

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES
			J	1 7
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 22-Jun-2004	4. REQUISITION/PURCHASE REQ. NO. W22W9K-4054-4871		5. PROJECT NO.(If applicable)
6. ISSUED BY U. S. ARMY ENGINEER DISTRICT, LOUISVILLE 600 DR. MARTIN LUTHER KING, JR. PLACE ROOM 821 LOUISVILLE KY 40202-2230	CODE W912QR	7. ADMINISTERED BY (If other than item 6) CONTRACT ADMINISTRATION BRANCH ATTN: DEBRAUH M. LARDNER P. O. BOX 59 LOUISVILLE KY 40201-0059		CODE DACA27
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			X	9A. AMENDMENT OF SOLICITATION NO. W912QR-04-R-0013
			X	9B. DATED (SEE ITEM 11) 26-Feb-2004
				10A. MOD. OF CONTRACT/ORDER NO.
				10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Subject Solicitation No. W912QR-04-R-0013, Trainee Dining Facility, Ft. Knox, KY, is amended as follows: See attached for amendment information.				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
			TEL: _____ EMAIL: _____	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)		22-Jun-2004

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

The following have been added by full text:

BCT DINING FACILITY, FORT KNOX**AMENDMENT 0002****SPECIFICATION CHANGES**

-SECTION 01453 – Delete existing paragraphs 3.5.1, 3.5.2, 3.5.3, and 3.5.4 and insert the following:

Para. 3.3.1 Content of CQC Plan changed within document only.

“3.5.1 PERSONNEL REQUIREMENTS

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. A Site Safety Health Officer (SSHO) will be required for this contract. The Site Safety Health Officer (SSHO) and CQC System Manager can be the same person/individual. The SSHO can either be a member of the CQC staff, or shall receive delegated authority directly from an authorized official of the firm; the SSHO shall have the authority to stop work which is not in compliance with the USACE EM 385-1-1. See Section 01525 for additional requirements and experience qualification for the SSHO. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.5.2 CQC SYSTEM MANAGER

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 10 years construction experience on construction similar to this contract or a construction person with a minimum of 15 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as CQC System Manager but may also perform the quality control duties of the civil, structural or architectural CQC personnel provided the person meet the qualification requirements as identified in the Experience Matrix Table for any position that the CQC is qualified (as well as the CQC System Manager qualifications). The CQC Manager shall not perform the duties of any of the other QC personnel. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.5.3 SITE SAFETY HEALTH OFFICER

The Contractor shall identify a full time SSHO for this project and submit qualifications to the Government for acceptance. This individual shall be a member of the prime contractor onsite work organization and be responsible for overall management of the safety and occupational health program, with authority to act in all safety matters for the Contractor. A copy of the letter to the SSHO signed by an authorized official of the firm describing responsibilities and delegating authority to stop work when safety or occupational health of workers is compromised must be provided to the Government. The SSHO shall be a college graduate with 5 years of previous construction safety experience or an individual having 10 years of previous construction safety experience. These educational requirements are in addition to the requirements listed in Section 01525. The Contractor must show evidence that this individual has completed OSHA training, is trained in First Aid, and CPR. An alternate for the SSHO shall be identified in the event of the SSHO absence. The qualifications for the alternate shall be the same as for the SSHO.

Acceptance of the Contractor's SSHO is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during construction. The Government reserves the right to require the Contractor to make changes to operations including removal of personnel, as necessary, to obtain a safe work site. At no time will the job be permitted to operate without a full time SSHO on duty at the work site.

Duties of the SSHO shall include, as a minimum, the following in addition to the duties listed per Section 01525: prepare the contractor's Safety Plan, and Activity Hazard Analysis for each definable feature of work; provide safety indoctrination to all construction site visitors; ensure the Contractor's accepted Accident Prevention Plan is carried out; ensure that all contractor/subcontractor employees have all HTRW, asbestos, and lead paint training, and their personnel protection equipment meets applicable OSHA/EPA requirements. Conducts daily walkthrough of the site ensuring work is being accomplished safely and occupational health is not compromised; attend and participate in all preparatory and initial quality control phase meetings; conduct weekly safety meetings for all workers; conduct monthly supervisory safety meetings; provide accident reports; produce a Daily Safety Report of activities performed and attach this report to the Contractor's Quality Control Report. Minutes shall be provided of weekly and monthly safety meetings with the Daily Safety Report.

3.5.4 CQC PERSONNEL

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: SSHO, electrical, mechanical, civil, structural, architectural, materials technician, kitchen equipment specialist, TAB and submittals clerk. These individuals shall be directly employed by the prime Contractor and may not be employed by a supplier or sub-contractor on this project (except for the kitchen equipment specialist); be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. One person may perform the duties of the civil, architectural and structural QC personnel provided that person meets the requirements listed below for any of those positions. Similarly, one person may perform the duties of the electrical and mechanical QC personnel provided that person meets the requirements listed below for either of those positions.

The word "graduate" below indicates an individual possessing a four-year college degree accredited in the respective field listed.

Experience Matrix

Area	Qualifications
a. SSHO	See Section 01525

b.	Civil	Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
c.	Mechanical	Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience
d.	Electrical	Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience
e.	Structural	Graduate Structural Engineer with 2 yrs experience or person with 5 yrs related experience
f.	Architectural	Graduate Architect with 2 yrs experience or person with 5 yrs related experience
h.	Submittals	Submittal Clerk with 1 yr experience
j.	Concrete, Pavements and Soils	Materials Technician with 2 yrs experience for the appropriate area
k.	Testing, Adjusting and Balancing (TAB) Personnel	Specialist must be a member of AABC or an experienced technician of the firm certified by the NEBB.
l.	Kitchen Equipment specialist	Specialist must have minimum 10 years experience in the installation of commercial kitchen and food service equipment.”

-SECTION 01020, delete the existing paragraph in its entirety and insert the following:

12.2.3.3. Bollards will be used at all sidewalk entrances at 4 feet on centers and as necessary where berm or gate construction is not feasible. Bollards shall be 8-inch in diameter and constructed/installed per Mil-Handbook 1013/14.

12.3.2 CURB AND GUTTER.

All parking lot and driveway pavement shall be bordered with 6-inch concrete curb and gutter 2 feet wide unless the curb is a part of the AT/FP system. In this case the height of the barrier curb shall be 10 inches. All gradients

shall provide positive drainage (no ponding allowed). Curb cuts shall be provided as necessary for pavement drainage except where there is an adjacent sidewalk. Sidewalks shall not block overland drainage nor shall concentrated overland flow be allowed across sidewalks. Runoff areas at curb cuts shall be protected from erosion by sodding this area in addition to the use of other appropriate erosion control measures.

12.3.3 PAVEMENT THICKNESS.

Pavement structure shall be designed for actual vehicle loadings and frequencies. Access drives, walks, and parking shall be asphalt pavement (with compacted graded aggregate base course, drainage layer and chock) or portland cement concrete. See the Layout Plan for locations of each pavement type. Pavement structure thickness shall be in accordance with TM-5-822-5, Chapter 1, and TM 5-822-5, Chapter 3 and pavement design calculation will be based on the latest version of the Pavement Transportation Computer Assisted Structural Engineering program which is available on the web at <http://www.pcase.com/>. Pavement structure shall be designed for a 20-year pavement life. Minimum asphalt pavement thickness shall be 3 inches of asphalt pavement (1 inch of surface course on 2 inches of base/binder course) over 8 inches of compacted base course. These minimums are in addition to the drainage layer and chock. Heavy-duty asphalt pavement and concrete pavement (as shown on the contract drawing) shall be used in all pavement areas. Minimum concrete pavement thickness shall be 7 inches and reinforced as necessary.

19.6.1. The wastewater collection and conveyance system shall be designed in accordance with the 1990 edition of the Recommended Standards for Wastewater Facilities (Ten State Standards). This includes the requirement that the waste plumbing be collected for a block of units and then run to the outside of the building as opposed to running the sewer longitudinally within the building.

21.11 All interior walls shall be metal stud / gypsum board or CMU. If gypsum board is used as a finish material, it shall be impact resistant where exposed (floor to ceiling). Gypsum board used in wet locations shall be moisture resistant and impact resistant. Impact resistant gypsum board shall be suitable as substrate for specified finish.

21.11.1. Impact Resistant Gypsum Board shall be a glass-mat, mold & mildew resistant interior wall panel: ASTM C 1177, coated inorganic glass mat-faced back and paper-faced front, enhanced mold and mildew resistant gypsum core wallboard. Conforming to the physical properties of ASTM C 36 and ASTM C 1177 on glass mat back. Glass Mat Back receives a rating of 10 "No Mold Growth" as tested for 4 weeks according to ASTM D 3273.

30.2 The Appendix D Spirit Requirements and Summary Table is provided to the Proposers to give them some insight into the points that the Government believes are possible for this project as well as to indicate which avenues the Proposers may consider to meeting the Gold rating as well as to indicate which are not desired or possible. The only requirement, relevant to the Spirit Rating, is that the design is able to satisfy the Gold evaluation criteria of the Spirit rating tool. The means the Proposer uses to reach that goal, while satisfying the other criteria of the RFP, is up to the Proposers.

-DRAWING CHANGES

Delete the following drawings and insert new: C100, C101, C102, and C201– C206. These are reissued for make them coordinately correct.

In addition, C100 is reissued with updated survey data; C102 is reissued for revised drawing note #2; and C201 is reissued for revised invert storm sewer elevations and pipe sizes.

The following clarification is provided for standard drawings in Appendix H: Discrepancies in quantities have been discovered between the standard kitchen equipment drawings A21-A22 and A23-A24. Base the quantity on the plans A21-A22 and assume the technical information relative to the equipment as shown on the schedules A23-A24 is correct.

-APPENDIX CLARIFICATIONS / CHANGES

Both Appendix A, Page A-12, List of IBC codes and Appendix C, Page C-1, list of reference codes, shall be 2000IBC.

Appendix B contains B-1, B-2, and B-3 only.

Appendix D – Spirit Requirements and Summary Table

Certain line items in the Spirit Rating System are predetermined for this project and are either given as points to all proposers or are prohibited to all proposers based on the desires of the Government. The following is intended to help clarify these issues.

All items identified as having 0 points are either not possible given the proposed site or are not desired by the Government for this particular project. The Proposers are advised to avoid attempts to capture these points.

Certain other line items are provided to all Proposers as these will be considered as satisfied through the site selection process and/or other activities that have already taken place. These line items include the following:

1.C1	All proposers are able to utilize 2 points available.
1.C2	All proposers are able to utilize 2 points available.
1.C5	All proposers are able to utilize 1 point available.
1.C6	All proposers are able to utilize 1 point available provided proposed design does not increase pavement beyond that shown in the RFP response.
1.C9	All proposers are able to consider that the second criteria required for the point is met by the concept design.
1.C10	All proposers are able to utilize 2 points available.
3.C5	All proposers are able to utilize 1 point available since this is a requirement of the RFP.
6.C1	The government personnel will participate in these exercises in order to satisfy this requirement if proposed by the Contractor.
7.C1	The government will provide periodic training program for occupants, etc.
7.C2	All proposers are able to utilize 3 points available.
8.C1	All proposers are able to utilize 2 points available.
8.C2	All proposers are able to utilize 2 points available

Appendix E – Geotech Report

Insert supplemental geotech analysis and recommendations included in the letter from RFP geotech dated June 16, 2004.

-WAGE DECISIONS

Wage Decisions KY030007 and KY030027 are deleted and KY030007 w/6 Amdts. and KY030027 w/8 Amdts. dated June 18, 2004 are attached and made a part hereof.

(End of Summary of Changes)

Amdt. #0002

SECTION 01453

CONTRACTOR QUALITY CONTROL FOR DESIGN/BUILD

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 (2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 (2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

1.3 SUBMITTALS

SD-01 Preconstruction Submittals

Design Quality Control Plan; G, ED

Construction Quality Control Plan; G, RE

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 DESIGN QUALITY CONTROL PLAN (DQCP)

All documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). The plan must identify the Independent Technical Review Team and their qualifications. The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should reflect calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within 7 calendar days. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal.

The Contractor shall furnish for review by the government, not later than 10 days after Notice to Proceed, the Contractor Design Quality Control Plan for the design portion of the contract. The professional quality, technical accuracy and the coordination of all design documents and other services to be provided by the prime Contractor and subcontractor/consultants are of major importance. A logical and functional quality control program requiring technical and interdisciplinary reviews to eliminate errors and deficiencies in the design documents is required. As a minimum, the DQCP will address the following elements:

Management Approach - Define the specific management-methodology to be followed during the design phase of the work including the relationship between prime contractor and subcontractors/consultants. Address coordination, quality control, communications and lines of responsibility. The DQCP must also cover the process of review and approval of construction submittals as specified in Section 01331.

Management Structure - Delineate the organizational structure and interrelationship of management and the design team including all subcontractor and consultants. Identify the key design and review team members showing their specific responsibilities. Either the designer or the reviewer must be a registered professional for the Architectural, Civil, Structural, Mechanical and Electrical disciplines.

List submittals required, dates for submittal, dates for completion of Government review and products required to be submitted. Technical review comments provided by the ITR Team must be submitted with each design submittals. The approved complete checklists shall be submitted at each design phase as part of the project documentation.

Designer or Designer of Record - The registered professional ultimately responsible and liable for adequacy and safety of the design. EOR review is required on all submittals and EOR approval is required on all submittals of extensions of design and submittals of critical materials. See Section 01331 for definitions of these type submittals.

3.2.1 Acceptance of Plan

Acceptance of the Contractor's Quality Control Plan for Design is required prior to the start of design. Acceptance is conditional and will be predicated on satisfactory performance during the preparation of design documents. The Government reserves the right to require the Contractor to make changes in his CQ Plan for Design, and operations including removal of personnel, as necessary, to obtain the quality specified.

3.3 CONSTRUCTION QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.3.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

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- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to someone higher in the Contractor's organization other than the superintendent. *2
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01331 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (The Contracting Officer will approve Laboratory facilities.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.3.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.3.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.4 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 30 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the Contractor.

3.4.1 Subcontractor CQC Orientation

Before a Subcontractor begins work on the job site, the CQC System Manager will train the Subcontractor by showing the videotape entitled "CQC - A Bridge (or Pathway) to Success" and answering any questions pertaining to quality control operations. This requirement is waived only if a Subcontractor attended the initial coordination meeting described above. A copy of this video can be borrowed from the Contracting Officer. A record of the orientation shall be documented in the QC Report.

3.5 QUALITY CONTROL ORGANIZATION

*2

3.5.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. A Site Safety Health Officer (SSHO) will be required for this contract. The Site Safety Health Officer (SSHO) and CQC System Manager can be the same person/individual. The SSHO can either be a member of the CQC staff, or shall receive delegated authority directly from an authorized official of the firm; the SSHO shall have the authority to stop work which is not in compliance with the USACE EM 385-1-1. See Section 01525 for additional requirements and experience qualification for the SSHO. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the

Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.5.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 10 years construction experience on construction similar to this contract or a construction person with a minimum of 15 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as CQC System Manager but may also perform the quality control duties of the civil, structural or architectural CQC personnel provided the person meet the qualification requirements as identified in the Experience Matrix Table for any position that the CQC is qualified (as well as the CQC System Manager qualifications). The CQC Manager shall not perform the duties of any of the other QC personnel. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.5.3 Site Safety Health Officer

The Contractor shall identify a full time SSHO for this project and submit qualifications to the Government for acceptance. This individual shall be a member of the prime contractor onsite work organization and be responsible for overall management of the safety and occupational health program, with authority to act in all safety matters for the Contractor. A copy of the letter to the SSHO signed by an authorized official of the firm describing responsibilities and delegating authority to stop work when safety or occupational health of workers is compromised must be provided to the Government. The SSHO shall be a college graduate with 5 years of previous construction safety experience or an individual having 10 years of previous construction safety experience. These educational requirements are in addition to the requirements listed in Section 01525. The Contractor must show evidence that this individual has completed OSHA training, is trained in First Aid, and CPR. An alternate for the SSHO shall be identified in the event of the SSHO absence. The qualifications for the alternate shall be the same as for the SSHO.

Acceptance of the Contractor's SSHO is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during construction. The Government reserves the right to require the Contractor to make changes to operations including removal of personnel, as necessary, to obtain a safe work site. At no time will the job be permitted to operate without a full time SSHO on duty at the work site.

Duties of the SSHO shall include, as a minimum, the following in addition to the duties listed per Section 01525: prepare the contractor's Safety Plan, and Activity Hazard Analysis for each definable feature of work; provide safety indoctrination to all construction site visitors; ensure the Contractor's accepted Accident Prevention Plan is carried out; ensure that all contractor/subcontractor employees have all HTRW, asbestos, and lead paint training, and their personnel protection equipment meets applicable OSHA/EPA requirements. Conducts daily walkthrough of the site ensuring work is being accomplished safely and occupational health is not compromised; attend and participate in all preparatory and initial quality control phase meetings; conduct weekly safety meetings for all workers; conduct monthly supervisory safety meetings; provide accident reports; produce a Daily Safety Report of activities performed and attach this report to the Contractor's Quality Control Report. Minutes shall be provided of weekly and monthly safety meetings with the Daily Safety Report.

3.5.4 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: SSHO, electrical, mechanical, civil, structural, architectural, materials technician, kitchen equipment specialist, TAB and submittals clerk. These individuals shall be directly employed by the prime Contractor and may not be employed by a supplier or sub-contractor on this project (except for the kitchen equipment specialist); be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. One person may perform the duties of the civil, architectural and structural QC personnel provided that person meets the requirements listed below for any of those positions. Similarly, one person may perform the duties of the electrical and mechanical QC personnel provided that person meets the requirements listed below for either of those positions.

The word "graduate" below indicates an individual possessing a four-year college degree accredited in the respective field listed.

Area	Experience Matrix	Qualifications
a. SSHO		See Section 01525
b. Civil		Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
c. Mechanical		Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience
d. Electrical		Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience
e. Structural		Graduate Structural Engineer with 2 yrs experience or person with 5 yrs related experience
f. Architectural		Graduate Architect with 2 yrs experience or person with 5 yrs related experience
h. Submittals		Submittal Clerk with 1 yr experience
j. Concrete, Pavements and Soils		Materials Technician with 2 yrs experience for the appropriate area

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|----|--|--|
| k. | Testing, Adjusting and Balancing (TAB) Personnel | Specialist must be a member of AABC or an experienced technician of the firm certified by the NEBB. |
| l. | Kitchen Equipment specialist | Specialist must have minimum 10 years experience in the installation of commercial kitchen and food service equipment. |

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3.5.5 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager shall have completed and passed within the past 5 years the course entitled "Construction Quality Management For Contractors" within the last 5 years. The Associated Builders and Constructors, Inc., or Associated General Contractor, Inc., and the U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01741-2751 periodically offers this course.

3.5.6 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.6 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01331 SUBMITTAL PROCEDURES FOR DESIGN/BUILD. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections shall be coordinated with Section 01331 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.7 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.7.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the Contracting Officer has accepted the portion of the plan for the work to be performed.
- j. Resolve all differences.
- k. Discussion of the initial control phase.
- l. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.7.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 46 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and

attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.7.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work that may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.7.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.8 TESTS

3.8.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers validated testing laboratory or establish ~~an approved a validated~~ testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.8.2 Testing Laboratories

3.8.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in [ASTM D 3740](#) and [ASTM E 329](#).

3.8.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$1,375.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.8.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.8.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

Commander and Director
Engineer Research and Development Center
ATTN: CEERD-GG-S
3909 Halls Ferry Road, Waterways Experience Station
Vicksburg, MS 39180-6199

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.9 COMPLETION INSPECTION

3.9.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Special Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items that do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.9.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for

completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.9.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The Contracting Officer based upon results of the Pre-Final inspection will formally schedule the final acceptance inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.10 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.
- k. These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports

need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.11 SAMPLE FORMS

Sample forms for Deficiency List is enclosed at the end of Section 00800 as well as other forms the Contractor may utilize during this project.

3.12 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

Amdt. #0002**SECTION 01020****GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS****1. GENERAL**

1.1 This section provides general scope information and design/construction requirements for this project. The design and construction requirements within this RFP represent the minimum quantity and quality acceptable for the proposal and project. The Contractor shall design and construct the Basic Combat Trainee Battalion Dining Facility at Fort Knox, Kentucky, resulting in a complete and useable Dining Facility. The Dining Facility (DFAC) is designed for a service population of 801-1300 persons. It will need to accommodate 520 persons at one time in the dining areas for three thirty-minute seatings.

Room numbers provided in this Section refer to the Fort Jackson Drawings unless otherwise noted.

1.1.1 Base bid shall include the following:

- Clearing and grubbing for the entire DFAC project.
- Complete grading of the site for the entire DFAC project.
- Complete installation of the storm drainage pipe and structure system for the entire DFAC project with consideration for future projects as shown on the contract drawings.
- Complete site development within the project limits shown on the contract drawings.
- Complete utility installation within the projects limits or as shown on the contract drawings.
- Complete installation of utility runs servicing utility lines installed within the project limits or as shown on the contract drawings.
- Complete landscaping for the building within the project limits.
- Complete erosion control measures for all disturbed area as required.

1.1.2 The scope of work for the Basic Combat Trainee (DFAC) at Fort Knox, Kentucky, includes providing additional survey as required in order to complete this project; design, site preparation and construction of a new dining facility on a previously developed site with minor aboveground structures, paving and underground utilities in place. All of the buildings on this site slated to be demolished have been removed (or will be removed prior to the contract being awarded). Remaining supporting facilities could include parking, concrete pavement, sidewalks, water, sewer, electrical service, fire alarm systems, storm drainage, erosion control measures, information systems, landscaping, and force protection measures.

1.1.3 Site Development and Utilities. Site development will include, clearing, grading, roads, parking lots, landscaping, sidewalks, curbs and gutters, force protection, and utilities for the facility.

1.2 The Civil/Site drawings and specifications provided from the Fort Jackson BCT Battalion Barracks are from a completed design for these facilities done elsewhere. The Fort Jackson drawings and specifications convey the functional intent and requirements and the quality requirements for this facility with the following general exception for site features.

1.2.1 The Site Development Concept Plan provided in Appendix I has been coordinated and approved with Fort Knox Directorate of Post Operations (DBOS). The site plan represents an acceptable solution to the functional requirements for this project. The use of this site plan for the Proposers' site layout is mandatory. The Proposers will further develop their site plan (providing additional site features such as force protection berms, etc.) in such a way as to minimize impact to adjacent land where future barracks complexes are planned.

1.2.2 Building setbacks and barricade/barrier requirements shall meet the latest antiterrorism/force protection standards as stated in Mil-Handbook 1013/14 and in this section of this RFP.

1.3 The drawings and specifications, other than the Civil/Site provided from the Fort Jackson Barracks BCT Battalion Complex are from a completed design for these facilities done elsewhere. The Fort Jackson drawings and specifications convey the functional intent and requirements and the quality requirements for these facilities with the following general exceptions for this building.

1.3.1 The structural systems indicated (including floor-to-floor height) are not mandatory (ceiling heights are mandatory minimums). Changes to accommodate proposed structural systems are allowed only if they have no adverse effect on use or aesthetics of spaces, minimum stated room areas, as conveyed by Standard BCT Complex drawings in Appendix H are met, and gross area limitations are not exceeded.

1.3.2 The interior color schemes are not mandatory.

1.3.3 The exterior elevations (including rooflines, fenestration patterns, materials and detailing) are not mandatory and must be designed to comply with the Army Installation Design Standards. An aesthetic reference to the historical character of the Post exemplified by Buildings 1109 and 1110 would be desirable. See Appendix J for photographs of these existing buildings.

1.3.4 All low-slope roofs must be eliminated for the DFAC.

1.3.5 The mechanical room size is not mandatory (coordinate mechanical room size to ensure proposed room size will accommodate proposed equipment). Changes to accommodate proposed mechanical, electrical and communications systems are allowed only if they have no adverse effect on use or aesthetics of spaces, minimum stated room areas, as conveyed by the Standard BCT Complex drawings, are met and gross area limitations are not exceeded.

1.3.6 The fire protection analyses are superseded by the fire protection analysis at Appendix C, which is the criteria for this project.

1.3.7 Building footprint may not be reversed (mirror-image). Service access to utility mains shall remain as shown on the conceptual utility plans.

1.3.8 Vehicle barriers are required at main entrances to all DFAC service roads.

1.3.9 This project has a sustainable design goal of achieving a minimum 50 points using SPIRIT "Sustainable Project Rating Tool," Appendix G, for the DFAC. See Appendix D for the "Spirit Requirements Summary Table" and also see ETL 1110- 3-491 for background information. See paragraph 30 of this document.

1.3.10 Environmentally preferable product substitutions for vinyl wall covering and vinyl composition tile are preferred and allowed only if substitute is of equal or better performance and aesthetics. The wall covering material 'Sisal' shall not used for this project.

1.3.11 Exterior Insulation and Finish System (EIFS) shall not be used. An alternative to EIFS identified on the Standard BCT Complex drawings shall be provided by the Proposer.

1.3.12 The Post preference for space cooling and heating for their facilities is geothermal heat pump (GHP) systems using vertical, ground-coupled heat exchangers. If a totally geothermal system will not be economically feasible for this facility due to the nature of the loads or budget or LCCA, special consideration will be given to proposals that apply a hybrid geothermal system design.

1.3.13 A crawl space shall be provided for access below 'wet' areas of the DFAC. The crawl space floor shall be a concrete slab on grade with a minimum clearance to the structure of the main floor of 48". Access to the crawl space shall be from an area adjacent to the Company Loading Dock. See Fort Jackson drawings for an example of a layout for the crawl space.

1.3.14 All access panels must be key-lock type.

1.3.15 Acid-stain concrete finish is not permitted. At all locations where acid-stain concrete finish is indicated substitute an integral permanent, non-fading colorant and finishing system that will withstand heavy traffic, is abrasion-resistant and is easy to maintain. Powdered dry-shake hardener with sealer is an example of an acceptable substitute.

1.3.16 Snow retention system is required on the metal roof.

1.3.17 Additional information regarding required changes, allowable options, and preferences are contained elsewhere in this RFP. Unless stated otherwise, all other features of the Standard BCT Complex documents are mandatory. Requirements stated in this RFP have precedence over Standard BCT Complex documents. The floor plans, including room dimensions of the Standard BCT Complex drawings, may not be modified except for the specific changes indicated in this RFP.

1.3.18 All kitchen equipment provided for the DFAC shall be new.

1.4 Project proposal and final design plans and specifications shall be in English inch-pound units of measurement. The plans and site survey drawings provided in the RFP are in English units. The Proposers shall present their plans in English units of measure. See paragraph 9 of this document.

2. DESIGN REQUIREMENTS AND CRITERIA

The proposal documents shall include adequate information in the form of narratives, drawings, calculations, catalog cuts, etc., to enable the Government to adequately review the proposal. (See Section 00115 for PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.) Proposal documents shall include all requirements listed in the contract clauses and compliance with the format requirements is encouraged to facilitate review and award.

2.1 The design, following award, will include a 60% and final design submittal and corrected final design submittals. See Section 01021 DESIGN SUBMITTAL REQUIREMENTS AFTER AWARD.

2.2 The proposal drawings may be done with any CADD software. Once the contract is awarded all drawings will be initiated and done in AutoCAD 2000 (or later version) in accordance with A/E/C CADD Standards Manual which is available at: <http://tsc.wes.army.mil/>.

2.3 Codes, reference documents and criteria referenced within this RFP, although not attached, are an integral part of this RFP. Each proposer shall be responsible for securing any necessary reference at his own expense and resources. Requirements of this RFP may delete, revise, add to, or substitute for criteria contained in the referenced documents and this RFP shall be deemed the controlling authority of any changes to the other referenced documents and criteria.

2.4 Information provided in the Appendices is intended to provide additional design requirements and information.

3. SPECIFICATION INTENT

The intent of the specification sections in this RFP is to describe the requirements for quality, function, and materials, and types of construction in sufficient detail to enable engineering and design to be completed by the Contractor. In this specification section, each engineering and design discipline describes design intent and outlines the parameters to which the Contractor shall design.

3.1 This section defines the design and performance criteria. The applicable building codes and standards shall be used as the minimum criteria to develop the construction documents unless more stringent criteria is defined for a specific area.

3.2 Section 01021 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD defines the format and submittal requirements in which the design and the construction documents shall be prepared by the Contractor.

4. COORDINATION BETWEEN DISCIPLINES

The Contractor shall be responsible for the coordination between design, engineering and construction disciplines in order to fulfill the requirements of this contract and to provide for a complete, integrated and functional design.

5. QUALITY OF WORK

Construction documents shall be sufficient to afford a clear understanding of the construction work required. The work shall be organized in a manner that will assure thorough coordination between the details on the drawings, and between the drawings and the specifications. The Contractor shall crosscheck all work until all conflicts have been reconciled. The US Army Corps of Engineers, Louisville District Design Guide For Military Construction, current edition, and Louisville District Guide Specifications are available on the Internet at: <http://www.lrl.usace.army.mil/ed/specs/cegs/specs.htm> .

Unified Facilities Guide Specifications (UFGS) are available on the internet at: <http://www.ccb.org/docs/ufgshome/UFGSToc.htm>.

SPECSINTACT software which is used to edit the guide specifications is available free of charge at the same site.

They shall be used as the basis for format and preparation of construction documents.

6. DESIGN REQUIREMENTS

6.1 General

6.1.1 The project shall be designed and constructed in accordance with the criteria contained herein using industry standard materials and efficient practices. Specific technical requirements by discipline are identified in the Louisville District Design Guide for Military Construction. The Contractor shall use materials and equipment accepted within the construction industry. The building design and the materials selected shall be high quality, durable and easily maintained.

6.1.2 The Contractor shall prepare complete construction documents for all work designed as required by the RFP. The construction documents to be prepared include, but are not limited to, construction drawings, specifications, submittals, and design analyses as required in Section 01021 DESIGN SUBMITTAL REQUIREMENTS AFTER AWARD. The Contractor's Designers of Record shall develop construction document technical specifications for all areas of work. The design documents shall be provided in English units, see paragraph 9 of this document.

6.1.3 The Contractor shall be responsible for the professional quality, code compliance, technical accuracy and coordination of all designs, drawings, specifications and other documents or publications upon which the design and construction are based.

6.1.4 The project specifications shall be prepared using current UFGS guide specifications. Unless noted otherwise, if there is more than one UFGS guide specification for the same thing, use the one with an "A" suffix. The Louisville District guide specification denoted with the "L" suffix shall be used when available. If a guide specification does not exist, the Design/Build Contractor will prepare a job-specific specification. The UFGS shall be edited and adapted by the designer for this project, incorporating UFGS instructions and recommendations in the notes to specifier contained in the guide specifications. The designer is to delete inapplicable portions of the guide specification and revise and/or supplement, as required, the applicable portions to provide a complete project specification. Editing of specifications shall be for bracketed options and project requirements as stated in the RFP only. Specifications shall be submitted at final design submittal in hard copy form that shows the text added and deleted with additions underlined and deletions lined through but still readable. This feature is available in SPECSINTACT. In Microsoft Word this feature is located under "Tools", "Track Changes" and "Highlight Changes". Following is a partial list of UFGS specifications required for this project. Other UFGS sections shall be added and submitted by the Design/Build Contractor as needed to address all other portions of the work in the accepted proposal. Use the Division 01 GENERAL REQUIREMENTS specifications that are provided in this RFP. No changes to these sections.

