

REQUEST FOR PROPOSAL OF ARCHITECTURAL/ENGINEERING SERVICES

Combined Arms Collective Training Facility (CACTF)

Department of Military and Veterans' Affairs
28 SEP 2009

In General:

The CACTF replicates realistic urban environment to include peripheral maneuver and staging areas. The designer must *site-adapt* the arrangement of the CACTF components (roads, buildings, and supporting features), ensuring that the layout complies with the training objectives. The facility consists of 18-21 buildings, tunnel/sewer system, single and multi-story buildings, targetry, Audio/image capture and edit/replay, Control and AAR facility, Breachable walls and vehicular and pedestrian circulation systems. The CACTF supports non-live fire training.

Because of how the CACTF's use, the AE shall provide structural designs based on codes, site-specific conditions and use, and must meet or exceed the normal floor live-loads for buildings and stairs. All subsurface features (such as basements and the storm sewer system) shall incorporate adequate provisions to ensure positive drainage.

There are minimum mechanical and electrical requirements are required for these buildings.

Provide a scale model of the CACTF site to support briefings before operations and for after-action reviews. In addition, two buildings will be designated to provide scale models with detachable roofs and floors.

CHANGES:

13 OCT 2009 – Initial Document

PROJECT REQUIREMENTS

SECTIONS

- A. General Bid Document Information.
- B. Time line
- C. Meetings / Site Visits
- D. Submittal Requirements
- E. Design Reviews – Document Review Procedures
- F. Type C services (Construction: 600-700)
- ☆ G. Track Required / Proposed
- H. Commissioning
- I. As-Built Record Documents
- ☆ J. General Overall AUTOCAD Standards
- K. Phase Submittal Requirements
- L. Site Investigation Report (NGR 415-5)

ENCLOSURES:

- I. DD 1390/1391 Program Document
- II. DMVA Charrette Documentation (@ Pre-Proposal)
- III. IT Infrastructure Standards and Requirements
- IV. COE Reference
- V. Controls Specification / Drawing (@ Pre-Proposal)
- VI. CAD Layer and Title Sheet (@ Pre-Proposal)

☆ = Indicates significant items although this whole document is applicable

SECTION A

GENERAL BID DOCUMENT INFORMATION

- a. The requirements of the AE are to develop 100% plans and specifications within the guidelines of this document, industry standards, and State/Federal/Military codes, regulations and design guides, and be able to justify the design.
- b. Not Applicable
- c. Not Applicable.
- d. Not Applicable
- e. Required items for documents and correspondence:
 - **Drawings and the cover page of bound documents shall have items 1-5 below located on the bottom right hand corner.**
 - **All paper correspondence shall have items 1-3 below.**
 - **All EMAIL shall have items 1-2 below as the beginning of the subject line and followed by purpose of the email**



1. Project name
2. DMVA project number and State project number if applicable,
3. Submittal date
4. Engineer Castle / State of Michigan Seal
5. Submittal phase (identify by percent and interim, initial or resubmittal)

- f. Construction drawings and specifications shall be 'hand' numbered
- g. The AE must pay special attention to the following areas: (1) Ventilation for Acceptable Indoor Quality ANSI/ASHRE 62-2001 (2) Energy Standard for Building Except Low-Rise Residential Buildings ANSI/ASHRE 90.1-2001 (3) ASHRE A-46.25, Table 34 (use Gymnasium for Drill Halls and Work Bays) (4) Utilizing energy efficient equipment with an approximate payback of 12years (examples are T8 lights and occupancy sensors in individual areas).
- h. LEED: The combined building LEED goal is a Gold Certification Rating. As many steps will be taken to achieve GOLD Rating for all other facilities.
- i. The front-end section will be the Department of Management Budget's MICHSPEC.

i. **Definition:**

AE = Architect/Engineer and various sub-disciplines. The party responsible for design, specifications and coordination of all design documents.

Owner = Department of Military and Veterans Affairs / USPFO

Contractor = The party responsible for implementing the design documents and coordinating all construction trades.

NGB = National Guard Bureau /COE (FOR THIS PROJECT ASSUME NGB = OWNER)

SECTION B

TIME LINE



The intent is to receive construction bids no later than **29 OCT 2010** in order to execute the contract in the first week of DEC. The below dates and design times are approximate. Reviews times by agencies by those outside of DMVA's control may require the design acceleration to meet the **28 SEP 2010 100%** completion time.

- Concept (10% - Charrette)	14 DEC 2010
- Preliminary (35%)	2 FEB 2010
- Pre-Final (65%)	16 MAY 2010
- Final 95%	17 AUG 2010
- Revised Final (100%).	28 SEP 2010



For 35%, 65% and 95% submittals a minimum of 38 review days are required by agencies outside of DMVA. This will include a review and meeting with the Corp of Engineers. AE will manage design time to allow DELEG (State Code) review comments incorporation into the bid documents prior to the bid date.

SECTION C

MEETINGS/SITE VISITS

A. Design Meetings:

- ☆ a. **Two days** prior to regularly scheduled meetings the AE will furnish the Owner with an agenda. As a minimum, the agenda will address the following: meeting purpose, estimated versus current schedule; items causing delays; actions to correct schedule delays; current work; work to be completed in the next two weeks; outstanding issues with responsible person, action, and action date; new items with responsible person, action and action date; review task status; and corrective actions; other significant events; Change Order/Bulletin status; time and place of the next scheduled meeting; and time and place of special meeting (s).
- b. AE will meet with the end users as required in order to understand their purpose and intent for the facility. In addition, the AE will develop the equipment and furniture layouts. The intent for the layouts is to design the facility so that it will accept government-furnished equipment and furnishings. It is not the intent for the AE to fully develop an equipment and furniture bid document (example of design effort - drill press requires single phase, 120v, xy connection, and occupy 2ft X 3ft X 9ft).
- c. AE will schedule meetings with the Owner to develop the bid documents' final intent and intermediate milestones for each phase. It should be the AE's understanding that each phase will be the foundation for follow-on submittals.
- ☆ d. At no additional cost to the Owner, the AE shall meet with the Owner when the intent, milestones and/or progress are not being accomplished. The Owner will indicate in writing when this shall occur.
- e. AE will have the appropriate design disciplines at meetings to ensure the full understanding of guidance and intent are understood by the Owner and the AE Design Team.
- f. AE shall have available for Owner review specified manufacturer's literature and samples.
- g. **Five days** after the meeting the AE shall provide comprehensive, organized notes of the meeting to the Owner and General Contractor. The AE shall be the note taker, creator and maintainer.
- h. Design and review meetings will occur at both Camp Grayling and the Lansing Engineering Office.

B. Construction Meetings/Site Visits:

- a. **Two days** prior to regularly scheduled meetings, the AE shall furnish a meeting agenda to the Owner and Contractor. If there are new items that need to be addressed, then the AE will furnish to the meeting participants a new meeting agenda at the beginning of the meeting.
- b. The meeting agenda shall address the following items: safety issues; estimated versus current work schedule; items causing delays, including administrative, technical (plans and specification), construction work force; materials, Gov't and weather; actions to correct schedule delays; current work; work to be completed in the next two weeks; Submittal Log review; RFI's Log review; major commissioning requirements; outstanding issues with responsible person, action and action date; new items, responsible person, action and action date; other significant events; Change Order/Bulletin Log review; time and place of the next scheduled meeting; time and place of the special meeting (s); as-built review; site review notes. Once a month the Construction Contractor's pay request will be reviewed at the end of the meeting.
- c. **Two days** prior to the meeting, the AE shall provide an up to date Submittal Log to the Owner and General Contractor. The Submittal Log shall show the date of submittal, date of approval/approval with exception/disapproval, date returned to Contractor, date of re-submittal and date re-submittal was returned. Submittals that affect the Contractor's critical path will be noted.
- d. **Two days** prior to the meeting, the AE shall provide an up to date RFI Log to the Owner and General Contractor. The RFI Log submittal date, date response furnished or date a response will be furnished. RFI's that affect the Contractor's critical path will be noted.
- e. **Two days** prior to the meeting, the AE shall provide an up-to-date Change Order/Bulletin Log to the Owner and General. It shall show the general description, amount and date the Contractor quoted, approved/disapproved and who/what/when actions are required.
- f. **Five days** after the meeting the AE shall provide comprehensive, organized notes of the meeting to the Owner and General Contractor. The AE shall be the note taker, creator and maintainer.
- ☆ g. For each site the AE shall create, maintain and furnish to the Owner and Contractor notes to include – date, time, weather, name and position of the person, decisions reached including background information, significant events, trades onsite, items impacting, construction occurring, work progress, verbal RFI's, and safety issues.

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- h. AE should anticipate special meetings to resolve onsite problems, complex construction task, and multiple trade construction tasks that may cause difficulties in the execution of the construction process.
- ☆ i. Special meetings to resolve conflicts that are bid document created will be at no additional charge to the Owner and will not count towards AE programmed meeting hours.
- ☆ j. Program two progress meetings a month. This does not include meetings addressed in item “ h “ above or Commissioning meetings.

