_____
	TOTAL OPTIONAL ITEMS (CLINS 0008 – 0010)				$_____
	TOTAL BASE PROPOSAL & OPTIONAL ITEMS (CLINS 0001 – 0010)				$_____

* Vertical linear feet

Contract Duration (See Note 5): _____

PRICING SCHEDULE NOTES

1. The Offeror shall submit pricing data on the latest Pricing Schedule as published in the solicitation or the latest amendment thereto. In lieu of

indicating additions/deductions to line items, all Offerors should state their revised prices for each item.

2. Offerors must insert a price on all numbered items of the Pricing Schedule. Failure to do so will disqualify the Offer.

3. If a modification to a proposal is submitted and provides for a lump-sum adjustment to the total estimated cost, the application of the lump-sum adjustment to each unit price and/or lump-sum price, in the Pricing Schedule must be stated or, if it is not stated, the Offeror agrees that the lump-sum adjustment shall be applied on a prorated basis to every item in the Pricing Schedule.

4. All the extensions of the unit prices shown (if applicable) will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the offer.

5. The Offeror shall propose a total contract duration in number of calendar days after the Notice to Proceed (NTP) is received by the Contractor, whether via electronic means or hard copy, whichever is the earliest method of delivery. The total number of proposed calendar days for construction through completion, ready for turnover shall not exceed the days shown at, SCR: 52.211-10 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK. The proposed duration shall become the required contract duration. The Government may issue the NTP via e-mail or Facsimile (FAX) or by other means. Day number 1 is the day after the date of receipt of the NTP.

6. AWARD

Only one contract will be awarded under this solicitation.

7. CLIN NO. 0002 & 0004 ***[Use similar type notes to clarify proposal items. Delete if not needed.]***

a. Costs for prime and tack coats associated with CLIN No. 0002, Lime-Modified Subgrade, shall be included in the costs for CLIN No. 0002.

b. Costs for prime and tack coats associated with CLIN No. 0004, Hot-Mix Asphalt, shall be included in the costs for CLIN No. 0004.

[Use the following notes if Options are included in the Proposal Schedule. Tailor Note 9 to fit the project. See Notes to the Editor, No. 2 below.]

8. OPTIONAL PROPOSAL ITEM DISCRIPTIONS

Provide a description of the Options here (preferable) OR include the following statement: Optional Proposal Items shall be as shown on the drawings or in the specifications.

9. EVALUATION OF OPTIONS

The Government will evaluate offers for award purposes by adding the total price for all options to the total price for the Base Proposal. (Total Base Proposal and Optional Proposal Items.) Evaluation of options will not obligate the Government to exercise the options.

10. AWARD OF OPTIONAL PROPOSAL ITEMS

a. Options 1 and 2 may, at the option of the Government, be awarded at the time of contract award or may be exercised at any time from the date of contract award until 361 days after issue of the Notice to Proceed.

b. Option 3 may, at the option of the Government, be awarded at the time of contract award or may be exercised at any time from the date of contract award until 90 days after issue of the Notice to Proceed.

All options or any combination thereof may be exercised solely at the discretion of the Government.

[Notes to the editor:

1. Always check with the Government's Project Engineer on how many days after Notice to Proceed that the options may be awarded. Ninety (90) days may not be correct for your project.

2. Note 9 is an example of different time periods for award of the options. The amount of time shown in 9a is an extremely long time thus adding additional cost (because of contractor risk) to the construction contract price.

3. Please note that the Pricing Schedule page number(s) begin with 00 11 00 - 3. The Government will add pages 00 11 00 -1 & 2. Exception to this is if the project is a Task Order to a MATOC or SATOC. Coordinate with the Government Technical Manager and Spec Writer.]

Appendix C – SAMPLE CIVIL WORKS BIDDING SCHEDULE (DESIGN-BID-BUILD)

PROJECT NAME PROJECT LOCATION

BIDDING SCHEDULE

CLIN No.	Description	Quantity	Unit	Unit Price	Amount
		BASE BID			
0001	Care of water	1	Lump Sum	xxx	$_____
0002	Demolition	1	Lump Sum	xxx	_____
0003	Clearing and grubbing	30	AC	_____	_____
0004	Excavation	340,000	CY	_____	_____
0005	Compacted fill, random	8,575	CY	_____	_____
0006	Sodding	164,170	SY	_____	_____
0007	Trees	1,225	EA	_____	_____
0008	Concrete low-water crossings	65	CY	_____	_____
0009	Concrete access ramps	100	CY	_____	_____
0010	Headwalls with 18-in riprap	1	EA	_____	_____
0011	Drop inlet DI-1	1	Lump Sum	xxx	_____
0012	RCB at Mingo Road	1	Lump Sum	xxx	_____
0013	3-in. asphalt surfacing	24	T	_____	_____
0014	Aggregate base (Type A)	75	T	_____	_____
0015	18-inch riprap	1,500	CY	_____	_____
0016	9-inch bedding	750	CY	_____	_____
0017	Pipe rail pole gates	24	EA	_____	_____
0018	Fencing (4 ft. chain link)	505	LF	_____	_____
0019	12-inch water line (east-west direction)	1	Lump Sum	xxx	_____
	TOTAL BASE BID (CLINS 0001 – 0019)				$_____
		OPTIONAL BID ITEMS			
0020	Drainage at New ODOT Channel	1	Lump Sum	xxx	$ _____
0021	Prefabricated bridge	1	Lump Sum	xxx	_____