Division 01 General Requirements

01312A	QUALITY CONTROL SYSTEM
01320A	PROJECT SCHEDULE
01331L	SUBMITTAL PROCEDURES FOR DESIGN/BUILD
01355A	ENVIRONMENTAL PROTECTION
01420	SOURCE FOR REFERENCE PUBLICATIONS
01453L	CONTRACTOR QUALITY CONTROL DESIGN BUILD
01460L	COMMISSIONING OF HVAC SYSTEMS
01500A	TEMPORARY CONSTRUCTION FACILITIES
01525L	SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
01572	CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
01780A	CLOSEOUT SUBMITTALS
01800L	EQUIPMENT, OPERATING MAINTENANCE AND REPAIR MANUALS

Division 02 Sitework

02231	CLEARING AND GRUBBING
02300	EARTHWORK
02315A	EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02316A	EXCAVATION, FILLING AND BACKFILLING FOR UTILITIES SYSTEMS
02360	SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL
02370A	SOIL SURFACE EROSION CONTROL
02510A	WATER DISTRIBUTION SYSTEM
02531	SANITARY SEWERS
02556A	GAS DISTRIBUTION SYSTEM
02560	VALVES, PIPING, AND EQUIPMENT IN VALVE MANHOLES
02621A	FOUNDATION DRAINAGE SYSTEM
02630	STORM DRAINAGE
02714A	DRAINAGE LAYER
02722A	AGGREGATE AND/OR GRADED-CRUSHED AGGREGATE BASE COURSE
02741A	HOT-MIX-ASPHALT (HMA) FOR ROADS
02754A	CONCRETE PAVEMENTS FOR SMALL PROJECTS
02763A	PAVEMENT MARKINGS
02770A	CONCRETE SIDEWALKS AND CURBS AND GUTTERS
02921A	SEEDING
02922A	SODDING

02930A EXTERIOR PLANTING

Division 3 Concrete

03101A FORMWORK FOR CONCRETE
03150A EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
03200A CONCRETE REINFORCEMENT
03300A CAST-IN-PLACE STRUCTURAL CONCRETE
03307A CONCRETE FOR MINOR STRUCTURES

Division 4 Masonry

04200A MASONRY
04810 NONBEARING MASONRY VENEER/STEEL STUD WALLS

Division 5 Metals

05090A WELDING, STRUCTURAL
05120A STRUCTURAL STEEL
05210L STEEL JOISTS
05310 STEEL DECKS
05400A COLD-FORMED STEEL FRAMING
05500A MISCELLANEOUS METAL

Division 6 Woods and Plastics

06100A ROUGH CARPENTRY
06200A FINISH CARPENTRY
06650 SOLID POLYMER (SOLID SURFACING) FABRICATIONS

Division 7 Thermal and Moisture Protection

07132A BITUMINOUS WATERPROOFING
07412A NON-STRUCTURAL METAL ROOFING
07416A STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
07600 FLASHING AND SHEET METAL
07840A FIRESTOPPING
07900A JOINT SEALING

Division 8 Doors and Windows

08110 STEEL DOORS AND FRAMES
08120 ALUMINUM DOORS AND FRAMES
08210 WOOD DOORS
08330A OVERHEAD ROLLING DOORS
08331A METAL ROLLING COUNTER DOORS
08520A ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS
08710 DOOR HARDWARE
08800A GLAZING

Division 9 Finishes

09200A LATHING AND PLASTERING
09250 GYPSUM BOARD
09310 CERAMIC TILE, QUARRY TILE, AND PAVER TILE
09510 ACOUSTICAL CEILINGS
09650 RESILIENT FLOORING
09670 FLUID-APPLIED FLOORING
09680A CARPET
09900 PAINTS AND COATINGS
09915 COLOR SCHEDULE

Division 10 Specialties

10153	TOILET PARTITIONS
10260	WALL AND CORNER PROTECTION
10430	EXTERIOR SIGNAGE
10440	INTERIOR SIGNAGE
10800	TOILET ACCESSORIES

Division 11 Equipment

11161	DOCK LEVELERS
11289A	CLOSURE GATES
11400A	FOOD SERVICE EQUIPMENT

Division 12 Furnishings

12490A	WINDOW TREATMENT
12705	FURNITURE SYSTEMS

Division 13 Special Construction

13080L	SEISMIC PROTECTION FOR MECHANICAL/ELECTRICAL EQUIPMENT
13100A	LIGHTNING PROTECTION
13721A	SMALL INTRUSION DETECTION SYSTEM
13851A	FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE
13920A	FIRE PUMPS
13930A	WET PIPE SPRINKLER, FIRE PROTECTION
13935A	DRY PIPE SPRINKLER SYSTEM, FIRE PROTECTION

Division 14 Conveying Systems

NOT USED

Division 15 Mechanical

15080A	THERMAL INSULATION FOR MECHANICAL SYSTEMS
15181A	CHILLED AND CONDENSER WATER PIPING AND ACCESSORIES
15190A	GAS PIPING SYSTEMS
15400A	PLUMBING, GENERAL PURPOSE
15566A	WARM AIR HEATING SYSTEMS
15569A	WATER AND STEAM HEATING; OIL, GAS OR BOTH; UP TO 20 MBTUH
15620A	LIQUID CHILLERS
15645A	COOLING TOWER
15652A	COLD STORAGE REFRIGERATION SYSTEMS
15700A	UNITARY HEATING AND COOLING EQUIPMENT
15741	VERTICAL GROUND-COUPLED HEAT EXCHANGE SYSTEMS (VGCHES)
15741N	WATER SOURCE HEAT PUMP SYSTEMS
15845A	ENERGY RECOVERY SYSTEMS
15895	AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM
15951A	DIRECT DIGITAL CONTROL FOR HVAC
15990A	TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS

Division 16 Electrical

16370A	ELECTRICAL DISTRIBUTION SYSTEM, AERIAL
16375A	ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
16415A	ELECTRICAL WORK INTERIOR
16528A	EXTERIOR LIGHTING INCLUDING SECURITY AND CCTV APPLICATIONS
16710A	PREMISES DISTRIBUTION SYSTEM
16711A	TELEPHONE SYSTEM, OUTSIDE PLANT
16751A	CLOSED CIRCUIT TELEVISION SYSTEMS
16770	RADIO AND PUBLIC ADDRESS SYSTEMS

16815A CABLE TELEVISION PREMISES DISTRIBUTION SYSTEM

7. RFP DESIGN AND TECHNICAL CRITERIA

All design and construction document drawings and specifications shall be prepared to comply with the RFP. The RFP describes the design work that shall not be changed and shall be included in the construction documents. All remaining design work shall be performed by the Contractor based on the design criteria as required by the RFP. No deviations from the criteria will be allowed unless prior approval is obtained from the Contracting Officer's Representative. Only questions or problems encountered by the Contractor in following criteria shall be promptly submitted with recommendations to the Contracting Officer's Representative for approval.

7.1 CONFLICTS IN RFP CRITERIA.

Where the various elements of the RFP are in conflict, the following priority shall be used to establish precedence, unless specifically noted otherwise:

1. RFP Specifications and Appendices
2. RFP Drawings
 - a. Fort Knox BCT Complex Concept Site Drawings
 - b. BCT Barracks Complex Standard Design
3. Army Installation Design Standards (ACSIM)
4. Louisville District Design Guide For Military Construction
5. Fort Jackson specifications
6. Fort Jackson drawings

The Fort Jackson drawings and specifications are furnished to convey functional and quality intent. They are not assumed to be correct or complete or to meet all RFP requirements. The Contractor is responsible for producing complete, coordinated design documents. Resolution of any conflicts and correction of errors in the Fort Jackson documents, as well as incorporation of all requirements stated in this RFP, shall be accomplished at no additional cost as part of Contractor's design development for this project.

8. APPLICABLE BUILDING CODES AND STANDARDS

The codes and criteria references of Appendix "A" pertain to this project. The codes of the most current adopted edition shall be used as standards for building construction and life safety design. Where there is a conflict between the RFP and building codes, the most stringent shall apply. When codes are in conflict, the most stringent shall apply. The list in Appendix "A" is not intended to be a complete list. All work shall be designed and constructed to meet all state and federal codes, standards and laws. Refer to the technical specifications for other standards and references not listed there.

9. ENGLISH DESIGN

The design shall be developed using the English units of measure. The site survey is done in English units. The Contractor shall coordinate all references. The Contractor shall resolve discrepancies, such as mismatches or product unavailability, arising from use of both metric and non-metric measurements and discrepancies between the measurements in the specifications and the measurements in the drawings. The BCT Barracks Complex Standard Design drawings are provided in metric and are to be converted by the Design/Build Contractor to English units of measure.

10. GENERAL CONSTRUCTION REQUIREMENTS

10.1 Government-Furnished Government-Installed Equipment (GFGI). Equipment, computers and related hardware, video projectors, VCR's, TV's, drink machines, vending machines, and microwaves are Government furnished and installed as indicated in the Standard Design drawings. The Contractor shall provide utility connections and space for these items. When wall or ceiling mounted equipment such as TVs, VCRs, monitors or projectors are required, the Contractor shall provide brackets with appropriate structural support for this equipment. Pay phones are provided by a separate contractor. Contractor shall coordinate with pay phone provider and provide preparation as needed for attachment and connection of phones and enclosures.

11. SITE DESIGN REQUIREMENTS

11.1 Project Limits. The Contractor shall confine all work within the area shown on the Site Development Concept Plan, as shown on the contract drawings, and in paragraph 12.1 below. The Contractor shall obtain any additional survey as required in order to construct this project at his own time and expense. Note that some additional survey east of N. Delaware St. will be required to complete final design. Since the area is relatively flat and contains no existing structures, the additional survey should not be required for the proposal design.

11.2 Disposal Of Waste Materials.

11.2.1 The Contractor shall identify, as a part of his submittals required by this contract, the specific disposal site or sites for any waste materials generated by the contractor's operations at Fort Knox.

11.2.2 The Contractor shall edit and submit the following UFGS as defined in Section 01021 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD:

01355 ENVIRONMENTAL PROTECTION. In addition to other requirements within Specification 01355, the following SD-07 Certificates shall be listed requiring Government Approval: specific disposal sites, documentation (i.e., weight tickets, etc.), and compliance of disposal by resale.

11.3 Demolition And Removals. The Contractor shall survey and stakeout the project boundaries before starting work (see drawing sheet C101). The survey drawing provided in the RFP indicates existing conditions and locations of existing utilities. The Contractor shall be responsible for locating and verifying the location of existing utilities prior to start of construction. The Contractor may utilize the utilities during construction operations and may incorporate the utilities shown as "to remain" on the drawing as part of the final project. Existing utilities that interfere with this project and are to remain, will be relocated as part of the project. Utilities that interfere with this project and are not required to remain shall be cut and plugged and removed from the interference area. Any utility lines not shown "to remain" shall not be used as part of the design. The information shown on the survey drawing is the most recent data. The Contractor shall be responsible for furnishing an independent verification of the topographic survey of the project site, all line and grade surveys, and as-built surveys of the construction. All demolition debris (except for bituminous and concrete pavement) shall be removed to the approved landfill on post indicated in the drawings. Bituminous and concrete pavement shall be recycled and reused for this project. Eisenhower Avenue and Spearhead Avenue shall not be open cut for utility construction.

11.4 Sustainable Design. This project has a goal of achieving at least 50 points using the SpiRiT Project Rating Tool for Sustainable Design. See paragraph 30. Site contributions can include the following:

Site Selection
Installation/Post Development
Alternative Transportation
Stormwater Management
Light Pollution Reduction
Optimize Site Features
Facility Impact
Site Ecology

12. NEW SITE DESIGN AND CONSTRUCTION

The Site Development Concept Plan in Appendix I represents the general geometric layout for the site work. Access by military and emergency vehicles is required at the building front and rear. The Contractor shall design the pavement and sidewalks as necessary to support vehicular traffic. The Contractor shall also design utilities including fire hydrants and streetlights.

12.1 Project Limits. The Contractor shall confine all work within the area of the project limits shown on the Site Development Concept Plan.

12.1.1 A Stormwater Pollution Prevention Plan (Best Management Plan) shall be designed and included in the design submittals in Section 01021. The plan shall be approved by Ft. Knox Environmental Management Division, DBOS. The approved plan shall be onsite at all times for inspection by EPA, KNREPC, and Fort Knox environmental personnel. All activities in the approved plan shall be implemented. The Contractor shall control erosion and sedimentation during construction. Sedimentation of adjacent sites or downstream ditches will not be permitted.

12.2 Site Requirements.

12.2.1 Preferred functional layout is shown on the Site Development Concept Plan in Appendix I. Grades shall be designed with the future barracks buildings, Battalion HQ and other site elements indicated in the BCT Battalion Complex in mind such that they are not adversely impacted.

12.2.2 Troop Marching Sidewalks. Troop marching sidewalks are 15-foot sidewalks that connect the Company Buildings to the Dining Hall, Battalion Headquarters, covered training areas, and outdoor training area. Company assigned vehicles and fire trucks shall use the troop marching sidewalks for vehicular access to the complex. Removable and lockable bollards shall be placed at the entry point to the complex from asphalt pavement and where force protection berms and bollards terminate. Removable bollards shall be 8-inch diameter and spaced at 4 feet on center across the troop marching sidewalk. The maximum slopes on the Troop Marching Sidewalks shall be 5%, however, 3% or flatter is preferred.

12.2.3 Antiterrorism and Force Protection (ATFP).

12.2.3.1 Antiterrorism/Force protection measures shall consist of landscaped berms, 10-inch barrier curb and gutter, bollards filled with concrete, manual bollards, and steel gates. Force protection measures shall be installed at a minimum of 82 feet from building exterior wall and as shown on the contract drawings. Steel gates shall be installed at all service road entrances. The layout shown on sheet C102 is conceptual. Other combinations of berm, ditches, or bollards can be employed to meet AT/FP requirements and sustainable design intentions as long as all other requirements of this RFP are met.

12.2.3.2 Landscaped berms shall be 6 feet high 5 feet wide at the top, with 2.5:1 side-slopes. They shall be constructed of compacted earth and landscaped. The berms shall meet other force protection items (such as gates or bollards) such that the gap between the two is no more than 4 feet. The height of

the berm may be reduced if a trapezoidal ditch is placed in front of the berm per Mil-Handbook 1013/14, Figure 28. If incorporated into the design, however, the ditch must be utilized as part of the drainage system and shall not pond water at any time.

***2**

12.2.3.3. Bollards will be used at all sidewalk entrances at 4 feet on centers and as necessary where berm or gate construction is not feasible. Bollards shall be 8-inch in diameter and constructed/installed per Mil-Handbook 1013/14. ***2**

12.2.3.4 Steel Gate. The Contractor shall install steel gates at the locations shown on the plans. Steel gates shall be constructed according to details for typical steel gate (G-1) on Sheet C700 of the Fort Jackson site/civil drawings.

12.2.4 Building Setback Requirements.

The building shall be located on the site in accordance with the DOD minimum Antiterrorism/Force Protection Construction Standards for buildings (UFC 4.010.01; 8 October 2003).

Project is within Post controlled perimeter.

Building Category:	Primary Gathering
Minimum acceptable building setbacks	
Adjacent Buildings:	33 feet
Building to berm, bollard, or gate barrier and/or parking and roadways outside the barriers:	82 feet

12.2.5 The trees on the site shall be incorporated in the design, retained and protected during construction to the extent possible. Removal of any trees from Fort Knox is prohibited from March 31 to October 15 in deference to the Indiana Brown Bat habitat preservation.

12.2.6 The new project grading and storm water system shall take into consideration the planned construction of the adjacent barracks complexes as shown on drawing sheet C101 (see Paragraph 18). Construction shall not impact the existing drainage system adjacent to the site.

12.3 Access Drives, Parking and Sidewalks. Design plans shall include typical section details, centerline profiles, and cross sections for access drives and shall include typical section details and cross sections for parking areas. Connections to existing asphalt or concrete pavements shall be accomplished by saw cutting the adjacent existing pavement.

12.3.1 Width Criteria. All pavement and radii dimensions in this section are from face of curb to face of curb. Minimum access drive width shall be 24 feet. Minimum turning radius for all intersections shall be 20 feet except where fire truck access and semi-truck and trailer access is required. Designer shall consider the types of vehicles traversing and parking on these facilities. Vehicles shall include but not be limited to: passenger cars, emergency vehicles, garbage vehicles, fire trucks, military vehicles, delivery service, and utility vehicles. Contractor shall provide traffic control signs and pavement markings. Parking stripes shall be white and handicap parking stripes shall be blue.

***2**

12.3.2 Curb and Gutter. All parking lot and driveway pavement shall be bordered with 6-inch concrete curb and gutter 2 feet wide unless the curb is a part of the AT/FP system. In this case the height of the barrier curb shall be 10 inches. All gradients shall provide positive drainage (no ponding allowed). Curb cuts shall be provided as necessary for pavement drainage except where there is an adjacent sidewalk. Sidewalks shall not block overland drainage nor shall concentrated overland flow be allowed

across sidewalks. Runoff areas at curb cuts shall be protected from erosion by sodding this area in addition to the use of other appropriate erosion control measures.

12.3.3 Pavement Thickness. Pavement structure shall be designed for actual vehicle loadings and frequencies. Access drives, walks, and parking shall be asphalt pavement (with compacted graded aggregate base course, drainage layer and chock) or portland cement concrete. See the Layout Plan for locations of each pavement type. Pavement structure thickness shall be in accordance with TM-5-822-5, Chapter 1, and TM 5-822-5, Chapter 3 and pavement design calculation will be based on the latest version of the Pavement Transportation Computer Assisted Structural Engineering program which is available on the web at <http://www.pcase.com/>. Pavement structure shall be designed for a 20-year pavement life. Minimum asphalt pavement thickness shall be 3 inches of asphalt pavement (1 inch of surface course on 2 inches of base/binder course) over 8 inches of compacted base course. These minimums are in addition to the drainage layer and chock. Heavy-duty asphalt pavement and concrete pavement (as shown on the contract drawing) shall be used in all pavement areas. Minimum concrete pavement thickness shall be 7 inches and reinforced as necessary. *2

12.3.3.1 Concrete Pavement. A concrete joint layout plan shall be required for all concrete pavements. Joint spacing, joint types, and joint grading shall be shown. Concrete pavement thickness shall be designed for an equivalent 18,000-pound single axle load for the design vehicle loading and number of passes. Pavement life shall be 20 years. Concrete pavement shall be designed in accordance with TM 5-822-5, Chapter 1. Concrete pavement shall be non-reinforced except for odd shaped slabs and slabs with manholes or other structures located in them. Odd shaped slabs are defined as non-square slabs where length exceeds the width by 125%. The number of joints shall be kept to a minimum by using the greatest joint spacing, which will effectively control cracking. The maximum length to width ratio of the non-reinforced slabs shall be 125 percent. Joint sealant type shall be preformed compression seal.

12.3.4 Sidewalks. Normal pedestrian sidewalks shall be a minimum 6 feet wide and shall be provided as indicated on the Layout Plan. Troop marching sidewalks shall be a minimum 15 feet wide with longitudinal contraction joints and shall be provided as indicated on the Layout Plan. Sidewalks shall be widened as necessary to meet building entrance and exit way widths. Sidewalks shall connect the parking areas to the building exits. Normal pedestrian sidewalks shall be non-reinforced concrete with a minimum nominal thickness of 4 inches. Troop marching sidewalks shall be wire mesh reinforced concrete with a minimum nominal thickness of 7 inches. Concrete strength for sidewalks shall be 3000 psi compressive strength. Contraction joints shall be spaced at 6 feet on center and expansion joints shall be placed at 50 feet on center and at the intersection of walks and curbs. The maximum slopes on the troop marching sidewalk shall be 5%, however, 3% or flatter is preferred. Minimum cross slope on sidewalks shall be 2 percent.

12.3.5 Handicap Access. Ramps or depressed curb and walk shall be provided for handicap parking located at the DFAC. Number of parking slots and site access for the physically disabled shall be as required by ADAAG, UFAS and FS 795 and shall be based on the number of support staff not the total number of occupants.

12.3.6 Parking.

12.3.6.1 Parking shall be provided as generally indicated in the layout presented in the Layout Plan. All parking shall be 90 degrees off-street parking; 24 POV parking spaces shall be provided for the DFAC. Area lighting and landscaping shall reinforce the parking area while meeting functional and safety requirements.

12.3.6.2 Parking areas shall be paint striped. POV parking stalls shall be 9 feet by 18 feet. Handicap parking spaces shall be a minimum 8 feet wide with an access aisle a minimum 5 feet wide by 20 feet long. Paint markings shall be 4 inches in width. Parking lot striping shall be white reflective-type paint. Traffic aisles shall be 24 feet in width.

12.3.6.3 Parking area drainage shall sheet flow to curb cuts then by overland flow to the existing or proposed storm sewer system. Turf at the curb cuts shall be protected with sod, riprap, or other "natural" channel stabilization methods. Slopes along parking lot aisles shall not exceed 3%, however, flatter slopes are preferred. Transverse slopes shall not exceed 2% (1/4-inch per foot).

12.3.6.4 Parking areas design shall conform to TM 5-822-2. Parking stalls and access drives shall be asphalt pavement with compacted crushed aggregate base course, drainage layer and chock.

12.3.6.5 Area Lighting. The Contractor shall design parking lot area lighting with dark bronze anodized poles and fixtures. Contractor shall provide all underground conduit and light pole bases. Nolin Electric shall wire and install lighting fixtures per Contractor's design.

12.3.6.6 Loading Dock Pavement. The loading dock access area shown at the rear of the facility shall be made of concrete and designed by the Contractor for standard maximum legal-sized, semi-truck, and trailer combinations.

12.3.6.7 Access roads shall be 24 feet wide and be designed as heavy duty pavement with asphalt over compacted crushed aggregate base, drainage layer and chock. Slopes on access roads shall not exceed 5%, however, flatter slopes are preferred

12.4 Building Connection to the Site.

12.4.1 The finish floor shall be a minimum of 6 inches above finished grade.

12.4.2 Finished grade shall slope a minimum of 4 percent away from the new building for a distance of 6 feet.

12.5 Exterior Signage

12.5.1 Complex identification sign shall be installed similar to the one used in the Fort Jackson design and shall conform to the Army Installation Design Standards. Location of identification sign shall be coordinated with Fort Knox DBOS.

12.5.2 Regulatory Signage shall be in accordance with Manual on Uniform Traffic Control Devices.

13. FOUNDATION AND GEOTECHNICAL DESIGN

13.1 Government Investigation

13.1.1 General

The Government has performed preliminary geotechnical explorations at the project site. A report of the explorations and analysis along with the locations of and drilling logs of soil test borings are included in Appendix E. The "preliminary" report provides an overview of the soils and geologic conditions, and is furnished for informational and proposal purposes and not for final design; however, the recommendations provided in the report shall be considered to be minimum requirements that shall be incorporated into the final design and construction of the project.

13.2 Contractor Investigation

The offeror, to whom this contract is awarded, shall employ the services of a consulting professional geotechnical engineer experienced in geotechnical engineering, who shall be responsible for determining site-specific geotechnical conditions. The site-specific geotechnical conditions, together with recommendations specific to the geotechnical design and construction requirements for the proposed

project, shall be addressed in a “final” geotechnical report prepared by the consulting geotechnical engineer. The geotechnical report shall include, but not be limited to, the following:

- a. Description of the site as to topography, existing surface conditions, and any other features that might influence the design.
- b. Description of the investigation program and the methods used. Information obtained from the explorations performed by the Government can be used, supplemented by the minimum numbers of additional explorations specified below, and any further investigations as deemed necessary by the consulting geotechnical engineer. Subsurface exploration may include soil test borings, cone penetrometer test (CPT) soundings, and test pits. The investigation, sampling, and identification of subsurface materials shall be in accordance with methods and procedures described in ASTM D 420. Soil investigation and sampling by hollow-stem auger borings shall be in accordance with AASHTO T 251. Drilling and sampling with the "Standard Penetration Test" (SPT) splitbarrel sampler shall be in accordance with ASTM D 1586. The procedure shall be modified to provide for continuous standard penetration and sampling tests for the initial 12 feet of the boring. Beginning at a depth of 15 feet below grade, penetration and sampling tests can be performed every 5 feet and at each change in soil stratification or soil consistency. The location of the groundwater table, if encountered, shall be measured and recorded after 24 hours. If drilling techniques that prevent determination of the groundwater table are used, install at least one piezometer for every six explorations to measure the depth to the groundwater table. Classification of soils shall be in accordance with ASTM D 2487 or D 2488, as appropriate. Cone penetrometer test (CPT) soundings shall be in accordance with ASTM D 3441 or ASTM D 5778, as appropriate. Undisturbed soil sampling shall be in accordance with ASTM D 1586.

The following minimum numbers of explorations (soil test borings and/or CPT soundings) shall be performed by the Contractor;

<u>Feature</u>	<u>Minimum Number of Borings</u>
Dining Facility	5
Roads, Emergency Lanes	1 per each 250 feet
Parking Areas	1 per each 3765 square feet

The depths of explorations shall be of sufficient depth to evaluate bearing capacity and settlement potential. However, beneath structures, explorations shall extend to a minimum depth of 25 feet below existing ground surface or below final design grade, whichever is lower. Beneath roads, hardstands, and/or parking areas, explorations shall extend to a minimum depth of 5 feet below existing ground surface or below final design grade, whichever is lower.

The Contractor shall be responsible for all applicable clearances and permits and for the protection of all underground utilities from damage during field investigations. Utility clearances and digging permits are required prior to drilling on the installation. Procurement of the clearances and permits shall be coordinated through the Contracting Officer.

- c. Discussion of the subsurface soil conditions and stratigraphy and groundwater conditions.
- d. Location plan of explorations.
- e. Logs of explorations. Indicate on logs complete information on who, when, and how made. Show soil description, standard penetration resistance, N, or other type resistance,

topsoil, water level observations, surface elevation and datum, and any other information gathered during the exploration.

Exploration locations shall be surveyed. Surveyed elevations and coordinates shall be provided on each exploration log. Elevations shall be in accordance with NGVD 29 and horizontal coordinates shall be in accordance with NAD 83 (Kentucky State Plane Coordinates); accuracy to be plus or minus 3 feet horizontal and plus or minus 0.5 foot vertical.

Soil test boring logs shall show graphical representation of soil strata, location of each change by depth or elevation, location of each sample by depth or elevation, and number of blows for each 6 inches and amount of soil recovered for each sample location. Logs shall also indicate type and size of casing, type of drilling fluid, and type and size of drill bit. If no casing is used, indicate size of borehole. Indicate when boring is terminated due to refusal.

Soil classifications for final logs shall be based on the field classifications, the results of tests, and further inspection of samples in the laboratory by geotechnical engineers.

Include a chart illustrating the soil classification criteria and the terminology and symbols used on the boring logs.

Locations of all explorations shall be shown on the grading and drainage plans of the submittal drawings. Logs of all explorations shall be included on plan(s) of the submittal drawings.

- f. Laboratory test data shall be included in detail. Laboratory testing shall be in accordance with the requirements set forth in EM 1110-2-1906, Laboratory Soils Testing, EM 1110-2-1909, Calibration of Laboratory Soils Testing Equipment, and/or applicable ASTM standards. All laboratory testing shall be performed by a commercial testing laboratory which has been found adequate and qualified by a Corps of Engineers Division Laboratory Inspection Team.
- g. Notation of the location of strata containing organic materials, weak materials or other inconsistencies that might affect engineering conclusions.
- h. Pavement design, or if not responsible for pavement design, pavement structural design data, including design California Bearing Ratio (CBR) and modulus of subgrade reaction.
- i. Discussion of the facilities under design and recommendations regarding foundation support of the structures and slabs on grade, including soil bearing pressures, bearing elevations, foundation design recommendations and anticipated settlements, including total and differential.
- j. Anticipation of, and management of, groundwater.
- k. Discussion of site preparation and the effect of weather and construction equipment on soils during construction.
- l. Areas requiring undercutting and removal of unsatisfactory soils.
- m. Types of materials to be excavated and possible uses and/or disposition of the materials.
- n. Fill and backfill placement procedures, and types of compaction equipment.
- o. Results of pH tests and salinity tests and resistivity measurements, as appropriate, necessary to design corrosion control and grounding systems. The raw field data shall be included in the report.

- p. Lateral earth pressures and pressure coefficients (active, passive, and at rest) and internal friction angles for design of walls below grade, including backfill, compaction and subdrainage, and their requirements.
- q. Results of laboratory soils testing, to include classification and compaction tests, on representative samples of proposed borrow material (both on and/or off the installation). Testing shall be as specified in subparagraph 13.8.1. If borrow material is to be obtained from sources off the installation, provide the name and location of the borrow source.
- r. Provide calculations that support the recommendations for the foundation design. The calculations may be included in an appendix to the report. Calculations shall include loadings, capacities, safety factors, settlement analysis, bearing analysis, and references from which calculations are based. Any graphs and formulas shall be clearly indicated along with derivation of curve slopes and data derived from laboratory testing. Computer outputs shall also be included.

Three copies of the geotechnical report shall be submitted with the Part 1 submittal. If revisions are made to the Part 1 design submittal that require revisions to the geotechnical report, a revised report (three copies) shall be provided with the Part 2 design submittal. In addition, the pavement design and/or pavement structural design data shall also be submitted with the Part 1 design submittal. See section 01021.3.4.1.

13.3 Certification

The successful proposer shall be fully responsible for acceptable foundations, pavements and other geotechnical aspects for the proposed project. The proposer and his professional geotechnical engineering consultant shall certify in writing that the design of the project has been developed consistent with the site specific geotechnical conditions. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the Part 1 design submittal. If revisions are made to the Part 1 design submittal, a new certification shall be provided with the Part 2 design submittal. See section 01021.3.4.1.

13.4 Foundation Design

13.4.1 General

Given the proposed site and the proposed structures, it is anticipated that shallow spread footings can be used for support of the proposed buildings.

13.4.2 Allowable Bearing Pressure

Allowable soil bearing pressure shall be determined by the consulting geotechnical engineer. An adequate level of protection against structural failure due to uniform and/or differential foundation settlement or general shear shall be provided.

13.4.3 Footing Dimensions

Column footings and load-bearing wall footings shall have minimum dimensions of 30 inches and 24 inches, respectively, and shall be located at a minimum depth of 30 inches below finish floor or finish grade, as appropriate. Non load-bearing wall footings shall have a minimum width of 18 inches and shall be located at a minimum depth of 18 inches below finish floor or finish grade, as appropriate. Increase footing depth as required for frost protection.

13.4.4 Foundations Over Utility Lines

No foundation shall be constructed over existing or new water, sewer, steam, natural gas, chilled water, industrial waste and foundation drain lines. All such utility lines shall be relocated.

13.4.5 Additional Requirements

Thickened slabs shall be required for walls and partitions which have a vertical load of 300 plf to 1100 plf. A separate isolated wall footing shall be used for walls having a vertical load in excess of 1,100 plf.

13.5 Site Classification for Seismic Design

The project site shall be classified as indicated in the geotechnical report included in Appendix E for the purpose of determining maximum considered earthquake spectral response accelerations S_{ms} and S_{ml} in accordance with Corps of Engineers Technical Instruction "TI 809-04, Seismic Design for Buildings" and the IBC (when IBC is used it shall be modified by UFC 1-200-01, 31 July 2002).

13.6 Slabs on Grade

All interior slabs on grade, including storage rooms, shall be underlain by a moisture vapor barrier consisting of lapped polyethylene sheeting having a minimum thickness of 10 mils and a minimum 4-inch thick capillary water barrier of open graded, washed pea gravel, or crushed stone. Concrete slabs shall be jointed around columns and along supported walls to minimize cracking due to possible differential movement.

13.7 Soil Compaction

13.7.1 Soil compaction shall be achieved by equipment approved by the consulting geotechnical engineer. Soil materials shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the compaction specified with the compaction equipment used.

The requirements shall be verified or modifications recommended by the consulting professional geotechnical engineer in the report wherever engineering, soils, or climatic factors indicate the necessity. Any modification to the specified compaction requirements shall require the approval of the Contracting Officer.

13.7.2 The Contractor, with recommendations and input from his consulting geotechnical engineer, shall edit and submit the following UFGS Specifications:

02300	EARTHWORK
02315A	EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02316A	EXCAVATION, FILLING AND BACKFILLING FOR UTILITIES

13.8 Construction Quality Control Testing

13.8.1 Prior to initiating any fill placement and/or compaction operations, representative samples of the soils which will be used as structural fill or subgrade, both suitable on-site soils and off-site soils (borrow, both on and/or off the installation) shall be obtained and tested to determine their classification and compaction characteristics. The samples shall be carefully selected to represent the full range of soil types to be used. The moisture content, maximum dry density, optimum moisture content, grain-size and plasticity characteristics shall be determined. These tests are required to determine if the fill and subgrade soils are acceptable and for compaction quality control of the subgrades and structural fill. A minimum of 14 compaction tests shall be performed on materials classified as satisfactory for use.

Tests for the above soil properties shall be in accordance with the following:

Moisture Content	ASTM D 2216
Maximum Dry Density and Optimum Moisture	ASTM D 1557

Grain-Size (Wash No. 200, w/o Hydrometer)
Plasticity

ASTM D 422 and ASTM D 1140
ASTM D 4318

13.8.2 A representative number of in-place field density tests shall be performed in the subgrade of compacted on-site soils and in the structural fill and backfill to confirm that the required degree of compaction has been obtained. In-place density tests shall be performed in accordance with the sand cone method prescribed in ASTM D 1556; the use of nuclear gauges for density testing will not be permitted. At least one density test shall be performed for each 5,000 square feet, or portion thereof, of compacted existing onsite soils, subgrades, and in each lift of compacted structural fill. At least one density test shall be performed in the bearing level soils for each 100 linear feet in continuous footings. Density tests shall be performed at 100-foot intervals along roadway subgrade soils. In addition, a density test shall be performed for each 200 linear feet of backfill placed per foot of depth in trenches for utilities. Where other areas are compacted separately by manually operated compactors, a minimum of one density test shall be performed for every 250 square feet, or portion thereof, of fill placed per foot of depth.

13.8.3 Any area that does not meet the required compaction criteria shall be reworked, and retested. If the moisture content of the soil is within the recommended range, additional compaction may be all that is necessary to increase the density. If the moisture content is not within the recommended range, then, the moisture content shall be adjusted to within the range, and the area recompacted.

13.8.4 All laboratory and field density testing shall be performed by a commercial testing laboratory which has been found adequate and qualified by a Corps of Engineers Division Laboratory Inspection Team.

13.9 Soil Treatment

13.9.1 The pesticide applicator's principal business shall be pest control and the pesticide applicator shall be State certified in the U.S. Environmental Protection Agency (EPA) pesticide applicator category which includes structural pest control, and certified in the State of the project's location.

13.9.2 Pesticides shall be delivered to the project site in sealed and labeled containers in good condition as supplied by the manufacturer or formulator. Pesticides shall be stored, handled, and used in accordance with manufacturer's labels. Labels shall bear evidence of registration under the Federal Insecticide, Fungicide, and Rodenticide Act (MX), as amended.