SECTION D

SUBMITTAL REQUIREMENTS

This section defines submittal requirements, to include Bid Documents, Estimates, TABS A, B and C and color charts. *Section K shows the submittal phase requirements.* TABS A, B, and C will be submitted separately from other submittal items. Each submittal will furnish the required number of hardcopy documents and an electronic copy. *The electronic copy will be in the same format as the As-Built Record Drawings. See Section I & J for AUTOCAD requirements.*



TAB A:

This tab provides a *description of the proposed facilities.* It contains a general overview of the work to be performed at the facility and detailed description of each room in the facility. Required paragraphs follow:

- a. Project Title -Provide a brief overview of the functions performed at the facility. It will contain DMVA's project number.
- b. Scope - This summary, together with the narrative required under Tab B paragraphs a and b, is intended to provide a concise and accurate description of full project requirements
- c. Maximum Construction Cost (Construction Budget and its calculation).
- d. Floor Plan - Attach two different simple, single line floor plans with room numbers, titles, and area proposed and programmed. The spatial relationship between functions is the most important of this floor plan and should receive input from facility users. If known, include on the same plan a phantom layout of furniture, equipment and/or utilities. These items serve to further highlight the special requirement of various room functions (this section can reference the bid documents).
- e. Number of Occupants- Provide weekday total and unit training assembly total for building.
- f. Hours of Operation - Provide weekday, weekend and night hours.
- g. Room number, title, functions, and special requirements. This paragraph and all subsequent paragraphs are used describe each room in the facility. For example, Room 100: classroom , seating for 40, overhead power point projector connection, 8 computer drops and dimmable lights.
 101. List room number and title, ensuring that number and title are coordinated with the number and title on the definitive floor plan. Room titles will reflect room function. Provide a brief functional description of each room. Subparagraphs (1) through (8) for each room are used to list special room requirements as follows:
 - (1) Architectural: Ceiling and floor heights; fenestration; door sizes; wall and roof treatments; and security requirements.
 - (2) Structural: Special floor loadings; wall thickness; vaults (include class); hoist; and lifts.
 - (3) Mechanical: List requirements for heating, ventilating, air conditioning, design temperature and humidity; compressed air; lavatories, urinals, sinks; showers, water closets; hoods/fans; eye wash/showers; floor drains; oil interceptors, neutralizers, process tanks, dust collectors, hazardous wastes.
 - (4) Electrical: Special receptacles or power sources, 28vDC, 240 v, 480v 400hertz; Special lighting; grounding; lighting protection; security alarms, standby power, transfer switches, etc..
 - (5) Communications: Voice, Data, image communication, intercom, etc.
 - (6) Fire Protection: Fire alarm systems; manual and/or automatic detection; suppression; automatic closing doors; and fire safety plan.
 - (7) Government furnished / Contractor installed and Government furnished /Government installed: Provide size, weight and utility requirements.
 - (8) Special Requirements:
 - (9) Exceptions to criteria and data processing equipment.



TAB B:

This tab provides a *description of the project site*. It contains information on all *exterior* work items needed to provide a complete and usable facility. Each paragraph of Tab B is described as follow:

- a. Project Title:
- b. Provide a brief summary of the major exterior work items needed and paragraphs subsequently described in further detail. This summary, together with the narrative required under Tab A paragraphs a and b, is intended to provide a concise and accurate description of the full project requirements.
- c. Vicinity Sketch and Location Map.
- d. Site Plan: Describe the immediate area of the project site. Attach a simple site plan showing building outline, driveways, parking, paved storage, fencing, and items to be demolished and existing rough ground contours, if known. The site plan is intended to show the nature and approximate extent of exterior work items.
- e. Utility Plan: Describe what is known about each of the existing utilities that are needed service the facility. Attach a simple utility plan and the location of all existing and proposed utilities including water, sanitary sewer, storm drain, gas lines, electric and electric communication and fire hydrants (size, location, pressure, owner, etc.).
- f. Architectural Treatment: Describe the architectural treatment and types of construction of surrounding existing facilities. Proposed exterior finish should be discussed. Where compatibility to an existing architectural treatment is desired, recommend compatibility to that style to be used in design of the facility.
- g. Environmental requirements: It is the responsibility of the AE to investigate the need for locally required documentation and construction features to satisfy environmental consideration. (1) The State will report to NGB on the status of environmental problems at the Preliminary and Final Design stages. (2) Other Environmental Requirements: Environmental related items previously described in the facility description should not be covered again. This subparagraph is used to describe other environmental considerations that may impact on the design of the facility. Examples are: water quality, solid waste disposal criteria (Federal, State or local), disposal method and sewage system capacity, project site location relative to flood plains, design for outside noise level reduction. Also include required items such as neutralizers, oil/water separators, sound attenuation, etc.

TAB C:

This section will be submitted as a separate document that contains (4) sections.

- a. List *design criteria* used for developing the project. Indicate documents that are Owner furnished, Owner furnished in part, industry standards and local, state, or federal requirements.
- b. Design calculations to include but not limited to the following disciplines civil, architectural, structural, plumbing, fire protection, mechanical, electrical, and energy conservation (passive and active). This data should be in a clear, readily understandable manner and in sufficient detail to assure a uniform interpretation of the project scope. Follow-on submittals will have supporting design data and new and/or changed assumptions chronologically added by phase (An example of this is a 10% assumption of a truss roof would require analysis for the trusses; at 35% design a new assumption of a precast roof will be used, therefore new structural calculations must occur).
- c. Assumptions for this submittal shall have the following disciplines: civil, architectural, structural, plumbing, fire protection, mechanical electrical, and energy conservation (passive and active). This data should be in a clear, readily understandable manner and in sufficient detail to assure a uniform interpretation of the project scope. Reference to applicable codes and/or supplemental information should be provided to support project intentions.
- d. Easements, including who they are granted to, restrictions and requirements for both DMVA and grantee

PLANS:

Graphical representation of the project that shows the project scope. Sheets shall be coordinated with themselves, the specification, and all other submittals. They shall be submitted in hardcopy and electronic format.

SPECIFICATIONS:

Written representation of the project that defines quality, methods of installation, quality control. State of Michigan front-end section will be incorporated into the Concept Specification.

Upon request the AE shall provide manufacture's information of items specified.

CODE ANALYSIS:

Use a spreadsheet format to perform a code analysis for each building/room type, use, material utilized, special electrical, and all safety features. At no additional cost to the Owner and at the appropriate design time, the AE will prepare documents for and meet with State of Michigan Consumer and Industry Services, Bureau of Construction Codes as required for code compliance review. The AE will prepare responses to code compliance comments and correct Bid Documents as required. Their current policy is each building on a project will be submitted for individual review and permits



- c. **CONCEPT ESTIMATE:** An estimate of construction cost is to be prepared based on the design of the project. The cost of various building features and outside supporting facilities are to be listed separately for verification of the accuracy of the programming cost estimate and design control cost of the total project (the estimate should be by discipline). If the preliminary cost estimate exceeds the design control cost by more than **5 percent**, the items contribution to the additional costs or the reasons for the increase are to be identified for special review and resolution of any potential funding problem. All items in the project that exceed the general construction standards authorized for Federal support, as outlined in NGR 415-10, will be identified and listed as bid alternates to be supported with other than Federal funds. The AE shall maximize the use of construction funds through bid alternates.

PRELIMINARY DOCUMENTS (35%)

This submittal shall include documents that communicate in narrative or drawing format responses to all review comments.

BID DOCUMENTS

NGB and Owner approval, guidance and comments should be obtained prior to incurring any expenses for the preparation of Pre-Final Documents (65%). These documents should expand and amplify the concept submittal and incorporate guidance from DMVA and NGB. The intent for these documents is to act as the foundation for building, expanding and amplifying follow-on submittals, which rely on direction and assumptions of this submittal, and lead to 100% Design Documents that meet DMVA's intent and they are clear, concise and coordinated. Beyond the minimum requirements, the AE shall use his professional judgment in determining document needs to ensure intent, clarity, conciseness and coordination. Review of the Preliminary Document by NGB and the Owner will occur in conjunction with the



- a. **Site Investigation Report: The Site Survey Report must be received prior to, or simultaneously with the 35% submission of the project's Preliminary submittal.**
- b. **b. Estimate:** An estimate of construction cost is to be prepared because of the proposed project design. The cost of the various building features and outside supporting facilities are to be listed separately for verification of the accuracy of the Programming cost estimate and design control cost of the total project (the estimate should be by discipline). If the preliminary cost estimate exceeds the design control cost by more than 5 percent, the items contributing to the additional costs or the reason for the increase are to be identified for special review and resolution of any potential funding problem. All items in the project that exceed the general construction standards authorized Federal support, as outlined in NGB 415-10, will be identified and listed as a bid alternate to be supported with other than Federal funds. The AE shall present proposals to the Owner to adjust the budget while staying within the project requirements.
- c. **Plan Sheets:** These should be submitted with sufficient data that adequately depict the basic design features being proposed for the project.
- (1)**Cover-**At a minimum the following items will be included on this sheet: project name; standard abbreviations; symbol submittals will be in normal text.
- (2) **Civil / Site** - At a minimum the following items will be included:
- (i) *One sheet:* Existing utilities with sizes, pressures, rim elevations, invert elevations and volumes; existing walks, roads, parking areas, and fencing; vegetation within the limits of construction grouped by size and/or type; existing contours; property boundaries; streets; general area surrounding the site to include streams, rivers, lakes, wetlands, flood plains, adjacent property buildings or environmentally sensitive areas; location and finish floor elevation of proposed building using phantom lines; and existing buildings within the limits of construction.
- (ii) *Another sheet:* Existing and proposed utilities with sizes, pressures, rim elevations, invert elevations and volumes; location and finish floor elevation of proposed building; and walks, roads, parking areas, and fencing existing not being demolished
- (3) **Facilities:-** At a minimum the following items will be included: (1) Electrical illumination systems showing the number and types (schedule) of lighting fixtures proposed, the required lighting intensity, and a reflective ceiling plan showing their positions. Include the lighting intensity in foot-candles for each area and the locations of electrical, data, telephone and intercom outlets and fixtures. (2)Plumbing (sewer, storm, water) fixture schedule and l
- d. **SPECIFICATIONS:** These should be submitted with sufficient data to adequately depict the basic design and standard for features being proposed for the project.