CLIN No.	Description	Quantity	Unit	Unit Price	Amount
	TOTAL OPTIONAL BID ITEMS (CLINS 0020 – 0021)				$_____
	TOTAL BASE BID & OPTIONAL BID ITEMS (CLINS 0001 – 0021)				$_____

AC = Acre LF = Linear Foot SY = Square Yard CY = Cubic Yard
EA = Each T = Ton

BIDDING SCHEDULE NOTES

1. Bidders are instructed to bid on all items.

2. All quantities are estimated except where the unit is given as Lump Sum.

3. Only one contract for the entire schedule will be awarded under this solicitation.

4. If a modification to a bid based on unit prices is submitted which provides for a lump-sum adjustment to the total estimated cost, the application of the lump-sum adjustment to each unit price in the Bidding Schedule must be stated. If it is not stated, the bidder agrees that the lump-sum adjustment shall be applied on a prorata basis to every unit price in the Bidding Schedule.

5. EVALUATION OF OPTIONS

The Government will evaluate offers for award purposes by adding the total price for all options to the total price for the Base Proposal. (Total Base Bid and Optional Bid Items.) Evaluation of options will not obligate the Government to exercise the options.

6. Optional bid items may, at the option of the Government, be awarded at the time of contract award or may be exercised at any time from the date of contract award until 60 days after issue of Notice to Proceed.

All options or any combination thereof may be exercised solely at the discretion of the Government.

[Notes to the editor:

1. Use notes 5 and 6 only if the bidding schedule contains options.
2. Always check with the Government's Technical Manager on how many days after Notice to Proceed that the options may be awarded. Sixty (60) days may not be correct for your project.
3. You are not limited to these notes. Add notes as needed to clarify any bid item, etc.
4. Please note that the Bidding Schedule page number(s) begin with 00 11 00-3. The Government will add pages 00 11 00-1 & 2.]

APPENDIX D
AMENDMENT PREPARATION INSTRUCTIONS

APPENDIX D
AMENDMENT PREPARATION INSTRUCTIONS

1. GENERAL

The following instructions pertain to non-Wizard projects. Always call the SWT specification personnel (918-669-7055, military) when you are working with a Wizard project to discuss the amendment process.

A/E's shall be responsible for preparing amendments for the solicitation documents (drawings, specifications and/or RFP sections). **Please remember that any change, however minor, to the solicitation documents MUST be documented by an Amendment.**

Ideally, amendments should be issued NLT 10 days prior to the bid opening date or proposal due date. Therefore, amendments must be transmitted to the Government's Project Engineer AND the specification writer NLT at the beginning of the business day 13 days prior to the bid opening date or proposal due date. Coordinate this with the Government's Project Engineer AND the specification writer.

The format of the amendments shall be in accordance with the following instructions and shall be transmitted to the Tulsa District in electronic form (e-mail, FTP, or CD).

2. AMENDMENT CONTINUATION SHEET

In addition to the changes to the solicitation documents, the A/E shall prepare a draft continuation sheet to the Standard Form 30 (SF30). Send this to the Government's Spec Writer in Word format. The continuation sheet contains instructions to the bidders/proposers. Precise wording of the continuation page instructions is very important. Keep the instructions simple (write to a 6th grade level) and tell the bidders/proposers exactly what to delete and what to add. Note: Word changes are to be used in emergency situations only. For Word changes, it is imperative to show the exact text to delete and/or add within quotation marks.

2.1 The Form SF30 (cover form) will be prepared by the Government.

2.2. A continuation sheet example is attached.

3. SPECIFICATIONS

3.1 ***Specification changes should be issued in the form of revised sections. Word changes may be for emergencies only.*** Always coordinate amendments through the Government Project Engineer and Spec Writer.

3.1.1 Revised text shall be readily identifiable by the bidders or proposers. Revised or added text shall be denoted by **bolded text,** underlined text or *italicized underlined text*. Precede the change by an asterisk and the amendment number and follow the revision with an asterisk (e.g., ***AM1 This is an example of revised text.***) Choose a style of text that does not occur in the original solicitation text and be consistent throughout the document. Use only one style for all amendments required for the project.

3.1.2 If entire paragraphs are deleted, retain the paragraph number; delete the text; and substitute the words "Paragraph Deleted" in place of the text after the paragraph number. The blank spaces may be closed or may remain open to avoid adjustment of the subsequent page(s) layout.

3.1.3 Revised pages shall be identified with the "Revised by Amendment 00XX" (insert the applicable section number) in a footer at the lower left.

3.1.4 New sections shall be contain a note on all pages in the footer at the lower left. Note shall read "Section added by Amendment 00XX". Do not include the bolded (or underlined) text on new sections.