13.9.3 The Contractor shall formulate, treat, and dispose of termiticides and their containers in accordance with label directions. Pesticides and related materials shall be kept under lock and key when unattended. Proper protective clothing and equipment shall be worn and used during all phases of termiticide application.

13.9.4 The Contractor shall provide a 5-year written warranty against infestations or reinfestations by subterranean termites of the buildings constructed under this contract. Warranty shall include annual inspections of the buildings. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and the soil and building conditions have not been altered in the interim, the Contractor shall:

- a. Retreat the soil and perform other treatment as may be necessary for elimination of subterranean termite infestation;
- b. Repair damage caused by termite infestation; and
- c. Reinspect the building approximately 180 days after the retreatment.

13.9.5 Termiticides shall be currently registered by the EPA.

13.9.6 At the time of application, the soil moisture content shall be sufficiently low to allow uniform distribution of the treatment solution throughout the soil. Applications shall not be made during or immediately following heavy rains or when conditions may cause runoff and create an environmental hazard.

13.9.7 The Contractor shall establish complete and unbroken vertical and/or horizontal (as necessary) soil poison barriers between the soil and all portions of the intended structure that may allow termite access to wood and wood related products. Application shall not be made to areas intended for use as a plenum air space. Surface treatments shall not be made for areas to serve as crawl spaces. Termiticide shall be applied as a coarse spray and provide uniform distribution unto the soil surface. Treatment shall be applied prior to placement of the vapor barrier and at least 12 hours prior to concrete placement. Where treated soil or fill material is not to be covered with a vapor barrier or waterproof membrane; adequate precautions shall be taken to prevent its disturbance. Soil or fill material disturbed after treatment shall be retreated as specified above before placement of slabs or other covering structures. Treatment of the soil on the exterior sides of foundation walls, grade beams, and similar structures shall be coordinated with final grading and planting operations so as to avoid disturbance of the treated barriers. Manufacturer's warnings and precautions shall be observed in the handling and use of such materials. Care shall be taken to prevent these chemicals from entering water supply systems, potable water supplies, or aquifers; and that they do not endanger plants or animals. The Contracting Officer shall be notified at least 48 hours prior to beginning of treatment and formulating, mixing, and application shall be performed in the presence of the Contracting Officer's representative.

13.9.8 Rates and methods of application shall be in accordance with the manufacturer's instructions on the pesticide label. Maximum application or dosage rates shall be used. If the pesticide contains less than the amount of active ingredient specified on the label, work shall be repeated with pesticides conforming to this specification.

13.9.9 The Contractor shall dispose of residual pesticides and containers off Government property in accordance with label instructions and EPA criteria.

13.9.10 The Contractor shall edit and submit the following UFGS Specification:

02360A SOIL TREATMENT MEASURES FOR SUBTERRANEAN TERMITE CONTROL

13.10 Decay Treatment

The Contractor shall be responsible for determining and implementing the appropriate treatment for prevention of subsurface induced decay.

13.11 Radon Mitigation

The design and construction of foundation walls, slabs, and crawl spaces shall include provisions for the reduction of radon entry and facilitate its removal. Radon mitigation shall comply with the requirements of EPA 402-R-94-009.

13.12 Soil Resistivity Testing

The proposer to whom this contract is awarded shall be responsible for all soil resistivity testing required for cathodic protection design of underground utilities.

13.13 Borrow

Borrow material (if needed) shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from borrow areas on the installation as shown on the Location Plan. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow

excavation. Borrow pits shall be neatly trimmed and drained after the excavation is completed. Borrow materials shall be free of any contaminants. Refer section 0-0800, paragraph 1.9.5 for additional requirements for the borrow area.

14. LANDSCAPE DESIGN

The landscape shall be designed using the Army Installation Design Standards. Graded and scarred areas shall be fertilized and seeded with permanent and temporary seeding. Temporary and permanent seeding used in conjunction with sod shall be used on all 4 to 1 slopes or steeper. Permanent ground cover may also be used for newly grade area. Existing sod not affected during construction shall be protected. Landscaping shall be absolutely minimum maintenance. Planting shall consist predominantly of tree species matching adjacent growth. Refer to Fort Knox list of native species in paragraph 14.3 of this document. Trees shall be planted in a formal pattern to provide shade for the east and west facades, and to highlight the building entrance. Trees shall also be planted in islands designed in the Contractor's parking layout with the intent of breaking up the linear image of the parking lots. Use low type shrubs and ground covers appropriate to the sun orientation of each building. Minimum size for all the shade trees shall be 2-1/2 inch to 3-inch caliper and minimum size for the large shrubs will be 7 gallons. No plantings higher than 6" shall be placed within the 33 feet unobstructed space for each exterior face of building, structural component, or drip-line of a canopy.

14.1 Turf. Temporary and permanent seeding used in conjunction with sod shall be used on all 4 to 1 slopes or steeper. All existing grassed areas not graded or disturbed shall remain sodded. Contractor shall be responsible for proper care and watering of grass from the beginning of the turfing operation and continuing for 3 months after completion of sod placement. New trees and shrubs shall be maintained for a 12-month period after installation. Proper care means watering, fertilizing, cutting and weeding. Trees and shrubs shall require a 1 year warranty and sod shall require a 90-day warranty. Turf preparation shall include eradication of unwanted vegetation with EPA approved weed eradicator and the use of a pre-emergent granular herbicide. Provide for a soil test that includes pH, potassium, phosphorus, calcium, magnesium, nematode count, and soil amendment recommendations (N-PK). Post planting fertilizer for the turf after the sod is rooted shall be applied based on the soil analysis. Grass shall be mowed initially after achieving a 3-inch growth and then twice monthly thereafter.

14.2 Landscape Plantings. Landscaping shall emphasize low maintenance. Mulch shall be shredded cypress or pine bark. Mulch should have a minimum thickness of 4-inch with a weed barrier under the mulch. Solid rubber guys with 2 foot long stakes shall be used to stabilize newly planted trees. Landscaping shall be in accordance with the Army Installation Design Standards.

14.3 Approved Plant List. Large trees and small shrubs at entrances, as defined in the following list shall be consistent with adjacent existing trees and plants. The selection of plant material shall take into consideration that irrigation systems are not allowed in the project.

TALL DECIDUOUS TREES (over 50 ft high when mature)
 Norway Maple (*Acer platanoides*)
 Red Maple (*Acer rubrum*)
 Sugar Maple (*Acer saccharum*)
 White Ash (*Fraxinus Americana*)
 Green Ash (*Fraxinus pennsylvanica*)
 Ginkgo (*Ginkgo biloba*)
 Kentucky Coffee Tree (*Gymnocladus dioica*) --- use male trees only
 Tulip Tree, Tulip Poplar (*Liriodendron tulipifera*)
 Cucumbertree Magnolia (*Magnolia acuminata*)
 Sawtooth Oak (*Quercus acutissima*)
 White Oak (*Quercus alba*)

Swamp White Oak (*Quercus bicolor*)
Shingle Oak (*Quercus imbricaria*)
Bur Oak (*Quercus macrocarpa*)
Chinqua-pin Oak (*Quercus muehlenbergii*)
Pin Oak (*Quercus palustris*)
Willow Oak (*Quercus phellos*)
Red Oak (*Quercus rubra*)
Bald Cypress (*Taxodium distichum*)

TALL EVERGREEN TREES (over 50 ft high when mature)

Norway Spruce (*Picea abies*)
White Pine (*Pinus strobes*)
Douglas Fir (*Pseudotsuga menziesii*)
Canadian Hemlock (*Tsuga Canadensis*)

MEDIUM DECIDUOUS TREES (25-50 ft high when mature)

Paperbark Maple (*Acer griseum*)
Red Horse Chestnut (*Aesculus x carnea*)
Downy Serviceberry (*Amelanchier arborea*)
Shadlow Serviceberry (*Amelanchier Canadensis*)
Apple Serviceberry (*Amelanchier grandiflora*)
Allegheny Serviceberry (*Amelanchier laevis*)
Yellow Birch (*Betula alleghaniensis*)
River Birch (*Betula nigra*)
American Yellowwood (*Cladrastis kentukea*)
Franklin Tree (*Franklinia alatamaha*)
Green Ash (*Fraxinus pennsylvanica*)
Carolina Silverbell (*Halesia caroliniana*)
Two-winged silverbell (*Halesia diptera magniflora*)
Golden Raintree (*Koelreuteria paniculata*)
Sweet Bay (*Magnolia virginiana*)
Hop Hornbeam (*Ostrya virginiana*)

MEDIUM EVERGREEN TREES (25-50 ft high when mature)

White Fir (*Abies concolor*)
Hinoki Cypress (*Chamaecyparis obtuse*)
Foster No. 2 Holly (*Ilex attenuate*)
American Holly (*Ilex opaca*)
Lacebark Pine (*Pinus bungeana*)
Upright Japanese Yew (*Taxus cuspidate*)

SMALL DECIDUOUS TREES/LARGE SHRUBS (10-25 ft high when mature)

Amur Maple (*Acer ginnala*)
Japanese Maple or Fullmoon Maple (*Acer japonicum*)
Bottlebrush Buckeye (*Aesculus parviflora*)
Dwarf River Birch (*Betula nigra*)

Fountain Buddleia (*Buddleia alternifolia*)
 Pagoda Dogwood (*Cornus alternifolia*)
 Flowering Dogwood (*Cornus florida*)
 Kousa Dogwood (*Cornus kousa*)
 Border Forsythia (*Forsythia intermedia*)
 Panicle Hydrangea (*Hydrangea paniculata*)
 Possum Haw (*Ilex decidua*)
 Finetooth Holly (*Ilex serrata*)
 Saucer Magnolia (*Magnolia soulangiana*)
 Star Magnolia (*Magnolia stellata*)
 Sweet or Smooth Deciduous Azalea (*Rhododendron arborescens*)
 Smooth Sumac (*Rhus glabra*)
 Common Lilac (*Syringa vulgaris*)
 Burkwood Viburnum (*Viburnum burkwoodii*)
 Fragrant Viburnum (*Viburnum carlcephalum*)
 Arrowwood Viburnum (*Viburnum dentatum*)
 Nannyberry Viburnum (*Viburnum lentago*)
 Cranberry Bush Viburnum (*Viburnum opulus*)
 Doublefile Viburnum (*Viburnum plicatum*)
 Black Haw (*Viburnum prunifolium*)
 Southern Blackhaw (*Viburnum rufidulum*)

EVERGREEN TREE/LARGE SHRUB (10-25 ft high when mature)

Buxus sempervirens

Hinoki Cypress (*Chamaecyparis obtusa*)
 Japanese Holly (*Ilex crenata*)
 Mountain Laurel (*Kalmia latifolia*)
 Dwarf Albert Spruce (*Picea glauca*)
 Azalea (*Rhododendron*)
 Japanese Yew (*Taxus cuspidate*)
 Canadian Hemlock (*Tsuga Canadensis*)

MEDIUM DECIDUOUS SHRUBS (6-10 ft high when mature)

Japanese Maple (*Acer palmatum*)
 Japanese Barberry (*Berberis thunbergii*)
 Orange-Eye Butterfly Bush (*Buddleia davidii*)
 Flowering Dogwood (*Cornus florida*)
 Yellow Twig Dogwood (*Cornus sericea*)
 Burning Bush (*Euonymus alata*)
 Border Forsythia (*Forsythia intermedia*)
 Oakleaf Hydrangea (*Hydrangea quercifolia*)
 Winterberry (*Ilex verticillata*)
 Privet (*Ligustrum vulgare*)
 Rosegold Pussy Willow (*Salix gracilistyla*)
 Spirea (*Spiraea nipponica*)

Mapleleaf Viburnum (*Viburnum acerifolium*)
Koreanspice (*Viburnum carlesii*)
Judd Viburnum (*Viburnum juddii*)
Weigela (*Weigela florida*)

MEDIUM EVERGREEN SHRUBS (6-10 ft high when mature)

Blue Holly (*Ilex x meserveae*)
Oregon Grape (*Mahonia aquifolium*)
Leatherleaf Mahonia (*Mahonia bealei*)
Dwarf White Pine (*Pinus strobus*)
Taxus cuspidata
Yew (*Taxus media*)
Canadian Hemlock (*Tsuga Canadensis*)

SMALL DECIDUOUS SHRUBS (4-5 ft high when mature)

Glossy Abelia (*Abelia grandiflora*)
Golden Japanese Barberry (*Berberis thunbergii*)
Rock Cotoneaster (*Cotoneaster horizontalis*)
Hills-of-Snow (*Hydrangea arborescens*)
Ilex verticillata
Potentilla fruticosa
Pyracantha (*Pyracantha coccinea*)
Azalea (*Rhododendron*)
Littleleaf Lilac (*Syringa microphylla*)
Dwarf Cranberrybush Viburnum (*Viburnum opulus*)
Compact American Cranberry Bush (*Viburnum trilobum*)

SMALL EVERGREEN SHRUBS (4-5 ft high when mature)

Boxwood (*Buxus microphylla*)
Buxus sempervirens x *B. microphylla*
Ilex crenata
Inkberry (*Ilex glabra*)
Maryland Dwarf American Holly (*Ilex opaca*)
Juniperus chinensis
Picea abies (Dwarf forms of spruce)
Picea pungens (Dwarf forms of Colorado Spruce)
Mugo Pine (*Pinus mugo*)
Dwarf Scots Pine (*Pinus sylvestris*)
Starry Night Rhododendron (*Rhododendron*)
Spreading English Yew (*Taxus baccata*)
Taxus cuspidate
Gentsch White Canadian Hemlock (*Tsuga canadensis*)

LOW DECIDUOUS SHRUBS (2-3 ft high when mature)

Berberis thunbergii
Early Cotoneaster (*Cotoneaster adpressus*)

Azalea (Rhododendron)
Coast or Dwarf Deciduous Azalea (Rhododendron atlanticum)
Spirea (Spirea x bumalda)
Japanese Spirea (Spirea japonica)

LOW EVERGREEN SHRUBS (2-3 ft high when mature)

Dwarf Balsam Fir (Abies balsamea)
Hinoki False Cypress (Chamaecyparis obtusa)
Compact Juniper (Juniperus horizontalis)
Savin Juniper (Juniperus sabina)
Juniper (Juniperus squamata)
Dwarf Norway Spruce (Picea abies)

DECIDUOUS GROUND COVERS (up to 18 inches high when mature)

Big Blue Lilyturf (Liriope muscari)
Alpine Spirea (Spiraea japonica)

EVERGREEN GROUND COVERS (up to 18 inches high when mature)

Purple Wintercreeper (Euonymus fortunei)
Shore Juniper (Juniperus conferta)
Creeping Juniper (Juniperus horizontalis)
Blue Forest Savin Juniper (Juniperus sabina)
Groundcover Azalea (Rhododendron)
Periwinkle (Vinca minor)

CLIMBING VINES

Sweet Autumn Clematis (Clematis paniculata)
Clematis (Clematis)

15. IRRIGATION SYSTEM

The project shall NOT include an operating lawn and landscape irrigation system.

16. UTILITY LAYOUT

Coordination of all site work on the project, including utility work, is the responsibility of the Contractor. It is the Contractor's responsibility to confirm the specific locations of the existing utilities and to design and construct new utility distribution and services for the new building. All utilities, including electrical service, telephone, cable TV and gas shall be installed underground. New underground utility lines, including appurtenant structures such as valve boxes, manholes, vaults, etc., shall not be located under pavement, road shoulders or drainage ditches to the maximum extent practicable. Unless otherwise approved, placing utilities and culverts under Spearhead Division Avenue and Eisenhower Avenue shall be by jack and bore (no open cuts).

16.1 Backflow prevention valves, post indicator valves, transformers, electric switches, telephone/cable boxes, manholes etc., shall be located in locations not immediately apparent to the facility users or personnel passing by the site. New utility lines shall not be located within 6 feet of the footprint of any future building as shown on the site.

16.2 Marking of Utility Lines: Utility lines shall be marked with plastic marking tape. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.01 mm. Tape shall have a minimum strength of 1800 psi lengthwise and 1500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 40 in deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Warning tapes shall be installed directly above all buried pipes or wires, at a depth of 18 inches below finished grade. Tape color shall be as specified below and shall bear a continuous printed inscription describing the specific utility.

Tape Color:

Red:	Electric
Orange:	Telephone, Telegraph, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems
Yellow:	Gas, Dangerous Materials

16.2.1 Tracer Wire. In addition to the plastic marking tape, tracer wire shall also be provided for all new underground utilities. Tracer wire shall be provided for all pipelines, including force mains but excluding storm drain and sanitary sewer lines. Tracer wire shall be provided for all electrical and communication conduits, direct buried cables and gas. Tracer wire shall be installed on the bottom of the trench just to one side of where the pipe, conduit, or cable contacts the trench bottom. The wire shall run continuously between and terminate at valve boxes on water and gas lines, regulator stub-ups on gas lines, sprinkler heads and valve boxes on sprinkler system lines, panel boxes on electrical lines, and other such aboveground appurtenances. Each end of the wire shall have an additional length of at least 0.6 m (2 feet) coiled up in the appurtenance. Tracer wire shall be insulated No. 12 AWG solid copper and of a type specifically manufactured for locating underground utilities. Insulation shall be solid yellow in color. Tracer wire shall be subject to approval by the Contracting Officer.

16.3 Metering. Meters shall be provided at each building where water, gas and electricity are connected to post distribution lines. Water, electrical, and natural gas meters shall be BACnet compatible to transmit usage data to the existing Fort Knox digital control system. Meters, interface devices and programming of the existing host shall be furnished as required to accomplish complete utility metering and remote usage monitoring as required by Fort Knox utility managing agency.

17. PERMITS

17.1 General. The Contractor shall determine permit requirements as part of the design process and shall submit permit draft applications as part of the submittal process (see Appendix F for known permit requirements at the time of the development of the RFP). Contractor shall be responsible for determining all permits required for the project and for all fees required to obtain the permits.

18. STORM DRAINAGE

18.1 The site storm drainage system, including any reused sections of the existing storm drainage system, shall be designed for a 10-year return storm frequency. No ponding shall occur for the 10-year event. Storm drainage system design shall be checked for a 100-year return event to ensure no flooding or adverse impacts downstream. The need for detention shall be determined by comparing pre-demolition conditions of the area (before the previous buildings in the 6700 block were demolished) with post-construction conditions (see drawing sheet C203). Storm drainage design shall be in accordance with

TM-5-820-4. Site grading shall be designed and constructed such that no ponding of water is allowed. New or relocated storm sewer systems shall be sized to accommodate total buildout of the 6700/6800 block (area bordered by N. Huron St., Eisenhower Ave., Regiment Ave., and Spearhead Division Ave.) and the existing drainage area north of Eisenhower Ave. that is piped through this area (see drawing sheets C101 and C202).

18.2 The storm drain collection system may consist of grassed swales, concrete inlet drop or curb inlets, concrete headwall and pipe systems. Stormwater collected within the boundaries of the force protection berms shall be conveyed to the existing storm system via pipe – walks or roadways shall not be used as outlets for collected stormwater. The proposed system shall tie to the existing grassed ditches or pipe systems. Minimum pipe velocities shall be 2.5 feet per second and the maximum shall be 10 feet per second for fully coated fully paved corrugated metal pipe and 15 feet per second for concrete pipe. The minimum pipe size for an open pipe system (culvert) shall be 18 inches and 15 inches for a closed system.

18.3 The allowable pipe types shall include concrete pipe, Type III or IV, or fully coated fully paved corrugated metal pipe as required. Pipe joints shall be water tight with gaskets.

18.4 Concrete inlets/catch basins may be poured in-place concrete or precast concrete. Metal grates or manholes shall be galvanized. Precast manhole or inlet rings shall connect with industry standard gaskets. Storm drain pipes shall be grouted into the concrete structures to provide a watertight connection.

18.5 New storm drainage pipes shall be installed to intercept all storm drainage flow from existing pipes draining onto the project site. The new storm drainage pipe will be sized to handle flow from the existing storm drainage pipe as well as runoff directed to the new pipe from the project site. Existing pipe flow will be determined by using post mapping and the Site Development Concept Plan with the rational formula method. Detention, if required for this project, will be sized to handle storm water for the DFAC with space reserved for detention for the future Basic Combat Training Complex around it.

18.6 Building downspouts shall connect to an underground storm drain collection system.

19. WATER AND WASTE WATER

19.1 The Contractor shall design and construct the new water distribution and wastewater collection system for the new complex while maintaining service to existing buildings to remain. Provide water service lines and connection to the existing water mains. The Contractor shall also provide new wastewater building laterals and connection to the existing sanitary sewerage system. The sewage facilities shall be designed and constructed in accordance with the criteria contained herein. Placement of a buried utility main under a new building shall not be allowed. Minimum earth cover for the new utility lines will not be less than 30 inches. Contractor shall comply with all state requirements.

19.2 Water Supply For Domestic Water

19.2.1 The water distribution system shall be designed in accordance with the 1997 edition of the Recommended Standards for Water Works (Ten State Standards). Ductile iron pipe shall be used.

19.2.2 Service lines for the DFAC shall connect to the 14" main in the Spearhead Division Avenue

19.2.3 Existing buildings that are to remain in service are shown in the drawings. The Contractor shall coordinate the design with Fort Knox to ensure that service is maintained to the buildings to remain.

19.3 The mains shall be designed and installed in accordance with NFPA 24 and applicable AWWA standards. Water mains shall follow existing streets or utility corridors. The design shall limit installation beneath pavement. No valves shall be placed under asphalt pavement.

19.4 Design of the service lines shall be in accordance with the Kentucky State Plumbing Code, International Plumbing Code and applicable AWWA standards. No corporation stop only valve shall be installed near the point of connection to the main. Water service lines shall be equipped with suitable meters. Metering of fire service lines is not required.

19.5 Water Supply for Fire Protection.

19.5.1 Interior and outside fire protection shall be designed in accordance UFC 3-600-01. Hydrants shall be consistent with Fort Knox Fire Department requirements. Fire hydrant flow test data from hydrants in the vicinity of the site follows. The tests were completed 06 March 2004 by the Fort Knox Fire Department. Refer to site utility drawings for hydrant locations.

Hydrant #713
Static pressure, psi: 80
Residual pressure, psi: 50
GPM: 1868

Hydrant #715
Static pressure, psi: 85
Residual pressure, psi: 52
GPM: 1927

Hydrant #716
Static pressure, psi: 90
Residual pressure, psi: 78
GPM: 2757

Hydrant #725
Static pressure, psi: 92
Residual pressure, psi: 80
GPM: 2706

From these data and the specific fire protection requirements, the Contractor shall determine the need for additional water supply components such as fire pumps, water storage, or new connection to off-site water mains (perhaps several blocks from the building site).

19.5.2 The Contractor shall provide the required water flow and pressure for buildings fire demand. Fire pumps and storage shall be provided as required to meet the required water demand. Connection to off-site water mains shall be considered the most desirable solution to water supply needs. Fire pumps (if required) shall be designed and installed in accordance with NFPA 20. Water storage (if required) shall be designed and installed in accordance with AWWA D100.

19.5.3 The fire sprinkler supply line shall include a post indicator valve with a tamper switch wired to the building fire alarm panel and assembly backflow prevention device equipped with a flow detection meter. The backflow prevention device is located in the building when possible.

19.6 Wastewater.

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19.6.1 The wastewater collection and conveyance system shall be designed in accordance with the 1990 edition of the Recommended Standards for Wastewater Facilities (Ten State Standards). This includes

the requirement that the waste plumbing be collected for a block of units and then run to the outside of the building as opposed to running the sewer longitudinally within the building. *2

19.6.2 All waste water conveyance shall be by gravity.

19.6.3 The wastewater conveyance system shall comply with all the above requirements and shall be compatible with the wastewater to be conveyed. The materials specified shall withstand the effects of the wastewater and not deteriorate as a result of pollutants in the wastewater. PVC piping and concrete manholes shall be used.

19.6.4 Existing buildings that are to remain in service are shown in the drawings. One sewer line relocation is anticipated for the DFAC project as shown on the drawings. The contractor shall coordinate the design with Ft. Knox to ensure that services are maintained to buildings that are to remain.

20 MECHANICAL UTILITIES

20.1 Gas Distribution System: An adequate supply of natural gas is available adjacent to the project site in Eisenhower Ave. and Spearhead Div. Ave. as indicated on the gas distribution site drawings. Connection to the existing main is to be made with the line under full pressure; no outage of service to existing facilities. Gas distribution system shall comply with the requirements of NFPA 54, National Fuel Gas Code. When connecting to existing steel piping system, provision shall be made to ensure that the integrity of the cathodic protection is not compromised. Plastic gas shutoff valves and valve boxes shall not be used. Gas valves shall be provided in a valve box at the tie-in point to the existing gas distribution system. Provide a gas meter at the building designed in accordance with local codes, utility company requirements and installation requirements. The gas regulator and meter assembly shall be located at least 15 feet from the air intakes. The building service entrance shall be installed at a height sufficient to allow for installation of the gas meter. Installation of gas piping shall be in accordance with manufacturer's recommendations and applicable sections of ASME B31.8, and the AGA Manual, and 49 CFR 192. UFGS Specification Section 02556 Gas Distribution System, shall be the basis for the gas distribution system specifications. Metallic underground gas piping shall not be used. Aboveground gas piping shall be steel. Gas mains and service lines shall be graded. Mains and service lines shall have 24-in minimum cover; and both mains and service lines shall be placed on firmly compacted select material for the full length. Where required, and at street crossings, gas piping shall be encased or designed to withstand any anticipated external loads as specified in ASME B31.8. Jack-and-bore method shall be used for routing gas piping under all existing streets. Saw-cutting of streets is not allowed, unless otherwise approved by the Contracting Officer.

20.1.1 Drips shall be installed at the low points, immediately following reduction from high pressure to medium pressure (at supply points) and at occasional low points throughout the system to provide for blowing out the lines.

20.1.2 Plug valves shall be installed so that interruptions to service can be confined to the building.

20.1.3 Service lines shall not be placed under any buildings. Lines shall be placed with a minimum of 2 feet of earth cover. Vented protective casings shall be provided to protect lines from superimposed street or heavy traffic loads. Tracer wire shall be installed with polyethylene piping. Tracer wire shall be terminated in valve box and at riser. The Contractor shall relocate any portion of the existing gas main required to construct the new facility to comply with the directives found in this paragraph.

21. ARCHITECTURAL DESIGN REQUIREMENTS

21.1 General. Design buildings to enhance the visual environment of the Installation and to be compatible with the immediate local context. Comply with the Army Installation Design Standards, and Louisville District Design Guide for Military Construction, which includes brick walls, standing seam metal roof and recessed glazing in bands under broad eaves for solar shading. The exterior shall be designed for durability and attractiveness with minimal required maintenance. Use exterior elements such as colonnades, porticos, entry porches and material detailing to provide human scale and to define the main public entrance of each building. Use durable interior materials and furnishings that can be easily maintained and replaced. Use interior surfaces that are easy to clean and light in color. Avoid trendy or bright color schemes. The design shall not permit opportunities for bird roosts. Any modifications to the standard design shall take this into consideration.

21.2 Applicable Codes And Standards. Applicable codes and standards are listed in Appendix "A" to this section.

21.3 ACCESSIBILITY.

Comply with both ADAAG and UFAS. Where these criteria conflict, the most stringent requirement shall apply. The DFAC is handicapped accessible except for the exterior entries to the toilets, which are for active-duty military use only and are not required to be accessible (these toilets, including interior access to them, are handicapped accessible).

21.4 Sustainable Design. This project has a goal of achieving at least 50 points using the SPIRIT Project Rating Tool for Sustainable Design for each building type. Architectural contributions include building envelope characteristics, solar control and daylighting, views, indoor air quality, environmentally preferable materials selections, salvage/reuse opportunities, waste reduction, and close collaboration with all team members and User to synthesize successful sustainable design solutions. (See paragraph 30)

21.5 Construction Type, Fire Protection and Life Safety. These facilities shall comply with UFC 3-600-01. UFC 3-600-01 requires compliance with IBC for construction type, occupancy separation and features related to location on property. It requires compliance with NFPA 101 for egress and life safety. It also contains specific requirements contained in the document itself. Minimum IBC Construction Types (based on the floor plans included in this solicitation) for the DFAC is as follows.

See Appendix "C" for additional code analysis information.

21.6 Gross Area. The gross area of these facilities shall not exceed the following, measured in accordance with TI 800-1:

Standard BCT Complex Dining Facility gross area 35,313 square feet minimum. Area may be increased to 35,736 square feet maximum to accommodate a mechanical mezzanine within attic space. These figures exclude the square footage of the canopy areas.

The information shown below is an overview of gross area calculation requirements. Refer to TI 800-1, Chapter 5, paragraph 1.c for specific instructions.

21.6.1 Enclosed Space. The area of all enclosed spaces as determined by the outside dimensions of the building. Includes basements, mezzanines, penthouses and usable attic spaces.

21.6.2 Half Space. Covered usable exterior spaces are included. One-half of the actual area of these spaces will be included in the gross area. Includes canopies, covered balconies, porches, loading docks, stairs, ramps and breezeways. (For purposes of code analysis, these spaces will be considered for their full areas rather than half space.) Detached covered usable spaces that are not physically connected to and contiguous with the building are considered site structures and are not included in building gross area.

21.6.3 Excluded Space. Open paved areas; roof overhangs and soffits for weather protection; uncovered ramps; uncovered stoops; covered unpaved areas; crawlspaces and utility tunnels and raceways will be excluded from the gross area.

21.7 Exterior Construction. These facilities shall be designed and constructed to provide a watertight durable facility consistent with industry standards and compliant with model building and energy codes. Appearance, materials and colors shall comply with the IDG. The following paragraphs are an overview of the exterior construction requirements.

21.7.1 Exterior Walls.

21.7.1.1 Primary exterior wall finish (minimum 90% of all walls) shall be brick veneer. Jumbo brick is not acceptable. Color of the primary finish brick, "Knox Blend" manufactured by Carolina Ceramics is the preferred brick for Fort Knox. Similar brick blends may be used if approved by Fort Knox DBOS. All brick shall be from same lot to maintain consistency. Preferred mortar color is a light tan to match historic buildings at Fort Knox. Accent finish may be darker color brick, concrete, precast concrete/cast stone, or split-face concrete masonry units. EIFS is not permitted. Single wythe masonry walls are not permitted. Composite wall construction (grout-filled cavity between wythes) is not permitted. A 1½ inch air space is required between masonry veneer and backup walls. Brick shall not be sealed. Exposed wood is not permitted. A sample masonry panel per UFGS is required. Louvers shall be prefinished, storm-resistant profile and shall have enclosed drainable sill pan and bird screen. Joint sealants used at building exterior shall have a service life for the exposure condition of at least 10 years, retaining elasticity and seal. All flashings shall be asphalt coated copper.

21.7.1.2 Cold bridges shall not be allowed anywhere on the exterior wall including at concrete floor slab and foundation wall

21.7.2 Roof. Roofs shall be hip roofs pitched minimum 4:12 slope as shown on the Standard BCT Complex design drawings for the DFAC. See 21.7.2.1 for DFAC roof requirements. Gable roofs are not permitted except for dormers having no exterior wall finishes located in hip roof for louvers or glazing. Roof covering shall be standing seam metal roof system (architectural or structural). Standing seam metal roof shall have concealed clip fastening system and be warranted per UFGS 07416a/07412a, manufacturer's 20 year weathertightness warranty is required. Two inspections by manufacturer's representative during roof installation are required. Exposed fasteners are not permitted at roofing system. Roof color shall be a darker color similar to the new Army Reserve Center at the Post. Exposed wood is not permitted. Pre-finished metal gutters, downspouts and fasciae with 20-year manufacturer's finish warranty are required. Gutter and downspout size and support shall be designed per SMACNA recommendations. Both gutter brackets and straps shall be secured to solid wood blocking with 2 screws per bracket/strap. Metal thickness and size of gutter brackets and straps shall be per SMACNA recommendations. Concealed gutters are not permitted. Roof detailing shall be in accordance with NRCA Roofing and Waterproofing Manual recommendations and standard details. Joint sealants used at building exterior shall have a service life for the exposure condition of at least ten years, retaining elasticity and seal. All gutters, downspouts, roof penetrations and roof-mounted items including fasteners for all of these shall match roof color. Include in technical proposal a roof plan and building elevations that show, to scale, all equipment on exterior walls and roof.

21.7.2.1 DFAC Roof. For DFAC roof, no low-slope roof is permitted. Entire roof must meet the requirements in paragraph 21.7.2. The following requirements also apply:

- a. The only mechanical equipment permitted to be mounted on the roof is upblast exhaust fans. It is preferred that mechanical equipment is not placed on the roof. If roof-mounted upblast exhaust fans are used, location on the loading dock side of the building is preferred to minimize adverse aesthetic impact.
- b. Provide permanent access (catwalk or similar) and sufficient clearance to all equipment for both routine maintenance and replacement without requiring demolition.

- c. Access to perform routine maintenance etc. to equipment located in attic is limited to mechanical room only. Ceiling access panels will not be permitted.