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- (1) A specification brief is to be prepared outlining the technical sections that are to be included in the Final Specifications. Each section should include a brief description of each system or piece of equipment to be used. Any substitutions of items or finishes authorized of items for Federal support will be listed as proposed alternates in the brief. The use of proprietary equipment or materials that would limit the number of bidders or require payment for permits, royalties, etc., are generally not authorized Federal funding support. Any Proposed use item must be specifically identified in the preliminary specifications with reasons and justifications presented in sufficient detail to support the items unique project requirements
- (2) Submittals that are requested within the specification shall be made available by the AE to the Owner throughout the design stages at no additional charge upon request.

PRE-FINAL DOCUMENTS - (65%)

These documents shall include documents that communicate in a narrative or drawing format responses to Preliminary Submittal review comments.

PLANS AND SPECIFICATIONS:

NGB and Owner approval and/or guidance should be obtained prior to incurring any expenses for the preparation of Final Documents (95%). These documents should expand and amplify the Preliminary submittal and incorporate guidance from DMVA and NGB. Include direct digital controls drawings and specifications. The intent of the pre-final documents is to form the foundation to build, expand and amplify follow-on submittals that rely on direction and assumptions of this submittal, and lead to Revised Final Documents (100%) and meet DMVA's project intent. They must be clear, concise and coordinated. The AE shall use his professional judgment to determining document needs for ensuring the intent, clarity, conciseness and coordination. All sheets listed on the Preliminary Drawing index sheet and Specification sheet shall be part of these documents and expanded upon.

FINAL DOCUMENTS - (95%)

This submittal shall include documents that communicate in a narrative or drawing format responses to Pre-Final review comments.

- a. Final Documents will be prepared upon NGB's and DMVA's approval of the Pre-Final (65%) and authorization to proceed with the development of the project. The purpose of these documents is to explicitly describe the quantity and quality of work to be performed by the construction contractor the will result in a complete and usable facility suited for the purpose intended without recourse to subsequent contract modifications or changes.
- b. The Final Project Design should be in conformance with comments provided by NGB and DMVA on the review of Pre-Final (65%), construction standards, authorized Federal local, State and Federal requirements and supported items outlined in NGB 415-10.
- c. Prior to this submission, the using personnel at the operating level (State, Environmental, Safety, Occupational Health and other State staff personnel) and the FMO for the State should check the Final Documents for completeness with special attention given to possible omissions of authorized items, environmental protection, and safety (OSHA/MIOSHA) regulatory requirements. If any omissions are noted, they may be marked in free-hand pencil on the documents being submitted for review and/or a narrative document clarifying comments and referencing requirements. These can be incorporated into the design later in conjunction with adjustments normally required to conform to NGB criteria and standards
- d. NGB approval and guidance on Federal supported and funding availability must be obtained before the project is advertised for the solicitation of bids. Final Plans shall include a table of showing interior and exterior proposed and programmed quantities and the percentage difference.
- e. Final Bid Documents must be stamped by an AE licensed to practice within the State.

FINAL PLANS

Final Bid Documents will include the necessary plans, elevations, sections, schedules and notes prepared in sufficient detail to assure: (1) Complete construction of all elements of the project building and exterior supporting facilities. (2) Coordination of drawings and specifications to eliminate omissions, conflicts, or ambiguities. (3) Completion of all details referenced in specifications. (4) Clear and uniform interpretation of project scope and complexity by all qualified bidders. (5) Conformance to NGB comments on Preliminary Plans. (6) Delineate between Owner furnished/Contractor installed and all other items (6) Complete delineation of any alternate bid items, and substitutes designated as "Contractor Options"; (7) On the plans a table showing proposed and programmed quantities for interior and exterior items.

FINAL SPECIFICATIONS

For convenience of reference, the technical specifications are to be separated into titled sections by trade of specialty and in conjunction with the plans, must include a complete identification of materials and equipment to be used and description of the methods of construction, installation, or application, as appropriate, for each type of work. Final Specifications must incorporate a clear and accurate description of the technical requirements of the material or product required in the completed project. Such product descriptions will not unduly restrict competition. The description may include a statement of the qualitative nature of the material or project specified or when necessary, may set forth those minimum essential characteristics and standards to which it must conform, if it is to satisfy its intended use. When it is impractical or uneconomical to develop a clear and accurate description of the technical requirements, a 'brand name or equal' description may be used as a means to define the performance of other salient requirements of specified item. In addition, a single manufacturer can be defined as a "Quality Condition", if a statement is added to the specifications allowing manufacturers with a similar degree of quality be acceptable. In all cases when a brand name is specified, the specific features of the named branch must be met by the contractor and clearly stated in the completed specifications. **Quality control portions of each section will clearly define testing responsibilities as the Contractor. In addition, the final specification will include a submittal log showing all required contractor submittals.**

REVISED FINAL DOCUMENTS - (100%)

This submittal shall include documents that communicate in a narrative or drawing format responses to Final review comments.

- a. The Revised Final Documents (100%) should be documents with the incorporation of NGB and DMVA Review comments into the Final Document (95%), in order to reduce the prebid and post bid addenda. If items have been designated as being in excess of authorized still remain in the project, but have not been listed or adequately identified for separate bidding, NGB will calculate a reasonable cost for the item (after bids have been opened if necessary) to determine the amount of reduction and the final cost supported by Federal funding.
- b. Revised Final Bid Documents must be stamped by an Architect/Engineer licensed to practice within the State of Michigan.
- c. The Revised Final Documents should incorporate Code Review Comments in order to reduce pre-bid and post-bid addenda.
- d. The AE shall assist the Owner in the bidding process by responding to verbal and written Contractor and Owner questions and coordinating and issuing addenda as required to execute the Construction contract. There will be no additional cost associated for time issuing addenda, answering questions because of incomplete bid documents, poor coordination and document clarity, or missing requirements. In addition, the AE should anticipate some design effort; feedback to the Owner and issuance of addenda to ensure the Owner gets maximum use of construction funds. As required the AE shall assist the Owner to evaluate bids and for completeness, accuracy and cost. The AE shall assist the Owner to determine the best qualified bidder.

SECTION E

DESIGN REVIEWS – DOCUMENT REVIEW PROCEDURES

a. NGB Reviews:

- i. The following submittals will be forwarded to National Guard Bureau for their review: 35%, 65% 95% and 100%.
- ii. NGB requires a minimum of 20 calendar days to review a design submittal. The SDZ will take up to 60 calendar days. Prior to forwarding documents to NGB for review the Owner will perform a cursor review for obvious errors and omissions. If the Owner determines the documents are unsuitable for submission to NGB because of errors, poor coordination or poor quality then the Owner will reject the submittal and require resubmittal by the AE. **The period of time to correct documents counts towards the overall time for the design contract and no additional time will be given to the AE.** After receiving NGB comments a period of time will be required to compile Owner and NGB comments before reviewing with the AE.
- iii. The Contractor shall respond to each NGB comment, specifically addressing each item. The response will address each comment in a narrative format or specify where and how the item was addressed with-in the documents. Do not respond to comments as "will comply", but respond with how a brief description, or a place in the documents where it is answered.

b. other Agencies:

- i. The following submittals will be forwarded to Other DoD Agencies for their review: 35%, 65% 95% and 100%.
- ii. These will require a minimum of 38-days per submittal for review and meeting with the agencies (approximately 30-days for the review). Prior to forwarding documents to DoD Agencies for review the Owner will perform a cursor review for obvious errors and omissions. If the Owner determines the documents are unsuitable for submission to because of errors, poor coordination or poor quality then the Owner will reject the submittal and require resubmittal by the AE. **The period of time to correct documents counts towards the design time and no additional time will be given to the AE.** AE must respond to COE comments via PROJNET prior to the review meeting.

c. Owner Review:

- i. The Owner will review the following submittals: 10%, 35%, 65%, 95% and 100%.
- ii. Owner comments will be combination of narrative and marked-up drawings. Narrative comments will require a response in similar format to NGB comments. Marked-up drawings will be returned to the Owner with the next submittal, signed and dated by the Contractor. Each comment on the drawings must indicate that it has been addressed and/or a narrative must be generated for the comments.

c. Document submittal times will be negotiated in conjunction with Section B, Timelines, but will not detract from the bid date of 29 OCT 2010 or the 100% date of 28 SEP 2010

SECTION F

TYPE C SERVICES (600/700 SERVICES)

These are the AE's responsibility during construction in addition to the other contract requirements during Type C Services.