If the entire spec section is completely revised or most of the text is new or revised, do not bold the text; include “Entire section revised by Amendment 00XX” (insert the applicable section number) in the footer.

For new or completely revised sections, Precede the section title by an asterisk and the amendment number and follow the last word of the section with an asterisk (e.g., ***AM1 SECTION 01 33 00** [section text] END OF SECTION***).

3.1.5 Previous amendment denotation in the footers shall be deleted.

3.1.6 Bidding/Pricing (Proposal) Schedules are reissued in their entirety if revisions are required. Word changes are **not** allowed.

3.1.7 Amendments specification files shall be provided to the Government Spec Writer in two formats:

(1) Specsintact (.sgml) or Word (.doc) files (Note: Word files should be an exception rather than the rule.);
(2) Adobe files (.pdf).

Adobe files shall be produced using the Acrobat PDF Writer; do NOT scan the files into .pdf format. Forward revised files by e-mail to the Government's Project Engineer and the Government's Specs Writer. Note: If the amendment is very large and contains revised drawings as well as text files, it is preferable to forward the amendment by file transfer protocol (FTP), or CD by overnight mail (if time permits). Coordinate the transfer method with the Government's Project Engineer and the Spec Writer.

4. DRAWINGS

Changes to drawings are handled as complete individual drawing substitutions. Word changes (with or without sketches) are permitted in emergency situations only.

4.1 Word (Narrative) Changes (For Emergency Situations Only). Word changes must tell the bidder/proposer the location of the revision(s) and exactly what to delete and what to add. Notice that the exact text to delete and add is always contained within quotation marks. The following examples illustrate the right and wrong ways to accomplish word changes:

Example 1:

WRONG: On Drawing A12, the piping should be cast iron.

RIGHT (Preferred example): Drawing A12, Detail G: Delete the notation "10-inch schedule 40 galvanized iron pipe"; replace with "10-inch cast iron pipe".

Or

Drawing A12, Detail G: Change the notation "10-inch schedule 40 galvanized iron pipe" to "10-inch cast iron pipe".

Example 2:

WRONG: Sheet A13. Change door type 5 to H.M. door.

RIGHT: Sheet A13, Door Types. Change door type 5 from "45 MIN. H.M. DOOR" to "H.M. DOOR".

Example 3:

WRONG: Sheet C1. Change note to New Concrete Dumpster Pad on plan.

RIGHT: Sheet C1. In sector C5, delete "NEW DUMPSTER PAD"; replace with "NEW CONCRETE DUMPSTER PAD".

If a word change occurs on a site plan, floor plan or some other type plan, it is permissible to describe the location of the change(s) by the sheet sectors as shown in Example 3 above.

4.2 Sketches. Sketches are used to issue revisions to plans, details, sections, schedules, etc. in lieu of reissuing an entire drawing in emergency situations only. Sketches may be a revision to an exiting drawing or may add details, etc. Changes should be made to the CADD drawing and these changes should be "clouded", "clipped" and printed to an 8 1/2" X 11" sheet. Revisions should be noted in the "Revision Block" of the title block. It is permissible to have several changes to the same sheet issued with a series of sketches. See the attached example. (An exception to the clouding rule is if the entire sheet was revised. See paragraph below.) Clouding shall be removed prior to generation of solicitation drawings. All deltas and revision notes in the title block shall remain in place.

4.3 Revised Drawings. Entire individual drawings shall be revised as the preferred method for drawing revisions. Word/sketch changes are allowed in emergency situations only. Revisions shall be "clouded," and noted in the Revision Block on the drawing. The drawing revision shall be denoted by a 3/8" delta symbol [located by the change(s) and in the revision block] with the revision number within the delta. (An exception to the clouding rule is if the entire sheet was revised. Then it is permissible to omit the clouding and note in the Revision Block that "Entire sheet revised by Amendment 00XX" (insert the appropriate amendment number). Include the delta in the revision block. Clouding shall be removed prior to generation of solicitation drawings. All deltas and revision notes in the title block shall remain in place. Coordinate revised drawings with the Government's Project Engineer AND the Specifications Writer. See the attached example of revision block notation.

CONTINUATION SHEET EXAMPLE

Use the following continuation sheet format. Please note that both a Design-Build Request for Proposal and a full-design, best-value or lowest-price technically acceptable solicitation will use an "R" designation in the solicitation number. A traditional bid-build solicitation will use the "B" designation in the solicitation number. Also remember that a traditional bid-build solicitation uses a Bidding Schedule. All others use a Pricing (***Proposal) Schedule. Notes to the A/E are shown in italics and highlighted. Also note that amendment changes will be accomplished by providing complete spec section & drawing substitution. Word changes will be allowed only under emergency situations.***

AMENDMENT 00XX
NAME OF PROJECT
MILITARY INSTALLATION OR CIVIL PROJECT NAME, STATE
W912BV-0X-[R or B]-10XX

The [Request for Proposal][solicitation] documents are revised as follows:

1. The revised/new sections/appendices listed below are hereby added to or revised and made a part of the solicitation. Revised or added/deleted information can be located in the specifications by searching for an asterisk and amendment number (i.e., *AM1).