21.7.3 Insulation. Provide a complete thermal envelope. Glass mat gypsum board sheathing is the preferred sheathing material. All water and sprinkler pipes must be inside the thermal envelope. Insulation shall not be placed directly on acoustic tile ceiling panels.

21.7.4 Exterior Building Signage. Provide exterior signage per Army Installation Design Standards.

21.7.5 Exterior Glass And Glazing. All exterior glass and glazing must be treated for fragment retention. Single glazing and the inner pane of insulated glass assemblies in exterior walls shall be a minimum 1/4 inch thick annealed laminated glass with 0.060 inch polyvinyl butyral (PVB) interlayer. To ensure that the full strength of the PVB interlayer is engaged, frames, mullions and window hardware shall be designed to resist a static load of 1 lb per square inch applied to the surface of the glazing. Glazing shall have a minimum frame bite of 3/8 inch for structural glazed window systems and 1 inch for window systems that are not structurally glazed. Reflective (mirror) glass finish is not permitted.

21.7.6 Windows including Storefront and Curtainwall. Revisions to fenestration to comply with Army Installation Design Standards must result in no less than the same amount of glass area in each space as that shown on the Standard BCT Barracks drawings. Do not provide windows in spaces shown windowless on the Standard BCT Barracks drawings. All windows shall be non-operable. Curtain wall is permitted. Windows shall have prefinished commercial grade aluminum frames with Architectural Class I anodic or high performance organic coating finish and thermal breaks. Windows shall be Performance Class HC. All operable windows shall have locks and insect screens. Windows, mullions and hardware shall be designed to resist a static load of 1 lb per square inch applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of unsupported member length. The glazing shall have a minimum bite of 3/8 inch for structural glazed window systems and one inch for window systems that are not structurally glazed. Frame connections to surrounding walls shall be designed to resist a combined loading consisting of a tension force of 200 lbs/in and a shear force of 75 lbs/in.

21.7.7 Exterior Doors. All storefront doors shall be medium or wide stile. All other exterior personnel doors and frames shall be painted insulated hollow metal. All exterior hollow metal frames shall be welded type construction. All exterior hollow metal doors and frames shall be galvanized.

21.7.8 Coordinate sizes and locations of louvers in exterior walls with window and doors openings as well as with minimum interior ceiling heights. Maintain AT/FP requirements for heights of applicable louvers.

21.7.9 Vehicle Barriers. Provide vehicle barriers at the main entrance to the DFAC.

21.8 Interior Construction. The following paragraphs are an overview of the interior construction. See also paragraph 22, Structural Interior Design.

21.8.1 Room sizes shown on the floor plans and in Appendix "B" are minimum net area. Adjustments to room sizes may be acceptable if furnishing and functioning of the rooms are unaffected.

21.8.2 Finishes. Sustainable design considerations shall be incorporated into finish selections and building aesthetics.

21.9 Doors

21.9.1 All interior doors shall be hollow metal except where noted in the Fort Jackson drawings. All exterior metal doors and frames and those exposed to high moisture, splashed water or other conditions conducive to rust shall be galvanized.

21.9.2 Door Hardware. Locksets at the DFAC shall have levers that meet the requirement of ADAAG. Lock trim shall not be aluminum. Lock trim shall be 400 series stainless steel at wet areas. Locksets shall not have plastic working parts. Locks shall be provided to accommodate interchangeable cores. Fort Knox Post locksmith will install final cores. Cores shall be purchased by contractor and shipped to the Post locksmith. Preferred manufacture is "Best"

21.9.3 All exterior overhead coiling doors shall be operated by an electric operator.

21.10 Suspended Ceiling Systems and Overhead Mounted Architectural Features. All suspended ceiling systems and other overhead mounted architectural features will be mounted so that they resist forces of 0.5 times the component weight in any direction and 1.5 times the component weight in the downward direction.

***2**

21.11 All interior walls shall be metal stud / gypsum board or CMU. If gypsum board is used as a finish material, it shall be impact resistant where exposed (floor to ceiling). Gypsum board used in wet locations shall be moisture resistant and impact resistant. Impact resistant gypsum board shall be suitable as substrate for specified finish.

21.11.1 Impact Resistant Gypsum Board shall be a glass-mat, mold & mildew resistant interior wall panel: ASTM C 1177, coated inorganic glass mat-faced back and paper-faced front, enhanced mold and mildew resistant gypsum core wallboard. Conforming to the physical properties of ASTM C 36 and ASTM C 1177 on glass mat back. Glass Mat Back receives a rating of 10 "No Mold Growth" as tested for 4 weeks according to ASTM D 3273. ***2**

21.12 A double door should be added between Vestibule (Room 134) and Vestibule (Room 144) Room numbers refer to standard design drawings. See Paragraph 28.24.3 for note regarding additional air curtains.

21.13 Air curtains should be used in lieu of plastic strip curtains at all walk-in freezer and refrigerator doors.

21.14 The Waste Pulp Room (136) shall be located at an elevation that does not require a ramp, lift, or retaining wall to navigate between the interior slab elevation of the room and outside grade leading to dumpster. A 4" high curb shall be added in front of the extractor to control the water. See the Fort Jackson drawings for layout of the curb.

21.15 Instructions for the operation of the pulper shall be included in the O & M Manual provided to the owner who may in turn provide to the kitchen equipment operators.

21.16 All toilet and urinal partitions shall be constructed of phenolic plastic and shall be floor to ceiling mounted. Coordinate door swing with partition mounted toilet accessories.

21.17 All vanities shall be solid surfacing with integral bowls.

21.18 Provide recessed walk-off mats. See Fort Jackson drawings for preferred size and location of mats.

21.19 Coordinate concrete slab heights with finish flooring material to minimize transition heights between different finish flooring materials, especially between quarry tile and VCT.

21.20 Mop racks at janitors closets shall be a prefabricated stainless steel one piece unit with integral shelf, cleaning rack hooks and ratchet type mop holders.

21.21 Janitors closet shall have moisture resistant gypsum board throughout. Use a ceramic tile wainscot in areas subject to excessive water and other liquids.

21.22 Entry hand wash areas. Consideration shall be given to coordination of location of soap dispensers, paper towel holders and trash receptacles.

21.23 Bumper and corner guards shall be provided in kitchen and serving area. See Fort Jackson drawings A-111 and A-112 for locations of the bumper guards. Bumper guards shall also be provided in the bread storage area.

21.24 Lockers in locker area shall be two tier high so that the quantity of lockers indicated on the standard design drawings may be doubled.

21.25 Material for ceilings in latrines, showers and other high moisture is preferred to be plaster. Water resistant gypsum board and vinyl faced gypsum backed suspended systems with aluminum grid may be considered. Access panels shall be provided in a plaster or finished gypsum board ceiling to allow direct access to all valves, controls or other items that may require maintenance.

21.26 Refer to food service and kitchen equipment plans and schedules for information specific to those areas.

21.26.1 Contractor to provide permanent, removable protection for CO2 tank located on the dock to prevent damage from material handling equipment.

21.26.2 The size of the backsplash at the soiled and clean drain board on the power soak is to be 18".

22. INTERIOR DESIGN

22.1 Structural Interior Design.

22.1.1 Definition. The Structural Interior Design (SID) shall involve the selection and sampling of all applied building related finishes necessary to complete the buildings interior and exterior architecture. The SID submittal shall be submitted concurrent with the architectural design submittals. The SID requirements and format shall be in accordance with the Louisville District Comprehensive Interior Design presentation requirements found in Appendix J of the Louisville District Design Guide for Military Construction.

22.1.1.1 All significant interior finishes shall be required to be part of a pilot installation or mock-up for review, inspection by the COR before general installation takes place.

22.1.2 In general, the SID should reflect a transitional, professional image. Wall colors throughout the facility shall be a neutral color that will enhance accent colors in the existing furniture related items. Accent walls will not be approved for private offices. Accent walls will not be approved except for the lobby and in the dining area. The cove base and door trim shall be a neutral color and shall be consistent throughout the facility. Interior stain colors and finishes shall be consistent throughout the facility. All finishes are to be Class A. This section covers only the general color and minimum characteristics of the exterior and interior materials and products that are exposed to view in the finished construction. The word "color" as used herein includes surface color and pattern. Requirements for quality and method of installation are covered in appropriate sections of the specifications herein and which the General Contractor will submit after award. Specific locations where the various materials are required will be indicated during the Predefinition Conference, Part 1 and Part 2, Section 01021 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD. The Contractor shall propose all colors not listed in the Contractor produced Section 09915, COLOR SCHEDULE or appropriate color and finish schedules shown on the drawings.

22.1.2.1 Tile Base - Except where noted, in all rooms with both wall tile and floor tile are used. The cove base shall match the floor tile material and color rather than the wall tile

22.1.2.2 Wall Base - Vulcanized rubber wall base shall be used in lieu of vinyl. Roll goods shall be used to minimize joints. Do not use pre-formed outside corners.

22.1.2.3 Corner Guards - Flush mounted corner guard shall be used throughout facility including all columns and corners in Kitchen and Serving areas. Coordinate height and mounting depth with finish wall material to ensure a 'flush' condition, especially at tile walls and wainscoting. Use a metallic finish or neutral color throughout to minimize visual obtrusiveness.

22.1.2.4 Vanity mirrors shall be attached same wall surface (gypsum board, CMU) as adjacent wall tile. Cut and install tile around mirror.

22.1.2.5 Floor Finish. Select a quarry tile that is slip resistant and will not discolor significantly especially with consideration to area around deep fat fryer. Porcelain tile shall be used in Dining areas. No carpet shall be used in the DFAC. Neither carpet nor stained concrete shall be used in the DFAC.

22.1.2.6 Consideration shall be given to providing acoustical dampening. The finishes described are hard and reflective contributing to a very noisy dining hall, especially considering the potential number of occupants.

22.1.2.7 Plywood. Where plywood is used as interior finish material, use matching edge banding at any exposed plywood edges.

22.1.2.8 Window blinds shall be specified with non-standard, specific cord and wand lengths so the blinds can be operated easily. Provide horizontal window blinds at all exterior windows and storefront except the following locations Dining Facility vestibules 101, 110, 112 and 115. Window blinds are not required in sleeping bays.

22.1.3 Signage Requirements. Interior signage is an important item that is to be fully integrated with the architecture and building related finishes. All signage shall be in accordance with the Department of the Army technical manual, Signage, TM 5-807-10. All signs are to be from one manufacturer and shall match in color and style. All room sign copy is to be Helvetica medium with a ratio of height and width to meet Americans with Disabilities Act (ADA) requirements. Signs are to be provided for all interior doors. Installation shall be wall mounted, on the latch side of the door with the center of the sign installed 60 inches above the finish floor and 6 inches from the outside edge of the metal door frame. Where conditions do not allow signs to be mounted directly adjacent to the door, install signs on the wall at the nearest point to the latch side. Signage for general office areas shall be a modular plaque format with a minimum of three insert slides. All signs are to have a changeable room number sign. All signs are to be a minimum overall dimension of 8 inches wide and 6 inches high. Copy for the first slide is to have a changeable integral, tactile, raised room number with corresponding, Grade 2 Braille indicating the room number. The second two slides are to be window insert slides to accommodate personnel changes or room name changes. Mechanical rooms and other building system room and service support rooms including restrooms are to have permanent room signs with copy that has raised room numbers and permanent room names. Copy is to be raised, tactile, letters and Grade 2 Braille indicating the room number and room name. All signs are to be permanently and mechanically attached to the building. Double-sided tape will not be accepted. Signage message shall be coordinated with the Government/user before ordering or installation. Provide Emergency Egress sign plaques that indicate "YOU ARE HERE" and the path of egress. These signs are to be fully coordinated with the Fort Knox Fire Chief (Marvin Gunderson, 502-624-6016) at the 100% review submittal design phase and before fabrication and installation. The Fire Chief is to review the correct placement and quantity of these signs within the building and also review the proposed path of egress that will be graphically illustrated on the sign. Suggested placements for these signs are to be determined before installation. See architectural drawings for details and schedules.

22.1.4 Reference To Manufacturer's Color and Product. The manufacturers' names and their products referenced only indicate the color, texture, and pattern required for the materials listed. Where color and product is shown as being specific to one manufacturer, an equivalent product/color may be submitted for approval. The products furnished shall meet the color, texture, and pattern indicated as well as the material quality and performance specified in the applicable technical sections.

22.1.4.1 Color Schedule. The color schedule in 09915, COLOR SCHEDULE will list the colors, patterns and textures and products for exterior and interior finishes, including both factory applied and field applied colors. Section 09915 may be part of the Contractor-prepared design documents after award or information may be shown on appropriate color and finish schedules on the drawings.

23. COMPREHENSIVE INTERIOR DESIGN (CID)

23.1 The preparation of the Comprehensive Interior Design is part of the base bid.

23.2 Definition. The CID shall involve all the furniture-related components necessary to complete the interior environment. The necessary components shall include all loose furniture/furnishings/artwork.

23.3 CID Philosophy. The CID for this facility shall be coordinated in color, texture, pattern, size, form and function with the building footprint and the SID. Furnishings submitted for approval shall reflect the image and style presented in the architecture to further support the corporate image, and with the function and mission of the facility occupants considered. All furniture/furnishings shall be selected under the guidance of the National Defense Authorization Act – FY 2002, S1438, Title VIII, Subtitle B, Sec 811, Para 2410 which states UNICOR is no longer a mandatory source for furniture and a waiver is not required from UNICOR on items before selecting from GSA Schedules. However, UNICOR shall be considered as a vendor to determine if UNICOR offers the "best available" product in terms of quality, price, and timeliness. If an UNICOR product is not the "best value", then GSA Schedules shall be used for selection of furniture/furnishings. Three GSA vendors shall be considered but only one selected for the prepared Order Form. A Best Value Determination Guideline Sheet shall be filled out for each vendor whose furniture has been specified and the sheet provided in the CID binder. (This is an addition to the requirements under 23.4 Format) All furniture/furnishings shall be selected from GSA Schedules. The GSA web site is: www.gsaelibrary.gsa.gov/. The UNICOR web site is: www.unicor.gov. The UNICOR regional sales representative for the territory including the Louisville District is Gene Franklin who may be contacted at gene.franklin@gmg-grp.com.

23.4 Format. The CID format shall be in accordance with the Louisville District Comprehensive Interior Design presentation requirements found in Appendix K of the Louisville District Design Guide for Military Construction.

23.5 CID Coordination and Installation. The Contractor shall develop and fully coordinate the CID package with the SID package. The CID submittals shall run concurrent with the SID submittals.

23.6 Requirement Analysis. The Contractor shall interview the Government and determine the CID requirements. CID items and quantities shall be determined by but are not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function (3) room functions (4) rank and grade.

23.7 CID Furnishing List. Typical CID items to specify for this facility: See Standard BCT Barracks Complex drawings for furniture/furnishings and placement. Contractor shall meet with the user during design of the CID to add any specific/special items as required by the Government/user.

24. NOT USED

25. STRUCTURAL DESIGN REQUIREMENTS

25.1 General Design Requirements. The Structural Engineer shall be responsible for the selection and design of the structural building system. A complete structural system for the building shall include foundations, walls, roof framing, roof diaphragms, lateral load stability, framing and connection of any architectural features, and support of mechanical and electrical equipment. The structural design shall be in accordance with the criteria, requirements, and guidance provided in the **International Building Code** unless modified by UFC 1-200-01 "GENERAL BUILDING REQUIREMENTS" and the other following requirements.

25.2 Design Loads.

25.2.1 Design loads and load combinations shall be in accordance with the requirements of the IBC and ASCE 7, "Minimum Design Loads for Buildings and Other Structures", unless otherwise specified herein.

25.2.2 Wind loads shall be based on a 90 mph basic wind speed, building classification category II, and exposure category C. Wind loads shall be computed and applied in accordance with ASCE 7.

25.2.3 Seismic loads shall be in accordance with the guidance given in both the IBC (when IBC is used it shall be modified by UFC 1-200-01, 31 July 2002) and TI 809-04, "Seismic Design For Buildings", using the following:

Spectral Response
From USGS EHP Maps or Zip Codes
Seismic Use Group II
 $I = 1.25$

25.2.4 Antiterrorism protection systems must be considered for this project and shall conform to UFC 4-01-01 "DEPARTMENT OF DEFENSE (DOD) MINIMUM ANTITERRORISM STANDARDS FOR BUILDINGS", dated 8 October 2003, available from the website:
<http://www.hnd.usace.army.mil/techinfo/engpubs.htm>.

25.3 Foundations. Design of foundations shall be based on the site-specific geotechnical report prepared by the Contractor's consulting geotechnical engineer and the requirements specified in this section.

25.4 Concrete

25.4.1 Codes and References.

American Concrete Institute
Portland Cement Association

25.4.2 Additional Requirements.

25.4.2.1 Minimum concrete strength shall have at least a compressive strength of 3000 psi at 28 days. All footings shall be constructed of reinforced cast-in-place concrete.

25.4.2.2 Reinforcing Materials. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

25.4.2.3 Concrete Materials

- a. Cement: ASTM C 150, Type I-II Portland cement.
- b. Fine Aggregate: ASTM C 33.
- c. Coarse Aggregate: ASTM C 33.
- d. Air-Entraining Admixture: ASTM C 260.
- e. Flowing Concrete Admixture: ASTM C 1017, Type 1 or 2.
- f. Calcium Chloride will not be permitted.
- g. Fly Ash: ASTM C 618, Class "F".

25.4.2.4 Ready-Mix Concrete. ASTM C94.

25.4.2.5 Reinforcement of concrete walls, continuous footings, and tie and bond beams shall be continuous, and typical details of reinforcing at corners and intersections of these members shall be shown on the drawings.

25.4.2.6 Slabs

25.4.2.6.1 Slabs supported on ground shall be a minimum thickness of 4 inches and reinforced with either welded wire fabric or fiber reinforcing.

25.4.2.6.2 Slabs supported on ground will conform to the minimum requirements for slab-on-grade: Horizontal runs of conduits and pipes shall not be embedded in slabs supported by ground. Vertical penetrations will conform to ACI 318. Aluminum conduit and pipes will not be embedded in any concrete.

25.4.2.6.3 Building slabs on grade shall be protected from moisture intrusion with 4 inch capillary water barrier covered with a vapor barrier of 6 mil thick polyethylene sheeting. Slabs shall be thermally isolated from foundations by a minimum ½" rigid insulation used as expansion joint material.

25.5 Steel.

25.5.1 Codes and References.

American Iron and Steel Institute
American Institute of Steel Construction
Steel Joist Institute

25.5.2 Additional Requirements.

25.5.2.1 Shop connections for structural steel shall be welded, and generally field connections shall be made with high strength bolts (ASTM A 325) in bearing type connections. All connections other than standard AISC shear connections shall be designed by the engineer of record and detailed on the final plans.

25.5.2.2 Joists shall be anchored to steel supports by bolting or field welding. Provide steel bearing plates in concrete work. Where top chords are extended, provide required properties of extensions on the drawings.

25.5.2.3 If braced frames are used as all or part of the main lateral force resisting system, the stability of the structural system shall not depend on any single member or connection. Redundancy shall be

provided either by using multiple bays of tension only X-bracing members or by using bracing members that are capable of both tension and compression if bracing is placed in a single bay.

25.6 Metal Deck.

25.6.1 Codes and References. Steel Deck Institute

25.6.2 Additional Requirements.

25.6.2.1 Form deck shall be galvanized. Metal form material shall have a minimum thickness of 28 GA.

25.6.2.2 Steel roof deck material shall be galvanized and have a minimum thickness of 22 GA. A structural steel roof deck shall be provided under all metal roofs in accordance with TI 809-29, Structural Considerations For Metal Roofing.

25.6.2.3 Galvanized steel roof deck in areas without ceilings which are exposed to view and are scheduled to be finish painted should be specified to receive a factory primer coat on the underneath side of the deck.

25.7 Masonry.

25.7.1 Codes and References.

American Concrete Institute
Brick Institute of America
National Concrete Masonry Association

25.7.2 Additional Requirements.

25.7.2.1 Mortar used on this project shall be type "S" mortar for structural masonry walls. Use type "N" mortar for masonry veneers unless type "S" is required for strength.

25.7.2.2 Brick veneer ties shall be corrugated galvanized steel spaced 16 inches on centers both vertically and horizontally for frame construction and adjustable metal ties spaced 16 inches on centers for masonry walls.

25.7.2.3 Installation of brickwork shall comply with the latest edition of the Brick Institute of America Technical Notes No. 28B; Brick Veneer/Steel Stud Walls.

25.7.2.4 Concrete masonry units including split face units shall have a minimum compressive strength of 2000 psi at 28 days.

25.7.2.5 Structural masonry walls (load bearing walls, shear walls, or exterior walls) shall be designed as reinforced masonry in accordance with ACI 530.

25.7.2.6 Horizontal reinforcement shall be provided continuously at floor and roof levels and at the tops of walls. Horizontal reinforcement shall also be provided above and below all wall openings as shown in FEMA 302.

25.7.2.7 Nonstructural masonry walls shall be reinforced in accordance with TI 809-04 and FEMA 302.

25.7.2.8 Masonry walls shall have vertical expansion joints as follows:

a. Interior Walls: 24 feet maximum,

b. Exterior Walls: 20 feet maximum,

- c. At changes in wall height or thickness,
- d. Near wall intersections,
- e. At points of stress concentration,
- f. At control joints in foundation walls and in floors that support masonry walls.

25.7.2.9 Exterior masonry veneer walls shall be provided with 3/8 inch expansion joints at 20 feet on center maximum. Masonry expansion joints shall be provided near the corner of exterior walls within a distance of 10 feet.

25.7.2.10 Horizontal expansion joints at exterior masonry veneer walls shall be provided between different masonry materials (concrete units and clay bricks) and also at each floor.

25.7.2.11 Masonry veneer walls shall be of cavity-type construction with minimum 1 1/2" air space behind veneer. Damp proofing shall be used on the exterior face of CMU backup walls. Brick veneer/steel stud walls shall be designed and constructed in accordance with TI 809-07 "Design of Cold-Formed Load bearing Steel Systems and Masonry Veneer/Steel".

25.7.2.12 Asphalt coated copper cap flashing shall be provided under the masonry precast or stone cap on top of all masonry parapet end walls and masonry screen walls. Dowel penetrations shall be sealed.

25.8 Wood (not permitted as primary structural material).

25.8.1 Codes and References.

National Forest Products Association
 American Institute of Timber Construction
 American Plywood Association

25.8.2 Additional Requirements.

25.8.2.1 Fire Retardant Treatment. Recommendations regarding the use of fire retardant treatments are provided in the USDA Wood Handbook and the National Fire Protection Handbook. Pressure impregnation is the preferred treatment method.

25.8.2.2 Termite Control. Termite control measures will be used in areas prone to termite infestation. Soil will be treated with commonly accepted termite control products prior to construction.

25.9 Roof.

25.9.1 Roof Requirements.

25.9.1.1 Roofing shall be structural standing-seam metal or architectural standing seam with concealed type clips over metal deck.

25.9.1.2 Standing seam roof clips shall be attached to roof framing members and not just to metal decking, unless it is 16 GA minimum thickness.

25.10 Cold Formed Steel Framing.

25.10.1 Codes and References.

American Iron and Steel Institute

TI 809-07 Design of Cold-Formed Load Bearing Steel Systems

25.10.2 Additional Requirements.

25.10.2.1 Trusses fabricated from cold-formed steel members shall be designed and the drawings stamped by an engineer registered in the State of Kentucky.

25.10.2.2 Cold-formed steel members, their components, and connection material shall have G60 galvanized coating.

25.10.2.3 Cold-formed metal framing systems used for fascias, soffits, exterior brick backup (if used), and architectural framing that is subject to the design loads specified in this section shall be designed by the engineer.

25.10.2.4 Top chords of cold-formed roof members shall be 16 GA, minimum, where standing seam roof clips are connected with screws.

26 PLUMBING REQUIREMENTS

26.1 General. Plumbing system shall be designed and installed in accordance with the Kentucky State Plumbing Code (KPC), latest edition, the International Plumbing Code and UFC 3-420-01. Specified materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products. Specified equipment shall essentially duplicate equipment that has performed satisfactorily at least two years prior to bid opening. Catalog cuts for major plumbing equipment shall be provided at each submittal and shall be for the actual equipment proposed to be installed. Deviations and installation of equipment other than proposed are only allowed subject to Contracting Officer approval. Plumbing chase wall dimensions shall be carefully coordinated with the plan layouts and fixture carrier requirements. There will be a utility access crawlspace under kitchen, serving and dishwashing areas with a minimum 4' clear height to facilitate repairs. Provide valving and cleanouts in the crawlspace for equipment service and maintenance and to allow for future equipment modifications. Toilet areas and plumbing fixtures in the Dining Facility shall be handicapped accessible as defined in paragraph 21.3 of this section. All piping shall be labeled, color coded, titled, and indicate direction of flow. Shutoff/isolation valves, water hammer arrestors, shower control valves, and all other control components and equipment requiring adjustment and/or maintenance shall be readily accessible through the use of lay-in ceilings and/or appropriately sized and located access doors. Domestic hot water delivered to plumbing fixtures shall not exceed 110°F. A hot water recirculation piping system shall be provided. Recirculation system piping shall extend and terminate within 5 feet of plumbing fixtures. A reduced-pressure type backflow preventer assembly shall be provided for the cold water service main, and located within the mechanical room. A pressure-reducing valve assembly (with valved bypass) shall be provided in the cold water main where system pressures exceed 60 psig. Routing of water piping direct-buried, below floor slabs shall be minimized, and limited to the building entrance penetration. Freezeproof exterior wall hydrants shall be provided around the perimeter of the facility. Perimeter separation distances between wall hydrants shall not exceed 150 feet, and a minimum of four wall hydrants shall be provided. Water hammer arrestors, conforming to ASSE 1010, shall be provided for all plumbing fixtures (quick and slow-closing devices) for shock suppression. The placement of water hammer arrestors shall be as referenced in the Kentucky State Plumbing Code and PDI-WH 201. Water connections to HVAC system shall be isolated from the domestic water system by a reduced-pressure backflow preventer assembly. Water connections to food service equipment shall be isolated from the domestic water system by a backflow preventer assemblies rated for the application and as required by the code. Domestic hot and cold water systems shall be insulated. Sanitary drain waste and vent systems shall extend from 5 feet outside the building to all fixtures and equipment requiring service. The exit location of the building sanitary sewer main shall be coordinated with existing site conditions shown on utility drawings. The system shall be provided with traps, vents, cleanouts, and all other components as required by code. Appropriate means shall be provided within the plumbing system design to insure

that all fixture trap water seals susceptible to loss of water seal by evaporation are replenished. System shall be tested and disinfected in accordance with code requirements.

26.1.1 Utility Metering: Gas and Potable Water: Potable water and gas shall be metered. Meters shall all have pulse outputs, data collection/communication capability and shall be compatible with Ft. Knox Standards. Meters shall determine consumption and rate-of-consumption.

26.1.2 Refer to food service and kitchen equipment plans and schedules for information specific to those areas.

26.1.3 Lawn/landscape irrigation and associated equipment is not required.

26.1.4 Comply with seismic requirements of KPC and TI 809-04.

26.2 Plumbing Materials, Equipment And Fixture Requirements.

26.2.1 Material for Domestic Water Lines: Water piping under concrete slab floors shall be copper tubing, type K, annealed and shall be completely wrapped in polyethylene. Materials for various services shall be in accordance with Table II – Pipe and Fitting Materials for Pressure Piping Systems of UFGS 15400A, Plumbing General Purpose. Pipe schedules shall be selected based on service requirement. Material or equipment containing lead shall not be used in any potable water system. See Table II of UFGS 15400A, Plumbing, General Purpose, for a complete list of domestic water piping materials. Valves shall be provided at each fixture and piece of equipment, at each toilet and kitchen, and on takeoffs from risers to each floor.

26.2.1.1 Routing and Design: All piping shall be concealed, properly supported with allowances for expansion and contraction. Interior water distribution piping shall not be buried under concrete floors. All piping systems shall be drainable. Interior hot and cold water piping systems shall be insulated. Water piping systems (including sprinkler piping) shall not be routed or located where subjected to freezing, and shall be located within the insulated building envelope. Heat tracing (to prevent freezing) of interior piping systems will not be allowed. Individual shutoff or stop valves shall be provided on water supply lines to all plumbing fixtures. Individual stops shall also be furnished at all equipment connections such as vending machines, icemakers, etc.. Isolation shutoff valves shall be provided for each toilet room group to allow isolation shutoff for maintenance purposes while continuing service to the remainder of the building. Consolidate fixture vents through one common vent whenever possible. All vent penetrations through the roof shall be made through a roof jack designed for use with the roofing system furnished and color-matched to the roof. Aboveground piping shall run parallel with the lines of the building and in accordance with UFGS 15400A, Plumbing General, Purpose, unless otherwise indicated. Do not route water and storm piping over food service equipment.

26.2.2 Material for Waste Lines: Materials for various services shall be in accordance with Table I – Pipe and Fitting Materials for Drainage, Waste, and Vent Piping System of UFGS 15400A, Plumbing, General Purpose. Pipe schedules shall be selected based on service requirements. Pipe fitting shall be compatible with applicable pipe. Plastic piping systems shall not be installed in air plenums. Soil, waste, drain and vent piping installed in spaces used as HVAC air plenums shall be cast iron. Each fixture and piece of equipment requiring connections to the drainage system shall be equipped with a trap, and all fixtures shall be vented. Surface or wall cleanouts shall be provided for each drainage main. Cleanouts shall be provided at each change in direction of sanitary sewer lines, at the intervals specified in the Kentucky State Plumbing Code, and at the building service entrance. All cleanouts shall be permanently accessible. Ground cleanouts shall be installed in a 12-in by 12-in, 4-in thick concrete pad, flush with grade. Provide access panels or cover plates in exposed areas. Pipes passing through the slab shall pass through a pipe sleeve and be installed in accordance with UFGS 15400A, Plumbing, General Purpose.

26.2.3 Gas Connections: The installation of interior natural gas distribution systems shall be in conformance with the provisions of NFPA 54 and AGA-01. The use of semi-rigid tubing and flexible

connectors for gas equipment and appliances is prohibited. Provide accessible gas shutoff valve and coupling for each gas equipment item.

26.2.4 Plumbing Fixtures: Fixtures shall be provided complete with fittings and chromium- or nickel-plated brass (polished bright or satin surface) trim. All shutoff valves shall be metal construction. All fixtures, fittings, and trim in a project shall be from the same manufacturer and shall have the same finish.

26.2.4.1 Plumbing shall meet the following criteria:

a. In general, all faucets shall have solid brass bodies, ceramic valving, and chrome plated or stainless steel trim.

b. Fixtures shall be water conservation type, in accordance with the Kentucky State Plumbing Code.

c. All vitreous china plumbing fixtures shall conform to ANSI A112.19.2M, Vitreous China Plumbing Fixtures. Stainless steel fixtures shall be in accordance with ANSI A112.19.3M, Stainless Steel Plumbing Fixtures (residential design). Plastic fixtures shall conform to ANSI Z124. Enameled cast iron plumbing fixtures shall comply with ANSI A112.19.1, and enameled steel fixtures shall comply with ANSI A112.19.4.

d. Floor drains shall be provided in toilet rooms, mechanical rooms, janitor rooms, food prep and food storage areas (except inside refrigerators and freezers), at vending equipment, all support areas (field feeding staging, insul. can drop-off, can wash, waste pulp (2 with 4" curb to control water flow), service vestibule, etc.), for equipment requiring drainage and crawlspace. Floor drains shall be provided in the dishwashing area, scullery or pot washing area, steam-jacketed kettle area, vegetable peeler area, vegetable preparation area, food washing area, dry storage rooms, adjacent to walk-in refrigerators, adjacent to reach-in refrigerators 20 cubic feet or larger, adjacent to ice making machines, and adjacent to garbage disposals and pulpers. Floor drains shall be cast iron body and nickel bronze grate. Recessed floor drains at refrigerators and freezers shall be carefully coordinated and located immediately at the wall of the refrigerated storage unit where the drain line penetrates. Horizontal offsets of refrigerator and freezer drain lines outside the units will not be permitted. Floor drains in all food preparation and serving areas in the Dining Facility shall be equipped with easily removable wire mesh baskets to catch food particles and prevent maintenance problems. All floor drain traps shall be automatically primed by single trap primers or where appropriate distribution unit type trap primers. Adequate cleanouts shall be provided in the Dining Facility crawl space to maintain drainage piping under the "wet" areas.

e. Areas in the Dining Facilities such as the final rinse area, the pot and pan sanitizer, and the dishwasher shall be served by local booster heaters to provide 82°C (180°F) domestic water.

f. Fixture descriptions shall be as described by the American Society of Mechanical Engineers, ASME A112.19.

26.2.4.2 Water Closets: Siphon-jet, elongated bowl, top supply spud, ASME A112.19.2M, wall mounted. Seat: ANSI Z124.5, heavy-duty, white plastic, elongated, open front, integral bumpers, stainless steel hinges and check hinge. Valve: Flushometer valve, ASSE ANSI/ASSE 1037, large diaphragm type with non-hold-open feature, backcheck angle control stop, and vacuum breaker. The maximum water use shall be 1.6 gallons per flush. Water closet trim shall conform to ANSI A112.19.5, Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards). Any water closets designed as handicapped water closets shall meet the top rim of the bowl height requirements of CABO A117.1.