- a. **Shop Drawings/Submittals:** Throughout the construction phase, the AE shall be responsible for reviewing and approving/disapproving shop drawings and submittals for bid document compliance. **The turn-around date for this process will be established prior to the AE contract execution.** Distribution shall be the AE's responsibility.
- b. **Inspections:** In conjunction with the scheduled and special meetings, the AE shall visit the construction site to become familiar with construction quantity compared to the submitted work schedule and the quality compared to bid documents, industry standards, approved shop drawings/submittals and approved sample construction. **AE should be present for initial item placement to ensure the project standards are initial met (window, paint, overhead door, etc.). The AE will break the areas down for these types of visits in the Commissioning Section.** If it is part of the scheduled or special meetings then minimum cost should be associated with it. During peak periods of construction, the AE should visit the site to ensure compliance with construction documents. The AE shall record all site visits as required by Section "MEETINGS/SITE VISITS", for Construction Meetings/Site Visits.
- c. **Contractor Close Out:** The AE will conduct a Pre-punch List inspection and a Substantial Completion/Punch-List inspection in conjunction with the Owner and Contractor.
 - (1) The Pre-Punch List will occur when the Contractor notifies in writing that the project is ready for a pre-punch list inspection. The AE and Owner will perform a cursory project review to ensure that level of completion is worth the effort to perform the pre-punch list inspection. . If the project status is not at a level of completion that warrants completing a Pre-punchlist, then the AE shall inform the Owner and the Contractor in writing. The document produced from this inspection will locate and identify non-conforming contract requirements that are communicated to the parties with a narrative, digital pictures and references to bid documents, codes and industry standards. The AE may demonstrate conforming/non-conforming areas using examples or preapproved sample construction. This demonstration must be documented in the communication document. The intent of the pre-punch list is to narrow the amount of items on the punch list that are non-conforming and shall not be used to change acceptable standards
 - (2) The Substantial Completion/Punch List will occur when the Contractor notifies in writing that the project is ready for a punch list inspection. The AE and Owner will perform a cursory project review to ensure that level of completion is worth the effort to perform the punch list inspection. . If the project status is not at a level of completion that warrants completing a Punchlist, then the AE shall inform the Owner and the Contractor in writing. The document produced from this inspection will locate and identify non-conforming contract requirements that are communicated to the parties with a narrative, digital pictures and references to bid documents, codes and industry standards. The AE may demonstrate conforming/non-conforming areas using examples or preapproved sample construction. This demonstration must be documented in the communication document. In addition to non-conforming construction the punch list will include all close-out requirements (warranties, permits, demonstrations, etc.), including any USPFO and DMVA requirements.

SECTION G
TRACK REQUIRED / PROPOSED

Project Name	139	0/91 Name	Base Finish	Wainscot Finish	Wall Finish	Ceiling Finish	Electrical Requirements	Light Requirements	Phone/Data Requirements	Heat	Cool	Dehumidify	Security	SQFT Proposed	SQFT Programmed	SQFT % Difference
D.H.	D.H.	EXP	GSU	EPOXY	EXP-P	Exposed	120V	30fc	yes	yes	no	no	NA	3000	2500	25
Clerk	Admin	CPT	RB	NA	exp-p	ACST	120V	70FC	yes	yes	yes	no	NA	100	100	0
supply	Admin	CPT	RB	NA	exp-p	GWB-P	120V	70FC	yes	yes	yes	no	NA	100	200	100
general	Admin	VCT	GSU	NA	exp-p	GWB-P	120V	90FC	yes	yes	yes	no	NA	200	150	20
														400	450	12.5

Project Name	1390/91 Name	Material Unit	Propose	Program	% Difference
POV parking	Flexible paving	SY	200	150	
Entrance	Flexible paving	SY	100	150	
			300	300	0
Military Parking	Ridge	SY	200	400	-50
Sidewalk	Concrete	SY	100	50	100
Security Fence	Fence	LF	700	700	0
Seeding	Seeding	SY	200	200	0

SECTION H **COMMISSIONING**

Design Documents shall incorporate Building Commissioning. The goal is to formalize milestones and ensure coordination prior to installation. This will include, but is not limited to, installation submittals, pre-installation meetings, functionality test, installation checklist, and Construction Contractor and Sub-Contractor commissioning meeting attendance. The AE will act as the 'Commissioning Agent'. The Owner or AE will not direct Contractor work method or means. The AE will work with the Owner to make the documents project specific and ensure plans and other specification sections coordinate with these documents. At a minimum the following items will be addressed: doors, windows, CMU installation, concrete, electrical, communications, finishes, plumbing, precast, controls and mechanical.

SECTION I

AS-BUILT RECORD DOCUMENTS

As-Built Drawings will be submitted in **both electronic and hard copy format (the electronic format is the format for all submittal phases).**

a. DRAWING ELECTRONIC FORMAT:

- (1) Follow the 'General Overall CAD Standards' Section for submission of the electronic format.
- (2) Provide a list of software used for creating drawings. At no additional cost, the AE will furnish the Owner licensed network capable programs to make the submitted documents useable with the programs listed in 'General Overall CAD Standards' Section.
- (3) All drawings shall have "As-Built" Stamped and corresponding "Completion Date" on them, as well as being marked, "FINAL RECORD."
- (4) These computer drawings shall be coordinated with the hard copy set submitted (referenced below).

b. DRAWING HARDCOPY FORMAT:

- (1) Submit a full size hard copy set of As-Built black-line drawings. All drawings shall have "As-Built" Stamped on them.
- (2) Each drawing shall have the corresponding Completion Date on them, as well as being marked, "FINAL RECORD".
- (3) These hard copy drawings shall be coordinated with the electronic set submitted (referenced above).

c. SPECIFICATION ELECTRONIC FORMAT:

Electronic As-Built Specifications compatible with Microsoft Office 2003 format and not include features exclusive to higher Office versions or other programs. At no additional cost, the AE will furnish the Owner licensed network capable programs to make the submitted documents useable with Microsoft Word 2003.

d. SPECIFICATION HARDCOPY FORMAT:

Submit a bound copy on 8 1/2 X 11-inch sheets. The cover shall be dated and marked with "As-Built" and "FINAL RECORD".

SECTION J

GENERAL OVERALL AUTOCAD STANDARDS

(version 1.0, 14 OCT 2009)

This Standard will provide guidance and procedures for preparing computer-aided design and drafting (CAD) products for the Department of Military and Veterans Affairs. These standards must be concise and are not intended to be all-inclusive and amendments shall be provided. *The Purpose of this Guide is to set a basic CAD Standard to ensure a consistent electronic deliverable product to DMVA. All drawings shall be produced according to the DMVA standard guidelines..*

The terminology or use of certain AutoDesk terms or phases within this scope are to be assumed the user is aware of, and understands the meaning of the term.

Objectives

1. Create uniform CAD (.dwg) drawings.
2. Create uniform design, presentation and construction information and establish a clear and precise method of communication.

Software Guidelines

All Software must follow the guidelines of the DMVA approved software list:

1. AutoCAD 2009
2. Autodesk Architectural Desktop 2009
3. Autodesk Building Systems 2009
4. Autodesk Civil 3D 2009

Only Autodesk software will be accepted in the design and drafting of projects for the DMVA. If any Autodesk software other than what is listed above is used, a licensed network copy must be furnished.

Drawings in General

Drawings produced under the guidance of these standards should demonstrate a professional and quality appearance. The technical competence and aesthetic judgment of DMVA should be appropriately demonstrated at every level, to the point that a Contractor should never find cause to question. Construction drawings should demonstrate at least as much refinement as the design they illustrate.

1. All drawing files (.dwg) must be purged of all unneeded blocks, fonts, layers, etc.
2. All contract document drawings files (.dwg) shall be saved in Paper Space and at "ZOOM EXTENTS".
3. All Model drawings (.dwg) shall be saved in Model Space and at "ZOOM EXTENTS".
4. The Leader command will be used for all leaders and associated text.
5. All text for Drawings shall be Arial. Use of bold or Italic fonts where desired is acceptable.
6. All text in title block shall be Arial.
7. Do not use unique shape files or font styles.

8. For any text that consists of more than one line, the MTEXT option shall be used.
9. All items put on the drawings shall be positioned in a manner to prevent a "crowded" drawing.
10. Use text masking when appropriate for clean appearance.
11. All graphics will be created "By Layer".

General Overall CAD Standards continued

Drawing Setup

1. Units: All work is to be produced in "real world" units, Architectural (feet and inches) to 1/32" precision and Engineering (feet and tenths) to 0.000" precision.
2. Origin: The Origin is the position within every electronic drawing file. Standardizing the location of the origin of a drawing is important because it serves as the point of reference from which all other elements are located. The global origin will be 0,0,0.
3. Survey: All electronic Survey's will be furnished in an original electronic file and will *not* be exploded or bound. All Survey's will be provided in a separate usable cad (.dwg) file.
4. Be sure all files are located in the correct location and the proper xrefs are attached.

Model Drawing Files

1. Model drawing files are created for the use of "xrefing" them into contract document drawings files. A Model file will contain the physical components of a building and/or the civil/topographic information used to create the sheet files.
2. The Model file shall be drawn at full scale.
3. The general rule is that anything at the site after construction will be placed in this type of drawing. No text entities will be created in the Model file.

Contract Document Drawings Files

1. These files are synonymous with a plotted Cad drawing file (.dwg) and will be used to generate plots, one plot per drawing file.
2. These files are a selected view or portion of the Model file(s) within a title block.
3. These files are plotted one to one with scaled viewports.
4. Each file will represent only one contract drawing. There will be no multiple generations of plots or tabs from one contract document drawing file. For example, you cannot plot the Architectural Floor Plan and the reflected Ceiling Plan from the same drawing file.
5. These files shall reference (xrefs) files in Model space where applicable.
6. These files shall contain the DMVA Title Block in Paper space.
7. All Title Blocks are inserted at 0,0.

External Reference Drawings Files

1. All External References (xrefs) shall be OVERLAYED and not ATTACHED.
2. All External Reference files shall be provided in their own separate file (.dwg).
3. Never xref one plotted drawing into another or across other disciplines folders.
4. All xref files' naming convention will begin with an "X".
5. All Engineering drawings that reference the architectural facility plans must change the back ground to color 254 so it will be plotted at a gray shade.
6. No deliverables shall be bound. Overall CAD Standards

General Overall CAD Standards

Layers

1. All Layer names must follow the latest *AIA* or *National CAD Standards* naming convention, all upper case.
2. All graphics will be created “by Layer”.