Revised sections/appendices:

00 11 00 (Pricing Schedule only)
00 22 30
01 10 00
01 58 00.00 10
02 41 00
06 10 00
23 00 00
Appendix KK

[Notes:
1. ***Changes to Div 00, with the exception of the Bidding/Pricing Schedule, will be added to the continuation sheet by the Government.***
2. ***If you are adding a new section, remember to revise the specifications Table of Contents also.]***

2. DRAWINGS

a. G001, Drawing Index: Add the following drawings to the end of the mechanical and electrical drawing lists, respectively:

M21 Miscellaneous Details
E20 Communications Details
E21 Miscellaneous Sections and Details

b. Delete the following drawings and replace with the attached revised drawings of the same number:

C1	A12	A32	M10	E20
C5	A31	S11	M12	E21

c. Add the attached new drawings:

M21 E20 E21

[Following are examples of amendment word changes. Word changes will be used ONLY in an emergency situation and must: 1) Tell the bidder/proposer exactly where to make the revision; 2) Tell the bidder proposer exactly what to delete and/or add. Put the text to be deleted and/or added in quotation marks.]

Section 01 10 00.

a. Add the following to the end of the list in Paragraph 1.3:

"Appendix H - Tinker Air Force Base Fire Safety Provisions
Appendix I - Record Drawings For Shop Area"

b. Delete paragraph 1.4 text in its entirety and insert "Paragraph Deleted" after the paragraph number.

Section 01 32 00.00 10. In the first sentence of the second paragraph under paragraph 1.2, delete the text “cost-plus”.

Section 01 33 00. Delete Section 01 33 00 in its entirety. Replace with the attached revised Section 01 33 00.

Drawing A304, Detail 1/A304. Add the following note:

"Note: Provide 3-1/2" unfaced batt insulation over ceiling in ADP Room 202."

Drawing A282:

a. Details 1, 2, 3, 4, and 5: Delete the notation "Use 1/2" Deep Form Liner" on all details. (8 locations)

b. Add Detail 10/A282 STAIR DETAIL issued as Sketch 1 attached herewith.

Drawing S4, Section A/S4: Delete "#4 Bars E.W."; replace with "#6 Bars E. W.".

CLARIFICATION

[Use the "clarification" portion of the continuation form only to explain existing information. You may not add or delete any information as a "clarification".]

[Please notice that the continuation sheet page numbers begin with "2". The Standard Form 30 (SF30) is page "1" and will be prepared by the Government.]

SAMPLE ENGLISH BORDER SHEET
REVISION BLOCK NOTATION

HORIZONTAL SCALE
0 5' 10' 20 30
SCALE IN FEET
10'-0'

VERTICAL SCALE
0 2.5' 5' 15
SCALE IN FEET
= 5'-0

'NOTE: BIDDERS ARE CAUTIONED TO USE BAR SCALES WHEN DOING QUANTITY TAKE OFFS ON LESS THAN FULL-SIZE DRAWINGS; NUMERICAL SCALES SHOWN BECOME INVALID ON REDUCED-SIZE DRAWINGS AND WILL YIELD INCORRECT DIMENSIONS."

SYMBOL	DESCRIPTION	DATE	APPR
2	AM 0004 REV TRACK LOCATION		
1	AM 0001 REVISED NOTES.		

HDR Engineering, Inc.
Tulsa District
Tulsa, Oklahoma

US Army Corps of Engineers

DESIGNED BY: B. THOMPSON
DRAWN BY: M. WURTELE
REVIEWED BY: T. BENNETT
SUBMITTED BY: B. THOMPSON

FORT SILL
FORT SILL, OKLAHOMA
POC: 041630 FY: 00
RAIL SYSTEM CONTAINER FACILITY

MAINLINE TRACK #12 AND
INTERCHANGE TRACK #13 CROSS SECTIONS
STA.53+50 TO STA.55+00

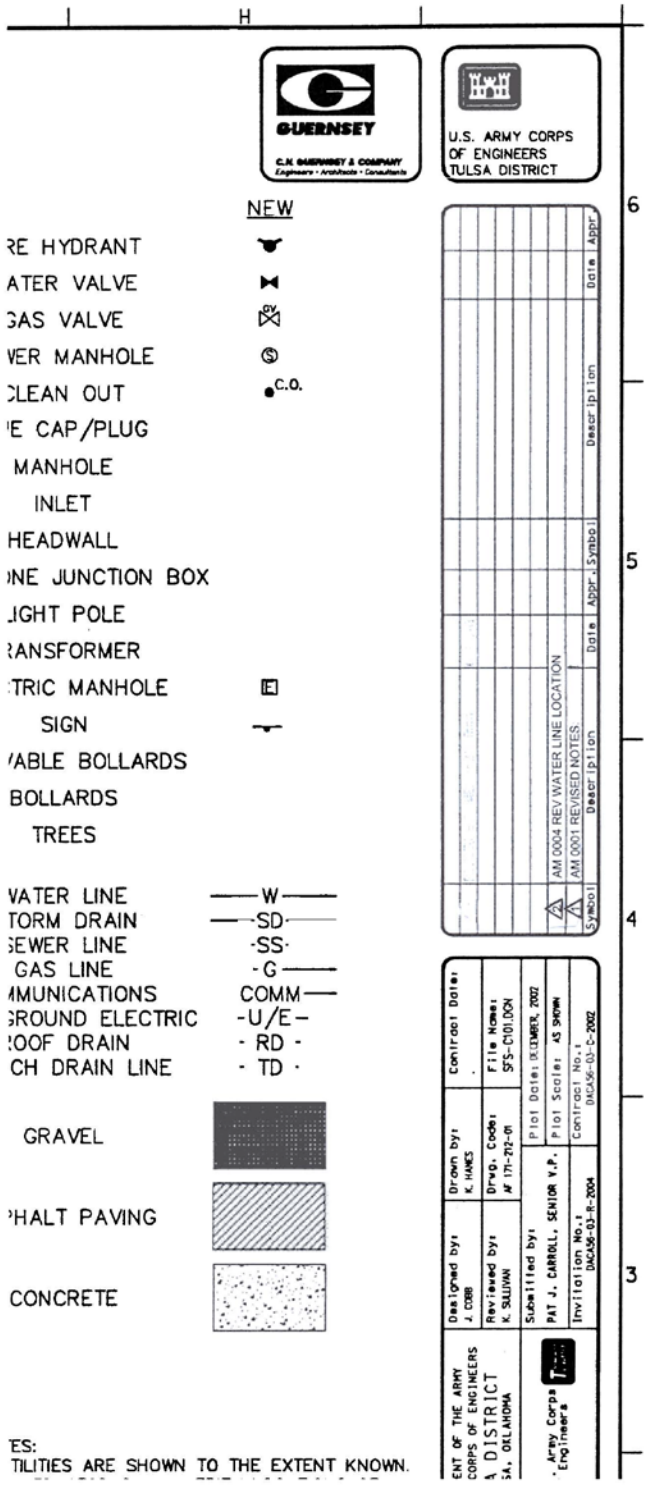
PROFESSIONAL CIVIL ENGINEER
BRIAN A. THOMPSON
E-8935
STATE OF NEBRASKA

PLOT SCALE: AS SHOWN	DWG. CODE: F-860-10-01	CONTRACT DATE:	SHEET REFERENCE NUMBER
DESIGN FILE: XS_IT1BT.DGN		INVITATION NO. DACA56-00-B-2005	C09
PLOT DATE: JULY 27, 2000	SHEET 10 OF 72	CONTRACT NO. DACA56-00-C-2015	

NOTES:
1. START WITH BOTTOM LINE IN THE REVISION BLOCK.
2. DELTAS ALWAYS BEGIN WITH "1" EVEN IF THE FIRST CHANGE TO THE DRAWING WAS MADE BY AMENDMENT 0003. THE NEXT DELTA IS "2" EVEN IF THE SECOND CHANGE TO THE DRAWING WAS MADE BY AMENDMENT 0005, ETC.

2

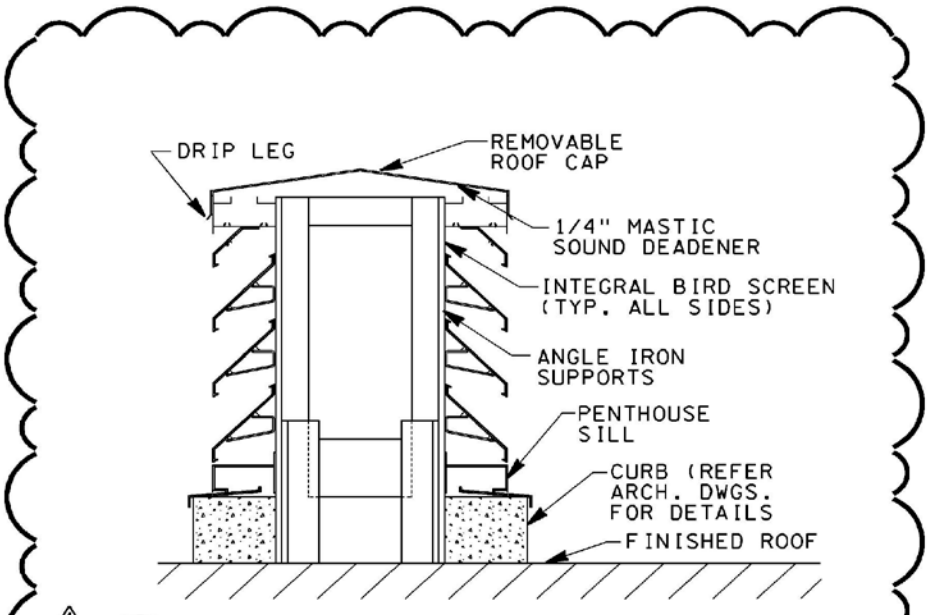
This border style is used primarily for Civil Works projects.



SAMPLE METRIC BORDER SHEET
REVISION BLOCK NOTATION

NOTES:
1. START WITH BOTTOM LINE IN THE REVISION BLOCK.
2. DELTAS ALWAYS BEGIN WITH "1" EVEN IF THE FIRST CHANGE TO THE DRAWING WAS MADE BY AMENDMENT 0003. THE NEXT DELTA IS "2" EVEN IF THE SECOND CHANGE TO THE DRAWING WAS MADE BY AMENDMENT 0005, ETC.

This border style may also be used with English units of measure primarily for military projects.



SAMPLE

U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT

TULSA CADD	PROJECT TITLE ADDITIONAL PROJECT DEFINITION	
	DESIGNER:JOHN Q. GOVERNMENT	DATE:8/13/03
	AMEND. #:0001 SKETCH # 01	SHT. #1 of 2

APPENDIX E
REQUEST FOR INFORMATION (RFI) PROCEDURES

APPENDIX E
REQUEST FOR INFORMATION (RFI) INSTRUCTIONS

1. GENERAL

1.1 The following instructions pertain to non-Wizard projects. If you are working on a Wizard project to be advertised by a Center of Standardization (COS), RFIs will likely be handled through the Bidder Inquiry system which is a module within DrChecks. Wizard projects advertised by SWT may use the Bidder Inquiry system or may handle RFIs as shown below. The manner of handling RFIs will be decided on a project by project basis.

1.2 The original designers (in-house or A/E) shall be responsible for preparing the responses to RFIs. RFIs must be given a high priority (handled quickly).

2. RFI PROCEDURES

2.1 All RFIs need to come through the Contract Specialist. As a designer or Technical Manager, if you are contacted by a contractor in regard to a solicitation, do NOT give the contractor any information other than the Contract Specialist's contact information as given in the solicitation package. Generally, this information will be in Section 00 21 00 INSTRUCTIONS, CONDITIONS & NOTICES TO OFFERORS. Task Orders to a MATOC or SATOC may have this information in Section 00 22 30 TASK ORDER DESIGN-BUILD SELECTION PROCEDURES AND BASIS OF AWARD.

2.2 The Contract Specialist will forward RFIs to the TM. TMs are to ensure that the Spec Writer is given a copy of all RFIs.

2.3 The TM will forward RFIs to the original designer (in-house or A/E). For RFIs forward to A/E's, the TM should flag any questions to be answered by the Government.

2.4 Responses to questions should be inserted below each individual question on the RFI. If this is not possible, the questions need to retyped with the answers entered below each questions. Include the Contractor's name and RFI # (if applicable) or the date of the RFI in the header. Do not combine sets of questions from different contractors. **IMPORTANT NOTE: If the question(s) requires giving information NOT contained in the solicitation or correcting information in the solicitation, the answer should be "See future amendment." Contact the Technical Manager and inform them that an amendment is needed to revise/add information to the solicitation. Answering an RFI DOES NOT change the solicitation documents.** Refer to Appendix D for amendment instructions.

2.5 Return all RFIs with answers (preferably in Word format) ASAP to the TM with a CC to the spec writer. Do not include the Contract Specialist. The Government will enter answers required to complete the RFI and review answers given by the A/E or in-house designer and coordinate with the Spec Writer. See attached examples of RFI formats.

2.6 The TM will forward the completed RFI to the Contract Specialist. The Contract Specialist will forward the answers to the contractor(s), post them with the solicitation on fbo.gov or, if applicable, release the responses in the Bidder's Inquiry module of DrChecks.

EXAMPLE OF COMPLETED RFI

COMPANY LETTERHEAD
REQUEST FOR INFORMATION (RFI) NO. 1
DATE OF RFI

PROJECT NAME, LOCATION, SOLICITATION NO.

1. Signage: In paragraph 1.3.1.9 of section 01 10 00 states the signage must match existing adjacent facilities. Does this require a stand-alone sign for the building or a surface mounted sign on the building?
   Response: Mount signage on building in a similar fashion and location as signage on adjacent building facilities.
2. Doors: Are door closers required for the exterior tornado resistant doors?
   Response: Yes this is a code requirement.
3. LEED Certification: The RFP states (Section 01 10 00, paragraph 1.3.1.1.4) that the project be "capable of obtaining a Silver LEED rating with a minimum of 50 points." The LEED MPR (USGBC, 2009) requires that a building must include at least 1,000 s.f. (93 s.m.) of gross floor area before it can be considered for LEED certification. Please advise whether this requirement should be disregarded, or, if the designers are to comply with the intent only, how this compliance should be documented.
   Response: Comply with the design intent to achieve a "certifiable" facility.
4. Architectural Theme: RFP requires that the administration building shall conform to "the local TAFB architectural theme." The project site is within the lease area of the TAC and is technically not within one of the established design districts described in the most current TAFB Design Standards. Would it be appropriate to conform to the architectural colors and materials of the TAC, or does TAFB intend that the standards of one of the design districts on base be used instead as a reference? If the former, please specify which one.
   Response: The design intent is to match the architectural colors of the TAC.
5. Storm Culvert: The site demolition plan (C-100) included in the RFP states to "preserve" the storm culvert passing beneath the rail road embankment. Can the intent be clarified? Hydraulic capacity and/or current condition may dictate that the culvert be removed and upgraded. The existing storm culvert has been crushed at the structures inlet and outlet locations, thus limiting structures flow capacity.
   Response: Refer to Amendment 0001.
6. New Paving Requirements: Can the Government advise if the new paving/roadways are to be designed in accordance with ODOT requirements and specifications?
   Response: Pavement design should be based on applicable UFC requirements, the final Geotechnical Evaluation Report, and the recommendations of a licensed Geotechnical, Civil and/or Structural Engineer. A Preliminary Geotechnical Engineering Report was included and may be used as a basis for preliminary design assumptions.
7. Administration Building: The RFP (1.3.1.2) states that the facility is to serve as a tornado shelter. What portion (S.F.) of the 333 S.F. maximum building size needs to serve as a tornado shelter or is the entire building to serve as a shelter?
   Response: The entire building is to be designed as a tornado shelter.
8. T-9 Facility Slab and Foundations Design: In Section 01 10 00; Paragraph 1.4.1.6; Subparagraph b it states to the standard foundation design A/F 32 T-9 Test Cell Plans. It also states that the standard foundation designs shall be verified.
   a. Will the Government/Vital Link be providing stamped and sealed drawings for the slab and foundation design to support their (Vital Link) structure?
      Response: No.
   b. If not, can the Government provide complete 100% facility design and specifications for the T-9 facility, to include calculations, control systems, architectural, structural,

plumbing, mechanical, electrical, etc.? The partial purpose of this request is so that the Structural Engineer can determine the loading for the slab and foundations systems.
Response: No.

9. Rock/Gravel Base: Can the Government advise if 6" rock or gravel base will be required under sidewalks, ramps, and access ways other than the foundations as noted on Sheet C; Note 6?
   Response: Note 6 on DWG 8521663 specifically refers to the test cell foundation slab. Design of sidewalks, ramps and access ways should be based on applicable UFC requirements, the final Geotechnical Evaluation Report, and the recommendations of a licensed Geotechnical, Civil and/or Structural Engineer. A Preliminary Geotechnical Engineering Report was included and may be used as a basis for preliminary design assumptions.
10. Existing TAC-9001 Existing Drive: On Sheet C-101 it is noted that the existing TAC-9001 drive (west of site) is concrete, but it is our understanding that it is asphalt. Is the new POV parking area to be installed under this contract to be asphalt or concrete?
    Response: The existing TAC Drive is asphalt; however, the new POV parking area may be either asphalt of concrete, see note 10 on C-101.
11. T-9 Slab and Exterior Utilities/Services: The Government-furnished design of the T-9 facilities slab and foundation design (Appendix G-Standard Foundation Design; Sheet #C1) required various Utilities, plumbing, and mechanical stub-ups in the slab and on the exterior of the building. Although the stub-ups are indicated in a general location it appears that the actual location or dimensions locating the referenced systems are not included. Can the Government provide the exact required locations for the various systems?
    Response: See sheet M-01. Exact locations will be determined during the detail design stage.
12. Fuel Systems: Due to the relatively small distribution system, will hand calculations be acceptable for the surge analysis required by Section 01 10 00, paragraph 1.5.4.4 (h) if the velocity in the pipe is held below 4 fps?"
    Response: Provide a computer simulation as is stated in this section.
13. T-9 Latrine and Wash-Room: The Government-furnished design of the T-9 facilities slab and foundation design (Appendix G-Standard Foundation Design; Sheet #C1; Note 16) States that some Users may request a Latrine, Wash Room, etc.. Are there any requirements to provide these areas or utilities?
    Response: See future amendment.
14. Fuel Systems Canopy/Protection: Is any type of canopy of covered area required at the fueling systems?
    Response: See future amendment.
15. Site Demolition/Clearing: Can the Government confirm that <u>all</u> existing trees and shrubs can be cleared from the project site area?
    Response: All existing vegetation may be removed.
16. Landscaping: SOW 1.2.6 requires installation of turf grass in all areas of construction. Can the Government advise if there are any additional landscaping requirements other than the referenced turf grass. (e.g. trees, scrubs, etc.). If, so can the Government provide the requirements for this landscaping. In addition, if landscaping is a requirement will a certified landscaping design/plan be necessary?
    Response: No additional landscaping will be required.

APPENDIX F
BUILDING INFORMATION MODELING (BIM) PROCEDURES

APPENDIX F
BUILDING INFORMATION MODELING (BIM)

1. GENERAL

BIM has been associated with Army MILCON Transformation projects solicitation packages produced through use of the Wizard program. However, BIM is being adopted by the Air Force also. Always determine if BIM is a requirement when beginning a project.

2. DEFINITION

Building Information Modeling (BIM) is the process of generating and managing building data during its life cycle. Typically it uses three-dimensional, real-time, dynamic building modeling software to increase productivity in building design and construction. The process produces the Building Information Model, which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.

3. CADD/BIM SYSTEM REQUIREMENTS

All CADD files shall be fully compatible with the Installation's BIM software requirements. Currently, projects are prepared using AutoCAD or MircroStation software. Determine the Installation's version of the applicable software for CADD and BIM. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8I Workspace unless otherwise stated by the Installation's representative. See Attachment F & G (extracted from the Wizard Section 01 33 16 DESIGN AFTER AWARD) for additional BIM requirements. BIM Model and associated Facility Data files shall be delivered in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F.

NOTE: There are three versions of Attachment F included. Determine the applicable version by reading the orange codes shown before "ATTACHMENT F" and by reading the first paragraphs of the attachment below.

<*COS*>**ATTACHMENT F**
Version 07-07-2010

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be «FULL_SIZE» size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. For each Center of Standardization (CoS) facility type included in this project, all BIM Models and associated Facility Data shall be submitted in Bentley Systems BIM «BENTLEY_VERSION» with associated USACE Bentley BIM Workspace (which includes specific standard BIM libraries and definitions). This Workspace can be downloaded from the CAD/BIM Technology Center. [Where available, the workspace will be specific to this CoS Facility Standard Design. The Contractor will be provided a baseline multi-discipline BIM Project Model for the CoS Facility Standard Design type, where such a model exists (for the purposes of site adaptation).] The USACE Bentley BIM Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included with the USACE BIM Workspace are permitted to be used.

2.1.1. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.2. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE «ISSUING_DISTRICT» District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2.1. IFC Support. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class - see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall be fully interoperable, compatible, and editable with the Bentley BIM tools. Use the specified version of the USACE Bentley BIM Workspace and conform to the requirements of **Sections 3 and 4 below**.

2.2.3. BIM Project Execution Plan.

2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.

2.2.4. BIM Requirements..

2.2.4.1. Facility Data. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

2.2.4.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.4.3. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.2.4.4. Output. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Model Standards Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.

2.3.2. CAD Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

2.4.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.

3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:

- The Model, Facility Data, Workspace and CAD Data files in native Bentley BIM/CAD.
- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.
- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

3.1.4. The Government will confirm acceptability of all submittals identified in Section 3 in coordination with the USACE «ISSUING_DISTRICT» BIM Manager

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.

3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Builts BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.

4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.

4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.

4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations

4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2” NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:

4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.

4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.

4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.

4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2”Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:

4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding Systems. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1”=100’) scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.

6.3.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.

6.4. Cost Estimating. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.***</COS>***

*<BIM_APP_NEUTRAL>*__ATTACHMENT F__
Version 07-07-2010

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be «FULL_SIZE» size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents.

2.1.1. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.2. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE «ISSUING_DISTRICT» District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2.1. IFC Support. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class - see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall conform to the requirements of **Sections 3 and 4 below**.

2.2.3. BIM Project Execution Plan.

2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.

2.2.4. BIM Requirements.

2.2.4.1. Facility Data. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

2.2.4.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.4.3. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.2.4.4. Output. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Model Standards Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.

2.3.2. CAD Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Check to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

2.4.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence.

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.

3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:

- The Model, Facility Data, and CAD Data files.
- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.
- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

3.1.4. The Government will confirm acceptability of all submittals identified in Section 3 in coordination with the USACE «ISSUING_DISTRICT» BIM Manager

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE «ISSUING_DISTRICT» District BIM Manager will confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.

3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Builts BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.

4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.

4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.

4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.

4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:

4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.

4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.

4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.

4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:

4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.

6.3.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.

6.4. Cost Estimating. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.***</BIM_APP_NEUTRAL>***

*<BIM_APP_SPECIFIC>***ATTACHMENT F**
Version 02-03-2010

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be «FULL_SIZE» size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. All submitted BIM Models and associated Facility Data shall be fully compatible with ***<AUTODESK_REVIT>***Autodesk Revit 9.0 or higher***</AUTODESK_REVIT><BENTLEY_BIM>***«BENTLEY_VERSION» with associated USACE Bentley BIM Workspace***</BENTLEY_BIM><ARCHICAD>***ArchiCAD 11 or higher***</ARCHICAD>***

2.1.1. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.2. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE «ISSUING_DISTRICT» District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2.1. IFC Support. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class - see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall conform to the requirements of Sections 3 and 4 below.

2.2.3. BIM Project Execution Plan.

2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.

2.2.4. BIM Requirements.

2.2.4.1. Facility Data. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

2.2.4.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.4.3. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.2.4.4. Output. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Model Standards Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.

2.3.2. CAD Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Check to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

2.4.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence.

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.

3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:

- The Model, Facility Data, and CAD Data files.
- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.
- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

3.1.4. The Government shall confirm acceptability of all submittals identified in Section 3 in coordination with the USACE «ISSUING_DISTRICT» BIM Manager

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE «ISSUING_DISTRICT» District BIM Manager will confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.

3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Builts BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.

4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.

4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.

4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.

4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:

4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.

4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.

4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.

4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:

4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.

6.3.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.

6.4. Cost Estimating. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.***</BIM_APP_SPECIFIC>***

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ATTACHMENT G
DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	