26.2.4.3 Urinals are not acceptable.

26.2.4.4 Lavatories: Solid polymer, undermount bowls provided with vanity tops.

a. Faucets: Sensor operated electronic type for tempered water including solenoid valve and transformer. Faucets shall have all brass and copper waterways. The flow shall be limited to 0.5 gpm at a flowing pressure of 60 psi.

b. Drain: Grid type. Strainer shall be copper alloy or stainless steel.

c. All lavatories shall be handicapped type. Handicap lavatories shall conform to ADA and Uniform Federal Accessibility Standards (Fed. Std. 795) for fixture height and safety insulation. Handicap lavatory faucets shall be ADA compliant.

26.2.4.5 Lavatories (kitchen handwashing). Rectangular wall-hung type, minimum 20 in x 18 in in size. Manufacturer's standard sink depth, vitreous china ASME A112.19.2M, faucet holes on 4 in centers, front overflow, self-draining deck area with contoured back and faucet ledge.

a. Faucet: Sensor operated electronic type for tempered water including solenoid valve and transformer. Faucets shall have all brass and copper waterways and ceramic valving. The flow shall be limited to 2.2 gpm at a flowing pressure of 60 psi.

b. Drain: Grid type. Strainer shall be copper alloy or stainless steel.

c. Handicap lavatories shall conform to ADA and Uniform Federal Accessibility Standards (Fed. Std. 795) for fixture height and safety insulation. Handicap lavatory faucets shall be ADA compliant.

26.2.4.6 Sink, Handwash Stations: Single compartment, type 304 stainless steel, 110 in x 25 in x 12 in undercoated with sound deadening material and provided with stainless steel backsplash. Bottom of sink shall be crossbroken and supported on heavy duty stainless steel tubular legs.

a. Faucet: Four (4) faucets per sink, cast or wrought copper alloy with chrome finish, volume control with laminar flow, mounted on sink backsplash. Sensor operated electronic type for tempered water including solenoid valve and transformer.

b. Drain: 2 in stainless steel with grid type strainer piped indirectly to floor drain with funnel.

26.2.4.7 Service sinks: Precast terrazzo, 300 psi Portland cement with black and white marble chips, 33 in x 25 in x 10 in with stainless steel wall guard and curb caps, floor mounted. Fiat TSB-3001 or approved equal.

a. Faucet and Spout: Cast or wrought copper alloy, with top or bottom brace, with vacuum breaker. Faucets shall have replaceable seat and the washer shall rotate onto the seat. Handles shall be lever type. Strainers shall have internal threads.

b. Drains Assembly: Plug, cup strainer, crossbars, jam nuts, washers, couplings, stopper, etc. shall be copper alloy or stainless steel.

c. Trap: Cast iron.

26.2.4.8 Bubbler Drinking Fountains: Drinking fountains shall meet the requirements of NSF 61, Section 9. Bubbler drinking fountains shall have self-closing valves. Self-closing valves shall have automatic stream regulators, flow control capability, a push button actuation or a cross-shaped index metal turn handle without a hood. Spouts shall provide a flow of water at least 4in high so as to allow the insertion of a cup or glass under the flow of water. Stops, stream regulators, flow controls, pushbuttons, handles, and traps shall be made of copper zinc alloy. Strainers and drains shall be made of copper zinc alloy or stainless steel. The bowl shall be made of corrosion-resisting steel.

26.2.4.9 Water Cooler Drinking Fountains: Units shall be electric refrigerated type. Water cooler drinking fountains shall be located in close proximity to each restroom. Water cooler drinking fountains shall be

self-contained, conform to ARI 1010 and the Lead Contamination Control Act of 1988, use one of the fluorocarbon gases conforming to ARI 700 and ASHRAE 34 which has an Ozone Depletion Potential of less than or equal to 0.05, have a capacity to deliver 7.6 gph of water at 50°F with an inlet water temperature of 80° F while residing in a room environment of 90°F and have self-closing valves. Self-closing valves shall have automatic stream regulators, have a flow control capability, have a push button actuation or have a cross-shaped index metal turn handle without a hood. Exposed surfaces of stainless steel shall have No. 4 general polish finish. Spouts shall provide a flow of water at least 4-in high so as to allow the insertion of a cup or glass under the flow of water.

26.2.4.10 Hose Bibbs

26.2.4.10.1 A recessed-type hose bibb, brass with 3/4 in male inlet, 3/4 in hose connection and integral vacuum breaker shall be provided in each toilet area to allow for hosing down of these areas.

26.2.4.10.2 A wall-type hose bibb, brass with 3/4 in male inlet, 3/4 in hose connection and integral vacuum breaker shall be provided in areas shown on plans. Note that some hose stations require hot water or hot and cold water as noted on either the Fort Jackson or Standard Design drawings.

26.2.4.10.3 Provide a hot and cold hose station in the waste pulp room.

26.2.4.11 Wall Hydrants (Exterior): Wall hydrants shall be provided at a maximum spacing interval of 150 feet around the exterior wall of the building. Each hydrant shall be box type, freezeproof, with an integral vacuum breaker/backflow preventer. Hydrants shall have 3/4 in hose connections.

26.2.4.12 Post Hydrants (Exterior): Post style hydrants shall be provided adjacent to or within waste dumpster/compactor and recycled grease storage areas. Hydrant shall be freezeproof, with an integral vacuum breaker/backflow preventer. Hydrants shall have 3/4 in hose connections. Provide bollard protection as required.

26.2.5 Grease Interceptors: Provide grease interceptor sized to handle waste from kitchen area, kitchen exhaust hoods with washdown feature, serving area, dishwashing area, waste pulping room, can wash room, pot/pan scrub room, and field feeding staging area. Interceptor shall be of reinforced concrete or precast concrete construction with removable three-section, 3/8 in checker-plate cover, and shall be installed outside the Dining Facility. Interceptor shall be tested and rated in accordance with PDI G-101. Concrete shall have 3,000 psi minimum compressive strength at 28 days.

26.2.6 Area Drains (Exterior): Cast iron body and slotted grate, circular or square with a 12 in nominal overall width or diameter and 10 in nominal overall depth. Provide vehicle load rating as required by location.

26.2.6.1 Locate area drains at all low spots such as entrance to crawl space, in front of dock area, etc.

26.2.6.2 Locate area drain in trash compactor area. Pipe this area drain to sanitary sewer.

26.2.7 Provide chair carriers for all water closets, urinals, lavatories and electric water coolers.

26.2.8 Utility Distribution Systems: Plumbing and gas connections to kitchen equipment under hoods shall be served by a UL-rated utility distribution system. Mechanical manifold assembly shall be accessible through removable 16 gauge stainless steel panels. Mechanical manifold assembly shall be in accordance with UFGS 15400A PLUMBING, GENERAL PURPOSE and UFGS 15190A GAS PIPING SYSTEMS. An automatic fuel shut-off device shall be provided in the gas fuel manifold to automatically shut off the gas supply to any piece of gas-burning equipment in the event of a fire. An automatic fuel shut-off device shall be provided for all cooking equipment served by a single exhaust hood and by adjoining exhaust hood systems. Activation of a shut-off device from one hood system or from adjoining exhaust systems shall not cause the shut down of fuel-fired equipment served by another hood system. The automatic fuel shut-off and manual fuel shut-off valves shall be mounted at the gas inputs to the

utility distribution system. The fuel shut-off device shall be in conformance with NFPA 96. Electrical Distribution Assembly shall be addressed in UFGS 11400A, FOOD SERVICE EQUIPMENT. Electrical shut-off of kitchen equipment in the event of activation of the hood system shall be addressed in the Section 29, ELECTRICAL DESIGN.

26.2.9 Water Filters: Cartridge-type water filters in the Dining Facility shall be provided on domestic water service to kitchen equipment based on manufacturer's recommendations if water quality does not meet requirements for kitchen equipment. See UFGS 11400A, FOOD SERVICE EQUIPMENT for specification of water filter.

26.2.10 Major Appliance Plumbing Connections: The Contractor shall provide appropriate connections for all appliances, vending machines, and any other items requiring water and/or drain connections.

26.2.11 Domestic water heaters shall have round, glass-lined tanks, and shall be installed with an integral insulating wrap with a minimum R value of 5 except as noted in standard specifications for storage tanks having more than 500 gallons storage. Access shall be provided in the wrap for service and maintenance openings. Storage water heaters that are not equipped with integral heat traps and having vertical pipe risers shall be installed with heat traps directly on both the inlet and outlet. Circulating systems need not have heat traps installed. A pressure/temperature relief valve, vacuum breaker on the water supply line, drain and a 6-in concrete pad shall be provided for the water heater and/or storage tank. Each domestic water heater shall be equipped with an inline type recirculation pump and recirculation piping and balancing valves when hot water piping extends further than 50 feet from a tank. The water heater relief drain shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system. Water heaters shall be sized based on the methods described in the American Society of Plumbing Engineers (ASPE) Volume I, Fundamentals of Plumbing Design, for a 90°F rise. Water heater energy factors shall meet or exceed the minimum requirements of 10 CFR Part 434 and shall be Energy Star or with efficiencies in the upper 25% of what is available. Additional consideration in the technical evaluation will be given to designs which exceed the minimum energy efficiency requirements and utilize high efficiency water heaters. Each water heater shall comply with Federal, state, and local emission regulations. Point of contact for air quality permits is Fort Knox DBOS/Environmental Division, Al Freeland (502) 624-3629.

26.2.11.1 Each domestic water heating system shall include a factory-precharged expansion tank, designed for potable water service, installed on the cold water supply to the water heater.

26.2.12 Exposed traps shall be chromium-plated, adjustable-bent tube, 20-gauge brass. Concealed traps may be plastic (ABS).

26.2.13 Testing: Entire plumbing system shall be inspected and tested in accordance with project specifications, and National Standard Plumbing Code.

26.3 Piping Materials: UFGS 15400A Table I and II shall be the basis for plumbing systems and materials.

26.3.1 Finish on all exposed piping in the kitchen and serving areas should be chromium plated or 300 series stainless steel.

26.4 Pipe Insulation

26.4.1 Insulation type shall be fiberglass, closed cell foam, or phenolic foam.

26.4.1.1 Domestic service hot water piping minimum pipe insulation performance shall be in accordance with the requirements of the latest edition of ASHRAE/IESNA 09.1.

26.4.1.2 Domestic service cold water piping shall be insulated with a minimum of 1/2-in insulation with vapor jacket.

26.4.1.3 Roof drain piping: Provide 1-in thickness insulation on all horizontal piping.

26.5 Water Softening: Treatment equipment shall be installed when water analysis indicates a total water hardness exceeding 2.5 grains per gallon (43 ppm) expressed as calcium carbonate. Water softening equipment will consist of two or more softener units and a regeneration brine tank utilizing common salt (NaCl) for regeneration of the softener exchange material.

26.6 Plumbing system design and installation must conform to the following mandatory energy and water conservation criteria: Title 10 CFR Part 434.

27. FIRE PROTECTION

27.1 Qualifications of Fire Protection Engineer: The design of the fire protection features shall be by a qualified fire protection engineer meeting one of the following conditions: a.) An engineer with a Bachelor of Science or Masters of Science Degree in fire protection engineering from an accredited university engineering program, plus a minimum of 5 years' work experience in fire protection engineering. b.) A registered professional engineer who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination. c.) A registered P.E. in a related engineering discipline with a minimum of 5 years' experience dedicated to fire protection engineering. The name and credentials (education, registration, experience) of the fire protection engineer shall be submitted with the initial contract documents and approved by the District fire protection engineer prior to proceeding with fire protection design.

27.2 Fire Suppression System: Automatic wet pipe sprinkler protection shall be provided for the Dining Facility. Sprinkler protection shall be provided throughout 100% of the building. Where the possibility of freezing exists dry pipe sprinkler protection shall be provided if required to provide complete protection. The requirements indicated below shall be incorporated into the design.

27.3 Sprinkler System: The facilities shall be fully protected with automatic wet pipe sprinkler systems. Dry pipe systems shall be provided if freeze protection is required. All areas of the facility shall be protected. The sprinkler system designs shall be in accordance with UFC 3-600-01, NFPA 13, NFPA 96, NFPA 230 and UFGS Specification Sections 13930A, Wet Pipe Sprinkler System, and 13935A Dry Pipe Sprinkler System. The sprinkler hazard classifications shall be in accordance with UFC 3-600-01, NFPA 13 and NFPA 230. Design densities, design areas and exterior hose streams shall be in accordance with UFC 3-600-01. The sprinkler systems shall be designed and all piping sized with computer generated hydraulic calculations. The exterior hose stream demand shall be included in the hydraulic calculations. A complete sprinkler system design, including sprinklers, branch lines, floor mains and risers, shall be shown on the drawings.

27.4 Sprinkler Service Main and Riser: The sprinkler service main shall be provided with an exterior post indicator valve with tamper switch reporting to the fire alarm control panel (FACP). The sprinkler entry riser shall include a backflow preventer, a fire department connection, and a wall hydrant with splash block for testing of backflow preventer. The sprinkler system shall include an indicating control valve, an alarm check valve, a water motor alarm and a flow switch reporting to the FACP. All control valves shall be OS&Y type and shall be provided with tamper switches connected to the FACP.

27.4.1 Locate sprinkler service piping, riser assemblies and air compressor (if required) for dry pipe system(s) in the mechanical equipment room.

27.4.2 Provide supervisory switch connected to the FACP for dry system air compressor(s).

- 27.5 Sprinklers: Sprinklers located in finished areas shall be chrome plated recessed pendant type with matching escutcheon. All sprinkler heads shall be quick response type. Extended coverage heads are not acceptable.
- 27.6 Exterior Hose Stream: Exterior hose stream demand shall be in accordance with UFC 3-600-01. This shall be 250 gpm for light hazard and 500 gpm for ordinary hazard. Exterior hose stream demand shall be included in the sprinkler system hydraulic calculations.
- 27.7 Backflow Preventer: A double check backflow preventer shall be provided on the fire water main serving each building. This shall be located within the building. An exterior wall hydrant with OS&Y valve shall be provided to allow testing of backflow preventer at design flow as required by NFPA 13.
- 27.8 Fire Department Connection: A fire department connection shall be provided for each building with sprinkler protection. These shall be located on the street side of the building, to be directly accessible to the fire department.
- 27.9 Kitchen Hood Fire Protection: Commercial food heat-processing appliances and equipment located in the dining facility shall be protected in accordance with NFPA 96. This shall include the cooking equipment, kitchen exhaust hoods, grease removal devices, exhaust system, fire suppression system, and fuel/power cut-off.
- 27.10 Fire Pump: If a fire pump is required provide a fire pump design and installation in accordance with NFPA 20 and Specification Section 13920A.
- 27.11 System Components and Hardware: Materials for the sprinkler system and fire pump system shall be in accordance with Specification Sections 13930A and 13935A and with NFPA 13 and NFPA 230. Sprinkler system piping shall be black steel and shall be minimum Schedule 40 for sizes 2 in and less and minimum Schedule 10 for sizes greater than 2 in.
- 27.11.1 Provide sleeves and firestopping for all piping penetrations of fire rated assemblies.
- 27.12 Protection of Piping Against Earthquake Damage: Sprinkler and fire pump piping systems shall be protected against damage from earthquakes. Seismic protection shall include flexible and rigid couplings, sway bracing, seismic separation assemblies where piping crosses building seismic separation joints, and other features as required by NFPA 13, IFC and TI 809-04 for protection of piping against damage from earthquakes.
- 27.13 Fire Water Supply: Refer to Civil Design for design requirements.
- 27.14 Fire Detection and Alarm: Refer to Electrical Design for design requirements.
- 27.15 Fire Extinguishers: Refer to Architectural Design for design requirements.
- 27.16 Fire Hydrants: Refer to Civil Design for design requirements.
- 27.17 Specifications: Unified Guide Specifications (UGS) shall be used for this project. The contractor shall edit the appropriate UGS Sections. These shall be submitted for review with the preliminary and final design submittals. Marked-up versions of the specifications shall be provided in the preliminary design submittal to allow reviewers to identify changes made. These specifications shall be followed for the design and installation of the sprinkler systems. The Contractor shall submit material data, hydraulic calculations, and shop drawings as required by Specification Section 13930A to the Contracting Officer for review and approval.
- 27.18 Catalog Cuts: Manufacturers' catalog cuts for major pieces of equipment shall be provided with each submittal and shall represent actual equipment to be installed. Deviations from equipment or

installation as indicated in the proposal or design submittals shall not be allowed or accepted unless approved by the Contracting Officer.

27.19 Site Investigation: The Contractor shall perform any site investigations required to gather any information necessary for completing fire protection system design for the project.

28. HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

28.1 Mechanical Design References, Codes, and Standards

28.1.1 The design and construction of the mechanical systems shall be in compliance with design criteria listed below, as required herein, and the referenced Unified Facility Guide Specifications (UFGS). Guide specifications are referenced in this RFP for their use in preparation of the design and shall be edited consistent with the criteria furnished. The most current edition of the codes, standards, and references shall be used for project design. Where there is a conflict between the RFP and the codes and standards the most stringent shall apply. When codes and standards are in conflict, the most stringent shall apply.

Design Criteria List:

- Louisville District Design Guide for Military Construction, WI-06-01-02
- Army Installation Design Standards
- International Mechanical Code
- ASHRAE Manuals, latest edition
- NFPA 90A, Installation of Air Conditioning and Ventilating Systems
- NFPA 90B, Installation of Warm Air Heating and Air Heating and Air Conditioning Systems
- ASHRAE Standard 62-1999, Ventilation for Acceptable Indoor Air Quality
- Technical Instructions, Design Criteria, T1-800-01, 20 July, 1998
- TM 5-785 Engineering Weather Data
- TM 5-805-4 Noise and vibration Control for Mechanical Equipment
- TI 809-4 Seismic Design for Building
- TI 810-10, 1 FEB 99, Mechanical Design, Heating, Ventilating, and Air Conditioning
- UFC 3-400-01, Design: Energy Conservation
- UFC 3-400-02, Engineering Weather Data
- UFC 3-410-01FA, Design: Heating, Ventilating and Air conditioning
- UFC 3-410-02A, Design: Heating, Ventilating and Air conditioning (HVAC) Control Systems
- International Ground Source Heat Pump Association.

28.2 General: The mechanical systems design for this project shall be in accordance with ASHRAE Handbooks, TI 800-01 Design Criteria Technical Instructions, ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality, Louisville District Design Guide for Military Construction, Volume II of II, applicable NFPA Standards, other applicable references listed above and within the RFP, and governing industry standards as applicable. The Contractor's proposal will list all pertinent standards and specifications and their applicability to the project. Catalog cuts for major HVAC equipment shall be provided at each submittal and will include manufacturer's published data stating that such equipment meets the applicable standard. Catalog cuts for major equipment shall be for the actual equipment proposed to be installed. Deviations and installation of equipment other than proposed are only allowed subject to Contracting Officer approval. Mechanical equipment room(s) shall be ventilated for heat dissipation and shall be designed to minimize interior temperatures from exceeding 10°F above outside design ambient temperature. As a minimum, the mechanical equipment room shall reflect the minimum clearance as specified by the equipment manufacturer in all five directions (all four sides and top). Equipment tube bundle and coil pull spaces shall be shown on mechanical room layouts. Mechanical room shall be adequate to allow the layout of equipment such that the removal or replacement of one major piece of equipment shall not require removal of adjacent equipment. Toilet rooms shall be directly

heated, cooled, and exhausted. All exposed exterior water piping systems shall be provided with protective aluminum jacketing. Freeze protection design measures shall be provided to protect all interior and exterior piping systems, and equipment. Refrigeration equipment provided shall be equipped with low-ambient controls to allow equipment operation down to minus 20°F.

28.3 The Post preference for space cooling and heating for this facility is a geothermal heat pump (GHP) system using a vertical, ground-coupled heat exchanger. If a totally geothermal system will not be economically feasible for this facility due to the nature of the loads and/or budget, special consideration will be given to proposals that apply a hybrid geothermal system design.

28.4 HVAC Design Conditions.

28.4.1 Outside Design Conditions.

Location: Ft. Knox, KY

Heating Degree-Days (basis 65°F): 4616

Cooling Degree-Days (basis 65°F): 1360

Heating Design Conditions: 7°F DB

Cooling Design Conditions: 32.2°C DB / 23.9°C WB (90°F DB / 75°F WB)

Air Water Cooled Condensing Design Conditions: 25.6°C WB (78°F WB)

28.4.2 General Inside Design Conditions (unless otherwise indicated).

Heating (Comfort Applications)	20°C DB (68°F DB)
Heating (Freeze Protection, Mech Rms)	7°C DB (45°F DB)
Cooling (Comfort Application)	23.9°C DB (75°F DB) / 50% Relative Humidity

28.4.3 Room HVAC Functional Requirements: Interior conditions as indicated above, unless otherwise stated.

Mechanical Room: heating, ventilation (supply), dedicated units

Offices: HVAC, individual room temp control

Dining Areas: HVAC

Kitchen Areas: HVAC, exhaust and make-up air at hoods, negative pressure relative to dining and service areas, maintain 60°F DB in work areas in accordance with ASHRAE recommendations, spot air conditioning or general air conditioning to maintain work areas at 84°F DB.

Service Areas: HVAC, exhaust and make-up air at hoods, negative pressure relative to dining areas.

Dishwashing Areas: HVAC, exhaust, maintain 60°F DB in work areas in accordance with ASHRAE recommendations, spot air conditioning or general air conditioning to maintain work areas at 84°F DB.

Comm: HVAC, dedicated unit, 72 °F DB / 50% RH year-round

Electrical/UPS: HVAC, dedicated Unit, 72 °F DB / 50% RH year-round

Electrical Room: heating, ventilation (supply), dedicated units

Toilets/Baths: Interior rooms indirectly heated, Exterior rooms heated, all with exhaust ventilation

Janitor: Interior rooms indirectly heated, Exterior rooms heated, all with exhaust ventilation

28.5 Air System Design and Zoning.

28.5.1 Air handling systems shall be zoned by functional requirements, operation schedules, environmental control conditions, and load characteristics. Systems shall be designed, installed, balanced, and adjusted to distribute heating and cooling to all habitable rooms, as well as bathrooms, in proportion to the calculated load requirements of these spaces. Additional consideration in the technical evaluation will be given to systems utilizing energy efficient equipment, additional space in the mechanical room, and other features which contribute to ease of system operation and maintenance.

28.6 Ventilation Systems Design: Ventilation for building occupants shall be provided in accordance with ASHRAE Standard 62. Ventilation air shall be injected into the building at each air handling unit or terminal upstream of the coils. Each unit shall maintain minimum outside air flow based on demand control. Air handling units shall include electronic airflow measurement station for control and documentation of outside air quantities. The outside air intake shall be located away from fumes including vehicle exhaust, generator exhaust and toilet exhaust etc. Outside air quantities will be sufficient to meet ventilation requirements and maintain a positive pressure relative to the outdoors. Air handling units, if utilized shall be provided with economizer control. Exhaust systems shall be provided for all toilet rooms, janitor's closets, dishwashing rooms and other spaces as required.

28.6.1 Provide powered exhaust ventilation with makeup for plumbing crawl space.

28.7 Utility Metering: Gas, Electricity and Potable Water: Potable water, electricity and gas shall be metered. Meters shall all have pulse outputs, data collection/communication capability (BACnet compatible) and shall be compatible with Ft. Knox Standards. Electric meter is specified in Section 29, ELECTRICAL DESIGN. All meters shall be monitored by the DDC system. Meters shall determine consumption and rate-of-consumption.

28.8 Electrical Rooms, Mechanical Rooms and Communications Closets: Mechanical Rooms and combination Mechanical/Electrical rooms shall be heated and ventilated. Unit heaters shall be provided in these rooms to maintain a minimum temperature of 40°F for freeze protection. Ventilation rate of 10 and 20 air changes per hour minimum shall be used. A two-speed, thermostatically-controlled fan shall be provided to accomplish the 10 ac/hr and 20 ac/hr rates. The space shall be maintained at a maximum of 10°F above outside design ambient in summer. Ventilation shall be positively introduced within the mechanical room if equipment with atmospheric burners are used in room. Electrical rooms shall be ventilated and shall maintain a winter design temperature of 55°F. Communication closets shall be air-conditioned with dedicated, standalone HVAC units.

28.9 System Maintainability: Ensure that filters, controls, control valves, and coils are easily accessible for servicing and cleaning. Isolation valves shall be provided for each terminal unit, zone, branch, long runs, etc. as necessary for proper isolation and maintenance. Coils shall be fully removable without requiring demolition of any building components. Piping configuration at all coils shall include unions to facilitate easy coil removal.

28.10 Commissioning: The Mechanical system commissioning shall be in accordance with UFGS Specification Section 01460L, Commissioning of HVAC Systems. Commissioning requirements shall be clearly detailed on the design drawings and shall be clearly stated in the construction specifications to ensure the HVAC systems are properly installed, balanced and calibrated prior to building occupancy. Commissioning procedures shall be in accordance with ASHRAE Standards.

28.11 Direct Digital Controls: Controls shall be in accordance with UFC 3-410-02A.

28.11.1 General: Direct Digital Controls (DDC) shall be used to control HVAC systems and equipment. The DDC controllers shall be a product of the existing EMCS (Energy Management and Control System) system at Ft. Knox which is a Trane Tracer wireless system. All equipment provided shall be connected to the post-wide system (EMCS) with all functions fully controllable through the EMCS.

28.11.2 Stand alone equipment, such as chillers supplied with packaged controls, shall be installed with all necessary additional communications support equipment for interface with the post-wide DDC system.

28.11.3 Controls System Specifications: Automatic temperature controls shall be designed in accordance with specification Section 15951A Direct Digital Control for HVAC. All control devices shall be labeled with laminated plastic tags using unique identifiers, which are cross referenced to the control drawings.

28.11.4 Identify mounting locations for all DDC control panels.

28.11.5 Identify mounting locations for all temperature and CO₂ sensors.

28.12 Acoustical Criteria: Systems shall be designed to meet the following balanced noise criteria per ANSI S12.2 (Beranek, 1989):

<u>Area</u>	<u>NCB Level</u>
Enclosed offices	30
Dining and common areas	40

Acoustical treatments such as duct lining and sound attenuators shall be used to achieve these levels. Any spaces not specifically listed above shall be coordinated with the user. Vibration transmission from equipment shall be minimized with the use of vibration isolation equipment as required.

28.13 Life Cycle Cost Analysis

28.13.1 A Life Cycle Cost Analysis (LCCA) is required. The analysis shall be in accordance with Chapter 11 of TI 800-01, TM 5-802-1 and NBS Handbook 135. Unless otherwise authorized, constant dollar methods given in TM 5-802-1 and NBS Handbook 135 shall be used. Analyses shall be based on actual expected operating conditions, energy usage and costs. The LCCA should compare the proposed systems design alternates.

28.13.2 Cost Estimates: Economic analyses must include cost estimates. Lump sum estimates are not acceptable.

28.13.3 Computer Economic Analyses: Computerized economic analyses shall be made using the Life Cycle Cost In Design (LCCID) program, the Building Life Cycle Cost (BLCC) program or one approved by HQUSACE, CEMP-E to be the equivalent thereof. The LCCID program is available from Building Systems Laboratories at 217-333-3977. The BLCC program is available from the FEMP web site at: <http://www.eere.energy.gov/femp/technologies/eeproducts.cfm>. Before using any computer program, make sure that it is updated with the most current discount factors published in the periodic supplement to NBS Handbook 135.

28.13.4 Computer Energy Analyses: Computerized calculations shall be performed using the Trane TRACE 600 or the Carrier Hourly Analysis programs. Detailed, room by-room, calculations shall be performed with the energy simulation calculated for 8,760 hour per year. The simulation period should be as follows:

Dining - 16 hours/day (4:00 AM to 8:00 PM), 7 days/week

28.13.5 Rules: The overriding factor in selections shall be the mission function of the customer. Alternatives must meet the functional requirements. Selections between alternatives shall be for systems

with the lowest total LCC and a resulting energy budget no greater than the energy target. In the case of alternatives with equivalent LCC see Chapter 2, para 2.2 of TM 5-802-1.

28.13.6 Utility Rates. The following rates shall be used in the development of the Life Cycle Cost Analysis:

Electricity \$0.057/kwh
Natural gas \$6.9638/therm

28.14 Energy Conservation: Public Law 100-615 and Federal Regulations 10 CFR 435 Subpart B, require Federal buildings to be designed and constructed to reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Each system, component or feature selected that impacts the energy or water use of the facility shall be in compliance with ASHRAE Standard 90.1. ASHRAE Standard 90.1 is essentially the same as 10 CFR 435, and like 10 CFR 435 presents several conformance paths. The path selected to show compliance with ASHRAE Standard 90.1 shall be clearly identified. In addition, energy efficiency ratings for equipment shall be in the upper 25 percent of that available as long as these efficiencies are life cycle cost effective. The Department of Energy (DOE) and Federal Energy Management Program recommendations from the Buying Energy Efficient Products Guide and the Environmental Protection Agency Star products program meet these requirements. The DOE recommendations are available at <http://www.eere.energy.gov/femp/technologies/eeproducts.cfm> . Submittals from the successful bidder shall be in compliance with above and address energy conservation features such as geothermal, air economizer cycles, water side economizer, variable frequency drives, heat recovery, etc.

28.15 HVAC Calculations

28.15.1 Design Criteria: Design calculations for determining capacities of all equipment, mechanical systems and components shall be performed by the Contractor, and shall be supported with a complete design analysis. Capacity of all mechanical system components shall be coordinated with the electrical designer. The Design Analysis shall contain all explanatory material giving the design rationale for any decisions that would not be obvious to an engineer reviewing final drawings and specifications. Except as indicated herein, calculations for sizing HVAC systems shall be in accordance with ASHRAE Handbooks, TI 800-01 Design Criteria Technical Instructions, ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality, and Louisville District Design Manual for Military Construction, Volume II of II, NFPA Standards. ASHRAE-based computer generated loads shall be provided and must be submitted with complete input and output data summaries. The design shall reflect heating and cooling capacities based on the design conditions indicated herein. The space (airflow) pressure relationships shall be maintained. The overall building pressurization shall be positive to minimize effects of infiltration.

28.15.2 Internal Loads and Heat Gains: The Successful proposer is required and responsible for determining all miscellaneous internal loads by coordination and consultation with the User in assessing such load requirements. Computers are located throughout the facility in offices; assumed to be one computer per person for internal load calculations. Kitchen equipment shall be as indicated in the Kitchen design drawings. Documentation and miscellaneous internal load requirements shall be provided within Design Analysis. Additional heat generation equipment data is described in the other paragraphs of this RFP.

28.16 Energy Budget Calculations.

28.16.1 A minimum requirement of the sustainable project certification is to perform an Energy Analysis to determine a design energy usage (DEU) budget. The DEU shall be calculated and compared to the maximum energy use budget value (EUB) for the facility type and weather region per table 11-1 of chapter 11, T1 800-01. The facility type for each building is given below. Proposers that exceed the EUB shall not be considered non-responsive but will receive a lower rating.

28.16.1.1 Facility: Dining

Maximum EUB (1,000 BTU/sf/yr) 60

28.16.2 The DEU shall include air conditioning, heating, ventilating, lighting, and domestic hot water usage for the facility. The DEU budget shall not include process loads. Process energy load is the energy consumed in support of all functions other than comfort and amenities for building occupants (refrigerators, stoves, computers, instruments etc.).

28.16.3 The facility type and operational hours for the calculation shall be as follows:

Dining - 16 hours/day, 7 days/week for facility type N

The DEU budget shall be based on availability of energy systems during operational schedule. For the remaining period lights, people, heating, air conditioning, and ventilating will be scheduled as OFF.

28.16.4 The area used in the DEU budget estimation is the gross floor area which is defined as the sum of all floor areas, measured from the outside of the exterior walls.

28.16.5 Calculation of the DEU shall be performed by computerized methods. Computerized calculations shall be performed using the Trane TRACE 600 or the Carrier Hourly Analysis programs. Detailed, room-by-room, calculations shall be performed with the energy simulation calculated for 8,760 hour per year.

28.16.6 Conversion Factors: Energy use or savings shall be calculated using the following factors. These conversion factors are given by 10 CFR Part 436. Equipment efficiencies and system losses must be accounted for in calculations. For energy media not listed here, use current standard engineering data or other approved reference data.

ENERGY MEDIUM	CONVERSION FACTORS
Natural Gas	1,031 BTU/cubic foot
Electricity	3,412 BTU/kilowatt hour

28.16.7 The DEU budget calculations (including all input and output information) are to be submitted by the successful proposer at the concept design stage. All proposers must submit in their proposals a statement that they will provide a facility that does not exceed the energy budget.

28.17 U-Values: Utilize the U-values presented below as a starting point. These values may be modified if a life cycle cost analysis indicates that a more cost effective value should be used. The life cycle cost analysis shall be based on the Department of Energy (DOE) Federal Energy Management Program (FEMP) criteria according to the provision of the latest version of Code of Federal Regulations, 10 CFR 436A. For guidance on the methodology, refer to National Bureau of Standards Handbook 135, Life Cycle Costing Manual for the Federal Energy Management Program.