Details/Blocks

1. Only Details pertaining to the project shall be on the final contract document drawings.
2. All Details must follow to the standards, including layer names, text font, etc.

Title Blocks

1. All contract document drawings shall use DMVA’s furnished Title Blocks.
2. Title blocks are always to be inserted as a block using the insert command and inserted in Paper Space with an insert point of 0,0.
3. Title blocks shall be inserted on layer “0.”
4. Title block layers shall keep the original layer colors.

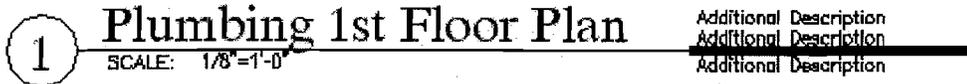
General Overall CAD Standards continued

5. All Title information needs to be Upper and Lower case (Title Case).

Drawing Title/ Detail Title

All drawings/details will include a TITLE, positioned in the lower section of the drawing/detail. All title annotation shall be placed in paper space on the individual drawing sheets. The block for the title information is located on the “Call outs” or “Annotations” tab of any of the pallets with in any AutoDesk software product.

Examples of title:



Examples of titles:

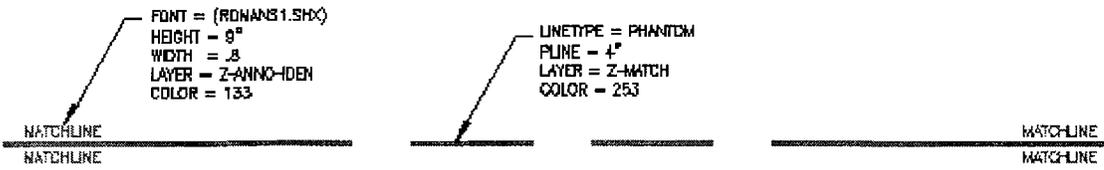
1. *Foundation Floor Plan*
2. *Framing Floor Plan*
3. *HVAC Floor Plan*
4. *Fire Protection Floor Plan*
5. *Plumbing Floor Plan*
6. *Electrical Floor Plan*

North Arrow / Site map

1. A North Arrow shall be located near the title used for that detail and inserted in the lower right corner of the detail.
2. Site Map (NTS) shall be located near the title used for that detail and inserted in the lower right corner of the detail.

Match lines

1. All drawings that consist of partial floor plans per sheet shall include a match line.
2. This match line will be placed on individual drawings so that they can be adjusted accordingly.
3. The match line and text will stay the same for all divisions for consistency.



Section and Elevation Marks

All Section and Elevation Marks are to be clear and consistent and well coordinated within the drawing set.

Dimensions

1. Dimensions will be placed in Model Space of the Contract Drawing file.
2. *No dimensions or dimension text is allowed in the model file which is xref^d.*
3. Dimension line terminators shall be either Architectural Ticks or Closed Filled Arrowheads.
4. Be consistent through out the project. Only one style can be used.
5. Associated Dimensions and Associated text shall be used.

Final Product

1. To produce Contract Drawings used as construction bidding documents.
2. To produce these drawings in such a manner that they are usable electronic files (.dwg) that the Design Section of DMVA can use at a later date and be incorporated into future projects.
3. Upon completion of said construction project and prior to final payment, the following shall be turned over to DMVA
4. Electronic Drawing files (Bidding Contract Documents as well as As-Built) in the format that this Guide Outlines.
5. These files shall be AutoCAD (.dwg) files.
6. Overall CAD Standards

General Overall CAD Standards continued

SCALING FACTORS

Architecture						
<u>Drawing Scale</u>	<u>Insertion Scale Factor</u>	<u>Scale Factor</u>	<u>Text Size</u>			
Full	1	1	3/32	1/8	3/16	1/4
3" = 1'-0"	0.25	4	3/8	1/2	3/4	1
1-1/2" = 1'-0"	0.125	8	3/4	1	1-1/2	2
1" = 1'-0"	0.08333	12	1-1/8	1-1/2	2-1/4	3
3/4" = 1'-0"	0.0625	16	1-1/2	2	3	4
1/2" = 1'-0"	0.041666	24	2-1/4	3	4 1/2	6
3/8" = 1'-0"	0.03125	32	3	4	6	8
1/4" = 1'-0"	0.0208333	48	4-1/2	6	9	12
1/8" = 1'-0"	0.0104166	96	9	12	18	24
1/16" = 1'-0"	0.0052083	192	18	24	36	48
Engineering						
1" = 20'	0.0041666	240	22-1/2	30	45	60
1" = 30'	0.0027777	360	33-3/4	45	67-1/2	90
1" = 40'	0.00208333	480	45	60	90	120
1" = 50'	0.00166667	600	56-1/4	75	112-1/2	150
1" = 60'	0.00138889	720	67-1/2	90	135	180
1" = 100'	0.0008333	1200	112-1/2	150	225	300
1" = 200'	0.0004166	2400	225	300	450	600

SECTION K
PHASE SUBMITTAL REQUIREMENTS

	PERCENT	Tab - A	Tab - B	Tab - C	Hard copy Plans	Hard Copy Specifications	Electronic Plans	Electronic Specifications	Estimate	Spreadsheet RM Req.	Code Analysis	Color Charts	Comment Responses: Owner, NGB, Agencies	Contractor Submittal List	Uncompleted Items
Concept	10	X	X	X	X	-	X	-	-	-	-	-	-	-	X
Preliminary	35	X	X	X	X	X	X	X	X	-	-	-	X		X
Pre-Final	65	*	*	X	X	X	X	X	X	X	X	X2	X	X	X
Final	95	*	*	X	X	X	X	X	X	X	X	X2	X	X	X
Revised	100	*	*	X	X	X	X	X	X	*	X	*	X	X	X

X = REQUIRED

* = NOT REQUIRED

X2 =REQUIRED 2 SETS (Both Interior and Exterior)



SECTION L **SITE INVESTIGATION REPORTS**

In conjunction with the Concept and Preliminary design efforts the AE shall ensure a Survey and Soil Investigation are completed. Site Investigation Report shall be submitted prior to or concurrently with the **Preliminary Submittal (35%)**. **Preliminary Review will not occur without the Site Investigation Reports being submitted.**

The following items will be

- a. A site survey with topography, utilities and any other structures.
- b. Description of existing ground surface conditions -vegetation, approximate ground slope, surface material.
- c. Layout plan of a sufficient number of soil borings to determine adequately the general subsoil conditions existing at the site in the areas of proposed improvements. The plans should indicate the location of the borings reference to the site boundaries and the ground surface elevation at the borings together with a log of the soil types and characteristics and encountered ground water levels.
- d. Laboratory test results as necessary, to determine classification, grading characteristics, CBR and strength of the surface land sub-soils in regards to support building and pavement construction.
- e. A **Declaration of Soil Bearing Capacity Declaration** in conformance with the wording of the declaration provided is required (document verbiage cannot be altered).
- f. A **Uniformity of Soil Declaration** in conformance with the wording of the declaration provided is required (document verbiage cannot be altered).
- g. Discussion and summary of the site investigation with special attention given to any features of the site that may either affect its suitability for construction or have a significant impact on project costs.
- h. Not Applicable
- i. Any Owner provided survey data is for job pricing only. All items shall be verified to their correctness and accuracy and be incorporated into the bidding documents. Cost for errors or omissions related to the survey shall be the responsibility of the AE at no additional cost to the Owner.
- j. Any Owner provided Soil Boring data is for job pricing only. It is the Owner's intent that these borings provide insight into the soil make-up and characteristics, but the AE shall make a professional decision as to the number s, depth and location of borings. All items shall be verified to their correctness and accuracy and be incorporated into the bidding documents. Cost for errors or omissions related to the borings shall be the responsibility of the AE at no additional cost to the Owner.

UNIFORMITY OF AREA SOIL CONDITIONS

**31 July 2003
Appendix G
Soils Declarations**

NG Pam 415-5

DECLARATION ON
UNIFORMITY OF AREA SOIL CONDITIONS

State:

Date:

Site Location:

Address:

Project:

I hereby declare, on the basis of my knowledge of soil conditions within this area and in conjunction with review of published geological data for this region, that the soil conditions and characteristics existing at the subject site for the proposed project are not peculiar to the site but are, in my judgement, the same type and nature of soils that are prevalent throughout the area within at least a 5-mile radius of the subject site to such an extent that it would not be reasonable to expect that the requirements for special foundation work needed for the proposed facilities at this site could be avoided by relocation of the project to another area within the 5-mile radius.

(Signature of Soils Engineer)

(Soils Engineer Name)

(Title)

(Firm Name)

SOIL BEARING CAPACITY

NG Pam 415-5

31 July 2003

DECLARATION
OF
SOIL BEARING CAPACITY

State:

Date:

Site Location:

Address:

Project:

On the basis of our surface and subsurface investigation, and on generally accepted practices and procedures of the geotechnical engineering profession, I hereby declare to the best of my professional opinion, that the existing soil conditions at the site for this project are of a nature and classification which determine that the undisturbed soils at elevation _____ feet (elevation of the bottom of the proposed footing) when considered in conjunction with the supporting capability of the underlying soils strata, are rated at an allowable design bearing capacity of not less than _____ pounds per square foot for a spread footing type of building foundation.