Nominal U-Values Btu/square foot – °F for Exposed Floors, Ceilings, and Walls

Heating Degree Days	Opaque Walls	Gross Walls	Ceiling/Roof	Floor
4,616 (Ref 65°F)	0.064	0.181	0.041	0.040

The U-Values above are taken from T1 800-1, table 11-4A in weather region 5. Coordinate actual U-values with the architectural design of the facility.

28.18 Mechanical Equipment.

28.18.1 Mechanical equipment shall be designed in accordance with UFGS guide specifications listed in this section of mechanical design and included in the appendix volumes. The equipment described below

is a minimum. All materials and equipment provided shall be standard catalogued products of manufacturers regularly engaged in the production of such materials and equipment shall be of the manufacturers' latest standard design. Equipment shall comply with the requirements of Underwriter's Laboratories, Inc. (UL), Air Conditioning Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturer's Association (NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), or other national trade associations as applicable.

28.18.2 All pieces of floor mounted mechanical equipment shall be installed on a 6-in thick concrete equipment pad. Provide pad 6-in larger than equipment footprint on all sides. Install dowel pins into floor slab prior to pouring equipment pad. All suspended equipment shall be supported only from the building structure and shall be properly supported according to the manufacturer's instructions. Provide trapeze hangers for larger pieces of equipment. Provide adequate clearance around all pieces of equipment for periodic maintenance, inspection and cleaning. Service of one piece shall not require disturbance of adjacent equipment.

28.18.3 Each pieces of motorized equipment shall be provided with vibration isolators. Nominal deflection and natural frequency of isolation equipment shall be selected based upon equipment size and structural attachment details.

28.18.4 All strainers and air separators are to be equipped with blowdown valves and piped to a floor drain.

28.18.5 The mechanical room shall be separate from the electrical utility room and be accessible from an exterior door. The mechanical room shall house any equipment for facility comfort conditioning.

28.18.6 Roof mounted equipment is not acceptable except for grease extracting exhaust fans. All equipment otherwise shall be accessible from the first floor, or mezzanine level, or in the attic space. See Architectural Section of RFP for requirements of catwalks, guardrails, and ladders.

28.18.7 Mechanical components shall be installed and mounted in accordance with T1-809-4 "Seismic Design for Buildings." The design for seismic protection shall be based on a seismic Use Group II Building Occupancy - Facility per TI 809-4.

28.19 Geothermal Systems

28.19.1 Vertical Ground-Coupled Heat Exchange Systems (VGCHES): Systems shall be designed and installed in accordance with UFGS-15741. Designed by a registered professional engineer who is regularly engaged in the design of the type and capacity of systems specified in this project. Installation shall be performed under the supervision of a Certified Installer, as certified by the International Ground Source Heat Pump Association (IGSHPA).

28.19.1.1 Borings shall be cased as required by subsurface conditions. Contractor shall bear all casing costs.

28.19.1.2 Pipe and fittings shall be high density polyethylene with heat fused joints.

28.19.1.3 Thermally enhanced grouts will be required if bored material (drillings) does not satisfy heat exchange requirements.

28.19.1.4 Borings shall be no closer than 20 ft on center.

28.20 Water Source Heat Pump Systems

28.20.1 Design heat pump systems for energy efficiency in compliance with FEMP./Energy Star requirements.

28.20.2 Provide ground-coupled, closed-loop, water-to-air, extended range heat pumps UL or ETL listed, rated in accordance with ARI 330 and in compliance with FEMP/Energy Star requirements of 14.1 SEER and minimum heating performance COP of 3.3. Units shall be able to supply the design heating requirement with 45°F entering water in winter and the design cooling requirement with 90°F entering water in summer.

28.20.2.1 Units shall be designed and installed in accordance with UFGS-15741N. Provide 2 in thick UL listed throwaway filters with a mean efficiency of 35% when tested in accordance with ASHRAE 52.1. Mount filters in frames with access panel(s) for filter replacement.

28.20.2.2 Provide factory sound attenuation package as required to satisfy acoustic criteria.

28.20.2.3 Provide microprocessor based controller with communications capability for remote direct digital control (by EMCS). Provide water flow switch interlocked with compressor for flow proving and low flow lockout.

28.20.3 Provide ground-coupled, closed-loop, water-to-water, extended range heat pumps UL or ETL listed, rated in accordance with ARI 330 and in compliance with FEMP/Energy Star requirements of 14.1 SEER and minimum heating performance COP of 3.3. Units shall be able to supply the design heating requirement with 45°F entering water in winter and the design cooling requirement with 90°F entering water in summer. Provide heat pump units with 2-way control valves and pumps with variable frequency drives and differential pressure control. Each heat pump shall comply with Federal, state, and local emission regulations. Point of contact for air quality permits is Fort Knox DBOS/Environmental Division, Al Freeland (502) 624-3629.

28.20.4 Provide cooling tower with plate and frame heat exchanger to isolate building loop.

28.20.5 Provide separate air handling units with heat recovery capabilities to handle outside ventilation air requirements. Conditioned outside air shall be ducted to each heat pump.

28.21 Air Handling Units

28.21.1 Air handling units shall be factory packaged, section modular type design, constructed of 2-in thick preinsulated double wall panels. Units shall include fans, coils, airtight insulated casing, adjustable V-belt drives, belt guards for externally mounted motors, access sections for maintenance, combination sectional filter-mixing box, vibration-isolators, and appurtenances required for operation. Air handling unit shall have published ratings based on tests performed according to ARI 430. All sections shall be constructed of a minimum 18 gauge galvanized steel or 18 gauge steel outer casing protected with a corrosion resistant paint finish. Casing shall be designed and constructed with an integral structural steel frame such that exterior panels are non-load bearing. A minimum 15-in access section with door shall be provided upstream, between and downstream of each coil. Inspection and access doors shall be insulated, fully gasketed, doublewall type of a minimum 18 gauge outer and 20 gauge inner panels. Coils shall be fin-and-tube type constructed of seamless copper tubes and aluminum or copper fins mechanically bonded or soldered to the tubes. Coils shall be rated and certified according to ARI 410. Maximum coil face velocities shall be limited to 500 feet per minute. Mixing boxes shall be factory or field fabricated and configured with dampers to promote mixing of return air and outdoor air streams. Control dampers shall be constructed to provide no more than 10 CFM/ft² air leakage at 4" water column. Filters shall be listed according to requirements of UL 900. Pre-filters shall be 2 in depth, sectional, disposable type and shall have an average efficiency of 25 to 30 percent when tested according to ASHRAE 52.1. Filters shall be UL Class 2. Angled filter section may be included as part of the mixing box. Final filters shall have an average efficiency of 85 percent. Cooling coil section shall be provided with a watertight, galvanized steel drain pan which will collect coil condensate from all coils. Equip drain pan opening with a liquid trap and cleanout plug.

28.21.2 Supply fan section shall be non-overloading double-inlet, centrifugal type with each fan in a separate scroll. Fan bearings shall be sealed against dust and dirt and shall be precision self-aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hours as defined by AFBMA Std 9 and AFBMA Std 11. Bearings shall be permanently lubricated or lubricated type with lubrication fittings readily accessible at the drive side of the unit. Fan base shall be isolated from air handling unit base rails by the use of housed spring isolators. Fans shall be V-belt driven by belt drives sized for 150% of design power requirement. Provide adjustable sheaves for fans up to 20 hp.

28.22 Air Distribution

28.22.1 Ductwork shall be constructed of sheet metal to SMACNA HVAC Duct Construction Standards, 1995 edition. Flexible ductwork runouts to terminal devices shall be limited to 4 feet in length and shall be preinsulated. Fiberglass duct shall not be used. Each duct branch shall be fitted with a manual balancing damper. All ductwork shall be located above slab, supported from roof structures. Return air shall be ducted. Ceiling return air plenums shall not be used. Duct return shall maintain NC-25 requirements at rooms for general occupancy space.

28.22.2 All ductwork designated to be constructed at a duct pressure class of 3-in water gauge or greater shall be pressure tested. Any device (filter, fan, coil or other component) in the air supply, return or exhaust system that will normally operate at these pressures shall be included in the test. The maximum allowable leakage rate shall be in accordance with the SMACNA Leakage Test Manual for the Leakage Class (C) associated with the duct Seal Class. Test procedure, apparatus, and report shall conform to SMACNA. The leakage test shall be satisfactorily completed prior to applying the external duct insulation. Access must be provided to all devices or areas that may require periodic inspection, including but not limited to balancing devices, motor operated dampers, flow measuring stations, smoke/fire dampers, etc.

28.22.3 Diffusers shall be located to ensure that the air distribution will completely cover all surfaces of exterior walls with a blanket of conditioned air or may be of a compact design so long as 'dead spots' within the units are avoided. At least one diffuser shall be provided in each habitable room. Diffusers shall be provided with integral opposed blade damper. Diffusers shall be provided with air deflectors as required for proper air flow in the space. Plastic diffusers are prohibited. Core velocity shall be limited to 600 fpm maximum, with a maximum pressure drop of 0.1 in water. Ceiling mounted units shall have factory finish to match ceiling color, and be installed with rims tight against ceiling. Spongerubber gaskets shall be provided between ceiling or wall and surface-mounted diffusers for air leakage control. Diffuser boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Suitable trim shall be provided for flush-mounted diffusers. Duct collar connecting the duct to diffuser shall be airtight and shall not interfere with volume controller. Wall supply registers shall be installed at least 6-in below the ceiling.

28.23 Duct Insulation

28.23.1 All supply, return, and outside air ductwork shall be insulated. Exposed heating only or exposed return air ductwork shall not be insulated. Exhaust ductwork does not require insulation. Internally lined ductwork shall not be allowed. Insulation shall be faced with a vapor barrier material having a performance rating not to exceed 1.0 perm. Insulation, vapor barrier, and closure systems shall be non-combustible as defined in NFPA 255, with a flame-spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E 84. Where insulated ducts pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials.

28.24 Miscellaneous Fans

28.24.1 Exhaust fans shall be cabinet type, inline, or wall mounted. Roof mounted fans are not acceptable. Fans shall be V-belt driven by belt drives sized for 150% of design power requirement. Provide adjustable sheaves for fans up to 20 hp. Small fans not available with V-belt drive may be directly driven. Motor selection shall permit non-overloading operation at all conditions. All fans shall be

provided with vibration isolators to decouple the motor assembly from the fan housing. Suspend fans with vibration isolators from building structure. Grease-laden kitchen exhaust fans shall be centrifugal type according to UL 705 and fitted with V-belt drive, round hood, and windband, upblast discharge configuration, integral residue trough and collection device, motor and power transmission components located in outside positively air ventilated compartment.

28.24.2 In-line fans: Fans shall have centrifugal, backward inclined blades, stationary discharge conversion vanes, internal and external belt guards, and adjustable motor mounts. Fans shall be mounted in a welded tubular casing. Air shall enter and leave the fan axially. Inlets shall be streamlined with conversion vanes to eliminate turbulence and provide smooth discharge air flow. Fan bearings and drive shafts shall be enclosed and isolated from the air stream. Fan bearings shall be sealed against duct and dirt and shall be permanently lubricated, and shall be precision self-aligning ball or roller type. Fans shall be tested and rated according to AMCA 210.

28.24.3 Air Curtain Fans: Air curtain fans shall be provided over all personnel entry and exit doors and receiving platform and vestibule doors, except emergency exit doors from dining areas. The devices shall extend the full width of the doors and be installed on the building interior immediately above door headers.

28.25 Kitchen Hoods and Ductwork: Hoods and duct work systems shall conform to ACGIH-2092M, NFPA 96, and SMACNA HVAC Duct Construction Standards. Hoods shall be U.L. listed per UL 710 and NSF approved. These standards represent only the minimum requirements; subsequent subsections of this clause may require construction that exceeds these minimum requirements. Unless otherwise specified, ducts and hoods shall be secured to building so as to be level and free from vibration under all conditions of operations.

28.25.1 Exhaust Duct: Exhaust duct for canopy or non-canopy hoods shall be constructed of 18 gauge stainless steel and shall have external seams welded continuously, liquid tight. Concealed ductwork may be constructed of 16 gauge galvanized steel, external seams welded continuously, liquid tight. Duct size shall be based on a minimum air velocity of 1500 fpm and maximum of 2500 fpm. Duct shall be continuously welded, liquid tight, to hood duct collar as required per NFPA 96.

28.25.2 Hood Support: Wall mounted or island type hoods shall be supported from the structure with stainless steel mounting brackets provided with hoods. Hanger rods shall be 1/2 in. diameter stainless steel, threaded at the bottom and designed at the top to fit into inserts in building slats above or shall have hanger attachments fastened to structural steel members. Hanger rods shall be spaced 48 in on center, maximum.

28.25.3 Integral Make-up Air System: Hood shall be provided with an integral make-up air system which automatically replaces the air volume that is exhausted by the hood. The make-up air system shall be in accordance with NFPA 96. Air supplied upstream of the hood suction opening does not qualify as make-up air. The exhaust air flow rate for ventilation of cooking equipment shall be drawn through the open area between cooking surfaces and the perimeter entrance of the hood. Make-up air diffusers shall be provided at the front panel and at the exterior length of the hood producing a low velocity discharge. The supply air plenum shall have a 1-in thick foil-faced fiberglass insulation at the interior of the plenum. The temperature differential between the make-up air and the air in the conditioned space shall not exceed 10°F, except for air that is part of the air-conditioning system or air that does not decrease comfort conditions of the occupied space.

28.25.4 Closure Panels: Vertical corner mullions, at removable closure panels, shall be 2 in by 2 in wide, 16 gauge stainless steel, and shall be welded integrally to the furring and head channel. Exhaust hood closure panels shall be 1/2-in pan-formed, 18 gauge stainless steel. Upper edge of panels shall be retained in 1 in by 2 in continuous 16 gauge stainless steel head channel secured to the hood superstructure. Lower edge of panels shall be mounted on perimeter furring cap, and shall be turned back 1-in and flanged up 1-in for "zee" clip retention.

28.25.5 Wall Panels: Double pan-formed wall panels shall be 18 gauge stainless steel, 1/2 in thick with internal stiffener members. The panels shall be filled with a "USDA Approved" thermal insulation the full height and width of panels, and shall be attached to the interior with mastic. Maximum allowable temperature at rear side of panel shall be 20°F. Lower edge and sides shall be leveled and squared. Panels shall have butt joints.

28.25.6 Hoods shall completely cover the cooking equipment. The hood shall overhang the cooking equipment a minimum of 6-in at each end and 12-in in front of the equipment. Exhaust air volumes for hoods, wall or double island type, shall be a minimum of 100 cfm per square foot of suction opening, to provide for capture and removal of grease-laden cooking vapors, except when over wood, charcoal, and grease-burning charbroilers, which shall be a minimum of 200 cfm per square foot of suction opening. Exhaust air volumes for single island type hoods shall be a minimum of 150 cfm per square foot of suction opening, to provide for capture and removal of grease-laden cooking vapors, except when over wood, charcoal, and grease burning charbroilers, which shall be a minimum of 300 cfm per square foot of suction opening. Test data or performance acceptable to the authority having jurisdiction over both shall be provided and displayed.

28.25.7 Grease Extracting Type Hoods: Grease extracting exhaust hoods shall be pre-engineered, factory fabricated and assembled with built-in washdown systems. Grease extracting exhaust hoods shall be welded to the exhaust ductwork as required by NFPA 96. Hoods shall have a minimum grease extracting efficiency of 95 percent to be accomplished without the use of filters, cartridges or constant running water.

28.25.7.1 Grease extracting exhaust hood construction shall be entirely of stainless steel. Grease extraction chamber and exhaust capture chamber shall be not less than 18 gauge stainless steel. Seams or joints that direct and capture grease laden vapors shall be continuously welded, with the weld ground and polished to match the adjacent finish where exposed. The vertical joint where the front outside face of the hood meets the end panel of the hood shall be continuously welded, with the weld ground and polished to match the adjacent finish. Joints, seams, extractor chambers, and appendages shall be mechanically sound and sealed grease tight in accordance with the hood manufacturer's listing procedures and NFPA 96. Hoods over 12 feet in length shall be provided in multiple, equal-length sections for mounting end to end; no section shall be less than 6 feet in length. Hoods comprised of multiple sections shall be factory preassembled and provided with predrilled mounting holes and stainless steel fasteners. Welded field joints inside the capture area and exposed to view shall be ground and polished to match the adjacent finish. Hoods shall be factory preplumbed and prewired and shall have a single connection point. Hoods built in multiple sections shall be furnished with unions and junction boxes for field connections. Grease extracting exhaust hoods shall be of the overhead type suitable for wall mounting or ceiling mounted island-type. Steel mounting brackets shall be provided by the manufacturer.

28.25.7.2 Automatic Washdown System: Each grease extracting type exhaust hood shall include a built in washdown system consisting of stainless steel wash manifold(s) with brass spray nozzles. The washdown system shall remove accumulations of grease and other cooking process contaminants from the internal hood surfaces using a hot-water and detergent solution. The washdown system shall operate using water at a temperature of not less than 140°F, at a flow pressure of 40.0 psig minimum. A pressure reducing valve, when supply line pressure exceeds 50.0 psig shall be provided ahead of the hood control panel. The wash water and grease shall be collected within the hood(s), piped to the outside of the hoods, and interconnected to the building plumbing system (and grease interceptor) through an air-gap hub assembly. Main supply water piping shall include a quarter turn ball-type shut-off valve conforming to MSS SP-72 or MSS SP-110 as applicable. As a minimum, a temperature/pressure gauge, water hammer arrester, line strainer, solenoid valve, flow check valve, detergent inlet fitting with check valve, detergent pump, detergent tank and pump test switch shall be provided with the system. Controls, plumbing, and detergent components shall be located within the utility distribution system. One control enclosure shall be provided for each exhaust hood or group of hoods served by a common exhaust fan. A vacuum breaker shall be furnished for the hot-water/detergent supply line from the control enclosure to the hood connection point. System operation shall be by a control system, including indicator lights, programmable clock timer, control relays and terminal blocks. "START" button shall start the exhaust fan and "STOP"

button shall stop the exhaust fan and activate the timed wash cycle. System shall be capable of being activated either manually or thermostatically in the event of a fire.

28.25.8 Internal Hood Fire Protection: Grease extracting hoods shall be furnished with piping and nozzles for a fire protection system providing protection of the exhaust hood system, grease extractor, exhaust duct system, and the cooking equipment served by the exhaust hood, per NFPA 96. Exposed piping and fittings shall be chrome-plated or stainless steel sleeved. Each grease extracting hood control panel shall be provided with a manual pull fire switch to activate the automatic washdown system and exhaust fan. Each hood shall be equipped with a full length, stainless steel fire damper located at the air inlet. In the event that a fire or heat in excess of 286°F in the exhaust duct collar exists, a thermal switch shall automatically close the fire damper, turn on the automatic washdown system and turn off the exhaust and supply fans. The washdown system shall remain on as long as the thermostat is above its activation temperature and once below that temperature run for an additional five minutes. Fire dampers shall be able to be open with a reset handle without the removal of access panels. Reset handle shall be located not greater than 7 feet above the finished floor. A wet chemical, Class K fire suppression system (NFPA 96) is required in all grease extraction hood(s). The controls for the hood fire protection system shall be equipped with switches to shut off fuel-fired and electric-powered cooking equipment served by the hood, when the internal hood fire protection system is activated. The hood fire protection system shall be equipped with normally open contacts for activating the building fire alarm system (FACP).

28.26 Condensate Hood: Hood and duct work systems shall conform to ACGIH-2092M, SMACNA HVAC Duct Const Stds, and NFPA 96. Unless otherwise specified, ducts and hoods shall be secured to building so as to be level and free from vibrations under all conditions of operation. Supply and installation of exhaust fans for food service equipment and exhaust hoods shall be as specified in UFGS 15895, AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS.

28.26.1 Exhaust Duct for Canopy Condensate Hoods: Ducts shall be constructed of 18 gauge stainless steel. External seams shall be welded and liquid-tight. Duct size shall be based on a minimum air velocity of 800 fpm. Duct shall be continuously welded, liquid tight, to hood duct collar as required by NFPA 96.

28.26.2 Hood Support: Wall mounted or island type hoods shall be supported from the ceiling structure with stainless steel mounting brackets provided with the hoods. Hanger rods shall be 1/2 in diameter stainless steel, threaded at the bottom and designed at the top to fit into inserts in building slats above or hanger attachments fastened to structural steel members. Hanger rods shall be spaced 48 in on center, maximum.

28.26.3 Make-Up Air, Tempered: The air volume which is exhausted from a kitchen shall be replaced as required by NFPA 96. Air supplied upstream of the hood suction opening does not qualify as make-up air. The exhaust air flow rate of ventilation of dishwash equipment shall be drawn through the open area between the dishwasher machine and the perimeter entrance of the hood. Make-up air diffusers shall be provided the full length of the front panels, at both sides of the hood producing a low velocity discharge. The supply air plenum shall have 1 in thick foil-faced fiberglass insulation at interior of plenum. The temperature differential between makeup air and the air in the conditioned space shall not exceed 10°F, except air that is part of the air conditioning system of air that does not decrease comfort conditions of the occupied space.

28.26.4 Closure Panels: Vertical corner mullions shall be provided at removable closure panels, 2 in by 2 in wide, 16 gauge stainless steel, and shall be welded integrally to furring and head channel. Exhaust hood closure panels shall be 1/2 in pan-formed 18 gauge stainless steel. The upper edge of the panel shall be retained in a 1 in by 2 in continuous 16 gauge stainless steel head channel secured to the hood superstructure. The lower edge of the panels shall be mounted on perimeter furring cap, and shall be turned back 1 in for "zee" clip retention.

28.26.5 Ducts at dishwashing machines shall consist of two vertical ducts, one at each end of the dishwasher. Exposed, seamless, ducts shall be constructed of not less than 18 gauge stainless steel and shall be sized to accommodate the machine exhaust vent. The intake of each duct shall be at the top

edge of the dishwasher and the ducts shall extend to 6-in above the finished ceiling for final connection. The duct shall be trimmed at the ceiling with a 16 gauge stainless steel angle flange with corners welded. The exhaust outlet shall be connected to the exhaust system.

28.26.6 Condensate Exhaust Hoods: Hoods, exposed ducts, and enclosures over dishwashing machines and the rinse compartment of pot washing sinks shall be constructed of 16 gauge stainless steel with seams welded, ground, and polished.

28.26.6.1 Condensate Gutter: Hood shall be fabricated so as to form a condensate gutter 3in wide by 1 in high at the perimeter and shall be provided with a condensate drain terminating at a floor sink location.

28.26.6.2 Duct openings with collars shall be with a stainless steel louvered grille at the openings. Penetrations of the dishwashing machine duct risers through the hood body shall be trimmed and sealed.

28.26.6.3 Ceiling Recessed Exhaust Hood at Dishwashing Machines: Hood over dishwashing machines shall be constructed of 16 gauge stainless steel with all seams welded, ground, and polished. Both long sides shall slope up to a 18 in interior height from 6in above bottom edge. Body shall have a 2 in wide perimeter flange turned-up 3/4 in at 90° (increase to 10 in width at supply air diffusers). Make up air diffusers shall be at vertical exterior length of hood. Duct openings with collars shall be with a stainless steel louvered grille at the openings. Penetrations of the dishwashing machine duct risers through the hood body shall be trimmed and sealed.

28.27 Prefabricated Walk-In Refrigerators and Freezers: Refrigerators and freezers shall be prefabricated, commercial, walk-in type suitable for the intended use. Units shall conform to UL 207, UL 471, and NSF 7, floorless design type. Refrigeration equipment for cold storage facilities shall be as specified under UFGS 15652A COLD STORAGE REFRIGERATION SYSTEMS.

28.27.1 Air (shields) curtain fans shall be provided over all walk-in refrigerated unit doors. The devices shall extend the full width of the doors and be installed on the building side immediately above the doors.

28.28 Heating Equipment: The hot water heating systems shall include gas-fired hot water boilers and circulation pumps. Boilers shall be designed, constructed and equipped in accordance with the ASME Boiler Pressure Vessel Code, Section IV, Heating Boilers. Each boiler shall be of the firetube type. The boiler capacity shall be based on the ratings shown in HYI-01 or as certified by the American Boiler Manufacturers Association, or American Gas Association. Boiler shall be designed to burn gas and/or a propane-air blend. Each boiler shall comply with Federal, state, and local emission regulations. Point of contact for air quality permits is Fort Knox DBOS/Environmental Division, Al Freeland (502) 624-3629. Burners shall be UL approved mechanical draft burners with all air necessary for combustion supplied by a blower, electric interlocked with the burner. Burners shall be provided complete with fuel supply system in conformance with UL 795, ANSI Z21.13 or NFPA 8501. Manufacturer's standard packaged operation controls shall be provided to handle all aspects of capacity modulation and safeguarding. Heating distribution pumps shall be variable speed to control and maintain constant pressure in the low temp water supply lines. A drop in pressure below setpoint shall override control to maintain constant pressure and shall increase pump supply pressure until the building pressure returns to setpoint. Pumps shall be base mounted and selected for non-overloading operation at all conditions. Closed coupled pumps are not acceptable. Provide hot water bypass feeder, expansion tanks and air separator tank.

28.29 Heating Piping, Pumps and Accessories

28.29.1 Heating water piping shall be ASTM B 88, ASTM B 88M, Type L copper or ASTM A53 Type E or S, Grade A or B, SCH 40 black steel. Ball valves shall be utilized for sizes up to 3"; larger piping shall be equipped with gate valves. Butterfly valves are not acceptable. Piping supports shall be in accordance with MSS SP-59 and MSS SP-69. System shall include an air separator, expansion tank, chemical bypass feeder and makeup water connections. Equip circulation pumps with strainers, check valve, balance valve, flexible couplings and isolation valves to permit pump maintenance. Pipe pump body drain and air vents from expansion tank to nearest floor drain. Provide pressure gage arranged across

pump suction and discharge such that pump differential pressure may be witnessed. Entire pump assembly shall be mounted on a structural steel frame equipped with housed spring vibration isolators. Provide manual or automatic waterflow control valves at each coil and balancing valve in each loop of piping branch.

28.29.2 Heating hot water piping shall be insulated with 1-1/2" glass fiber insulation. Piping passing through hangers shall be supported on insulation shields.

28.30 Chiller Equipment

28.30.1 Chilled water shall be generated at a supply temperature of 44°F and shall be designed for a return temperature of 56°F. The chilled water system shall include exterior and interior mounted equipment. Chiller components exterior to the building shall be protected from freezing through the use of a glycol solution with heat tape as a secondary backup. Manufacturer's standard packaged controls shall be provided to handle all aspects of compressor staging and safeguarding.

28.30.2 Chillers

Packaged air-cooled liquid chillers: The chiller shall be provided with demand management capabilities. Minimum chiller efficiency shall be Energy Star or in accordance with the following minimum efficiencies:

Minimum Efficiencies for Water-Cooled Chillers:

Capacity	Full Load COP	(EER)	IPLV COP	(kW/ton)
80 tons or less	3.9	(13.3)	4.7	(0.75)
Greater than 80 tons or less than or equal to 100 tons	3.9	(13.3)	5.1	(0.70)
Greater than 100 tons or less than or equal to 200 tons	4.7	(16.0)	5.4	(0.65)
Greater than 200 tons or less than or equal to 500 tons	5.7	(19.4)	6.1	(0.58)

28.30.3 Total chiller system shall be constructed and rated in accordance with ARI 590. Individual chiller components shall be constructed and rated in accordance with the applicable ARI standards. Chiller shall be assembled, leak-tested, charged (refrigerant and oil), and adjusted at the job site by a factory representative. Unit components delivered separately shall be sealed and charged with a nitrogen holding charge. Unit assembly shall be completed in strict accordance with manufacturer's recommendations. Chiller shall operate within capacity range and speed recommended by the manufacturer. Parts weighing 50 lbs or more which must be removed for inspection, cleaning, or repair, shall have lifting eyes factory installed insulation on surfaces subject to sweating. Chiller shall include all customary auxiliaries deemed necessary by the manufacturer for safe, controlled, automatic operation of the equipment. Refrigerants shall be one of the fluorocarbon gases. Refrigerants shall have an Ozone Depletion Potential (ODP) of less than or equal to 0.05. Chiller shall be provided with a complete factory mounted and prewired microprocessor based control system. Controls package shall contain as a minimum a digital display or acceptable gauges, an on-auto-off switch, motor starters, power wiring, control wiring, and disconnect switches. Control package shall provide operating controls, monitoring capabilities, programmable setpoints, safety controls, and EMCS interfaces.

28.30.5 Chilled Water Pumps and Condenser Water Pumps: Chilled water circulating pumps shall provide a constant volume of water through the chillers. Condenser water pumps shall provide a constant volume of water through the cooling towers. Chilled water distribution pumps shall be variable speed to control

and maintain constant pressure in the chilled water supply lines in the building. A drop in pressure below setpoint, in the building, sensed by the building EMCS system, shall override control to maintain constant pressure and shall increase pump supply pressure until the building pressure returns to setpoint. All pumps shall be based mounted and selected for non-overloading operation at all conditions. Closed coupled pumps are not acceptable.

28.30.6 Chilled water piping shall be steel piping conforming to ASTM A 53/A 53M, Grade A or B, black steel, schedule 40 or copper tubing conforming to ASTM B 88, ASTM B 88M, Type K or L. Chilled water piping system shall include an air separator, expansion tank, chemical bypass feeder, makeup water connections, chemical treatment systems, surge/volume tank if system volume is not adequate, temperature and pressure ports, temperature and pressure gages, flow switch, and all other required appurtenances. Circulation pumps shall be equipped with strainers, check valve, balance valve, flexible couplings and isolation valves to permit pump maintenance. Pipe pump body drain and air vents from expansion tank to nearest floor drain. Provide pressure gages arranged across pump suction and discharge such that pump differential pressure may be witnessed. Entire pump assembly shall be mounted on a structural steel frame equipped with housed spring vibration isolators.

28.30.7 All chilled water piping and exterior condenser water piping shall be insulated. Piping passing through hangers shall be supported on insulation shields and vapor barrier shall be maintained continuously.

28.30.8 Refrigerant sensors and exhaust ventilation systems shall be provided as required for electric chillers in accordance with ASHRAE 15. Partitions within the mechanical equipment room separating the electric chillers from the gas-fired boilers and water heaters shall be provided as necessary to comply with ASHRAE 15 requirements.

28.31 Cooling Towers: Each tower shall be the forced mechanical draft, crossflow or counterflow, factory fabricated, factory-assembled type. Towers shall conform to NFPA 214. Fire hazard rating for plastic impregnated materials shall not exceed 25. Plastics shall not drip or run during combustion. Determine ratings by ASTM E 84 or NFPA 255. Casing shall be constructed of Type 304 stainless steel or FRP. Basin shall be completely watertight and constructed of Type 304 stainless steel or FRP. The fill shall be PVC formed sheets arranged in a honeycomb or waveform configuration. Fill shall be removable or otherwise made accessible for cleaning. Provide space supports as required to prevent sagging and misalignment, and provide for an even mixing of air and water. Structural supports shall be provided in accordance with the recommendations of the manufacturer of the tower unless otherwise indicated. Water distribution systems shall be accessible and permit flexibility of operation. Systems shall be self-draining and non-clogging. Provide drift eliminators in tower outlet to limit drift loss to not over 0.02 percent of specified water flow. Fans shall be the centrifugal or adjustable-pitch propeller type, constructed of Type 304 stainless steel, aluminum or an aluminum alloy, or FRP. Provide electric basin heaters and electronic sensors with remote water makeup. Each tower shall comply with Federal, state, and local emission regulations. Point of contact for air quality permits is Fort Knox DBOS/Environmental Division, Al Freeland (502) 624-3629.

28.32 Thermostats: A thermostat shall be provided in each room, with the exception that small rooms with similar load profiles, may be grouped together on a single thermostat. Thermostat shall not be located in location subject to unrepresentative temperatures.

28.33 Seismic Protection: Seismic protection (based on the seismic zone and geographical location of project) shall be provided for this project. Design requirements shall be in accordance with Army Technical Instructions TI 809-04, Seismic Design for Buildings. Detailed narrative and documentation shall be provided in Design Analysis to support the seismic protection design.

28.34 Cathodic Protection: Cathodic protection and dielectric features shall be provided for all materials and systems subject to corrosion and shall comply with the provisions of the National Association of Corrosion Engineers (NACE) criteria and standards. Contractor is required to provide a cathodic protection design where underground metallic piping systems are utilized.

28.35 Quality and Workmanship of Mechanical Equipment, Piping Systems, Materials and System Components: The project specifications form the basis for the required level of workmanship and quality of all equipment, piping systems, materials, and system components provided for this project. All materials and equipment provided shall be standard catalogued products of manufacturers regularly engaged in the production of such materials and equipment shall be of the manufacturers' latest standard design. All products shall be supported by a service organization. All mechanical system components shall be environmentally suitable for the intended application. Other than exhaust fans for kitchen hood makeup, roof mounted equipment is not acceptable to be used on this project. All floor-mounted equipment shall be installed on concrete equipment pads. Equipment pads shall extend a minimum of 6 in beyond the footprint of the equipment on all sides. All suspended equipment shall be properly supported according to the manufacturer's instructions. Vibration isolation devices shall be provided for all equipment which house rotating components, and shall be in accordance with equipment manufacturer's recommendation.