(Signature of Soils Engineer)

(Soils Engineer Name)

(Title)

(Firm Name)

ENCLOSURE I
DD 1390/1391 – Program Document

1. COMPONENT ARNG		FY 2011 MILITARY CONSTRUCTION PROJECT DATA			2. DATE 18 Aug 08	
3. INSTALLATION AND LOCATION MTC-H CAMP GRAYLING GRAYLING, MI				4. PROJECT TITLE Combined Arms Collective Training Facility		
5. PROGRAM ELEMENT 0505896A		6. CATEGORY CODE 17901	7. PROJECT NUMBER 260207		8. PROJECT COST (\$000) 20,187	
9. COST ESTIMATES						
ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)	
PRIMARY FACILITIES:					13963	
Municipal Bldg (3 Story w/Base)		SF	11,145	175.00 (	1951)	
Office Bldg (2 Story)		SF	4,403	175.00 (	771)	
Retail Office Bldg (2 Story)		SF	4,403	175.00 (	771)	
Police Station Bldg (1 Story w/B		SF	2,160	165.00 (	357)	
Business Bldg 1		SF	1,152	155.00 (	179)	
Business Bldg 2		SF	1,152	155.00 (	179)	
Business Bldg 3		SF	1,152	155.00 (	179)	
Residential (9 Bldg)		SF	12,484	155.00 (	1936)	
Hotel Bldg (3 Story w/Half-Base)		SF	12,544	115.00 (	1443)	
School Bldg (2 Story)		SF	8,320	115.00 (	957)	
Townhouse-4 Unit Bldg (2 Story)		SF	6,400	140.00 (	896)	
Warehouse/Market Bldg		SF	4,061	110.00 (	447)	
Junk Yard/Warehouse		SF	4,061	110.00 (	447)	
Service Station		SF	1,664	135.00 (	225)	
Bank Bldg		SF	1,152	170.00 (	196)	
Church Bldg/Cemetery		SF	4,062	150.00 (	610)	
Soccer Field		LS	-	- (	173)	
Tunnel/Sewer System		LF	200	480.00 (	96)	
Streets, Parking & Turn Pads		SY	17,675	60.00 (	1061)	
Downrange Electrical		LF	4,255	36.00 (	154)	
Downrange Data Cabling		LF	4,255	24.00 (	103)	
Site Prep		AC	14	2,820.00 (	40)	
Energy Management Control System		LS	-	- (	264)	
Anti-Terrorism/Force Protection		LS	-	- (	264)	
SDD_EPAAct05		LS	-	- (	264)	
SUPPORTING FACILITIES:					4624	
Site Improvement		LS	-	- (	2035)	
Rigid Concrete Paving		SY	7,975	34.00 (	272)	
Flexible Paving		SY	5,000	24.00 (	120)	
Security Fencing		LF	1,240	17.00 (	22)	

CACTF
PROJECT NUMBER 260207
13 OCT 09

1. COMPONENT ARNG	FY 2011 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 18 Aug 08																																																																																										
3. INSTALLATION AND LOCATION MTC-H CAMP GRAYLING GRAYLING, MI																																																																																												
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Parking Paved	SY	778	37.00 (29)																																																																																								
Covered Mess	SF	800	80.00 (64)																																																																																								
Camera Towers	LS	-	-	(29)																																																																																								
Night Lighting	LS	-	-	(30)																																																																																								
Anti-Terrorism/Force Protection	LS	-	-	(69)																																																																																								
TOTAL CONSTRUCTION COST				<u>18587</u>																																																																																								
Contingencies																																																																																												
Supervision, Inspection & Overhead																																																																																												
Commissioning																																																																																												
TOTAL PROJECT COST				<u>20187</u>																																																																																								
Equipment Funded Other Appr (Non-Add)				(3154.0)																																																																																								

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Project consists of construction of a permanent, standard design Combined Arms Collective Training Facility (CACTF) for Mission Over Urban Terrain (MOUT) training. The standardized non-live fire training facility includes a 14 acre site featuring 28 buildings to replicate an urban setting. The facilities range from single story to multiple story structures, paved roads, paved and unpaved parking lots, exterior lighting, and include a tunnel-sewer training system, and breaching walls. Construction consists of reinforced concrete masonry floors and walls and applicable roofing systems. Non-live fire targetry is fully automated, utilizing event-specific, computer driven target scenarios and scoring with plug and play capability. Closed-circuit camera coverage is provided to support the training scenario. A Range Operations and Control (ROC) facility provides a range operations center, operations storage building, latrine, covered mess, and a large classroom. The ROC supporting facilities include access road, paved parking, air-conditioning, heating, utilities, electrical, mechanical, sewer, and sanitary sewer. Force protection measures will utilize

ENCLOSURE II
CHARRETTE

FURNISHED AT THE PRE-PROPOSAL

ENCLOSURE III **IT STANDARDS**

VERSION 3.0
14 August 2009
Previous Editions are superseded

Information Technology Infrastructure Standards and Requirements

1. Data Network Requirements:

- A) Blue Category 6 (Cat 6), plenum-rated riser cable will be used to connect all data jacks at customer interface (wall plate or in-furniture base using proper furniture modules).
- B) The data jack at the customer interface will be Orange.
- C) All data jacks and cable connection systems will be certified Cat 6.
- D) All terminations will follow ANSI/TIA/EIT 568-B standard pin-out configurations.
- E) All cable construction, suspension, presentation and termination will follow Building Industry Consulting Services International (BICSI) standards verified by a Registered Communications Distribution Designer (RCDD).
- F) A minimum of two data jacks will be provided at each customer interface.
- G) A minimum of 12-inches of excess cable will be left after termination, coiled neatly inside the 4"x4" wall box, and the minimum bend radius for the coil will be observed.
- H) Minimum bend radius is defined as a radius of curvature no less than 4 times the outside diameter of the cable.
- I) IDF (Intermediate Distribution Frame, secondary closet) data terminations will be constructed using Cat6 patch panels mounted in 19" free-standing racks using ANSI/TIA/EIA 568-B termination pattern.
- J) A service loop of no less than six feet of excess cable will be neatly coiled above the equipment rack while ensuring that minimum bend radius is observed.
- K) A standard labeling and marking system will be used to label each end of the IDF connections with permanent markings to identify the source or destination of the connection. See Appendix A.
- L) 100% of the connections from the IDF to the customer interface will be scanned and tested using industry standard equipment for a minimum of length, pin-out and attenuation. These results will be produced in electronic and original documentation copies and provided to the DOIM Network Engineer in MS Excel format.
- M) 100% of the connections from the IDF to the customer interface will be documented in an MS Excel spreadsheet to show the patch panel-to-customer interface connections as connected and labeled. These results will be produced in electronic and hard-copy documentation and provided to the DOIM Network Engineer prior to completion. See Appendix B, Figure 1.

2. Telephone Systems Requirements

- A) Yellow Category 6, plenum-rated riser cable will be used to connect all telephone jacks at customer interface (wall plate or in-furniture base using proper furniture modules).
- B) The telephone jack at the customer interface will be White.
- C) All telephone jacks will be Cat 6.

- D) All terminations will follow ANSI/TIA/EIT 568-B standard pin-out configurations. All pairs of the Cat 6 cable will be terminated.
- E) A minimum of one telephone jack will be provided at each customer interface.
- F) A minimum of 12-inches of excess cable will be left after termination at the customer interface, coiled neatly inside a standard 4"x4" wall box, and the minimum bend radius for the coil will be observed.
- G) Minimum bend radius is defined as a radius of curvature no less than 4 times the outside diameter of the cable.
- H) IDF (Intermediate Distribution Frame, secondary closet) telephone terminations will be constructed using Cat6 patch panels mounted in 19" free-standing racks using ANSI/TIA/EIA 568-B termination pattern.
- I) A service loop of no less than six feet of excess cable will be neatly coiled above the equipment rack while ensuring that minimum bend radius is observed.
- J) A standard labeling and marking system will be used to label each end of the IDF connections with permanent markings to identify the source or destination of the connection. See Appendix A.
- K) 100% of the connections from the IDF to the customer interface will be scanned and tested using industry standard equipment for a minimum of length, pin-out, and attenuation. These results will be produced in electronic and hard-copy documentation and provided to the DOIM Network Engineer in MS Excel format.
- L) 100% of the connections from the IDF to the customer interface will be documented in an MS Excel spreadsheet to show the patch panel-to-customer interface connections as connected and labeled. These results will be produced in electronic and hard-copy documentation and provided to the DOIM Network Engineer prior to completion.

3. Intermediate Distribution Frame Area, Environment and Construction

- A) IDF racks will be open, two-post, 19"w x 72"h standard, pre-drilled and tapped equipment racks.
- B) Ladder systems mounted above the rack will be provided to support cable installation from above, and be securely mounted to the wall on at least one end to provide stability and continuous support for all incoming overhead cable systems.
- C) IDF racks will be grounded per NEC standards
- D) IDF Racks will present NEMA 5-20R, 120-V, 20A, commercial AC power to the equipment on the rack. These power sources will be mounted to the rack in such a way as to not interfere with mounting surfaces, positioned no less than 12" from the base and no more than 24" from the base of the rack.
- E) IDFs containing multiple racks will have no less than 18" linear spacing between the rack positions.
- F) Each rack in a multiple-rack IDF will be separately powered for energy as defined above.
- G) Each IDF will be constantly cooled with independent commercial grade, service-rated HVAC systems to maintain an ambient average temperature of no more than 72-deg F.
- H) Environmental monitors will be included in all IDF closets and alerts programmed to warn key personnel when temperature or humidity thresholds are exceeded.
- I) Maximum alert temperature will be 82-degrees F and maxim humidity alert will be 60%.

4. Data network interconnections between Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF)

- A) Data connections between MDF and IDF will be provided using Plenum-rated, Single-Mode (SM) fiber-optic cable contained inside orange interduct from end-to-end.
- B) Fiber optic terminations at each end will be SC-type UPC connectors placed within standard fiber optic distribution trays positioned at the top of the IDF/MDF racks.
- C) No fewer than six-pairs (12-strands) of fiber optic cables will be provided as means of connection between the IDF and MDF.
- D) A service loop of no less than 12-feet coiled neatly above the installation frame will be provided at each end for reconstruction. The minimum bend radius for cable of this type is no less than 1.5 feet (3' diameter loops.) This service loop will exist at both ends of the IDF-MDF interconnection.

- E) A standard labeling and marking system will be used to label each end of the IDF connections with permanent markings to identify the source or destination of the connection. See Appendix A.
 - F) 100% of the connections from the IDF to the MDF will be scanned and tested using industry standard equipment for a minimum of length, pin-out and attenuation. These results will be produced in electronic and hard-copy documentation and provided to the DOIM Network Engineer prior to completion.
 - G) 100% of the connections from the MDF to the IDF and from the MDF/IDF to customer interfaces will be documented in an MS Excel spreadsheet to show the patch panel-to-customer interface connections as connected and labeled. These results will be produced in electronic and hard-copy documentation and provided to the DOIM Network Engineer prior to completion.
5. Telephone network interconnections between Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF)
- A) Category 6 multi-pair backbone cable will be used to connect the telephone system at the MDF to the IDF with 25% excess capacity over the quantity of lines feeding from the IDF to the Customer Interfaces.
 - B) The largest pair-count cable possible will be used to perform this connection with a maximum of 100-pr. Pair-count cables come in 25-pair, 50-pair, 100-pair. Example: An IDF subscribing 75 incoming lines will use a single, 100-pair cable to feed from the IDF.
 - C) The IDF termination of the Multipair will be done on CAT6 patch panels with one pair per port, skipping every 25th pair (violet), which will not be terminated and will have a neatly coiled lead remaining no less than three feet long. Each pair will be terminated on the blue termination block of each port on the Cat 6 patch panel on pins 4 & 5.
 - D) The MDF termination of the Multipair will be done on 110-blocks unless called for on patch panels. When using 110-blocks they will be mounted on fire-proof plywood boards on the wall no more than six feet from the mounting position of the telephone PBX unit.
 - E) A service loop of no less than 12-feet coiled neatly above the installation frame will be provided at each end for reconstruction. The minimum bend radius for cable of this type is no less than 1.5 feet (3' diameter loops.) This service loop will exist at both ends of the IDF-MDF interconnection.
6. Main Distribution Frame Specifications
- A) The Main Distribution Frame (MDF) area will be sized appropriately to allow for large equipment entry to include oversized entry doors, 10' ceilings, plenty of space all around installed equipment racks and systems to allow for proper equipment handling, entry and operation from both sides and both ends.
 - B) The MDF will be sufficiently cooled with HVAC to maintain an ambient temperature of 72-degrees F and a maximum humidity of 45%.
 - C) Environmental monitoring systems will be installed that will allow monitoring and automatic notification of out-of-bounds conditions. Automated alerting will trigger at a maximum temperature of 82-degrees F and a maximum humidity of 60%.
 - D) MDF distribution frame racks will be open, two-post, 19" w x 72" h standard, pre-drilled and tapped equipment racks.
 - E) Ladder systems mounted above the rack will be provided to support cable installation from above, and be securely mounted to the wall on at least one end to provide stability and continuous support for all incoming overhead cable systems.
 - F) MDF racks will be grounded per NEC standards
 - G) MDF distribution racks will present NEMA 5-20R, 120-V, 20A, commercial AC power to the equipment on the rack. These power sources will be mounted to the rack in such a way as to not interfere with mounting surfaces, positioned no less than 12" from the base and no more than 24" from the base of the rack.
 - H) IDFs containing multiple racks will have no less than 18" linear spacing between the rack positions.
 - I) Each rack in a multiple-rack MDF will be separately powered for energy as defined above.

- J) In addition to the distribution frame racks the MDF will include at least one standard server rack made by Dell, model 4210 with appropriate accessories to complete the rack system (fans, power distribution strips, rack screws and hardware). Specific part numbers are included from a previous quote and will be attached to this document as a PDF.
- K) The server rack will be provided with AC power from underneath or above and presented to the inside of the cabinet at a level no lower than 12" from the base and no more than 24" from the base of the cabinet.
- L) AC power will be minimum of 4 x NEMA 5-20R, 120V, 20A commercial outlets, 1 x NEMA L5-30R, 120V, 30A locking connectors on a drop-in cable from the top suspended 24" from the base of each computer enclosure.
- M) Additional power requirements should be reviewed based on the application and size of the MDF area.
- N) All racks in the MDF will be grounded with #6 gauge copper wire in series and then terminated to the main building ground.

7. Telephone PBX facilities and installation within the MDF

- A) The MDF will present an area for the telephone switch installation that is no more than 6 feet from the outgoing feeds to the Multipair cables connecting to the IDFs.
- B) A set of 110-blocks will be provided adjacent to and between the IDF feeds and the phone switch for connection of the 'pig tails' from the switch.
- C) These 110-blocks will be mounted to fireproof plywood backing boards.
- D) The phone switch will be provided with an isolated ground that feeds directly to the main electrical panel of #6 copper bonding. No other equipment will share this bond and this will be a continuous wire from the phone switch ground to the electrical panel.
- E) The phone switch will be provided with 4 x NEMA 5-20R, 120V, 20A commercial outlets.

8. CATV Cabling and Distribution Systems

- A) CATV system backbones will be constructed with no less than RG-11 to feed to taps that run to individual distribution points on RG-6 coaxial cable. The Cable TV Backbone will need to be determined PRIOR to the specification being written and put out to bid. The backbone will be determined by the number of cable TV drops required in the structure and/or the distances from the MDF to IDF and cable TV drops.
- B) Sufficient amplification devices and AC power will be provided at junctions throughout the facility to ensure that attenuation is minimal and that all customer interfaces have sufficient power to be used simultaneously.

9. Video display systems

- A) Ceiling mounted projection equipment will be utilized wherever possible.
- B) Ceiling mounts will be standard equipment that provide a mounting point for projection equipment and all interfaces will be supplied in a ceiling mounted plate including VGA, S-video, HDMI, Ethernet, Composite RCA connections.
- C) An instructor station will be provided where the interfaces from the projection equipment plate will be terminated with the same connections available to the projector.
- D) The instructor station will be provided with 4 x NEMA 5-20R, 120V, 20A electrical outlets, guest connections for computer overhead display, 1xRCAS data and 1xTelephone connection.

APPENDIX A:

SERVICE CONNECTION, MARKING AND LABELING STANDARDS

I) Common Areas & Office Marking Standard

- A. The connection boxes placed on walls or in the bases of cubical furniture shall be labeled clockwise from the main entrance door A, B, C, around the outside wall, then to interior walls and cubical connections until all interfaces are designated.
- B. A two-letter system can be used in rooms where more than 26 interfaces exist, AA, AB, AC, etc.
- C. Each jack position on the interface will be numbered 1, 2, 3, etc, from right to left, top to bottom on that jack below the connector with a label. The label will include the room number, interface designation, and port number as in this example: RM145DA01 on the top line. On the second line of the same label or separated with a ' / ' the patch panel designation as defined below and shown in this example: 01R01DA32. This would indicate IDF 01, Rack 01, Panel DA, port 32.

II) Main Distribution Frame (MDF)

1. MDF Data Systems Rack Identification and Interconnection

- A. The primary service entry facility room shall be designated as MDF.
- B. The MDF area is designated as Area 00 and is typically on the ground floor of the facility.
- C. All racks enclosures are labeled in the MDF in consecutive order starting with R01.
- D. All Fiber optic patch panels will be located at the topmost position in R01.
- E. Fiber optic patch panels will be labeled from the top down as FA, FB, etc.
- F. Each strand of fiber connecting to the panel shall be designated 1, 2, 3, 4 in grouped pairs and from right to left, top to bottom of each module, then each module from left to right.
- G. Each side of the fiber will be labeled on the patch panel clearly with label tape. For example, 2 strands of fiber from the MDF to IDF 1 would be labeled on the MDF 00R1FA panel as 01R01FA1 and 01R01FA2 respectively; 2 strands of fiber from the MDF to IDF 2 would be labeled on the MDF 00R1FA panel as 02R01FA1 and 02R01FA2 respectively, and so on.
- H. Two rack units will be left open between the fiber optic patch panels and the array of Cat 6 patch panels mounted below.
- I. Patch panels that terminate multi-pair telephone cable will be designated with the marking MA, MB, MC, etc and be ordered from top to bottom.
- J. Patch panels that terminate telephone station cables to work area interfaces will use yellow CAT 6 wire and will be designated with the marking VA, VB, VC, etc and be ordered from top to bottom.
- K. Patch panels that terminate computer/data station cables to work area interfaces will use blue CAT 6 wire and will be designated with the marking DA, DB, DC, etc and be ordered from top to bottom.
- L. Patch panels that terminate interconnecting panels for adjacent racks in the same room (horizontal wiring) will use blue CAT 6 wire and will be designated with the marking IA, IB, IC, etc and be ordered from top to bottom.
- M. A patch panel can have from 24 – 48 ports. Do not use patch panels with more than 48 ports per panel.
- N. Each port on the Cat 6 patch panel will be designated by its actual port number.
- O. The first port on the first Cat 6 patch panel in rack R01 shall be referred to as 00R01DA01 (data port in this example). Each consecutive port, patch panel, rack shall be then determined from this point.
- P. A minimum 24-port Cat 6 patch panel located in R01 shall be designated as panel 00R01DA and will be the point for termination of all incoming service systems including but not limited to:
 - i. Primary routing and switching equipment
 - ii. Central Office Smart Jacks
 - iii. CSU/DSU for incoming and outgoing services.
 - iv. DSL/Cable data network interfaces