28.36 Mechanical Systems Maintainability and Accessibility: Accessibility features (i.e. access panels, etc.) shall be designed and included in this project as required to allow complete access to all mechanical systems and system components which are concealed, or require adjustment, inspection, maintenance, and replacement. Provide adequate clearance around all pieces of equipment for periodic maintenance, inspection and cleaning. Service of one piece of equipment shall not require disturbance of adjacent equipment or building components.

28.37 Work Coordination: The Contractor is responsible for insuring that the installation of all mechanical features required is coordinated with the work of all other trades.

28.38 Emergency Power/UPS System: See electrical narrative for mechanical systems and equipment requirements pertaining to backup power conditions, life safety backup power conditions, etc.

28.39 Testing, Adjusting, and Balancing (TAB) of HVAC Systems

28.39.1 Testing, adjusting and balancing of each system shall be the Contractor's responsibility. All HVAC systems shall be tested, adjusted, and balanced in accordance with the requirements of AABC or NEBB Procedural Standards. UFGS Specification Section 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS forms the basis for HVAC system TAB. The TAB firm shall be either a member of AABC or certified by NEBB, and certified in all mechanical system categories applicable to this project. The TAB contractor shall be an independent firm (not financially associated with the mechanical subcontractor on this project) hired by the prime contractor. The TAB Standard shall be used for all aspects of TAB. The TAB firm shall additionally perform the following:

28.39.2 Final design review (report provided to COR) of HVAC construction documents to insure the HVAC design provides the proper quantity and location of balancing devices and test ports necessary for accurate TAB results.

28.39.3 Prior to start of TAB effort, the installed systems shall be inspected (report provided to COR) by the TAB firm to insure the system components, which affect the TAB effort, are properly installed and functioning. TAB shall not begin until the TAB firm's final report indicates all necessary corrective actions have been accomplished. Testing of individual items of equipment shall be performed by a person authorized to perform such testing and startup by the equipment manufacturer. The contractor shall correct all systems and equipment not found in compliance, and shall be responsible for all labor and materials required for this effort. AABC MN-1 or NEBB-01 shall be used as the standard for providing testing of air and water systems. The selected standard shall be used throughout the entire project. All recommendations and suggested practices contained in the selected standard shall be considered mandatory. Instrumentation accuracy shall be in accordance with selected standard. The provisions of the TAB standard, including checklists, report forms, etc., shall, as nearly as practical, be used to satisfy the Contract requirements.

28.39.4 Piping systems: Each piping system including pipe, valves, fittings and equipment shall be hydrostatically tested and proved tight at a pressure of 1-1/2 times the design working pressure, but not less than 100 psi for a period of not less than two hours with no appreciable loss in pressure. Piping shall not be insulated until testing is completed and acceptable. Upon completion of installation and prior to startup, each hydronic system shall be balanced. All balancing data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time.

28.39.5 Air Systems: Where specific systems require special or additional procedures for testing, such procedures shall be in accordance with the standard selected. All data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time.

28.39.6 Equipment: Each item of operating equipment provided, including boilers, air handling units and chillers shall be tested in accordance with the equipment manufacturer's standard testing procedures. A factory representative shall be present for the startup and testing of each item of equipment. A certified report shall be provided for each item of equipment tested.

29. ELECTRICAL DESIGN

The Design/Build Contractor shall provide an Electrical Design Analysis for the DFAC.

The Design/Build Contractor shall also provide UFGS specifications for this project in accordance with the requirements contained within this RFP.

29.1 Codes and Standards. The design and construction of the electrical systems shall be in compliance with: (1) National Fire Protection Association Standards, (2) the rules and recommendations of ANSI C2, (3) as required herein, and (4) the referenced Unified Facility Guide Specifications (UFGS). Guide specifications are referenced in this RFP for their use in preparation of the design and shall be edited consistent with the criteria furnished. The most current edition of the codes and standards shall be used for building construction and life safety design. Where there is a conflict between the RFP and the codes and standards the most stringent shall apply. When codes and standards are in conflict, the most stringent shall apply. Standards and codes are listed in the guide specifications. Design/Build Contractor shall provide fault current coordination analysis.

29.2 Not Used

29.3 Site Electrical

29.3.1 Underground distribution. System shall consist of direct buried conduit and copper conductors. Design shall be in accordance with ANSI C2 and NFPA 90.

29.3.1.1 The electrical service for the Training Battalion Dining Facility and the future Initial Entry Training Barracks Complex Increment 1 shall be from the existing 12470/7200V overhead electric power distribution lines along Spearhead Division Avenue. The electrical services shall be designed utilizing 4-way pad mounted primary air switches which will feed a pad mounted loop feed transformer. The design shall include adding a future Barracks Complex and Battalion Headquarters with minimal disruption of the electrical power system.

29.3.1.2 The underground cable systems shall employ manholes or aboveground sectionalizing and pulling cabinets.,

29.3.1.3 Provide (4) four 3 inch PVC Schedule 40 conduits, direct buried 48 inches below grade, at a location along Spearhead Division Avenue to new site. Exact connection location along Spearhead Division Avenue shall correspond to the location of existing 750 KVA stepdown transformer riser on the road. A similar 4-way duct bank shall be extended and terminated to the northern limits of the current anticipated barracks construction site to accommodate future connections to future construction of barracks and dining hall to be preformed by others. All conduit shall be provided with pull wire. One conduit shall be spare.

29.3.1.4 Provide steel 90 degree elbows for conduits entering transformer pads, switches and cabinets.

29.3.1.5 The electrical system on the Post is privatized to Nolin Electric. The Design/Build Contractor shall size the 4-way primary switches, pad mounted transformers and primary conductors. Nolin Electric shall provide, install switches, conductors, and transformers and make all primary connections. The design build contractor shall provide all equipment pads, duct banks and secondary conductors and connections. Nolin Electric will furnish design drawings for pad installation. Nolin Electric will inspect all pad and conduit installation.

29.3.1.6 Provide concrete encased duct banks from transformer pads to the Dining Facility for secondary service conductors. The duct banks shall be buried a minimum 30 inches below grade. There shall be a spare conduit in all duct bank runs. All spare conduits shall be provided with a pull wire.

29.3.1.7 Coordinate all primary equipment pad sizing with Nolin Electric.

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29.3.1.8 Contact Nolin Electric, Vince Heuser, 270-765-6153 for coordination and design for primary service installation. ***2**

29.3.1.9 All outside branch circuits and feeders shall be permanently marked to identify the circuit number and the location from which it receives power. Cable tags shall be provided on both ends of all primary cable identifying the equipment or building it serves. Transformers, switches and cabinets will also have a permanent one line drawing or other approved identification so post personnel can tell direction of feed or load they serve.

29.3.1.9 Any outages on the existing systems shall be scheduled for an off peak time (night, weekend, holiday) to be determined by the Ft .Knox's DBOS. Full preparation shall be done before the outage to keep the downtime duration to a minimum. Nolin Electric shall schedule all work items requiring an outage on the same feeder to be accomplished concurrently during the single outage. All coordination with the Ft. Knox's DBOS shall be done through the Contracting Officer's Representative.

29.3.1.10 Design/Build contractor shall provide a connection to the Post's, EMCS system to monitor power usage. Refer Para 28.11.1. The existing system on Post is a wireless system. The contractor shall provide a meter that will have a signal sent to the wireless transmitter in the building in order for the systems to work together.

29.3.1.11 The landscape architect shall be consulted to provide appropriate screening in accordance with the Army Installation Design Standards of the pad mounted transformer, primary switches and termination cabinets, etc.

29.3.1.12 Provide the necessary equipment and outdoor loudspeakers for the playing of the Ft. Knox reveille and taps. Speakers shall be mounted on area lighting poles. Point of connection shall be from Sound System Amplifier which will be located in Dining Facility mechanical room. Design/Build Contractor shall route underground conduit and cabling to speaker locations.

29.4 Site Communications.- All exterior cables shall be provided by the Design/Build Contractor. Design/Build Contractor shall route 50 pair telephone cable to the Training Battalion Dining Facility. Design/Build Contractor shall route cable from existing aerial line at the corner of Spearhead Avenue and

Huron Road. Cable shall be routed down pole and underground to existing manhole across the street. From the existing manhole contractor shall route a new ductbank systems with 50 pair cable to the new Dining Facility. See utility drawings for connection points.

29.4.1 Duct bank shall be a minimum 24" below grade and a spare conduit provided in all ductbanks. The communications ductlines shall be concrete encased under roads and all areas subject to vehicle traffic. A pull wire shall be provided in all empty ducts.

29.4.2 The Design/Build Contractor shall exercise care when working around the existing cables. Any cables damaged by the Design/Build Contractor shall be repaired or replaced by the Design/Build Contractor immediately and at no additional cost to the Government. All work shall be coordinated with the DOIM. Post communication group shall make all final connections in the Dining Facility Communication Room.

29.4.3 All communication cables ran outside shall be Ft. Knox standard type cable for outside installations.

29.5 Manhole/Duct Bank.

29.5.1 Electrical Distribution System.

29.5.1.1 Underground cable systems shall employ manholes or above ground sectionalizing and pulling cabinets depending on local geological conditions and potential for damage from vehicles.

29.5.1.2 Manholes or above ground cabinets shall be spaced to meet facility needs; to conform to the facility master plan; and as required by the cable pulling calculations. Manholes located in traffic areas shall be design for a H2O wheel loading as defined by AASHTO HB-13.

29.5.1.3 Manholes will not be less than six feet in depth, by six feet in length, by four feet in width with an access opening to the surface above (outer air) of not less than 30 inches in diameter. Manholes will provide a minimum wall space of six feet on all sides where splices will be racked. Duct entrances into the manhole can be located near one end of long walls so that sharp bends of cables at the duct mouth are avoided, or else sufficient space will be provided for a reverse bend before the cable straightens out on the wall on which the cable is racked. The manholes will require a sump, ground rod, straps and cable racks. Manhole elevations and elevations of duct lines entering manholes will be shown.

29.5.1.4.1 Electrical equipment such as transformers or switches, etc. shall not be installed in manholes or underground vaults.

29.5.1.4.2 Locate manholes a maximum of 500 feet apart along any duct routing.

29.5.2 Communication System.

29.5.2.1 The communication systems shall employ the use of manholes in the distribution. The manholes shall be 38Y-J4. The manholes will require a sump, ground rod, straps and cable racks. Any manhole located in traffic areas shall be design for a H2O wheel loading as defined by AASHTO HB-13.

29.5.2.2 Coordinate the exact elevation, placement and orientation of communications manholes with Fort Knox's DOIM through the Contracting Officer's Representative. Coordinate the tie-in of new ducts with the Fort Knox's DOIM through the Contracting Officer's Representative. The ducts shall be placed in the lowest terminators. No conduit crossovers in the telephone manholes will be allowed.

29.5.2.3 Manhole and ductbank systems must be completed (to include pumped out and clean), inspected and accepted by the DOIM at least six (6) months prior to the BOD (Beneficiary Occupancy Date) for the project.

29.5.2.4 For additional criteria, See Installation Information Infrastructure Architecture (I3A) Design and Implementation Guide.

29.5.2.5 CATV shall be ran in separate ducts. Provide entrance duct for CATV to enter building underground without trenching complete turf. Provide 4 inch Schedule 40 PVC duct direct buried 48 inches below grade and shall be extended from existing aerial power/communication pole along Spearhead Ave. and be extended directly to the communication room in the Dining Facility. Provide a 4 inch duct from the Comm. Room in the Dining Facility to a point outside the Dining Facility construction limits for future connection by others. Cap conduit. Design/Build contractor shall coordinate private CATV connections. Design/Build contractor shall coordinate private CATV connections.

29.5.2.6 Locate manholes a maximum of 500 feet apart along any duct routing.

29.6 Utility Routing.

29.6.1 Coordinate the installation of the underground electric and communication lines with all other new utilities which shall include but not be limited to: power, communications, storm drains, sanitary sewers, water lines, steam lines, high temp water lines, chilled water lines, gas lines, and any other utilities. The minimum separation between electric or communication lines and other utility lines shall be 36 inches vertically and 36 inches horizontally when running adjacent. If utilities are crossing minimum separation shall be 12 inches vertically. In the case of concrete encasement, the clearances shall be measured from the outermost dimension of the utility line and shall have suitable supports on each side of the upper line to prevent transferring any direct load onto the lower line.

29.6.2 Prior to commencing work on any new underground power or communication line, the Design/Build Contractor shall stake the route of each line and indicate the exact location of all new ducts, primary sectionalizing cabinets and switches, manholes and transformers for approval by the Post's DBOS and DOIM, and by the Contracting Officer's Representative.

29.6.3 The routing of the secondary and communications service ductlines into the buildings shall be coordinated with the structural footings to avoid any conflicts.

29.6.4 New underground utilities including manholes shall be located outside the tree drip lines of existing trees scheduled to remain. Ducts that cannot be routed around tree drip lines shall be tunneled through the drip line area as approved by the Contracting Officer's Representative.

29.7 Grounding.

29.7.1 The secondary electrical distribution system shall be the solidly grounded neutral type with no intentionally introduced grounding impedance. Grounding shall be in accordance with Article 250, National Electrical Code. A green insulated grounding conductor shall be provided with all branch and feeder wiring.

29.7.2 A grounding counterpoise shall be provided around each transformer pad, chiller and around each building. Counterpoises shall be bonded together. Building counterpoises provided under lightning protection system requirements shall be connected to the transformer and chiller counterpoise, the main electrical panel, the main communications ground, building steel, and lightning protection down conductors. Ground rods shall be provided at each counterpoise connection. Connections shall be by exothermic weld. Building counterpoises shall be connected together where one building is located next to another building. The ground ring is to be located 3 to 6 feet outside the drip edge of the building.

29.7.3 Grounding conductors shall be copper. Driven grounding electrodes shall be 3/4 inch diameter solid rods of the following materials: copper or copper-clad steel.

29.7.4 Even though ground rods are indicated above, the grounding system shall be designed for a maximum of 25 ohms. Chemical or other similar designs, which calls for the user to maintain the system,

will not be used. Impedance measurements should be made using a direct reading ground resistance meter. Documentation will be provided to the Contracting Officer's Representative.

29.7.5 Grounding and bonding shall conform to UL 467.

29.8 Exterior Lighting.

29.8.1 The Design/Build Contractor shall design the exterior parking lot and street lighting system per the requirements of the installation design guide and herein stated. Nolin Electric company shall provide and install the conductors, light poles and lighting fixtures. The Design/Build Contractor shall install all bases for poles and all conduits. Nolin Electric Company shall provide required transformers and controls to feed lighting systems. Conduit routing shall be coordinated with Nolin Electric Company.

29.8.2 The design of exterior lighting and associated lighting levels not indicated shall be in accordance with Illuminating Engineering Society, IES, Lighting Handbook Reference and Application, 9th Edition. Exterior lighting shall include any new roads and parking lots, as well as any walkways, canopies, facility entrances/exits, and loading dock areas. The maximum brightness ratio will be 1 to 6. All exterior lighting shall utilize color corrected high pressure sodium (HPS) lamps. Parking lots and street lighting shall be zero-beam illumination (IESNA) and photocell controlled. All site lighting shall be zoned and shall have a separate photocell for control unless otherwise indicated. Each contractor/zone shall be equipped with Hand-Off-Auto switches unless otherwise indicated. Location of controls shall be coordinated with the User after Contract award. Walkways shall be illuminated to .5 footcandle. Parking areas shall be illuminated to .5 footcandle and utilize cut-off type fixtures. Fixture types shall be in accordance with the "ASCIM Army Installation Design Standards". Pole bases shall be in accordance with the Army Installation Design Standard. Pole bases shall be in accordance with the Army Installation Design Standard. Facility entrances/exits shall be illuminated with wall mounted fixtures or recessed fixtures mounted in the soffit, if applicable All exterior fixtures shall be dark bronze anodized aluminum.

29.8.3 Metal poles shall be the pole manufacturer's standard design for supporting the number of fixtures indicated. Poles shall be designed for a wind velocity of 100 mi/hr at the base of the pole, for a wind gust factor of 1.3, and for the height and drag factors recommended by AASHTOLTS-3. The effective projected area of luminaries and other pole-mounted devices shall be taken into account in pole design. Poles shall have grounding provisions. The type of pole shaft material provided shall not be mixed for the same type of fixture types. Grounding connection shall be provided near the bottom of each metal pole and at each concrete pole anchor base. Scratched, stained, shipped, or dented poles shall not be installed. Design/Build contractor may use FRP poles to match existing poles in the vicinity of Building 1109 as an option to Metal poles.

29.8.4 Security lighting shall be provided at service entrances and at utility rooms (i.e. mechanical, electrical, communications, etc.). Wall mounted security light fixtures shall be shrouded to minimize glare. Fixture shall use compact fluorescent lamps whenever possible; where compact fluorescent lamps are inadequate, fixtures shall be equipped with color corrected high pressure sodium.

29.8.5 Utility lighting: Provide security and maintenance lighting for outdoor mechanical/electrical courtyards. Lighting shall provide sufficient lighting to inspect equipment at night. A weatherproof switch located within the mechanical courtyard shall control lighting. Lighting fixture shall be a die-cast aluminum housing wall pack with a polycarbonate refractor with an incandescent lamp source.

29.8.6 Street and area lighting. Residential roadway lighting, including collector streets, shall be provided in accordance with the IES Lighting Handbook. Provide lighting at roadway intersections, and at intervals not exceeding 200 feet between intersections. Area lighting shall be provided at intervals not exceeding 200 feet along area walkways not otherwise illuminated, common area walks, and at all steps in area walkways. Area lighting shall be provided in accordance with the IES Lighting Handbook. Luminaries shall be actuated by photoelectric control, one photocell per circuit.

- 29.8.7 Provide a 30-inch tall elevated concrete pedestal base for all lighting poles placed in parking lot surfaces.
- 29.8.8 Exterior lighting fixtures shall have zero-beam illumination.
- 29.9 Interior Distribution System.
- 29.9.1 All electrical equipment shall fit into the space required and provided with all the access and clearance required by code.
- 29.9.2 Series rated breakers/switchboards/panelboards/loadcenters, etc. shall not be used.
- 29.9.3 Wiring shall be copper and shall be run in conduit. Use solid bare copper wire for sizes No. 8 AWG and smaller diameter, and Class B, Stranded bare copper wire for Sizes No. 6 AWG and larger diameter. MC cable not allowed.
- 29.9.4 Provide a connection point on the exterior of the building for the government to install a portable (trailer mounted) generator to be able to power all the walk-in refrigerators and walk-in freezers and their associated mechanical equipment during a power outage. Transfer between normal and emergency power shall be by a solid state logic, manual transfer switch. Provide a convenient connection point to ground for a generator to tie to.
- 29.9.5 Provide shunt trip breakers tied into the Hood Control or Fire Suppression Panels for tall electrical equipment under hoods that contain a fire suppression systems.
- 29.10 Interior Lighting.
- 29.10.1 Lighting shall be provided for specialty items such as display cases and other items as necessary as identified by the User during further development of the design.
- 29.10.2 Fluorescent lamps shall be T8 or compact. Fluorescent ballast shall be the electronic type. All fluorescent lamps shall be low mercury content certified to pass the U.S. Environmental Protection Agency (EPA) Toxic Characteristics Leaching Procedures (TCLP) test for non-hazardous waste.
- 29.10.3 Illuminated exit signs and emergency lights shall be provided by self-contained emergency battery units for all emergency exits and passageways as required by the NFPA Life Safety Code No. 101. Exit fixtures shall be LED (red).
- 29.10.4 Upon loss of power the emergency lamp shall light regardless of the light switch position.
- 29.10.5 Coordinate light switch with room finish schedules for proper mounting heights and placement.
- 29.10.6 The following requirements apply to rooms that are changed or reconfigured if allowed by the RFP.
- Corridors and Vestibules (20 fc.)
 - Storage areas (20 fc.)
 - Mechanical and electrical rooms (30 fc.)
 - Communication room (50 fc.)
 - Areas where recipes are read (50 fc.)
 - Kitchen, work & food prep areas (70 fc.)
 - Kitchen Offices (50 fc.)
 - Serving Areas (70 fc.)
 - Head Count Desks (30 fc.)
 - Dining areas (30 fc.)
 - Clean end of dishwasher (70-100 fc.)

Other Areas – See paragraph 29.10.7

29.10.7 The color temperature and minimum CRI of all fluorescent T8 lamps shall be 3500 degrees Kelvin and 84 respectively unless otherwise indicated. The color temperature and minimum CRI of all compact fluorescent lamps shall be 3500 degrees Kelvin and 82 respectively, unless otherwise indicated. All lamps shall be approved by the lamp manufacturer for the indicated ballast type.

29.10.8 Incandescent light fixtures may be used only for architectural effect and in refrigeration and freezer areas. Incandescent light fixtures will not be used for general lighting.

29.10.9 Light fixtures in dish washing areas, cart and can washing areas, and pot and pan washing areas will be gasketed, vaporproof. Light fixtures in kitchen areas shall be NSF listed as suitable for the applicable food processing or handling zone. Lenses in cooking areas shall be inverted tempered glass and lenses in food storage and serving areas shall be inverted tempered glass or inverted 0.125 inch acrylic. Light fixtures in walk-in prefabricated refrigerators and freezers will be gasketed, vapor-proof type with protective shields that automatically turn off when the doors are closed.

29.10.10 Lighting fixtures shall be as follows, refer to Appendix B5 for locations:

Fixture schedule:

- A 2' x 4' 3 lamp 3000K, recessed parabolic, 3" deep 24 cell
- Ca 2' x 4' 2 lamp 3000K recessed .125" pattern 12 acrylic prismatic
- Cb 2' x 4' 2 lamp, 4100K, recessed .125" pattern 12 acrylic prismatic
- Cc 2' x 4' 2 lamp, 4200K, recessed .125" pattern 12 acrylic prismatic with protective shield
- C6a 2' x 4' 4 lamp, 3000K, recessed .125" pattern 12 acrylic prismatic with protective shield
- C6b 2' x 4' 4 lamp, 4100K, recessed, shatterproof glass smooth side up
- C6c 2' x 4' 4 lamp, 4100K, recessed .125" pattern 12 acrylic prismatic with protective shield
- C6d 2' x 4' 4 lamp, 4100K, recessed .125" pattern 12 acrylic prismatic, gasketed, vaporproof
- D2 4" 2 lamp, 4100K, surface/chain hung fluorescent strip
- E 50" long, 2 lamp 3000K, surface mounted exterior, enclosed and gasketed, UL wet location
- E5 50" long, 2 lamp 4100K, surface mounted exterior, enclosed and gasketed, UL wet location
- F8 6" dia compact fluorescent can light, (1) 26 W , 3000K, UL damp location, exterior
- F9 6" dia compact fluorescent, recessed can light, (1) 32 W, 3000K
- F10 6" dia compact fluorescent, recessed can light, (1) 32W 3000K, UL damp location exterior
- G 120 volt, 90 watt incandescent surface mounted, Jelly Jar, wall mounted.
- G1 120 volt, 90 Watt incandescent surface mounted, Jelly Jar, ceiling mounted.
- H1 70 watt, HPS exterior wall pack

29.11 Interior Power.

29.11.1 Electrical power for kitchen equipment shall be 120/208 volt, 3phase service.

29.11.2 GFI receptacles are to be wired such that the loss of power on one receptacle does not affect downstream receptacles.

29.11.3 Appropriate outlet types shall be provided for items identified in other portions of the RFP (i.e., vending machines, overhead motorized projectors and screens, solvent cleaning unit, etc.).

29.11.4 Provide appropriate outlet types for any Government furnished equipment identified.

29.11.5 Outlets shall be provided for copying machines. The user may adjust locations after the Final Review stage.

29.11.6 Waterproof, GFI receptacles shall be provided on the outside areas at entrances to all buildings.

29.11.7 Provide TV receptacles adjacent to each of the Cable TV outlets in the dining areas.

29.11.8 Electrical receptacles mounted on conduit stub-ups extending above or flush mounted with the finish floor for 120 volt equipment shall not be installed in kitchen areas. Ceiling cord reels with the appropriate outlet shall be provided in the kitchen area only. Electrical stub-ups for the 3- phase floor mounted equipment in the Kitchen area are acceptable.

29.11.9 Electrical receptacles mounted on conduit stub-ups extending above the finish floor shall not be installed in the self-service areas for equipment that is located away from the walls that people can walk around. Flush mounted receptacles shall be used for this equipment in this area only.

29.11.10 Electrical outlets and receptacles mounted on conduit stub-ups, or stub-ups for 3-phase equipment extending above the finish floor will be installed in serving line work areas, or self-service areas that will not be a hazard.

29.11.11 Waterproof electrical receptacles will be provided in all areas subject to wet cleaning methods, such as in kitchens, serving line, self-service, dish washing, pot and pan washing, and cart and can washing areas. These receptacles will be installed not less than 4 feet above the finish floor, except in areas where serving line tray slides are installed since they are less than 4 feet high. Ground fault circuit interrupting protection will be provided in accordance with the National Electrical Code. 29.11.4.7

29.11.12 Appropriate outlets or connections shall be provided for the Food Service and kitchen equipment. Coordinate with the equipment to be furnished so that any cord and plug furnished equipment will be within reach of the receptacle. Maximum voltage for the food service and kitchen equipment shall be 208 volts.

29.11.13 Review requirements for NEMA-4 and specify as required

29.11.14 Provide detail for bracing and support of retractable outlets through an acoustical ceiling.

29.11.15 Mounting of all controls in dishwashing room shall be mounted on a metal plate of equipment served.

29.11.16 Refer to the Fort Jackson drawings for the minimum quantity of outlets required. In addition provide an additional duplex receptacle on the opposite side of item 134, counter.

29.12 Telephone, Local Area Network (LAN) and Cable TV. Refer to Appendices B3 for addition requirements.

29.12.1 A completely operational cabling system including, but not limited to, all necessary raceway, cabling, terminations, jacks, patch panels, and faceplates shall be provided. All duplex outlets (voice/data) and cable TV (CATV) outlets will be 18 inches above finish floor (AFF) except wall telephone outlets will be 54 inches AFF. Voice and data will be in the same outlet. The cable for the outlet will be 4 pair, 24 AWG solid unshielded twisted pair (category 6) copper for voice and a 4 pair, 24 AWG solid unshielded twisted pair (category 6) for data. Termination of copper at instrument end will be in a RJ-45 jack (Category 6) for "voice" and RJ-45 jack (category 6) for "data". The cable for CATV shall be RG 6 and connectors shall be a "F" type. Termination at the communication closet/room for both voice and data shall be on 110 type block 5E complaint termination panels (rack mount),(punched down "B" standard). Coordinate with the Post Directorate of Information Management (DOIM) on the termination equipment racks. All equipment racks shall be floor mounted. The DOIM shall make final connections on Outside Plant cables only. The contractor will be responsible for all other connections. All CATV head-end equipment, incoming service, etc. shall be furnished and installed by the local Cable TV Company.

29.12.2 Conduit from telephone or CATV outlets shall be a minimum of 1-inch electrical metallic tubing (EMT) conduit. One inch EMT conduits shall be installed as a "home run" between the telecommunications closet telephone backboard and each outlet or between each outlet and the cable tray. "Home run" means one continuous conduit run with NO pull boxes and NO more than two 90-degree bends in the entire conduit run. Metallic Flex-Tray (or approved equal) cable trays shall be used to provide a centralized cable distribution system if space permits and is readily accessible. Cable trays (if used) shall be no higher than 6 inches above finished ceilings. The cable tray shall be provided with 1 square inch of cross-sectional area per outlet location to be served. An optimal fill ration of 40% should be the design plan. The EMT conduit shall be physically strapped to the cable tray and an anti-chaffing grommet attached. All empty conduits routed to outlet boxes shall be provided with a pull cord. All conduits to administrative outlet boxes shall be provided with a pull cord for future installation of fiber optic cable (FOC).

29.12.3 All voice pairs from the copper building entrance cable shall be terminated on a protected entrance terminal. Interconnections and equipment between the patch panels carrying the "data" cables will be done by the local DOIM. Interconnections, equipment, etc. between the incoming copper cables and the "voice" cables shall be by the Design/Build Contractor. The Design/Build Contractor shall furnish all patch cords.

29.12.4 Connect Dining Facility into the Ft. Knox EMCS System.

29.12.5 Layout for the telephone rooms shall be in accordance with the Installation Information Infrastructure Architecture (I3A) Design and Implementation Guide.

29.12.6.1 Provide two cable TV outlets in each Dining Room and stack one outlet above the other. Locate one of the outlets 12 inches below the ceiling and the other that directly below 18" AFF. Provide a Cable TV outlet in each office.

29.12.7 Coordinate requirements for ceiling mounted CATV outlets with room equipment requirements.

29.12.8 Provide data outlets in storage rooms next to offices.

29.12.9 Provide empty conduit with pull wire for LAN access to (4) cash registers at each head count station, each office space and dry storage room.

29.12.10 For additional criteria, see the Installation Information Infrastructure Architecture (I3A) Design and Implementation Guide.

29.13 Fire Alarm System

29.13.1 The fire alarm system will consist of a control panel, manual pull stations, horns and strobe lights, sprinkler water flow switches, valve tamper switches, air pressure supervisory switches, control and monitor modules for non-addressable devices and smoke and heat detectors as required by criteria.

29.13.2 In addition to the manual pull stations at all exits; provide pull stations at all other exterior entrances such as mechanical, electrical and communication rooms. In addition to the horns/strobes throughout the facility, provide them also in these rooms.

29.13.3 Provide horns/strobes throughout the facility so that alarm sound levels at any location are at least 15 dB above normal ambient sound levels and can be heard in all rooms (i.e. in shower with water running). Provide strobe lights to comply with NFPA 72-1999. Strobe lights shall meet Underwriter's Laboratories (UL) Standard 1971 and shall be synchronized.

29.13.4 The fire alarm system shall be a completely supervised system employing analog addressable initiating devices and multiplex communication techniques. Each detection, monitor and control device

shall be individually addressable. Devices which are not inherently addressable (i.e. tamper, flow switches etc.) shall be equipped with addressable monitor and control modules.

29.13.5 Coordinate with the other disciplines to provide tamper switches on all fire alarm system control valves and the Post Indicator Valve (PIV). Coordinate with the Architect for releasing all electromagnetic doors.

29.13.6 Conduit and wiring shall be installed in accordance with Specifications Section 13851A. System shall be a four wire, two conduit loop system. Vertical and horizontal separation of conduits shall be in accordance with NFPA 72. Conduits are to be marked with a red stripe every 10 feet. All junction or pull-boxes shall be painted red.

29.13.7 Provide cabinet mounted MOV based surge protection device in addition to surge protection integral to the FACP. Device shall be UL 1449 listed and shall satisfy the requirements of IEEE C62.41.

29.13.8 A Monaco Fire Alarm Transmitter shall be provided by the Government and installed by the contractor Locate the Fire Alarm Control Panel (FACP) and the transmitter in the Electrical Rooms.

29.13.9 Provide manual disconnect for 120 Volt, 1phase air compressor and a contact on the FACP to supervise compression.

29.14 Public Address and Sound System.

29.14.1 Zone the PA system in the Dining Facility as follows:

- zone 1 – kitchen, dishwashing and all other associated working areas,
- zone 2 – take out kitchen and associated areas,
- zone 3 – serving line areas,
- zone 4 – dining area A and associated areas rest rooms, etc.,
- zone 5 – dining area B, and associated areas rest rooms, etc.

29.14.2 Provide an additional microphone outlet in each of the offices.

29.14.3 Amplifier(s) shall be mounted in mechanical room.

29.14.4 Provide rack with all equipment.

29.15 Lightning Protection.

29.15.1 Lightning protection shall be provided. A complete protection via air terminals shall be provided. The system shall have the appropriate U.L. master label installed on the building. Down and roof conductors shall be concealed within the buildings. Lightning protection system shall be in accordance NFPA 780.

29.16 Transient Voltage Surge Protection (TVSP).

29.16.1 TVSP shall be provided. Surge suppressors shall parallel the operating devices in providing a path to ground for an electrical surge and limiting the magnitude of transient voltage surges on the system. Units shall be mounted adjacent to the main distribution panel in accordance with the manufacturer's recommendation. Unit shall be hard-wired into the electrical distribution system utilizing a circuit breaker connection. Units shall be tested in accordance with IEEE C62.45 using an IEEE C62.41 Category B waveform. Units shall be UL 1449 listed and labeled. Modes of protection shall be normal mode (L-N, L-L) and common mode (L-G, N-G). The unit shall include self-diagnostic and self-testing capabilities, a resettable transient event counter, and a local audible alarm with mute capability.

29.17 Seismic protection.

29.17.1 Seismic protection shall be provided for all the buildings. Seismic design shall be in accordance with Army Technical Manual, TI 809-04, Seismic Design for Buildings, dated December 1998.

29.19 Americans with Disabilities Act (ADA). The electrical, communication and fire alarm systems shall comply with the Americans with Disabilities Act (ADA) for buildings identified in the RFP with this requirement.