- Q. Upon completion of initial construction Panel 00R01DA will have a minimum of 12 open, un-terminated ports reserved for future expansion.
- R. Horizontal wiring between adjacent racks in the MDF will be provided as a patch panel in R01 connected to a patch panel in the adjacent rack with a minimum of 12 lines connected between them and a minimum of 12 lines un-terminated and open for future construction.
- S. A distribution frame with multiple racks will have a rack designated as the primary switch rack. All other racks in the room will have interconnection panels to the primary switch rack using horizontal wiring systems described.
- T. The primary switch rack will contain the fiber optic connections to other distribution frames and it will be at the top of that rack.
- U. A customer interface data jack connected to a port on a patch panel located in the MDF originating from another room or area will be labeled on that jack cover with the Area, Rack, Patch Panel and Port number of the connected patch panel as in example shown here: 00R02DA15.
- V. A patch panel port connected to a data jack originating in another room shall show the Room Number, Box Number and Port number on the box as in the example shown here: RM145DA04.
- W. Space for at least one additional 48-port patch panel will be left at the bottom of the initial construction in each enclosure in the MDF or a spare panel may be mounted for future construction.
- X. In large construction areas this construction of R01 may overflow into R02 which must be immediately adjacent to R01 and be horizontally connected with a minimum of 48 port Cat 6 patch panel with a minimum of 24-ports interconnected and a minimum of 24-ports un-terminated in each rack. This interconnect panel will be Panel B in R01 and Panel A in R02. Primary routing and switching equipment will move to R02 along with their electrical requirements.

2. MDF Telephone Systems Rack Identification and Interconnection

- A. Telephone systems use a standard marking convention that will be implemented on the 110-blocks in the MDF connected to the PBX.
- B. For termination marking of Multipair on CAT 6 patch panels in the MDF the label will indicate the Terminal Number (TN) will be used to match the port on the patch panel to the connected port at the 110-blocks in the MDF located on the backboard near the PBX.
- C. Cat 6 patch panel terminations from the 110-block to the distribution frame will be labeled with the connected TN designator.
- D. Telephone connections from the MDF telephone rack to customer interfaces are constructed on Cat 6 patch panels and labeled in the same manner as Data Systems interfaces as defined elsewhere in this appendix (ex: RM145VA01).
- E. Customer telephone interfaces in rooms are labeled with the area, rack, patch panel and port number (ex: 00R2VA12)
- F. The terminated Multipair cable interface from the PBX will be in the same rack frame as the terminated connections to customer interfaces.
- G. These two interfaces will use Cat 6 standard patch cables to interconnect.

III) Intermediate Distribution Frame (IDF)

1. IDF Data Systems Rack Identification and Interconnection

- A. The IDF on the ground floor or same floor as the MDF will be labeled 01, 02, etc.
- B. The IDF areas on each floor above the ground floor will be labeled 11, 12, 21, 22 where the first digit is the number of floors above ground floor and the second is the IDF number on that floor.
- C. Each rack in each IDF will be labeled R01, R02, etc
- D. R01 of an IDF will be connected to R01 of the MDF using no less than 12-strand single-mode fiber optic cable.
- E. All Fiber optic patch panels will be located at the topmost position in R01 of the IDF.
- F. Fiber optic patch panels in the IDF will be labeled from the top down as FA, FB, etc.

- G. Each strand of fiber connecting to the panel shall be designated 1, 2, 3, 4 in grouped pairs and from left to right, top to bottom of each module, then each module from left to right.
- H. Each side of the fiber will be labeled. For example, 2 strands of fiber from the IDF 01 connecting to MDF would be labeled on the IDF 01R1FA panel as 00R01FA1 and 00R01FA2 respectively.
- I. Two rack units will be left open between the fiber optic patch panels and the array of Cat 6 patch panels mounted directly below.
- J. Each Cat 6 patch panel within an enclosure will be labeled from top down A, B, C, etc. A patch panel can have from 24 – 48 ports. Do not use patch panels with more than 48 ports per FRU.
- K. Each port on the Cat 6 patch panel will be designated by its actual port number.
- L. The first data port on the first Cat 6 patch panel in rack R01 of IDF 01 shall be referred to as 01R01DA01. Each consecutive port, patch panel, rack shall be then determined from this point.
- M. Horizontal wiring between adjacent racks in the IDF will be provided as a patch panel in R01 connected to a patch panel in the adjacent rack with a minimum of 12 lines connected between them and a minimum of 12 lines un-terminated and open for future construction.
- N. Additional racks located in the IDF will all incorporate horizontal wiring to R01 as defined above.
- O. A data jack connected to a port on a patch panel located in the IDF originating from another room will be labeled on that jack cover with the Area, Rack, Patch Panel and Port number of the connected patch panel as in example shown here: 01R01DA15.
- P. A patch panel port in the IDF connected to a data jack originating in another room shall show the Room Number, Box Number and Port number on the box as in the example shown here: RM145DA04.
- Q. Space for at least one additional 48-port patch panel will be left at the bottom of the initial construction in each enclosure in the IDF or a spare panel may be mounted for future construction.

2. IDF Telephone Systems Rack Identification and Interconnection

- A. Telephone systems use a standard marking convention that will be implemented on the 110-blocks in the MDF connected to the PBX.
- B. For termination marking of Multipair on CAT 6 patch panels in the IDF the label will indicate the TN will be used to match the port on the patch panel to the connected port at the 110-blocks in the MDF located on the backboard near the PBX.
- C. Cat 6 patch panel terminations from the 110-block to the distribution frame will be labeled with the connected TN designator.
- D. Telephone connections from the MDF telephone rack to customer interfaces are constructed on Cat 6 patch panels and labeled in the same manner as Data Systems interfaces as defined elsewhere in this appendix (ex: RM145VA1).
- E. Customer telephone interfaces in rooms are labeled with the area, rack, patch panel and port number (ex: 00R2VA12)
- F. The terminated Multipair cable interface from the PBX will be in the same rack frame as the terminated connections to customer interfaces.
- G. These two interfaces will use Cat 6 standard patch cables to interconnect.

IV) Telephone Systems Multipair Marking and Labeling System

- A. Multipair direct connections (pigtailed) from the PBX to the 110-blocks will be labeled with the TN descriptor.
- B. Multipair connections on the 110-block leading to other IDFs for termination on Cat 6 patch panels will be labeled on the 110-block with the patch panel description in the format 00R2VA01.

END: IT ENCLOSURE

ENCLOSURE IV COE REFERENCE

<http://www.hnd.usace.army.mil/rdg/InterTemplate.aspx>

The screenshot shows the homepage of the USACE Huntsville Center. At the top, there is a navigation bar with links for NEWSROOM, WHO WE ARE, MISSIONS, HISTORY, RELATED LINKS, and PRESS CORNER. Below this is a large banner with the US Army Corps of Engineers logo on the left, a central image of a person, and the text "HUNTSVILLE CENTER" and "RELEVANT READY RESPONSIVE RELIABLE". To the right of the banner is a quote: "Proudly serving the Armed Forces and the Nation now and in the future." Below the banner is a section titled "HOW DO I..." with several links: "Contact CEHNC?", "Contract with CEHNC?", "Get a Job with CEHNC?", "Get Visitors' Information?", "Request FOIA Info?", "Find TECHINFO?", "Find a Local Corps Office?", "Find Corps Publications?", "Find a Corps Map?", "USACE Topics A to Z", "Advanced USACE Search", "Site Map", and "Remote Network Access". At the bottom of the page, there are links for "USACE, Huntsville Center Home, RTLP Home" and "Contact Web Site Manager".

The screenshot shows the "Range Design List" page. The page title is "Range Design List" and it features a "Range Design Guides" logo. The main heading is "(CACTF) Combined Arms Collective Training Facility". Below this is a "Cover" section with a list of items: "CACTF Cover and Title Page", "Foreword", "Range Description, Purpose, and Information" (with sub-items: "CACTF Narrative Description", "Range & Training Land Program Information", "DD 1391 - URBAN RANGES", "Unexploded Ordnance (UXO)", "Range Safety Requirements", "Environmental Requirements", "Siting Considerations CACTF"), "Primary Facilities" (with sub-items: "Downrange Area" (with sub-items: "Downrange Power & Data Distribution - General", "Downrange Power & Data Distribution - CACTF", "Warehouse", "Municipal Building", "Two Story Office Building", "Service Station", "Three Story Hotel", "Police Station and Jail", "Church"). The page also has a navigation menu on the left with links for "HNC Home", "RTLP Home", "Range Design Guides", "RDG List", "RDG Report", "Electrical Tools", "Target Feeder", "Voltage Drop Calculator", and "Email RTLP".

ENCLOSURE V
CONTROLS SPECIFICATION / DRAWINGS (@ Pre-Proposal)

ENCLOSURE VI
CAD LAYER AND TITLE SHEET (@ Pre-Proposal)