29.20 See Appendices B1-B6 – Functional Room Requirements for additional information.

29.21 See paragraph 30 on Sustainable Design Goal.

29.22 Location of Documents referenced in Section 29.

29.22.1 TI-800-01 & TI-800-04 – <http://www.hnd.usace.army.mil/techinfo/ti.htm>

29.22.2 Specifications Sections - <http://www.ccb.org/docs/ufgshome/UFGSToc.htm>

29.22.2 Installation Information Infrastructure Architecture (I3A) Design and Implementation Guide <http://arch-odisc4.army.mil/I3A/i3a.htm>

29.22.4 Army Regulations (AR's) - <http://www.apd.army.mil/>

30. SUSTAINABLE DESIGN

30.1 Sustainable Design Goal. The goal for this project is to achieve at least 50 points using SPIRIT, the Army's project rating tool for sustainable design. SPIRIT is a modified version of the US Green Building Council's LEED project rating tool. Solutions that minimize building maintenance costs are preferred. The Sustainable Rating Tool is included in Appendix G.

***2**

30.2 The Appendix D Spirit Requirements and Summary Table is provided to the Proposers to give them some insight into the points that the Government believes are possible for this project as well as to indicate which avenues the Proposers may consider to meeting the Gold rating as well as to indicate which are not desired or possible. The only requirement, relevant to the Spirit Rating, is that the design is able to satisfy the Gold evaluation criteria of the Spirit rating tool. The means the Proposer uses to reach that goal, while satisfying the other criteria of the RFP, is up to the Proposers. ***2**

30.3 Prohibited Solutions. Any solution that conflicts with other RFP requirements is prohibited.

- End of Section -



- Architecture
- Civil & Structural
- Environmental
- Geotechnical & Material Testing
- Highways & Bridges

June 16, 2004

Mr. Alan Hautman, P.E.
KZF Design, Inc.
655 Eden Park Drive
Cincinnati, Ohio 45202-6000

**RE: Estimated Settlement Values and Approximate Undercut Depths below Proposed Footers
Fort Knox Proposed Barracks Complex, Fort Knox, Kentucky**

Dear Mr. Hautman:

Following are amended estimated settlement values for test boring B-1 based on suggested undercut depths and new estimated settlement values for test boring B-2 based on footers bearing directly on existing soils and based on suggested undercut depths for the above referenced project.

At the request of KZF personnel, PRIME is providing these additional estimated settlement values to facilitate the contractor bidding process. The total settlement values provided in our subsurface investigation report dated April 19, 2004 were on the order of 5.0 to 6.0 inches based on the soils encountered in test boring B-1 without any soil removal or replacement below the proposed footers. As explained in our report, these values were conservative because they were derived from a formula based on normally consolidated soils even though the soils encountered across the site were determined to be preconsolidated. However, to derive accurate consolidation settlement values from preconsolidated soils, a one-dimensional consolidation test must be performed and due to the general nature of our subsurface investigation, a one-dimensional consolidation test was not included in the scope. One-dimensional consolidation testing is recommended when a complete subsurface investigation is performed at each proposed structure location.

In order to reduce potential consolidation settlement, PRIME recommends undercutting the existing soils below the proposed footers and replacing them with approved, engineered fill. By doing this, the calculated estimated settlement can be reduced to tolerable limits. Once again, PRIME recommends basing the final undercut depths on one-dimensional consolidation test results that should be performed prior to final design.

Additional information provided by KZF indicates that the proposed structure(s) may contain crawl spaces, which may lower the elevation of the footers. This, will in turn, reduce or eliminate the need for undercut of existing soils and replacement with engineered fill.

The settlement values were calculated at test boring locations B-1 and B-2 using a design load of 2000 psf. These settlement values, with and without undercutting and replacing with engineered fill, are listed in the following table.

Estimated Total Settlement Values

Test Boring	Bearing Depth	Approx. Undercut and Replacement Depths Below Footers	Estimated Total Settlement
B-1	3.5'	None	5.3"
B-1	8.0'	4.5'	1.6"
B-2	3.5'	None	3.3"
B-2	7.0'	3.5'	1.4"

Note that all of the estimated settlement values listed in the above table are conservative based on the aforementioned formula used to calculate settlement and the estimated total settlement values of 1.6" and 1.4" may be on the order of 1.0" or less. However, one-dimensional consolidation testing must be performed to confirm these values. Also note, that differential settlement values should be determined from subsurface information obtained at each structure location during the site-specific subsurface investigation to be performed at a later date.

Based on the above information, PRIME feels that the approximate undercut and replacement depths listed in the above table with estimated total settlement values on the order of 1.0 inch can be used to help estimate construction costs. However, PRIME does not recommend using these values for final design of the proposed structure foundations.

Please contact Steve Mileski if you have additional questions or comments regarding the contents of this letter.

Respectfully Submitted,
PRIME ENGINEERING & ARCHITECTURE, INC.

Stephen E. Mileski

Stephen E. Mileski
 Project Manager

Walid I. Najjar

Walid I. Najjar, P.E.
 Vice President - Akron

General Decision Number: KY030007 06/18/2004 KY7

Superseded General Decision Number: KY020007

State: Kentucky

Construction Types: Building

Counties: Hardin, Jefferson and Meade Counties in Kentucky.

BUILDING CONSTRUCTION PROJECTS (Does not include single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	06/13/2003
1	10/31/2003
2	12/12/2003
3	03/05/2004
4	03/19/2004
5	05/14/2004
6	06/18/2004

ASBE0051-001 10/01/2003

	Rates	Fringes
Asbestos/Insulator Worker (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)	\$ 21.68	8.24

ASBE0207-014 06/01/2002

	Rates	Fringes
Hazardous Material Handler (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)	\$ 14.80	5.70

BOIL0040-001 01/01/2004

	Rates	Fringes
Boilermaker	\$ 29.40	14.42

* BRKY0001-001 06/01/2004

	Rates	Fringes
Bricklayer		
BRICKLAYERS; CAULKERS; CLEANERS; POINTERS & STONE		
MASONS	\$ 21.53	7.20
LAYOUT MAN & SAW MAN	\$ 21.78	7.20
REFRACTORY & ACID BRICK	\$ 22.03	7.20
REFRACTORY; & ACID BRICK	\$ 21.43	6.70

BRKY0001-003 06/01/2003

	Rates	Fringes
Marble Setter, Terrazzo Worker & Tile Setter	\$ 19.94	4.60
Marble, terrazzo and tile finisher	\$ 13.64	3.95

* CARP0064-002 06/01/2004

	Rates	Fringes
Carpenters:.....	\$ 20.00	8.17
Piledriverman.....	\$ 20.25	8.17

* CARP1031-003 06/01/2004

	Rates	Fringes
Millwright.....	\$ 22.90	11.65

* ELEC0369-001 06/02/2004

	Rates	Fringes
Electricians:.....	\$ 26.25	8.89

ELEC0369-002 05/28/2003

	Rates	Fringes
Line Construction		
Backhoes.....	\$ 16.76	4.70
Cable Splicer.....	\$ 25.75	15.5%+2.75
Equipment Operator A: John Henry Rock Drill, D6 (or equivalent) and above, Trackhoe Digger, Cranes (greater than 25 tons and less than 45 tons).....	\$ 22.73	15.5%+2.75
Equipment Operator B: Cranes (6-25 tons), Backhoes, Road Tractor, Dozer up to D5, Pressure Digger-Wheeled or Tracked, all Tension Wire Stringing Equipment.....	\$ 20.20	15.5%+2.75
Equipment Operator C: Trencher, Vibratory Compactor, Ground Rod Driver, Boom Truck (6 ton or below), Skid Steer Loaders.....	\$ 16.41	15.5%+2.75
Groundman.....	\$ 18.94	15.5%+2.75
Groundmen.....	\$ 13.00	4.19
Lineman & Technician.....	\$ 25.25	15.5%+2.75
Linemen; Equipment Operators; & Line Truck Operators.....	\$ 20.94	5.28
Trenchers.....	\$ 15.72	4.66
Truck Drivers.....	\$ 14.67	4.41

Cranes 45 tons or larger to be paid 100% of journeyman
lineman's rate.

ELEV0020-001 10/01/2001

JEFFERSON COUNTY:

	Rates	Fringes
Elevator Mechanic.....	\$ 25.755	7.455+a+b

FOOTNOTES:

a. Seven Paid Holidays: New Year's Day; Memorial Day;
Independence Day; Labor Day; Thanksgiving Day; Day after
Thanksgiving; & Christmas Day

b. Employer contributes 8% of regular hourly rate to vacation
pay credit for employee who has worked in business more
than 5 years; 6% for less than 5 years.

 * ENGI0181-020 06/01/2004

	Rates	Fringes
Power Equipment Operator		
GROUP 1.....	\$ 21.25	9.65
GROUP 2.....	\$ 18.01	9.65
GROUP 3.....	\$ 16.74	9.65

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1 - Auto Patrol; Batcher Plant; Bituminous Paver; Cableway; Central Compressor Plant; Clamshell; Concrete Mixer 1 cu. ft. or over); Concrete Pump; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loader; Hoe Type Machine; Hoist (1 Drum when used for stack or chimney construction or repair); Hoisting Engine (2 or more Drums); Locomotive; Motor Scrapper; Carry-All Scoop; Bulldozer; Mechanic; Orangepeel Bucket; Piledriver; Power Blade; Motor Grader; Roller (Bituminous); Scarifier; Shovel; Tractor Shovel; Truck Crane; Winch Truck; Push Dozer; Highlift; Boom Cat; Core Drill; Hopto; Tow or Push Boat; A-Frame Winch Truck; Concrete Paver; Gradeall; Hoist; Hyster; Pumpcrete; Ross Carrier; Boom; Tail Boom; Rotary Drill; Hydro Hammer; Mucking Machine; Rock Spreader (Attached to Equipment); Scoopmobile; Kecall Loader; Tower Crane (French, German & Other Types); Hydrocrane; Backfiller; Gurry; Subgrader; Tunnel Mining Machine, including Moles; Shield or similar types of Tunnel Mining Equipment; & Forklift (Regardless of Lift Height)

GROUP 2 - Air Compressor (Over 900 CFM); Bituminous Mixer; Joint Sealing Machine; Concrete Mixer (Under 21 cu. ft.); Form Grader; Roller (Rock); Tractor (50 H.P. & Over); Bull Float; Finish Machine; Outboard Motor Boat; Flexplane; Fire person; Boom Type Tamping Machine; Greaser on Grease Facilities Servicing Heavy Equipment; Switchman or Brakeman; Whirley Oiler; Self-Propelled Compactor; Tractair & Road Widening Trencher & Farm Tractor with attachments (Except Backhoe, Highlift & End Loader); Elevator; Hoisting Engineer (1 Drum or Buck Hoist, Firebrick Masonry Excluded); Well Point; Grout Pump; Throttle Valve Person; Tugger; & Electric Vibrator Compactor

GROUP 3 - Bituminous Distributor; Cement Gun; Conveyor; Mud Jack; Paving Joint Machine; Roller (Earth); Tamping Machine; Tractor (Under 50 H.P.); Vibrator; Oiler; Concrete Saw; Burlap & Curing Machine; Truck Crane Oiler; Hydro Seeder; Power Form Handling Equipment; Deckhand Steersman; & Hydraulic Post Driver

CRANE WITH BOOM 150 FEET & OVER, INCLUDING JIB SHALL RECEIVE \$.50 ABOVE GROUP 1

 IRON0070-001 10/01/2003

	Rates	Fringes
Ironworkers:		
Structural; Ornamental; Reinforcing; & Precast		
Concrete Erectors.....	\$ 23.39	11.75

 LABO0576-001 07/01/2003

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 14.67	6.43
GROUP 2.....	\$ 14.87	6.43

GROUP 3.....	\$ 15.07	6.43
GROUP 4.....	\$ 15.67	6.43
GROUP 5.....	\$ 16.17	6.43

GROUP 1 - General; Carpenter Tender; Cement Finisher Tender; Placing of Concrete; Wrecking of Buildings; Hand Digging & Hand Backfilling of Ditches; Clearing of Rights-of-Way & Building Sites; Curing of Concrete; Application Hardener; Handling of Chemically Treated Lumber; Installing of Wood Sheeting & Shoring; Signal Laborer; Concrete Bucket & Masonry Work; Cleaning & Moving of General Purpose Materials; General Cleanup of Scrap & Debris

GROUP 2 - Mason Tender; Side Rail Setter (Metal); Stackman; Fork Lift Operator (Masonry & Plastering Contractors only); Power Driven Georgia Buggy; Chain Saw; Vibrator Operator; Mesh Handler; Power Tools (Air, Diesel, Electric, Gasoline); Wagon Drill; Pipe Layer; Wall Man; Treatment of Exposed Concrete (Chip, Bush Hammer & Rub); Concrete Saw; Gasoline Tamper Machine; Walk Behind Trenching Machine; Burner Man; Joint Maker; Asphalt Raker; & Mobile Sweeper

GROUP 3 - Air Track Driller; Introflax Burning Rod; Gunnite Nozzle Man Operator; Sewer, Tunnel Laborer (Free Air); & Sand Hog or Mucker (Free Air)

GROUP 4 - Holeman Drilled Piers; Augered Caissons; Sand Miner (Tunnel Free Air); Caisson Worker; & Powderman

GROUP 5 - Tunnel Person & Tunnel Miner (Pressure & Free Air); Environmental Worker; Toxic & Hazardous Waste; & Asbestos Removal Free Hanging Scaffold Above 30' receives \$.25 Premium

PAIN0118-001 05/01/2004

	Rates	Fringes
Painters:		
Abrasive Blaster;		
Fireproofing; Lead		
Abatement; Spray; &		
Waterblasting 4000 PSI and		
Above.....	\$ 18.27	7.02
Brush; Drywall Finisher-		
Vinyl Hanger.....	\$ 17.77	7.02

PAIN0639-002 05/01/2003

	Rates	Fringes
Sign Painter & Erector.....	\$ 17.57	4.55+a+b+c

FOOTNOTES: a. 7 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; Christmas Day & 1 Floating Day

b. Vacation Pay: After 1 year's service - 5 days' paid vacation; After 2, but less than 10 years' service - 10 days' paid vacation; After 10, but less than 20 years' service - 15 days' paid vacation; After 20 years' service - 20 days' paid vacation

c. Funeral leave up to 3 days maximum paid leave for death of mother, father, brother, sister, spouse, child, mother-in-law, father-in-law, grandparent & inlaw provided employee attends funeral

PAIN1165-004 04/01/2004

	Rates	Fringes
Glazier.....	\$ 22.05	7.30

 PLAS0692-028 06/01/2003

	Rates	Fringes
Cement Mason.....	\$ 18.15	7.50

 PLUM0107-001 02/01/2004

	Rates	Fringes
Plumber/Pipefitter.....	\$ 27.60	8.52

 PLUM0522-001 08/01/2003

	Rates	Fringes
Pipefitter/steamfitter.....	\$ 27.60	8.52

 ROOF0147-001 07/01/2003

	Rates	Fringes
Roofers:.....	\$ 18.40	6.07

 SHEE0110-003 12/01/2003

HARDIN & JEFFERSON COUNTIES:

	Rates	Fringes
Sheet metal worker.....	\$ 25.55	10.42

 SHEE0110-004 12/01/2003

MEADE COUNTY:

	Rates	Fringes
Sheet metal worker.....	\$ 27.30	10.42

 TEAM0089-001 06/01/2003

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 17.52	a&b
GROUP 2.....	\$ 17.63	a&b
GROUP 3.....	\$ 17.70	a&b
GROUP 4.....	\$ 17.80	a&b

WORK ON HAZARDOUS OR TOXIC WASTE SITES - \$4.00 PREMIUM

FOOTNOTES:

a. Employer contribution of \$321.70 per employee per week whose name appears on the payroll and has been employed a minimum of 20 work days within any 90 consecutive day period.

b. Paid vacation of 40 hours to any employee who has been regularly employed on a project for 1 year and who has worked a minimum of 1,200 hours during the year, and 2 weeks' paid vacation to any employee who has completed 3 years' employment on a project and who has worked 1,200 hours since their 2nd anniversary date.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - 3 Tons & Under; Greaser; Tire Changer; & Mechanic Tender

GROUP 2 - Over 3 Tons; Semi-Trailer or Pole Trailer; Dump Tandem Axles; Farm Tractor (When used to pull building

material & equipment)

GROUP 3 - Concrete Mixer (Hauling on jobsites); & Truck
Mechanic

GROUP 4 - Euclids & Other Heavy Moving Equipment; Lowboy;
Winch, A-Frame & Monorail Truck (To transport building
materials)

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
=====

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates
listed under the identifier do not reflect collectively
bargained wage and fringe benefit rates. Other designations
indicate unions whose rates have been determined to be
prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can
be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on
a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests
for summaries of surveys, should be with the Wage and Hour
Regional Office for the area in which the survey was conducted
because those Regional Offices have responsibility for the
Davis-Bacon survey program. If the response from this initial
contact is not satisfactory, then the process described in 2.)
and 3.) should be followed.

With regard to any other matter not yet ripe for the formal
process described here, initial contact should be with the
Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an
interested party (those affected by the action) can request
review and reconsideration from the Wage and Hour Administrator
(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

General Decision Number: KY030027 06/18/2004 KY27

Superseded General Decision Number: KY020027

State: Kentucky

Construction Types: Heavy and Highway

Counties: Anderson, Bath, Bourbon, Boyd, Boyle, Bracken, Breckinridge, Bullitt, Carroll, Carter, Clark, Elliott, Fayette, Fleming, Franklin, Gallatin, Grant, Grayson, Greenup, Hardin, Harrison, Henry, Jefferson, Jessamine, Larue, Lewis, Madison, Marion, Mason, Meade, Mercer, Montgomery, Nelson, Nicholas, Oldham, Owen, Robertson, Rowan, Scott, Shelby, Spencer, Trimble, Washington and Woodford Counties in Kentucky.

Heavy and Highway Construction Projects

Modification Number	Publication Date
0	06/13/2003
1	10/31/2003
2	11/07/2003
3	12/05/2003
4	12/12/2003
5	03/05/2004
6	03/19/2004
7	05/14/2004
8	06/18/2004

BRIN0004-003 04/01/2004

BRECKENRIDGE COUNTY:

	Rates	Fringes
Bricklayer.....	\$ 24.45	8.65

* BRKY0001-005 06/01/2004		

BULLITT, CARROLL, GRAYSON, HARDIN, HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, & TRIMBLE COUNTIES:

	Rates	Fringes
Bricklayer.....	\$ 21.53	7.20

BRKY0002-006 06/01/2003		

BRACKEN, GALLATIN, GRANT, MASON & ROBERTSON COUNTIES:

	Rates	Fringes
Bricklayer.....	\$ 23.71	7.89

* BRKY0007-004 06/01/2004		

BOYD, CARTER, ELLIOT, FLEMING, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
Bricklayer.....	\$ 24.46	9.93

* BRKY0017-004 06/01/2004		

ANDERSON, BATH, BOURBON, BOYLE, CLARK, FAYETTE, FRANKLIN, HARRISON, JESSAMINE, MADISON, MERCER, MONTGOMERY, NICHOLAS, OWEN, SCOTT, WASHINGTON & WOODFORD COUNTIES:

	Rates	Fringes
Bricklayer ((Layout Men)).....	\$ 21.40	7.20
Bricklayer.....	\$ 21.15	7.20

Refractory (Refractory/Acid
Brick/Glass).....\$ 21.65 7.20

CARP0064-001 07/01/2003

	Rates	Fringes
Carpenter.....	\$ 22.20	6.63
Diver.....	\$ 33.675	6.63
Piledriverman.....	\$ 22.45	6.63

* CARP1031-008 06/01/2004

ANDERSON, BATH, BOURBON, BOYLE, CLARK, FAYETTE, FRANKLIN,
HARRISON, JESSAMINE, MADISON, MERCER, MONTGOMERY, NICHOLAS,
OWEN, SCOTT & WOODWARD COUNTIES:

	Rates	Fringes
Millwright.....	\$ 20.45	10.48

* CARP1031-009 06/01/2004

BOYD, CARTER, ELLIOTT, FLEMING, GREENUP, LEWIS, MASON,
ROBERTSON & ROWAN COUNTIES:

	Rates	Fringes
Millwright.....	\$ 27.33	9.99

* CARP1031-010 06/01/2004

BRECKINRIDGE, BULLITT, CARROLL, GALLATIN, GRAYSON, HARDIN,
HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY,
SPENCER, TRIMBLE & WASHINGTON COUNTIES:

	Rates	Fringes
Millwright.....	\$ 22.90	11.65

CARP1066-004 09/01/1999

BRACKEN & GRANT COUNTIES:

	Rates	Fringes
Millwright.....	\$ 21.90	7.92

ELEC0212-008 06/02/2003

BRACKEN, GALLATIN & GRANT COUNTIES:

	Rates	Fringes
Electrician.....	\$ 24.24	8.39

ELEC0212-014 11/01/2000

BRACKEN, GALLATIN & GRANT COUNTIES:

	Rates	Fringes
Sound & Communications		
Cable Puller.....	\$ 9.00	2.64
Installer.....	\$ 18.00	3.475

ELEC0317-012 05/30/2001

BOYD, CARTER, ELLIOT & ROWAN COUNTIES:

	Rates	Fringes
Electricians:		

Cable Splicer.....	\$ 24.27	11.08
Electrician.....	\$ 23.11	11.04

 * ELECO369-007 06/02/2004

ANDERSON, BATH, BOURBON, BOYLE, BRECKINRIDGE, BULLITT, CARROLL,
 CLARK, FAYETTE, FRAONKLIN, GRAYSON, HARDIN, HARRISON, HENRY,
 JEFFERSON, JESSAMINE, LARUE, MADISON, MARION, MEADE, MERCER,
 MONTGOMERY, NELSON, NICHOLAS, OLDHAM, OWEN, ROBERTSON, SCOTT,
 SHELBY, SPENCER, TRIMBLE, WASHINGTON, & WOODFORD COUNTIES:

	Rates	Fringes
Electrician.....	\$ 26.25	8.89

 * ELECO575-002 05/31/2004

FLEMING, GREENUP, LEWIS & MASON COUNTIES:

	Rates	Fringes
Electrician.....	\$ 26.92	9.89

 ENGI0181-018 01/01/2004

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 21.75	9.65
GROUP 2.....	\$ 19.33	9.65
GROUP 3.....	\$ 19.71	9.65
GROUP 4.....	\$ 19.07	9.65

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller;
 Batcher Plant; Bituminous Paver; Bituminous Transfer Machine;
 Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carr
 Deck Crane; Central Compressor Plant; Clamshell; Concrete Mixe
 (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete
 Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat;
 Ditching & Trenching Machine; Dragline; Dredge Operator;
 Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurrie
 Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Typ
 Machine; Hoist (Two or More Drums); Hoisting Engine (Two or
 More Drums); Horizontal Directional Drill Operator;
 Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mech
 Mechanically Operated Laser Screed; Mechanic Welder; Mucking
 Machine; Motor Scraper; Orangepeel Bucket; Piledriver; Power
 Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to
 equipment; Rotary Drill; Roller (Bituminous); Scarifier;
 Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom;
 Telescoping Type Forklift; Tow or Push Boat; Tower Crane
 (French, German & other types); Tractor Shovel; Truck Crane;
 Tunnel Mining Machines, including Moles, Shields or similar
 types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.);
 Bituminous Mixer; Boom Type Tamping Machine; Bull Float;
 Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric
 Vibrator; Compactor/Self-Propelled Compactor; Elevator (One
 Drum or Buck Hoist); Elevator (When used to Hoist Building Mat
 Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklif
 (Regardless of Lift Height); Form Grader; Joint Sealing
 Machine; Outboard Motor Boat; Power Sweeper (Riding Type);
 Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted
 Concrete Pump; Skid Steer Machine with all Attachments;
 Switchman or Brakeman; Throttle Valve Person; Tractair & Road
 Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oile
 Welding Machine; Well Points; & Whirley Oiler

GROUP 3 - All Off Road Material Handling Equipment, including
 Articulating Dump Trucks; Greaser on Grease Facilities servi

Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling leads equals or exceeds 150 ft. - \$1.00 over Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WO

IRON0044-009 10/01/2003

BOURBON (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan);

CARROLL (Eastern third, including the Township of Ghent);

FLEMING (Western part, excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nept Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);

MASON (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington);

NICHOLAS (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills);

OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley);

SCOTT (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Sadieville, Skinnersburg & Stonewall) &

BRACKEN, GALLATIN, GRANT, HARRISON & ROBERTSON COUNTIES:

	Rates	Fringes
Ironworker		
Fence Erector.....	\$ 22.05	11.58
Structural.....	\$ 24.00	11.58

IRON0070-006 10/01/2003

BOURBON (Southern two-thirds, including Townships of Austerlity, Centerville, Clintonville, Elizabeth, Hutchison, Littlerock, North Middletown & Paris);

CARROLL (Western two-thirds, including Townships of Carrollton, Easterday, English, Locust, Louis, Prestonville & Worthville);

CLARK (Western two-thirds, including Townships of Becknerville, Flanagan, Ford, Pine Grove, Winchester & Wyandotte);

OWEN (Eastern eighth, including Townships of Glenmary, Gratz, Monterey, Perry Park & Tacketts Mill);

SCOTT (Southern third, including Townships of Georgetown, Great

Crossing, Newtown, Stampling Ground & Woodlake);

ANDERSON, BOYLE, BRECKINRIDGE, BULLITT, FAYETTE, FRANKLIN, GRAYSON, HARDIN, HENRY, JEFFERSON, JESSAMINE, LARUE, MADISON, MARION, MEADE, MERCER, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE, WASHINGTON & WOODFORD COUNTIES:

	Rates	Fringes
Ironworker.....	\$ 23.39	11.75

IRON0372-006 06/01/2002

BOURBON (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan);

CARROLL (Eastern third, including the Township of Ghent);

FLEMING (Western part, Excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksville, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);

MASON (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington);

NICHOLAS (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills);

OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley);

SCOTT (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall);

BRACKEN, GALLATIN, GRANT, HARRISON & ROBERTSON COUNTIES:

	Rates	Fringes
Ironworker		
Beyond 30-mile radius of Hamilton County, Ohio Courthouse.....	\$ 22.96	10.47
Up to & including 30-mile radius of Hamilton County, Ohio Courthouse.....	\$ 22.71	10.47

IRON0769-007 06/01/2003

CLARK (Eastern third, including townships of Bloomingdale, Hunt, Indian Fields, Kiddville, Loglick, Rightangele & Thomson);

FLEMING (Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksville, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);

MASON (Eastern third, including Townships of Helena, Marshall, Orangeburg, Plumville & Springdale);

NICHOLAS (Eastern eighth, including the Township of Moorefield Sprout);

BATH, BOYD, CARTER, ELLIOTT, GREENUP, LEWIS, MONTGOMERY & ROWAN
COUNTIES:

	Rates	Fringes
Ironworker		
ZONE 1.....	\$ 25.67	11.57
ZONE 2.....	\$ 26.07	11.57
ZONE 3.....	\$ 28.07	11.57

ZONE 1 - Up to 10 mi. radius of union hall, Ashland, Ky.,
1643 Greenup Avenue
ZONE 2 - 10 to 50 mi. radius of union hall;
ZONE 3 - 50 mi. radius and beyond

LABO0189-003 07/01/2003

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 16.88	8.03
GROUP 2.....	\$ 17.13	8.03
GROUP 3.....	\$ 17.18	8.03
GROUP 4.....	\$ 17.78	8.03

LABORERS CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement
Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter
Tender; Cement Mason Tender; Cleaning of Machines;
Concrete; Demolition; Dredging; Environmental - Nuclear,
Radiation, Toxic & Hazardous Waste - Level D; Flagperson;
Grade Checker; Hand Digging & Hand Back Filling; Highway
Marker Placer; Landscaping, Mesh Handler & Placer; Puddler;
Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail
& Fence Installer; Signal Person; Sound Barrier Installer;
Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; &
Wrecking of Concrete Form

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer);
Brickmason Tender; Mortar Mixer Operator; Burner & Welder;
Bushhammer; Chain Saw Operator; Concrete Saw Operator;
Deckhand Scow Man; Dry Cement Handler; Environmental -
Nuclear, Radiation, Toxic & Hazardous Waste - Level C;
Forklift Operator for Masonary; Form Setter; Green Concrete
Cutting; Hand Operated Grouter & Grinder Machine Operator;
Jackhammer; Pavement Breaker; Paving Joint Machine;
Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy
& Wheel Barrow; Power Post Hole Digger; Precast Manhole
Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand
Blaster; Concrete Chipper; Surface Grinder; Vibrator
Operator; & Wagon Driller

GROUP 3 - Air Track Driller; Asphalt Luteman & Raker;
Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump
Operator; Powderman & Blaster; Side Rail Setter; Rail Paved
Ditch; Screw Operator; Tunnel (Free Air); & Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;
& Tunnel Mucker (Free Air)

PAIN0012-005 06/14/2003

BATH, BOURBON, BOYLE, CLARK, FAYETTE, FLEMING, FRANKLIN,
HARRISON, JESSAMINE, MADISON, MERCER, MONTGOMERY, NICHOLAS,
ROBERTSON, SCOTT & WOODFORD COUNTIES:

	Rates	Fringes
Painter		

KY030027.txt

Bridge/Equipment Tender and/or Containment Builder..\$ 17.96	3.35
Brush; Roll; Spray; Sandblasting; Steam Cleaning; Steeplejack Work; Lead Abatement; & Coal Tar.....\$ 16.81	3.35
Swing & Scaffold Bridges; Structural Steel; Open Acid Tanks; High Tension Electrical Equipment; & Hot Pipes.....\$ 21.00	3.35

PAIN0012-017 06/15/2002

BRACKEN, GALLATIN, GRANT, MASON & OWEN COUNTIES:

	Rates	Fringes
Painter (Heavy & Highway Bridges - Guardrails - Lightpoles - Striping) Bridge/Equipment Tender and/or Containment Builder..\$ 18.95	18.95	5.10
Bridges when highest point of clearance is 60 feet or more; & Lead Abatement Projects.....\$ 22.30	22.30	5.10
Brush & Roller.....\$ 21.30	21.30	5.10
Sandblasting & Hopper Tender; Water Blasting.....\$ 22.05	22.05	5.10
Sandblasting, Hopper Tender, Waterblasting (Bridges when highest point of clearance is 60 feet or more).....\$ 23.05	23.05	5.10
Spray.....\$ 21.80	21.80	5.10
Painter Elevated Tanks.....\$ 22.30	22.30	5.10

PAIN0118-004 05/01/2004

ANDERSON, BRECKINRIDGE, BULLITT, CARROLL, GRAYSON, HARDIN,
HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY,
SPENCER, TRIMBLE & WASHINGTON COUNTIES:

	Rates	Fringes
Painter, Brush.....\$ 17.77	17.77	7.02
Painter Abrasive Blaster; Fireproofing; Lead Abatement; Spray; & Waterblasting 4000 PSI and Above.....\$ 18.27	18.27	7.02

PAIN1072-003 06/01/2003

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
Painters: Bridges.....\$ 23.92	23.92	9.57
All other work.....\$ 19.92	19.92	9.57

PLUM0107-004 02/01/2004

BRECKINRIDGE, BULLITT, CARROLL (Western Half), FRANKLIN
(Western three-fourths), GRAYSON, HARDIN, HENRY, JEFFERSON,
LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE &
WASHINGTON COUNTIES:

Rates Fringes

Plumber.....\$ 27.60 8.52

* PLUM0248-003 06/01/2004

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS & ROWAN COUNTIES:

Rates Fringes

Plumber and Steamfitter.....\$ 24.26 13.64

PLUM0392-007 06/01/2003

BRACKEN, CARROLL (Eastern Half), GALLATIN, GRANT, MASON, OWEN & ROBERTSON COUNTIES:

Rates Fringes

Plumbers and Pipefitters.....\$ 26.02 9.42

PLUM0522-004 08/01/2003

BRECKINRIDGE, BULLITT, CARROLL (Western Half), FRANKLIN (Western three-fourths), GRAYSON, HARDIN, HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE & WASHINGTON COUNTIES:

Rates Fringes

Pipefitter/steamfitter.....\$ 27.60 8.52

SUKY2001-002 10/08/2001

Rates Fringes

Truck drivers:
GROUP 1.....\$ 16.57 7.34
GROUP 2.....\$ 16.68 7.34
GROUP 3.....\$ 16.86 7.34
GROUP 4.....\$ 16.96 7.34

TRUCK DRIVER CLASSIFICATIONS

- GROUP 1 - Mobile Batch Truck Tender
GROUP 2 - Greaser; Tire Changer; & Mechanic Tender
GROUP 3 - Single Axle Dump; Flatbed; Semi-trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Distributor; Mixer; & Truck Mechanic
GROUP 4 - Euclid & Other Heavy Earthmoving Equipment & Lowboy; Articulator Cat; 5-Axle Vehicle; Winch & A-Frame when used in transporting materials; Ross Carrier; Forklift when used to transport building materials; & Pavement Breaker

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations

indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
 Wage and Hour Division
 U.S. Department of Labor
 200 Constitution Avenue, N.W.
 Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
 U.S. Department of Labor
 200 Constitution Avenue, N.W.
 Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
 U.S. Department of Labor
 200 Constitution Avenue, N.W.
 Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION