

SECTION C

GENERAL PARAGRAPHS

ADVANCED METERING INFRASTRUCTURE, PHASE 4: WATER METERING
FOR THE PUBLIC WORKS BRANCH
MARINE CORPS BASE QUANTICO
QUANTICO, VIRGINIA

SPECIFICATION BY: PUBLIC WORKS BRANCH
WORK REQUEST NUMBER: PWB# 2011237
HQMC PROJECT NUMBER: QU1239M

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2. REQUIREMENTS:

Specific project requirements are included in the SCOPE OF WORK / DRAWINGS/PLATES: PDF Package Pages 48 through 115.

3. SPECIAL INSTRUCTIONS:

3.1. SAFETY: Safety will be a high priority as normal Government operations in the facility and surrounding area of the facility will continue during the construction process. Noise restrictions do apply.

3.2. Some work to be performed is located in a Secure Building which will required an escort at all times. Escort staff will be provided by the Facility's S4 office and will be made available to the Contractor Monday thru Friday from 8:00 AM to 4:00 PM. No provisions are available at this time, for any off-duty/after hour work, and over the weekend work.

3.3. NATIONAL ENERGY POLICY ACT: All work must be Categorical Exclusion (CATEX) compliant. Refer to Section H of the contract and CATEX-related requirements to be provided at time of award.

4. DEFINITIONS AND ORDER OF PRECEDENCE:

4.1. Definitions: As used throughout the contract, the following terms shall have the meaning set forth below:

Contracting Officer (KO): The individual designated to administer the contract. Throughout this contract this individual will be responsible and possess the authority to act on behalf of the Government with respect to the specific contract.

Contracting Officer Representative (COR): The individual designated by the Contracting Officer as the authorized representative of the Contracting Officer. The COR is responsible for monitoring

performance and technical management of the effort required and should be contacted regarding questions or problems of a technical nature.

Contractor: The term Contractor refers to both the prime Contractor and subcontractors, including the Designer of Record.

Designer of Record (DOR): Licensed architect/engineer working as subcontractor to or partner with prime Contractor who provides design for this contract.

Quality Control (QC): Contractor's system to control the quality of design, material, equipment and construction.

Quality Assurance (QA) Program: Government's program to evaluate the effectiveness of the Contractor's quality control. The Government's QA Program is not a substitute for the Contractor's QC Program.

Federal Holidays: New Year's Day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day; Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas Day.

Contract: Contract or task order.

4.2. Order of Precedence: NFAS Clause 5252.236-9312. In the event of conflict or inconsistency between any of the below described portions of the confirmed contract, precedence shall be given in the following order:

A. Any portions of the proposal or final design that exceed the requirements of the solicitation.

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

B. The requirements of the solicitation, in descending order of precedence:

- 1) Standard Form 1442, Price Schedule, and Davis Bacon wage rates.
- 2) Contract Clauses.
- 3) General Requirements.
- 4) Statement of Work/Project Program Requirements.
- 5) Attachments (excluding Concept Drawings).
- 6) Prescriptive Specifications, exclusive of performance specifications.
- 7) Minimum Materials, Engineering and Construction Requirements, exclusive of prescriptive specifications.
- 8) Attachments (including Concept Drawings).

5. GENERAL NOTES:

5.1. The contractor shall field verify all dimensions, measurements, and quantities before submitting any bid or proposal, and in addition before ordering any material or equipment to ensure suitability of specific application.

5.1.1. Site Visit: Contractor(s) should visit the site and acquaint themselves with all existing conditions prior to preparing their bid. Submit Requests for Information (RFI's) to the Contracting Officer to clarify any questions.

5.1.2. The contractor is cautioned to ensure that their cost proposal includes all cost elements required to complete all work. The Contractor's proposal shall include support documentation to indicate that adequate engineering and planning has been done and that the tasks proposed are reasonable for the work to be performed as requested by the Contracting Officer. Documentation to be submitted with the proposal shall include price estimate arrange in order according to the CSI format.

5.1.3. Omissions from the drawings or specifications or the mis-description of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or mis-described details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications. Refer to contract clause "DFARS 252.236-7001, CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)".

5.2. All materials provided in this project shall be new and shall comply with all current versions of applicable regulatory and industry standards unless otherwise noted for reuse and repair as delineated in the project scope and/or drawings.

5.3. The Contractor shall provide preconstruction submittals for Materials/Product Cut Sheets to the Contracting Officer or Contracting Officer Representative, and the Contracting Officer shall approve the submittals prior to any materials being ordered or provided. Long lead time manufactures' items shall also be submitted. Specific design and construction submittal requirements are specified in the General Requirements Paragraph 15 Submittals, and in the technical sections of the project statement of work and submittal register.

6. PROTECTION OF GOVERNMENT PROPERTY: Take special care to protect Government property. Return areas damaged as a result of construction under this contract to their original condition. In addition to FAR 52.236-9, PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS, perform the following:

6.1. Remove or alter existing work or facilities in such a manner as to prevent injury or damage to any portion of the existing work or facilities that remain.

6.2. Repair or replace portions of existing work altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

6.3. All soil and turf disturbed by the contractor's operation shall be restored to its original condition upon completion of the project. Such restoration shall include fine grading, fertilizer, lime, grass seed, straw and mulch. Specific design and construction requirements are specified in the technical sections of the project statement of work.

6.4. In the event of inadvertent discovery of human remains, artifacts, or unexploded munitions the contractor shall cease work immediately and notify the contracting officer of the discovery. The contractor shall not then resume work on the project until directed to do so by the Contracting Officer.

6.5. Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. Conform to the national permitting requirements of the Clean Water Act.

7. Availability of Utility Services: Reasonable amount of water and electric utilities at the prevailing rates will be made available to the Contractor from existing outlets, without charge.

7.1. All labor, material, and equipment necessary to affect temporary utility tie-ins, including transformers if necessary, shall be at the expense of the Contractor and under the surveillance of the Contracting Officer.

7.2. The Contractor shall be responsible for any damages to Government, private or public facilities and/or property that may result from the installation and removal of these temporary utility tie-ins. Corrections and repairs shall be made at the Contractor's expense.

7.3. The actual location and installation of the temporary tie-in, together with any interruptions of utilities systems, shall be identified and approved by the Contracting Officer prior to execution. Comply with General Paragraph 12.2.4 "Utility Outage/Utility Connection Requests". Allow 20 calendar days to obtain approvals for tie-ins.

7.4. Permanent utility systems, when indicated, will be available for tie-in.

7.5. Telephone and Data Service: Make arrangements with local telephone company, NMCI and other pertinent base communication departments. Ensure initial request is submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance before contacting and coordinating with Base Telephone and Data Service Dept.

7.6. Temporary Facilities: The Contractor may provide his own office facilities; coordinate and obtain advance approval from the Contracting Officer. Provide and maintain suitable sanitary facilities within the construction limits of the contract. Dispose of sanitary waste in accordance with the applicable laws, and local regulation.

7.7. Maintain utility services to existing facilities surrounding the site at all times during construction.

7.8. When project involves connections to potable water supply system, the Contractor shall install and certify back flow preventers on all connections to the potable water system. Submit a current certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations.

7.9. Existing Underground Utilities: Verify on-site utilities and have them marked out by a utility locator service prior to the start of construction. Where existing piping, utilities, oil and gas lines, and underground obstructions of any type that are to remain are indicated in locations to be traversed by new piping, ducts, and other work provided herein, and such are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could be made. Obtain required dig permits and notify the Contracting Officer 21 calendar days prior to any excavation. Refer to Statement of Work for specific station requirements.

7.10. Energy Conservation: High energy consuming tools or equipment are encouraged to not be used without the prior approval of the Contracting Officer and/or designated representative. Comply with the base energy conservation program as defined in local base regulations.

8. Existing Building Work Site Conditions: The existing building area(s) will be occupied during construction. The existing building area(s) and contents shall be kept secure at all times, and the Contractor shall provide all temporary closures as required to maintain security as directed by the Contracting Officer. The Contractor shall provide all temporary dust prevention measures as required to maintain dust free areas in occupied areas and as directed by the Contracting Officer.

8.1. The Contractor shall remove all debris from all spaces being used by the activity at the end of each shift or more frequently if required to keep the space usable. Comply with EM 385-1-1.

8.2. Design work shall be accomplished between 7:00 a.m. and 4:00 p.m. Monday through Friday. No work will be scheduled or planned to be done on Saturday, Sunday, holidays, and QMCB "closed" days unless approved by the Contracting Officer.

Required outages for construction will be granted only for nights, weekends and holidays ("weekend" is defined as the time period between 1700 Friday to 0700 Monday).

8.3. Asbestos / Hazmat Materials: Existing material(s) are not suspect to contain asbestos or other hazmat material(s). Inspection and testing is not required. If during construction, hazmat material(s) is encountered and must be disturbed, do not touch the material. Notify the Contracting Officer in writing. If encountered suspect material is not a danger, the Contracting Officer will direct the Contractor to proceed without change. If the material is asbestos or other hazmat material(s), which must be handled and is a danger, the Contracting Officer will direct a change pursuant to FAR 52.243-4, CHANGES and "FAR 52.236-2, DIFFERING SITE CONDITIONS."

8.4. Limit use of the premises for work and for storage of material and equipment associated with the contract. Unless otherwise specified or separately agreed to, Government owned material handling equipment, transportation equipment or general tools will not be available for Contractor's use.

8.4.1. Contractor-Furnished Equipment: Equipment is subject to the inspection and approval of the Contracting Officer, prior to and during the life of the contract. All equipment and vehicles shall display readily visible Contractor identification markings. Relocate stored Contractor equipment which may interfere with operations of the Government or with others on-site.

8.4.2. Contractor-Furnished Material: Protect and secure products stored at this site. All replacement units, parts, components, and materials to be used in the maintenance, repair and alteration of facilities and equipment shall be new and compatible with the existing equipment on which it is to be used, and shall comply with applicable Government, commercial, or industrial standards such as Underwriter's Laboratories, Inc., and National Electrical Manufacturers Association.

9. SAFETY

9.1. All work on this project shall be performed in accordance with the Army Corp of Engineers Safety and Health Requirements Manual EM-385-1-1, most recent edition, the UFGS Specification Section 01 35 29, and the latest edition of the International Building Code. The Contractor's workspace may be inspected periodically for compliance by OSHA and other Inspectors.

9.1.1. The contractor shall complete and submit for approval an Activity Hazard Analysis (AHA) in accordance with the EM 385-1-1. Contractors shall have an approved AHA for this project before commencing any on-site work.

9.2. Smoking Policy: Smoking is prohibited within and outside of all buildings on military installations except in designated smoking areas. This applies to existing buildings, buildings under construction, and buildings under renovation. The contracting officer will identify designated smoking areas on construction projects.

9.2.1. Discarding tobacco materials other than into designated tobacco receptacles is considered littering and is subject to fines.

9.3. Lockout and Tagout Program: The Contractor shall establish and adhere to a Lockout and Tagout program that effectively disables machinery, utilities, and equipment to prevent unexpected energization, start-up, and release of stored energy. The Lockout and Tagout program shall comply with the Code of Federal Regulations 29 CFR 1910.147, Control of Hazardous Energy, and the National Safety Council.

10. LAY DOWN AREAS, SPOILS AND DEBRIS SITES: The contractor shall request approval of a designated lay down area and/or spoils or debris area for staging of materials and equipment from the Contracting Officer. Proposed Lay down area(s) is identified in statement of work or shown on drawings. Lay down area(s) are limited and the Contractor may need to use a remote site.

10.1. The contractor shall provide temporary fencing or other appropriate means as necessary to secure the area against trespass or illegal dumping.

10.2. The contractor shall post appropriate signage at the designated lay down/spoils area containing the contractor's name, phone number, contract number, and ROICC phone number and POC.

10.3. The security of all material and/or equipment within the designated lay down or spoils area shall be the responsibility of the contractor.

10.4. In spoils or debris sites which contain loose soil, hazardous, or contaminated materials, the contractor shall furnish silt fencing or other appropriate control measures to contain all run off of such materials within the site.

10.5. For spoils or debris sites identified as containing hazardous or contaminated materials, the contractor shall post readily visible, appropriate signage warning of said hazards or contamination.

10.6. For spoils or debris sites planned to contain erodible soil, hazardous or contaminated materials, the contractor shall submit, in writing, to the Contracting Officer, a containment and cleanup plan for said site. The plan shall be approved by the Contracting Officer prior to any materials being placed on the site. In the event that unforeseen hazardous or contaminated materials are discovered after the work is in progress, the contractor shall immediately notify the Contracting Officer of the discovery of said material, and shall prepare and submit a containment and cleanup plan at that time.

10.7. Spoils and debris shall not be stockpiled for longer than 30 days before being transported off base for proper disposal.

11. ENVIRONMENTAL PROTECTION:

11.1. The Contractor shall provide and maintain during the life of the contract, environmental protective measures as required to control pollution that develops during normal construction practice. Comply with all federal, state, and local regulations pertaining to water, air, solid waste, and noise pollution.

11.2. Keep dust down at all times, including non-working hours, weekends, and holidays. Air blowing is permitted only for cleaning non-particulate debris, such as from steel reinforcing bars. No sandblasting is permitted unless dust containment is provided. Only wet cutting of concrete blocks, concrete, and asphalt is permitted. Contain run-off from all wet-cutting and washing operations and dispose of the material in accordance with local, state, and federal environmental regulations.

11.3. The Contractor shall not intentionally release any hazardous materials to the environment and shall make efforts to avoid the unintentional release of hazardous materials (including oils). All spills and/or releases of hazardous materials shall be immediately (within 15 minutes) reported to the Contracting Officer and/or designated representative and the MCB Quantico Fire Department (911 from QMCB phone, or 784-2636 from personal cell phone). In addition notify the MCB Quantico NREAB (784-4030) and the activity's Command Duty Officer (MCB Quantico CDO (784-2707)). The Contractor shall also immediately attempt to clean up or control any oil spills which result from the Contractor's operations.

11.4. Do not disturb hazardous materials and report condition immediately to the Contracting Officer potentially hazardous conditions that are uncovered or the Contractor becomes aware of that have not been identified in the RFP. This includes hazardous components and materials and contamination (see UFC 3-800-10 for more information). This includes conditions that are not only hazardous to humans but wildlife, marine life and the environment. Stop work in the area of the questionable material or condition until identification and direction is provided.

12. PERMITS, MANIFESTS and UTILITY OUTAGE /UTILITY CONNECTION REQUESTS

12.1. The Contractor shall, without additional expense to the Government, obtain all appointments, licenses, and permits required for the prosecution of the work. The Contractor shall comply with all applicable federal, state, and local laws and base regulations and procedures. Evidence of such permits and licenses shall be provided to the Contracting Officer and/or designated representative before work commences. The Contractor is cautioned that FINAL APPROVAL for all applications and permits will be by the Contracting Officer. (see FAR 52.236-7, PERMITS AND RESPONSIBILITIES)

12.2. All Permit Application Requests, Manifests, and Utility Outage/Utility Connection Requests shall be made in writing to the Contracting Officer and/or designated representative in advance of contacting and coordinating with QMCB Base Permit Issue Offices.

12.2.1. **“Construction Waste Management Report”**: All spoils and debris generated by the contractors operation shall be transported off base and disposed of in accordance with all federal, state, and local regulations. The attached construction waste management report [Appendix “A”] will be completed and forwarded to G-5 Installation & Environment Division/Solid Waste upon completion of the work, or no later than October 15 for waste generated prior to September 30 (end of fiscal reporting year for solid waste) to be included in the annual solid waste report. Submit copy of the waste management plan to the Contracting Officer and/or designated representative, and to the Environmental Protection Specialist/G-5 Installation & Environment Division Solid Waste POC: Mr. David F. Smith, 703-784-2333.

12.2.1.1 Solid Waste Management Report: Monthly with each payment invoice, submit a solid waste disposal report to the Contracting Officer and/or designated representative. For each waste, the report will state the classification, amount, location, and name of the business receiving the solid waste. Include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales

documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor will submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

12.2.1.2. Develop a Waste Management Plan that identifies all recyclable material and disposal methods for all material. Contractor shall reduce, recycle or salvage as much waste material as possible with a goal of diverting at least 50% of construction waste from landfill. Address waste reduction, recycling and salvage as part of the waste management plan. Report volume or weight of disposed and recycled materials. The Contractor is responsible for removing and disposing of all waste materials generated. Consider all material recyclable or reusable, unless clearly demonstrated the material requiring disposal is waste material.

12.2.2. **“Digging Permit”**: Prior to any excavation, the contractor shall obtain a “digging permit” from the Head, Requirements Office, Bldg 3252 [Appendix “B1”]. POC for digging permits is Maria Self, (703-784-1405). It is estimated Utility locates done by the Base Shops may take 15 days to complete. All excavation permits must include clearance from the AC/S G-6, Telecommunications Branch (Bldg 1999). After initial processing by the Requirements Office, applicants are required to coordinate directly with the G-6 office & other clearing agencies, as applicable. The G-6 requires applicants to submit a work request. A sample work request form is attached [Appendix “B2”]. Ensure initial request is made in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance and before contacting and coordinating with QMCB Requirements Office.

12.2.3. **“Burn Permit”**: Obtain a flame tool hot work permit through QMCB Fire Department prior to performing hot work. [Appendix “C”] POC for burn permits Fire Dept Dispatch Office 703-784-2636 or 2637. Ensure initial request is first submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance before contacting and coordinating with QMCB Fire Dept.

12.2.4. **“Utility Outage/Utility Connection Requests”** Requests for utility outages and connections shall be made at least twenty (20) days prior to the requested outage date. Each request shall state the system involved, area involved, approximate duration of outage, and the nature of work. Ensure initial request is submitted in writing to the Contracting Officer and/or designated representative. The ROICC will contact and coordinate with QMCB Base FMS Operations and Utilities Offices and make the notification to Base customer(s) affected by outages.

12.2.4.1. **Work Interruptions to Utility Systems and Building Operations**: Approval from the Contracting Officer shall be received before any utility systems or building operations are interrupted. Normal building functions will remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with the normal operations of the activity and any activity in close immediate area. Interruptions of utility services or operating systems will be allowed only when they will cause the least possible interference with the operations of the activity (normally weekends or at night).

12.2.5. **“Permit Required Confined Spaces”**: In addition to the requirements of Section 06.I of USACE EM 385-1-1, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b)(6) the Contractor shall comply

with the following. Any potential for a hazard in the confined space requires a permit system to be used. Provide a confined space entry program for approval by the Contracting Officer.

12.2.5.1. Confined Space Signage: The Contractor shall provide permanent signs integral to or securely attached to access covers for permit-required confined spaces provided by this contract. Signs wording: "DANGER - PERMIT - REQUIRED CONFINED SPACE - DO NOT ENTER" in bold letters a minimum of 25 mm (one inch) in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m (5 feet).

12.2.5.2. Entry Procedures: Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.06 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

12.2.5.3. Forced air ventilation: Required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

12.2.6. **"Hazardous Waste Manifest"**: Hazardous waste that is generated as a result of construction aboard MCB Quantico must be manifested. All hazardous waste handling and disposal must be coordinated with the Contracting Officer and/or designated representative in order for the Contract Construction Management Office to contact/ coordinate any necessary meeting(s) and submissions with QMCB Base Natural Resources and Environmental Affairs Office (NREA) Permit Issue Office. (703-783-4030). Only authorized personnel from NREA have authority to sign hazardous waste manifests. Ensure initial request is submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance.

12.2.7. **"Material Safety Data Sheets (MSDS)"**: MSDS shall be obtained by the contractor for all hazardous materials to be used in performance of this contract in accordance with Federal Acquisition Regulation (FAR) 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997). These MSDS and an inventory of hazardous material shall be provided to the Contracting Officer and/or designated representative prior to bringing the material on site. MSDS shall be maintained at the job site and available to all employees and inspectors. The contractor must have an active Hazardous Communication Program place for all employees as required by Code of Federal Regulations 29 CFR 1910.1200.

12.2.8. **"Land Disturbance Requirements and Permits"**: Ensure initial request is submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance in order for the Contract Construction Management Office to contact and coordinate any necessary meeting(s) with QMCB Base Natural Resources and Environmental Affairs Office (NREA) Permit Issue Office for NREA's initial review and approvals of land disturbance applications and to process the necessary Storm Water Construction Permits to Department of Conservation and Recreation (DCR). The Contractor is cautioned that FINAL APPROVAL for all applications and permits will be by the Contracting Officer upon receipt of permit approval from the NREA office, and prior to any land disturbance work. It is recommended that all required submittals be provided to NREA **45** days to from anticipated date of the proposed land disturbing activity.

12.2.8.1. The following permit and plans submissions are required for all projects with land disturbance as specified in Paragraphs 12.2.8.1.3 through 12.2.8.1.6 for specific land sizes, locations near water, drainage lines, resource protection areas, and sensitive areas unless otherwise specified:

- a) Storm Water Construction Permit for DCR (Original Check and Signatures to be submitted through NREA). DCR Application fees are identified in Paragraph 12.2.8.1.7.
- b) Storm Water Pollution Prevention Plan (SWP3) (narrative and plans).
- c) Erosion and Sediment Control (E&SC) (narrative and plans).
- d) NREA Online Storm Water Construction Training. (proof of completing training)
- e) Onsite Responsible Land Disturber (RLD) (Virginia State Certified). RLD requirements are identified in Paragraph 12.2.8.1.8.

12.2.8.1.1. All construction sites disturbing a soil area less than 2,500 SQ FT (232 SQ.M., 0.057 ACRES): No DCR permit or E&SC and SWP3 plans are required, however applicable state and federal erosion and sediment control regulations still apply. Erosion and sedimentation control Best Management Practices to be utilized during all phases of work associated with this contract.

12.2.8.1.2. All construction sites disturbing a soil area more than 2,500 SQ FT (232 SQ.M., 0.057 ACRES) and less than 10,000 SQ FT (928 SQ.M.) located anywhere on Base, and more than 100 feet of from open water, RPA sensitive areas, or drainage lines: No DCR permit or E&SC and SWP3 plans are required, however applicable state and federal erosion and sediment control regulations still apply. Erosion and sedimentation control Best Management Practices to be utilized during all phases of work associated with this contract.

12.2.8.1.3. All construction sites disturbing a soil area greater than 2,500 SF (232 SQ.M, 0.057 ACRES) and located within 100 feet of any water body (lake, river, stream, etc.): Submit all requirements specified in Paragraph 12.2.8.1 (a through e).

12.2.8.1.4. All construction sites disturbing a soil area greater than 2,500 SF (232 SQ.M., 0.057 ACRES) and lies within a Resource Protection Area (RPA), or an area determined by NREA to be in a sensitive area: Submit all requirements specified in Paragraph 12.2.8.1 (a through e). Sensitive areas are designated as:

- a) Tidal wetlands
- b) Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow
- c) Tidal shores
- d) Such other lands considered by the local government to meet the provisions of this section and to be necessary to protect the quality of the state waters (ex: county delineated RPAs)
- e) A buffer area not less than 100 feet in width located adjacent to and landward of the components listed above, and along both sides of any water body with perennial flow.” (9VAC 10-20-10 et seq.).

12.2.8.1.5. All construction sites disturbing a soil area greater than 10,000 SF (928 SQ.M.) and less than one (1) Acre (43,560 SF, 4,047 SQ.M) located anywhere on Base, and more than 100 feet of from open water, RPA sensitive areas, or drainage lines: Submit all requirements specified in Paragraph 12.2.8.1 (a through e). Submit requirement specified in Paragraph 12.2.8.1 (c) Erosion and Sediment Control (E&SC) (narrative and plans) using the Short Form.

12.2.8.1.6. All construction sites disturbing a soil area greater than one (1) Acre (43,560 SF, 4,047 SQ.M) located on the Base installation: Submit all requirements specified in Paragraphs 12.2.8.1 (a through e).

12.2.8.1.7. DCR Application fees are:

- a) \$200 (sites less than one (1) acre but greater than 2,500 SF)
- b) \$300 (sites one (1) acre but less than 5 acres)
- c) \$500 (sites 5 acres and over)

12.2.8.1.8. Responsible Land Disturber (RLD): The contractor shall provide the name of the Responsible Land Disturber (RLD) for the construction site to the Contracting Officer and/or designated representative. The Contracting Officer designated representative will forward the Contractor's RDL to the QMCB NREA Permit Issue Office for NREA's initial review and approval. The Contractor is cautioned that FINAL APPROVAL for the RDL will be by the Contracting Officer upon receipt of permit approval from the NREA office, and prior to any land disturbance work. All contractor RDLs are required to complete the online module of Storm Water Training at the following site:

http://nreabweb.emainc.com/MCBQ_SW_Training/SWPP%20Training/index.asp. The RLD must fall under one of the following criteria to be acceptable:

- He/she must have a state RLD certificate (see http://www.dcr.state.va.us/sw/es_rld.htm for more information.) OR:
- Must be a certified P.E. in the state of Virginia, OR
- Must be enrolled in the state Erosion and Sediment Control Certification Program (see <http://www.dcr.state.va.us/sw/estr&crt.htm> for more information) or have obtained a state certificate through this program.

12.2.8.1.9. The following permit application forms and general guidelines can be obtained at the website: http://www.dcr.virginia.gov/soil_and_water/vsmp.shtml or via the NREA Water Programs website at <http://www.quantico.usmc.mil/activities/display.aspx?PID=1786&Section=NREA> :

- a) VSMP general permit application form for construction activities
- b) General permit notice of termination (NOT) for storm water discharges from construction activities
- c) Permit application fee form
- d) Erosion & Sediment Control, Storm Water Pollution Prevention and Low Impact Development (LID) on MCB Quantico

12.2.9. “Ozone Depleting Substance (ODS) Equipment Certifications and Forms”: All work on ODS containing equipment must be performed by a certified technician. A copy of all technician certificates must be provided to the Base Natural Resources and Environmental Affairs Branch (NREAB) Air Program Manager (APM) and kept on file by the Contractor and Contracting Officer prior to any work on ODS equipment. Ensure initial request and certificate is submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance before contacting and coordinating with QMCB NREAB Permit Issue Office. The Contractor is cautioned that FINAL APPROVAL for all requests will be by the Contracting Officer prior to any work on ODS equipment.

12.2.9.1. A “Service Order Form” [Appendix “D”] shall be completed for ODS equipment work and is to document work being performed on any ODS unit. The Equipment Reporting Form [Appendix “D1”] shall be completed when installing or removing equipment. Submit Service Order Form and Appliance Input Form to Contracting Officer and NREAB Air Program Manager within 24 hours of performed work. The Contractor shall conduct all work in accordance with the requirements of the Code of Federal Regulations 40 CFR 82.

12.2.10. CONTRACTOR PERSONNEL SCREENING AND ACCESS PERMIT

REQUIREMENTS: All contract employees performing work services on Marine Corps Base Quantico (MCBQ) requiring physical access to the installation shall be properly screened in accordance with the

standards set forth by the policy described in MCBO 4200.3 CONTRACTOR SCREENING POLICY [Appendix “E thru E5”].

12.2.10.1. Contractor Personnel: After Contract Award and at least 15 days prior to the desired date of worksite entry, submit to the Contracting Officer and/or designated representative, an original alphabetical list of all personnel who require entry into Government property to perform work on the contract. The Contracting Officer designated representative will forward the alphabetical list to the Services Section of the Provost Marshall Office (PMO) for back-ground checks and clearances. All Contractor personnel employees will require screening, personnel approval, and clearance from the PMO Services Section. It is estimated PMO back-ground checks and clearances will take 3-5 days to complete. Final Approval of worksite entry for Contractor personnel will be by the Contracting Officer and/or designated representative upon receipt of clearances from PMO Services Section. POCs for the Contractor List of Employees or Representatives Form are Services Officer (703-784-4167) or Assistant Services Officer (703-784-4170).

12.2.10.1.1. The Contractor Employees or Representatives List [Appendix F and F1] for personnel screening shall be filled out in the “Name Block” and signed by the Contractor, and accompanied by Form I-9 for each employee. Furnish a completed EMPLOYMENT ELIGIBILITY VERIFICATION (DHS FORM I-9) form for all personnel. This form is available at http://www.uscis.gov/files/form/I-9_IFR_02-02-09.pdf. Federal Contractors are required to use the E-verify program (www.dhs.gov/e-verify). Documentation for proof of citizenship identified on the MCBO Contractor Screening List [Appendix F1] are multiple representative samples. Provide only the acceptable source documents for proof of citizenship identified in MCBO 4200.3 and required for the DHS Form I-9. (refer to FAR E-Verify Clause: 52.222-54)

12.2.10.1.2. Immediately report any changes to the approved Contractor Employee List to the Contracting Officer and/or designated representative. Provide the required employee information for any new employee change in order to obtain the appropriate Contractor Screening and approvals prior to entry to the work site.

12.2.10.1.3. Contractor Personnel Requirements: Failure to obtain screening entry approval will not affect the contract price or time of completion. The Contractor’s worksite may be inspected periodically for compliance of MCBO 4200.3 by PMO and other Inspectors.

12.2.10.1.4. Citizenship Requirements: Contractor personnel will not be admitted to the work site without approval by Contracting Officer. Work under this contract is restricted to U.S. citizens and legal alien status in accordance with MCBO 4200.3 - CONTRACTOR SCREENING POLICY.

12.2.10.1.5. [**NOT USED**]

12.2.10.1.6. Contractor Emergency Personnel Contacts: From the approved Contractor Employees List, furnish to the Contracting Officer and/or designated representative the contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency.

12.2.10.1.7. Identification Badges: [**NOT USED**]

12.2.10.1.8. Vehicle Passes: [**NOT USED**]

13. Project Points of Contacts (POC): The points of contacts will be provided at the Preconstruction Meeting. The PWB Engineering Project Technical Designer shall be included at the Preconstruction coordination meeting. The Preconstruction coordination meeting will be held No Later Than fifteen (15)

calendar days after contract award. Within seven (7) days after contract award, the Contractor shall schedule a Preconstruction coordination meeting with the Contracting Officer. The Contractor shall comply with FAR Clause 5252.201-9300 CONTRACTING OFFICER AUTHORITY (JUN 1994).

14. Final Acceptance Inspection: The PWB Engineering Project Technical Designer shall be included on the Final Acceptance Inspection in addition to the personnel representing PWB Facilities Maintenance Section, and the Customer/Client as described in UFGS 01 45 00.00 20. The Contracting Officer will be notified at least five (5) calendar days in advance before the Final Inspection takes place in order to schedule Engineering representation and all other personnel attendance.

15. SUBMITTALS: All submittals require the approval of the Contracting Officer. Proposed material submittals required of the Contractor shall be made allowing sufficient time for processing, reviews, approval, and procurement before the Contractor is ready to use the material. No material shall be used prior to written approval. Seven (7) copies of each submittal shall be prepared and submitted, or as designated by Contracting Officer. The Contractor shall certify on all submittals that the material being proposed conforms to contract requirements.

15.1. Post Construction Award Submittals

- a. Site Specific Safety Plan
- b. Site Specific Quality Control Plan
- c. Construction Schedule
- d. Submittal register
- e. Schedule of prices
- f. Work plan
- g. Certificates of insurance
- h. Surety bonds
- i. Site Specific Activity Hazard Analysis Plan
- j. Contractor Employees or Representatives List as specified in Paragraph 12.2.10.1.1.
- k. Asbestos and Lead Paint Tests Written Report **[NOT USED]**
- l. Waste Management Plan:

15.2. Product Data Submittals

- a. Material Safety Data Sheets (MSDS) [For all paints, thinners, cleaners, sealants, refrigerant or other hazardous materials proposed for use on this project.]
- b. Door unit products: door, frame and hardware. : [NOT USED]
- c. Lighting fixtures and control devices: [NOT USED]
- d. Heat pump and A/C product data and warranty submittal: [NOT USED]
- e. Thermostat product data and warranty submittal: [NOT USED]
- f. Fan coil unit data and warranty submittal: [NOT USED]
- g. Thermostat product data and warranty submittal: [NOT USED]
- h. Transfer switch information: [NOT USED]
- i. Genset info: [NOT USED]
- j. Panic hardware, all locks and cylinders : [NOT USED]
- k. Sump pumps and can: [NOT USED]
- l. Carpet / Floor tile product information: [NOT USED]
- m. Exit Lights / Emergency Lights: [NOT USED]
- n. Fluorescent Light Fixtures: [NOT USED]
- o. Sprinkler Heads: [NOT USED]
- p. Roofing Materials / Standing seam metal roofing canopy and covers: [NOT USED]

15.3. Submittal Samples

- a. Paint / Stain color samples: [NOT USED]
- b. Suspended ceiling products: [NOT USED]
- c. Insulation: for both sound and thermal type: [NOT USED]
- d. Carpet / Floor Tile products: [NOT USED]
- e. Rubber cove base: [NOT USED]
- f. Window blind color samples: [NOT USED]
- g. Light Fixture(s) : [NOT USED]
- h. Standing seam metal roofing product sample: [NOT USED]

15.4. Other Submittals

- a. MAXIMO Tagging and Equipment Record Submission Form
- b. Warranty Tagging List
- c. As-built drawings
- d. CADD GIS Deliverables
- e. DD Form 1354
- f. HVAC system: the system shall be pressure tested for leaks. Provide test results: [NOT USED]
- g. HVAC Testing and Balancing Commissioning Reports: [NOT USED]
- h. HVAC O&M maintenance manuals and installation instructions: [NOT USED]
- i. HVAC warranty information: [NOT USED]
- j. Transfer switch warranty information: [NOT USED]
- k. Genset warranty info: [NOT USED]

16. OTHER SPECIAL CONDITIONS:

16.1. Asbestos/Lead Paint Testing/Abatement: [NOT USED]

16.2. MAXIMO Equipment Tagging: As part of this contract, the contractor shall do the following:

Ensure initial request is submitted in writing to the Contracting Officer and/or designated representative at least five (5) calendar days in advance before contacting and coordinating with Maximo Equipment Inventory Administrator.

Coordinate all actions involving equipment inventory tags with the Quantico Maximo Equipment Inventory Administrator. Currently this is Mr. Pat Janis who is located in Bldg 3252, 2nd Floor and his phone # is 703-784-1407. Contact the Administrator before starting the project to verify if any changes in the process outlined below have been changed. Before any new tags can be issued by the Administrator, the information required on the Equipment Record Submission Form will need to be filled out and provided to the Administrator.

- Turn in old tags on demolished equipment to the Administrator. Inform the Administrator if demolished equipment is to be replaced by a new unit.

- For any new equipment installed, contractor shall obtain an inventory tag from the Administrator.

- If a tagged piece of equipment is relocated, submit Equipment Record Submission Form with tag # to the Administrator providing the old and new locations for the equipment on the bottom half of the sheet.

- If any equipment that the contractor is working on as part of the awarded project is found not to have a tag or has a damaged tag, contractor shall obtain a new inventory tag for equipment providing the required info to the Administrator.

- Under no circumstances shall tags from equipment to be demolished be reused on new or other equipment.
- Rebuilt equipment will keep the same tag #. However the Equipment Record Submission Form with tag # identified still needs to be submitted to the Administrator with the date the equipment was rebuilt, the name of the company that rebuilt the unit, brief description of what was done. Note this information in the bottom half of the form.
- Some pieces of equipment shall have multiple tags because they have multiple pieces of sub-equipment. An example of this would be a chiller unit which will have a tag for the coil unit, one tag for each compressor and one tag for each motor. Another example would be an AHU unit which would have a tag for the blower unit, one tag for the motor, and one tag for the gearbox (if applicable).

16.3. Warranty and Tagging: Warrant all materials and work for not less than one year, except as otherwise indicated in the contract, and after final acceptance of the work by Contracting Officer. If required to provide remedial repair of previously installed work due to latent defect or unacceptable work performance, warrant the repaired work for one year after the completion and acceptance of the repair. Provide any extended or special warranties provided by the manufacturer. For warranted items, furnish the manufacturers' original written warranty accompanied by a copy of the supplier's receipt showing place of purchase, telephone number of supplier, address, delivery order number if applicable, ticket number, etc. Provide two (2) copies of a notebook (indexed and bound) containing all warranties. Each warranty shall provide the contractor's company name, address, telephone number, date of acceptance, and the warrantor's representative. The contractor shall tag each item of warranted equipment with a durable, oil and water resistant tag attached to the equipment securely with copper wire. In the event a tag cannot be installed a fade resistant, water resistant, heat resistant label approved by the Contracting Officer shall be applied. For roof installations or repairs this information shall be installed as describe above, but it will be posted at an access to the roof. The tags shall show the following information:

EQUIPMENT / PRODUCT WARRANTY TAG
Type of Equipment/Product _____
Warranty Period _____ From _____ To _____
Contract No. _____
Inspector's Signature _____ Date Accepted _____

Construction Contractor:
Name: _____
Address: _____
Telephone: _____

Warranty Contact: _____
Name: _____
Address: _____
Telephone: _____

DURING THE WARRANTY PERIOD, ACTIVITY PERSONNEL SHALL PERFORM ONLY PREVENTIVE MAINTENANCE. Public Works Department / MAXIMO Office, 703-784-1407.

16.3.1. Submit two (2) copies of a notebook (indexed and bound) containing all warranties to the Contracting Officer. One copy of the compiled Warranty Notebook shall be turned over and delivered to the Maximo Equipment Inventory Administrator / MAXIMO Office in Public Works.

16.3.2. Warranty Repairs: Any equipment repaired during the warranty period shall be warranted from the date of repair for a period of one (1) year per FAR Clause 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994) unless an extended warranty applies.

16.3.3. Warranty Response Time: Per LANTNAVFACENGCOM instruction 4340.3 a reasonable time to respond to a warranty call issue is within 72 hours.

17. DD Form 1354: For all new construction, demolition, and any construction on an existing facility that adds new parts, items, or systems that are not maintenance or repair; e.g. replacement of windows, replacement of roofs, replacement of an exterior utility, adding an AC system, adding exterior lighting, etc. the Contractor shall prepare DD Form 1354 TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY, in accordance with UFC 1-300-08 CRITERIA FOR TRANSFER AND ACCEPTANCE OF DoD REAL PROPERTY, available at http://65.204.17.188/report/doc_ufc.html. Submit form for Government approval a minimum of 30 days prior to final acceptance of work. Provide the Contracting Officer two copies of the Final Approved DD Form 1354. One Copy of the Final Approved DD Form 1354 shall be turned over and delivered to the Facilities Management Officer in Public Works.

18. RECORD DRAWINGS AND OPERATION & MAINTENANCE (O&M) DATA: Furnish hard copy and electronic format for all as-built and O&M information. Record drawings shall incorporate all changes to the approved final design. Provide O&M data for as-built products, materials, and equipment, including data sheets, test reports, warranties, certificates, list of spare parts suppliers for all pieces of equipment, and approved construction submittals. Design drawings may be prepared more like shop drawings to minimize construction submittals after final designs are approved. Therefore, the Contractor is encouraged to prepare and submit with the design drawings, appropriate connection, fabrication, layout, and product specific drawings.

18.1. AS-BUILT DRAWINGS & RECORD OF MATERIALS: Furnish as-built drawings and record of materials. As-built drawings consist of updated design drawings and/or shop drawings. A typical list of materials includes, but would not be limited to, roofing, insulation, and wall coverings. Where several manufacturers' brands, types, or classes of the item listed have been used in the project, designate specific areas where each item was used. Designations shall be keyed to the areas and spaces depicted on the drawings. Make all drawing changes in AutoCAD compatible format to the original design drawings. Transfer all signatures, initials, and dates in the title block area on the drawings as text onto the as-built. Electronic signatures are not required. Provide extra sheets as required to accommodate amendments, sketches and field changes. Save all drawing files with the exception of X-ref's with new names reflecting Record Drawing Status (RD). Provide the Contracting Officer two electronic copies (2) containing drawings in both Adobe PDF and AutoCAD formats and all manufacturers' catalog cut sheets. CDs of As-Built Drawings & Record of Materials are to be turned over and delivered to the Engineering Officer and the Facility Management Officer in Public Works.

19. PROPOSALS: Proposals shall include at least:

19.1. The facility number, facility name, and a definition of the limits of the work area such as room numbers or floor numbers. Where limits cannot be defined clearly in writing a drawing shall be furnished.

19.2. Demolition quantities expressed separately when they differ from installation quantities.

19.3. A description of incidental work sufficient to show that related needs have been considered. For example, building a wall may include rewiring lights, installing a switch, repairing a ceiling, and so on.

19.4. The quantity and cost of direct labor and materials.

19.5. A clear explanation of costs beyond labor and materials.

19.6. An initial project schedule

20. INVOICES: As directed by Contract Officer the Contractor Invoices shall be submitted electronically using the DOD Wide Area Workflow (WAWF) system. (See clause DFARS Clause 252.232-7003 ELECTRONIC SUBMISSION OF PAYMENT REQUESTS AND RECEIVING REPORTS (MAR 2008) and clause 5252.232-9301 INVOICING PROCEDURES ELECTRONIC (FEB 2009) for details).

20.1. Contractor requests for payment shall conform and will be processed in accordance with the requirements of FAR 52.232-5 PAYMENT UNDER FIXED PRICED CONSTRUCTION CONTRACTS (SEP 2002) and FAR 52.232-27 PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (OCT 2008).

A. Content of Invoice: Requests for payment in accordance with the terms of the contract shall consist of the following: (If NFAS Clause 5252.232-9301 is present in the contract, documents shall be provided as attachments in Wide Area Workflow (WAWF). The maximum size limit per attachment is less than 2 megabytes, but you may have an unlimited number of attachments. If a document cannot be attached to WAWF due to system or size restrictions it shall be provided as instructed by the contracting officer). If NFAS Clause 5252.232.9301 is not present in the contract, follow the invoicing instructions provided in the contract.

1. Contractor's Invoice on NAVFAC Form 7300/30, which shall show, in summary form, the basis for arriving at the amount of the invoice.
2. Contractor's Monthly Estimate for Voucher (LANTNAVFACENGCOM Form 4-4330/110 (New 7/84)), with subcontractor and supplier payment certification.
3. Affidavit to accompany invoice (LANTDIV NORVA Form 4-4235/4 (Rev. 5/81)).
4. Updated copy of submittal register.
5. Updated copy of progress schedule. Furnish as specified in "FAR 52.236-15, Schedules for Construction Contracts."
6. Network mathematical analysis.
7. Contractor Safety Self Evaluation Checklist (original)
8. Final release (for final payment only)

B. Payment:

1. Payment will be made on Contractor's submission of itemized requests and will be subject to reduction for overpayments or increased for underpayments from previous payments. The Government may withhold payment or reduce payments for the following:

- a) Defects in material or workmanship.
- b) Claims the Government may have against the Contractor under or in connection with this contract.
- c) Contractor's failure to submit an updated schedule.
- d) Payroll violations.
- e) Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor.

2. Payments may be made for materials, stored off construction sites, under the following conditions:

- a) Materials adequately insured and protected from theft and exposure.
- b) Materials not susceptible to deterioration or physical damage in storage or in transit to the job site are acceptable for progress payments. Items such as steel, machinery, pipe and fittings and electrical cable are acceptable, but items such as gypsum board; glass, insulation and wall covering are not.
- c) Materials in transit to the job or storage site are not acceptable for payment.
- d) Conditions specified in FAR 52.232-5(b) PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (2002).

21. POST AWARD KICKOFF MEETING (PAK): Prior to commencement of design, and within **21 calendar days** of award, meet with representatives of the Contracting Officer, Installation's PWB Engineering Project Technical Designer Manager and Client to present the concept design for discussion and acceptance. The project team will develop a mutual understanding relative to the approved proposal, safety program, environmental permits and requirements, quality control procedures, and design and construction schedule. During the meeting, Contractor shall propose and gain acceptance for any critical path work activities requiring advance submittal and approval. If the contract includes work on any fire protection system, including fire alarm and mass notification systems, the Contractor and the appropriate DOR shall meet with the NAVFAC Fire Protection Engineer (FPE) to establish clear expectations of fire protection requirements of the project.

The Contractor's key personnel shall attend at the expense of the Contractor. Key personnel are defined as the Project Manager, Superintendent, CQC representative(s), DOR, major subcontractors and specialized supplementary personnel.

The PAK includes partnering, held during normal work hours with the non-labor –related costs shared by both parties. Partnering is a structured process, as well as philosophy of doing business with Contractors and clients that recognizes common goals through communication and teamwork. It helps create an environment where trust and teamwork prevent disputes, foster good working relationships to everyone's benefit, and facilitate the completion of a successful contract. A Performance Assessment Plan that provides monthly performance feedback to the Contractor, will be discussed during the partnering session.

Key personnel will meet to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the PAK Meeting utilizing the NAVFAC Red Zone (NRZ) Checklist and convene the Facility Turnover Meetings once the project has reached approximately 75% completion or 3 to 6 months prior to Beneficial Occupancy Date (BOD), whichever comes first. The Contracting Officer's Representative will lead the meetings and guide the discussions based on an agenda provided by the Government. The Facility Turnover effort shall fill in the NRZ Checklist including Contractor, Client, and NAVFAC Checklist Items and assign a person to be responsible for each item and a due date. The Contracting Officer's Representative will facilitate the assignment of responsibilities and fill out the NRZ Checklist. The Contracting Officer's Representative shall develop a Plan of Action and Milestones (POAM) for the completion of all Contractor, Client, and NAVFAC Checklist items.

22. DESIGN and WORK STANDARDS : Design is the work necessary to ensure functionality, quality, and safety for critical facets of the project. Special coordination requirements, such as for phone, LAN and cable, are included in the Statement of Work.

22.1. Provide work in compliance with the following design standards and codes, as a minimum. Government standards listed in this RFP take precedence over industry standards.

22.1.2. This RFP references published standards, the titles of which can be found in the Unified Master Reference List (UMRL) on the Whole Building Design Guide at the Unified Facilities Guide Specification (UFGS) Website. The publications referenced form a part of this specification to the extent referenced.

22.1.3. The advisory provisions of all codes, requirements, and standards shall be mandatory; substitute words such as “shall”, “must”, or “required” for words such as “should”, “may”, or “recommended,” wherever they appear. The results of these wording substitutions incorporate these code and standard statements as requirements. Reference to the “authority having jurisdiction” shall be interpreted to mean “Contracting Officer”. Comply with the required and advisory portions of the current edition of the standard at the time of contract solicitation.

22.1.4. The following list of codes and standards is not comprehensive and is augmented by other codes and standards referenced and cross-referenced in the RFP. Refer to the Statement of Work for specific requirements within other UFC’s.

- a) UFC 1-200-01, General Building Requirements
- b) UFC 1-300-08, Criteria for Transfer and Acceptance of Military Real Property
- c) UFC 1-300-09N, Design Procedures
- d) UFC 3-560-01, Electrical Safety, O&M
- e) UFC 3-600-01, Fire Protection Engineering for Facilities
- f) UFC 3-600-10N, Fire Protection Engineering
- g) UFC 3-800-10N, Environmental Engineering for Facility Construction
- h) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
- i) UFC 4-020-01, Security Engineering: Facilities Planning Manual

22.2. Provide professional registration and design signing and stamping requirements: per requirements of UFC 1-300-09N, Design Procedures.

22.3. ACCESSIBILITY: **[NOT USED]**

22.4. See Statement of Work for project-specific criteria requirements.

22.5. DESIGN SUBMISSIONS: Submit design drawings or sketches, calculations and manufacturer’s data to demonstrate compliance with contract requirements. The Contractor is encouraged to prepare design drawings more like shop drawings to minimize construction submittals.

22.5.1. Provide hard and electronic copies of design submittal package(s) 3 weeks prior to the in-progress review meeting. See Statement of Work for project-specific criteria requirements for number of review submission, type and quantity of submissions.

22.5.2. The final design submittal must be professionally signed and sealed by the DOR and forwarded to the Contracting Officer prior to the start of construction. Separated final design packages will only be

considered for Government review and approval during the Post Award Kick-off Meeting. The following design submittals must be approved by the Contracting Officer prior to the start of construction:

- a) See statement of work for a list of deliverables.

23. FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS: Work shall comply with applicable criteria identified herein and the Statement of Work. Any project including work on means of egress, fire rated elements, Fire Suppression, Mass Notification, or Fire Alarm Systems shall require the services of a Registered Fire Protection Engineer (FPE).

23.1. Final Life Safety/Fire Protection Certification Documentation: Unless otherwise specified the Contractor should provide certification that all life safety and fire protection features and systems have been installed in accordance with applicable criteria, the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features.

24. QUALITY CONTROL: Maintain quality control for and inspect all work under the contract. The DOR, as a member of the Contractor QC organization, shall remain directly involved during the construction process. For certain projects, the Quality Control Manager, Superintendent, and Site Safety and Health Officer may be combined.

24.1. The Superintendent may serve also as the Quality Control Manager on this project.

24.2. Special inspections [**NOT USED**]

24.3. Submit a QC Plan for Government review and acceptance. The QC plan shall include the following:

- a) **NAMES, QUALIFICATIONS and RESPONSIBILITIES:** For each person in the QC organization (design and construction).
- b) **OUTSIDE ORGANIZATIONS:** Outside organizations , including architectural and consulting engineering firms, and a description of the services these firms will provide.
- c) **INITIAL SUBMITTAL REGISTER (CONSTRUCTION):** Include submittal reviewer, estimated date of delivery, and which construction submittals require Government approval prior to construction, per General Requirements Paragraph 15 – SUBMITTALS
- d) **TESTING LABORATORIES:** Accredited laboratories as applicable.
- e) **TESTING PLAN AND LOG:** Tests required, referenced by specification paragraph number requiring the test, frequency, and person responsible for each test.
- f) **LIST OF DEFINABLE FEATURES:** A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews.
- g) **COMMUNICATION PLAN:** Provide a plan for key decisions and possible problems the Contractor and Government may encounter during the design phase of the project. Communication Plan shall indicate the frequency of design meetings and what information is covered in those meetings, key design decision points tied to the Network Analysis Schedule and how the DOR plans to include the Government in those decisions, peer review procedures, interdisciplinary coordination, design review procedures, and comment resolution.

24.4. QC Manager Responsibilities:

- a) Participate in the **Post Award Kick-off**, Coordination Meetings and Production Meetings.
- b) Immediately stop any work that does not comply with contract plans and specifications, and direct the removal and replacement of any defective work.
- c) Prepare QC Reports.
- d) Hold weekly/biweekly QC meetings with DOR, Superintendent and Government technical team; participation shall be suitable for the phase of work.
- e) Ensure that safety inspections are performed. Attend weekly Toolbox meetings.
- f) Maintain submittal log.
- g) Maintain updated as-built drawings on site.
- h) Maintain testing plan and log. Ensure that all testing is performed per contract.
- i) Maintain deficiency log on site, noting dates deficiency identified, and date corrected.
- j) Certify and sign statement on each invoice that all work to be paid under the invoice has been completed in accordance with contract requirements.
- k) Perform Punch-out and Pre-final inspections, and participate in Final Inspections. Establish list of deficiencies; correct prior to the Final inspection.
- l) Ensure that all required keys, operation and maintenance manuals, warranty certificates, and the As-built drawings are submitted to the Contracting Officer.

24.5. Use the Three Phases of Control process for construction QC.

- a) **Preparatory Phase:** Review all applicable documents for compliance with all applicable laws, codes, regulations, and the requirements of the contract, including contract drawings and specifications. Determine requirements for testing and certification. Review submittal approvals for materials, equipment, shop drawings, and applicable methods of construction and installation. Include all Preparatory Phase items, along with preparatory phase checklist, and including date, in the QC Report.
- b) **Initial Phase:** Observe and inspect the initial portion of the work performed under a Definable Feature of Work (DFOW), to ensure that testing, when required, is being done and certified by the approved laboratories, and to check all work procedures to ascertain that the work is in conformance with required safety requirements. Record and report all nonconforming work and work not of acceptable quality and requiring correction or rework. Include all Initial Phase items, along with initial phase checklist and including date, in the QC Report.
- c) **Follow-Up Phase:** Occurs at the completion of each DFOW. Ensure that the work is in compliance with the contract requirements, quality of workmanship for all work is maintained, and all work being performed meets safety requirements. Include all Follow-Up Phase items, including date, in the QC Report.

24.6. The QC Manager must possess a current certificate showing successful completion of the NAVFAC contractor Quality Management (CQM) Training.

25. SUBMITTAL PROCESS: Provide to the Government submittals as listed. In addition, see Paragraph 15, and Statement of Work for specific construction submittals, format and approval and surveillance requirements. Design drawings may be prepared more like shop drawings to minimize construction submittals after final designs are approved. Therefore, the Contractor is encouraged to prepare and submit with the design drawings, appropriate connection, fabrication, layout, and product specific drawings.

- a) QC Plan, prior to Design / Construction.
- b) Design and Construction submittals, prior to construction, approved IAW QC Plan, The DOR or QC Specialist is the approving authority for submittals unless otherwise indicated in Paragraphs 9; 15; and 41.
- c) If applicable DOR-approved design and construction submittals identified in Paragraph 15 for Government surveillance (typically Fire Protection system and Life Safety submittals). Stamp the submittals "FOR SURVEILLANCE ONLY." Submit Surveillance submittals to the Government prior to starting work for that item. Submittals required for surveillance will be returned only if corrective actions are required.
- d) Schedule: Provide detailed design schedule and preliminary construction schedule, due prior to PAK.
- e) Material Safety Data Sheets (MSDS) as applicable.
- f) Waste Management Plan, prior to construction.
- g) Safety Submittals: Per EM-385-1-1 prior to construction.
- h) Schedule of Prices, initial due 21 days after award, detailed prior to construction.
- i) As-Built Record Drawings, due at Beneficial Occupancy.
- j) Operation and Maintenance Info: Per General Requirements Paragraph's 15-SUBMITTALS and 18-RECORD DRAWINGS AND OPERATION & MAINTENANCE (O&M) DATA and as specified in the Statement of Work. Due prior to testing as applicable, no later than 15 calendar days before Beneficial Occupancy.
- k) Licenses and Permits: Per General Requirements Paragraphs 12-PERMITS, MANIFESTS and UTILITY OUTAGE /UTILITY CONNECTION REQUESTS; 15-SUBMITTALS, and as specified in the Statement of Work.
- l) Environmental Protection Plan, prior to start of the work.
- m) DD Form 1354: For all new construction, demolition, and any construction on an existing facility that adds new parts, items, or systems that are not maintenance or repair; e.g. replacement of windows, replacement of roofs, replacement of an exterior utility, adding an AC system, adding exterior lighting, the **Contractor** shall prepare DD Form 1354 TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY, in accordance with UFC 1-300-08, available at http://65.204.17.188/report/doc_ufc.html. Submit form for Government approval a minimum of 30

calendar days prior to final acceptance of work.

- n) Contractor Safety Self-Evaluation Checklist.
- o) Accident Reports – submit if incidence occurs.
- p) Safety Submittals: Per Paragraphs 9; 15; and 41.
- q) Schedule of Prices, initial due 21 calendar days after award and a detailed due prior to construction.

26. SUPERVISION: The Contractor shall have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, the Quality Control (QC) representative shall also have fluent English communication skills.

27. SCHEDULE: Provide Design and Construction Schedule adequate for Contractor to efficiently manage project and for Government to efficiently manage QA and scheduling interfaces. Include construction phasing and any work restrictions (such as occupied spaces, special hours, potential work disruptions). Schedule shall contain DFOWs and dates for completion of each task including material procurement, and construction activities. Update the schedule at least monthly; use 3-week look-ahead for each QC meeting.

28. BUDGET MANAGEMENT: The Contractor shall be responsible for budget management throughout the entire project. It is the intent of the Government to partner with the Contractor to maximize project value while strictly controlling contract modifications and maintaining overall fiscal control.

29. PRECONSTRUCTION CONFERENCE: Prior to construction and/or demolition start, meet with representatives of the Contracting Officer to discuss and develop mutual understanding relative to administration of the safety programs, environmental issues, safety of building occupants and surrounding area, hazardous materials, waste disposal, construction QC procedures, construction schedule, labor provisions and other construction phase contract procedures. If applicable, a Performance Assessment Plan that will be used to provide monthly performance feedback to the Contractor will be presented and discussed.

30. PERFORMANCE EVALUATIONS: The evaluation will take into account all aspects of the Contractor's performance, including evaluations from Performance Assessment Plans when included. Performance evaluations may be completed any time during the contract. The Government will provide a copy of the performance evaluation and an opportunity to discuss the evaluation. The performance evaluations will have an impact on the award of future contracts.

31. ELECTRONIC DOCUMENT MANAGEMENT: The contractor shall submit all documents associated with this contract in PDF format. This includes, but is not limited to, daily production reports, QC reports, preparatory and initial checklists, RFIs, submittals and various logs. Additionally, select submittals, schedules and other documents shall be presented in native format (i.e. AutoCAD, Excel, Word, etc.) upon request by the Government or in accordance with other sections of the contract. It is preferred that documents be created through electronic conversion rather than optically scanned.

- a) Electronic files shall be submitted via email, or other mutually agreed upon method to the Government representative(s) as directed by the Contracting Officer and contract. The contractor is solely responsible for the timely submission of electronic files to the Government. A submittal is considered received by the Government when a usable electronic file has been provided to and accepted by the Government.

- b) All electronic files shall follow the naming convention described in the QMCB ROICC eFiles Instruction, which will be provided after award.
- c) Review comments, or a lack of review comments, made by the Government on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the contract documents. The Contractor is responsible for managing, tracking, and documenting the work to comply with the requirements of the contract documents. Government acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.
- d) The Contractor shall prepare submittals using software that meet the requirements of viewing and review by use of latest version of the Adobe Acrobat Reader program (currently 8.0). The Contractor will upgrade systems as needed to provide files as required. Upgrading of the Contractor's computer systems will not be justification for cost or time modifications.
- e) The Contractor is responsible for maintaining the project submittal register and RFI log. Contractors are allowed to utilize existing in-house RFI and/or submittal tracking systems or adopt the Excel based format used by QMCB ROICC. A PDF print out of the current submittal register and RFI log shall be provided to the government at least once per week and discussed on a regular basis. The Government and the Contractor QC manager shall exchange native versions of the submittal register file and RFI log as needed throughout the life of the project.

32. CONTRACTOR'S PRODUCTION REPORTS: Submit Contractor Production Reports on forms furnished for this purpose. The reports shall be completed daily, unless otherwise requested by the Contracting Officer. Reports shall include:

- a) Worker hours by classification, move-on and move-off of construction equipment furnished by the prime, subcontractor or the Government, and materials and equipment delivered to the site.
- b) Safety meetings, checks and inspections.
- c) Disposition of Construction Waste Material: Per Environmental Protection Plan.
- d) Design and Construction Services: Including, but not necessarily limited to:
 - 1) Check all Contract Documents for correctness and correlation. If the Contractor notes any discrepancy or ambiguity, immediately notify the COR.
 - 2) Examine the work site as to conditions affecting the work. Field verify the site and scope of work, including but not limited to the measurement and location of all significant items required to perform the work. Failure by the Contractor to familiarize oneself with available information regarding these conditions shall not relieve the Contractor from the responsibility of successfully completing the work.

33. SCHEDULE OF PRICES: Submit on forms furnished by the Government. The initial schedule of prices may be preliminary for construction activities until the design is developed. Include a detailed breakdown of the contract price, with quantities for each kind of work. Include General Conditions, profit, and overhead in the unit prices. Break down into design and each construction category. The Contractor may invoice for bonds once the Government has approved the bonds, however, no other requests for payment will be processed without an approved Schedule of Prices.

34. SECURITY REQUIREMENTS: All security requirements apply to all subcontractors and suppliers associated with this contract. Special or extraordinary security requirements are identified under General Paragraphs 12.2.10-CONTRACTOR PERSONNEL SCREENING AND ACCESS PERMIT REQUIREMENTS and as required by the Statement of Work. In addition to special or extraordinary security requirements, comply with the following:

- a) Do not publicly disclose any information concerning any aspect of the materials or services relating to this contract, without prior written approval of the Contracting Officer.
- b) Do not disclose or cause to be disseminated any information concerning the operations of the activity's security or interrupt the continuity of its operations.
- c) Do not disclose any information to any person not entitled to receive it. Failure to safeguard any classified information that may come to the Contractor or any person under his control, may subject the Contractor, his agents or employees to criminal liability under 18 U.S.C., Sections 793 and 798.
- d) Direct to the Contracting Officer and or Installation Security Officer for resolution all inquiries, comments or complaints arising from any matter observed, experienced, or learned as a result of or in connection with the performance of this contract, the resolution of which may require the dissemination of official information.
- e) Coordinate photography requirements with the Contracting Office. Some areas restrict or prohibit photographing Government property.

Deviations from or violations of any of the provisions of this paragraph, will, in addition to all other criminal and civil remedies provided by law, subject the Contractor to immediate termination for default and withdrawal of the Government's acceptance and approval of employment of the individuals involved.

35. REQUIRED INSURANCE: Within 15 calendar days after award, furnish the Contracting Officer a Certificate of Insurance as evidence of the following insurance coverage amounts not less than the amount specified below in accordance with FAR Clause 52.228-5, INSURANCE WORK ON A GOVERNMENT INSTALLATION:

- a) Comprehensive General Liability: \$500,000 per occurrence.
- b) Automobile Liability: \$200,000 per person, \$500,000 per occurrence for bodily injury; \$20,000 per occurrence for property damage.
- c) Worker's Compensation: As required by Federal and State Worker's compensation and occupational disease and other laws.
- d) Employer's Liability Coverage: \$100,000, except in states where worker's compensation may not be written by private carriers.
- e) Others as required by state law.
- f) Above insurance coverages are to extend to Contractor personnel operating Government owned equipment and vehicles
- g) The Certificate of Insurance shall provide for 30 calendar days written notice to the Contracting Officer by the insurance company prior to cancellation or material change in policy coverage.

For projects which require removal of asbestos containing materials the Asbestos Contractor or Subcontractor, as the case may be shall provide occurrence-based liability insurance with asbestos

coverages in an amount not less than \$1,000,000 and shall name the Government and PQP as additional insureds.

36. PROPRIETARY RIGHTS: All field notes, design drawings, specifications, and other documents collected and produced as part of this contract shall be considered property of the Government. These data shall not be used, in whole or part, published or unpublished, as a part of any technical or non-technical presentation without written pre-approval of the Contracting Officer.

37. GOVERNMENT FURNISHED MATERIAL AND EQUIPMENT: [NOT USED]

38. ORAL MODIFICATION: No oral statement by any person other than the Contracting Officer, as provided in the contract clause entitled, "CHANGES AND CHANGED CONDITIONS," will in any manner or degree modify or otherwise affect the terms of this contract.

39. NO WAIVER BY THE GOVERNMENT: The failure of the Government in any one or more instances to insist upon strict performance to any of the terms of this contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or options on any future occasion.

40. EQUITABLE ADJUSTMENTS – WAIVER AND RELEASE OF CLAIMS:

- a) Whenever the Contractor submits a claim for equitable adjustment under a clause which provides for equitable adjustment of the contract, such claim shall include all types of adjustments in the total amounts to which the clause entitles the Contractor, including, but not limited to, adjustment arising out of delays or disruptions.
- b) Except as the parties may otherwise expressly agree, the Contractor shall be deemed to have waived: (1) any adjustments to which he otherwise might be entitled under the clause where such claim fails to request such adjustments; and (2) any increase in the amount of equitable adjustments additional to those requested in its claim.
- c) The Contractor agrees that, if required by the Contracting Officer, it shall execute a release, in form and substance satisfactory to the Contracting Officer, as part of the supplemental agreement setting forth the aforesaid equitable adjustment. The Contractor further agrees that such release shall discharge the Government, including its officers, agents, and employees, from any further claims, including, but not limited to, further claims arising out of delays or disruptions caused by the aforesaid change.

41. SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS:

41.1. References: The publications listed below form a part of this specification to the extent referenced. Use current version of referenced requirements at the time of contract solicitation. The publications are referred to within the text by the basic designation only.

- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- ANSI Z359.1, Safety Requirements for Personal Fall Arrest System, Subsystems and Components*
 - ANSI A10.32, Fall Protection systems for Construction and Demolition Operations*
 - ANSI A10.6, Demolition Operations*
 - ANSI Z9.2, Fundamentals Governing the Design and Operation of Local Exhaust Systems*
 - ANSI Z88.2, Respiratory Protection*

ANSI Z358.1, *Emergency Eyewash and Shower Equipment*

ASME INTERNATIONAL (ASME)

ASME B30.22, *Articulating Boom Cranes*

ASME B30.3, *Construction Tower Cranes*

ASME B30.5, *Mobile and Locomotive Cranes*

ASME B30.8, *Floating Cranes and Floating Derricks*

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM Standards on Lead-Based Paint Abatement in Buildings

ASTM E 1368, *Visual Inspection of Asbestos Abatement Projects*

DEPARTMENT OF DEFENSE (DoD)

MIL-STD-1472F, Military Standard, *Human Engineering Design Criteria for Military Systems, Equipment and Facilities*

DoD-HDBK 743A, *Anthropometry of US Military Personnel*

DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25, *Storage and Handling of Compressed Gases and Liquids in Cylinders*

EPA Standards and Documents – General

15 U.S.C. 2601 – *Toxic Substances Control Act*

EPA Title X – *The Residential Lead Based Paint Hazard Reduction Act*

EPA & HUD – *Lead Safe Work Practices*

HUD Guidelines, *Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing*

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241, *Safeguarding Construction, Alteration, and Demolition Operations*

NFPA 51B, *Fire Prevention During Welding, Cutting, and Other Hot Work*

NFPA 70, *National Electrical Code*

NFPA 70E, *Electrical Safety in the Workplace*

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety -- *Safety and Health Requirements*

UNITED FACILITIES CRITERIA (UFC)

UFC 3-560-01, *Electrical Safety, O&M*

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 *Occupational Safety and Health Standards*

29 CFR 1910.146 *Permit-required Confined Spaces*

29 CFR 1915 *Occupational Safety and Health Standards for Shipyard Employment*

29 CFR 1926 *Safety and Health Regulations for Construction*

41.2. Submittals: A "G" following a submittal indicates that Government approval action is required.

- a) Contractor Accident Prevention Plan (APP), comply with EM 385-1-1, Appendix A; G
- b) Contractor Safety Self-Evaluation Checklist; G

- c) Monthly Work-Hour Reports
- d) Crane Critical Lift Plan; G
- e) Accident Reports – submit if incidence occurs.
- f) Activity Hazard Analyses, as applicable.

41.3. Weight Handling Equipment (WHE) Accident: A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over).

41.4. Contractor Safety Self-Evaluation Checklist: Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor. Complete the checklist monthly and submit with each request for payment. A score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.

41.5. Regulatory Requirements: In addition to the detailed requirements included in this contract, work performed shall comply with USACE EM 385-1-1, and the laws, ordinances, criteria, rules and regulations included in Attachment A. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. UFC 3-560-01 takes precedence over all other guidance for electrical safety.

41.6. Site Safety and Health Officer (SSHO) Qualifications & Duties: SSHO shall perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The assignment of the SSHO does not relieve the Contractor from the regulatory requirements governing safety responsibility. The SSHO on this project can be the site superintendent unless otherwise indicated in Attachment A. The SSHO shall meet the following requirements:

- a) A minimum of 5 years safety work on similar projects.
- b) 30-hour OSHA construction safety class or equivalent within the last 5 years.
- c) An average of at least 24 hours of formal safety training each year for the past 5 years.
- d) Competent person training as needed.
- e) Successfully completed the Environmental Compliance Awareness Training (ECATT) Program.
- f) In addition to duties required in EM 385-1-1, perform the following:
 - 1. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the daily production report.
 - 2. Attend pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic progress meetings.

Failure to actively apply an acceptable safety program will result in dismissal and a project work stoppage that will remain in effect pending approval of a suitable replacement.

41.7. Accident Notification and Reports

- a) For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) form and provide the report to the Contracting Officer within 5 calendar days of the accident. The Contracting Officer will provide copies of any required or special forms.
- b) For any weight handling equipment accident (including rigging gear accidents), the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.
- c) Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (e.g., type of construction equipment used, PPE used). Preserve the conditions and evidence on accident site until the Government investigation team arrives and Government investigation is conducted.
- d) Monthly Work-Hour Reports: Monthly work-hour reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

41.8. Hot Work: Prior to performing "Hot Work" (e.g., welding, cutting) or operating other flame-producing/ spark-producing devices, request a written permit from the Fire Division. **CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED.** It is mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site as required after completion of the task or as specified on the hot work permit. Comply with the "Hot Work" permit request requirements as stated General Requirements Paragraph 12.2.3.

41.9. Hazardous Material Use: Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

41.9.1. Hazardous Material Exclusions: Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, or lead-based paint are prohibited. The Contracting Officer, upon written request may consider exceptions to the use of any of the above excluded materials.

41.9.2. Unforeseen Hazardous Material: The Request for Proposal should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, CHANGES (JUN 2007), and FAR 52.236-2, DIFFERING SITE CONDITIONS (APR 1984).

41.10. Pre-outage Coordination Meeting: Apply for utility outages at least twenty (20) days in advance as stated in General Requirements Paragraphs 12.2.4 and 12.2.4.1 "Utility Outage/Utility Connection Requests", and provide any additional necessary sketches to convey location(s). Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist

41.11. Fall Hazard Protection and Prevention Program: The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Include company policy; identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

41.11.1. Fall Protection for Roofing Work: Implement all protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

- a) A safety monitoring system is not adequate fall protection for low sloped roofs and is not authorized.
- b) Work on steep-sloped roofs, including residential or housing type construction, requires a personal fall arrest system, guardrails with toe-boards, or safety nets.

41.11.2. Fall Prevention and Design: During design, consider and eliminate fall hazards encountered at the facility during maintenance evolutions whenever possible. If it is not feasible to eliminate or prevent the need to work at heights with its subsequent exposure to fall hazards, include control measures in the design to protect personnel conducting maintenance work after completion of the project. In addition to the detailed requirements included in the provisions of this contract, incorporate the requirements of 29 CFR 1910 Standards in the design (29 CFR 1915 applies for work in Shipyards).

41.12. Weight Handling Equipment:

- a) Crane Critical Lift Plan: Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit the plan 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.C.18. as well as the following:

- a) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.550(g).
- b) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.
- b) Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. The Certificate of Compliance shall state that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post these certifications on the crane.
- c) Notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.
- d) Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- e) Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
- f) Under no circumstance make a lift at or above 90% of the crane's rated capacity in any configuration.
- g) When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.
- h) Use cribbing when performing lifts on outriggers.
- i) Position the crane hook/block directly over the load. Side loading of the crane is prohibited.
- j) Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall be available for review by Contracting Officer personnel.
- k) Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
- l) Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

- m) Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations, set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. Include this maximum wind speed determination in the activity hazard analysis plan for that operation.

41.13. Utility Locations and Verification Prior to Excavation: Obtain appropriate digging permit from Base personnel through Contracting Officer prior to digging as stated in the General Requirements Paragraphs 12.2.2. "Digging Permit". All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Maintain all markings during utility investigation throughout the contract.

41.13.1. Physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Use hand digging within 0.61 m (2 feet) of a known utility. If construction is parallel to an existing utility, expose the utility by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

41.14. Utilities Within Concrete Slabs: Utilities located within concrete slabs are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

41.15. Conduct of Electrical Work: Follow electrical safety criteria specified in UFC 3-560-01, USACE EM 385-1-1, and NFPA 70E during the conduct of all work.

41.15.1. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel shall comply with the requirements of NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

41.16. Work in Confined Spaces: The Contractor shall comply with the requirements described in General Paragraphs "Permit Required for Confined Spaces" Paragraph 12.2.5 through 12.2.5.3.

41.17. Ergonomics Considerations During Design: Design facilities, processes, job tasks, tools and materials to reduce or eliminate work-related musculoskeletal (WMSD) injuries and risk factors in the workplace. Design maintenance access to reduce WMSD risk factors to the lowest level possible. In addition to requirements included in this contract, design shall incorporate the requirements of MIL-STD-1472F.

General Paragraph – Appendix “A”

G-5 ISWM Revd: _____
 FY Reporting Period: _____

**Construction Waste Management Report
 Quantico Marine Corps Base**

Report Date: _____
 Project Number: _____ Project Name: _____
 Contract Number: _____ Contract Task Order/Delivery Order: _____
 Reporting Period: _____ to _____

RETURN THIS FORM TO FAX (703) 784-2332 ATTN: Mr. David Smith

Comments: _____

Waste Stream	Disposal (Tons)	Disposal Cost	Recycled (Tons)	Recycled Cost	Recycled Revenues
C&D		\$		\$	\$

CONSTRUCTION & DEMOLITION DEBRIS (C&D).

- Record hazardous and non-hazardous C&D waste as one entry. Enter total tons of C&D disposed of in a landfill, by incineration, and/or by hazardous waste contract.
- Enter total disposal cost for C&D.
- Enter the recycled hazardous and non-hazardous C&D tons as one entry under the recycling column. You can also claim C&D diversion conducted by a construction contractor or MILCON project. If you have recycled C&D, it is likely that some was disposed of as well. Therefore, if there are recycled tons of C&D there should be some disposed tons of C&D.
- Enter the cost associated with recycling. Recycling costs include handling, processing, transportation, and other costs associated with recycling C&D. Soils that are used at another location or that are reclaimed count toward recycling.
- Enter Recycling Revenues. Enter only actual revenues received from recycling. Do not enter cost avoidance for recycling revenues.

Reported by: _____
 Company: _____ Contact: _____
 Address: _____ Title: _____
 _____ E-mail address: _____
 Telephone: _____
 Fax: _____

Definitions:

Construction and Demolition (C&D) Debris. Waste derived from the construction, renovation, demolition or deconstruction of residential and commercial buildings and their infrastructure. C&D waste typically includes concrete, wood, metals, gypsum wallboard, asphalt, and roofing material.

Other Select Waste (OSW). Construction and demolition debris are the “Other Select Waste” categories for purposes of DoD metric reporting via SW module. If the Other Select Wastes are hazardous they must also be reported in the calendar year HW module.

General Paragraph – Appendix “B1”

Public Works Branch, Requirements Section
MCB Quantico, VA
EXCAVATION PERMIT REQUEST FORM – Updated 11 Apr 11

MCBO 11000.3

PERMIT EXPIRES**: _____ PERMIT#: _____ DATE APPROVED: _____

****Note: G-6 must be renewed every 10 days after signature; Miss Utility every 15 days**

1. REQUESTER: _____ Estimated Depth of Excavation ___ Ft
NAME: _____
COMPANY: _____ Planned Mobilization Date _____
PHONE: _____
CONTRACT # _____ Planned Completion Date _____

2. LOCATION OF AREA TO BE EXCAVATED: _____

** (NOTE: A to-scale drawing of the excavation site must be submitted along with this form. Excavation route must be staked or flagged by the requester every 10 feet.)**

3. TYPE OF WORK TO BE PERFORMED: _____

4. MISC INFORMATION:

a. This excavation permit is used for any work that may disrupt underground utilities, communications, right of ways or any routine activities. Processing of this permit will take approximately **10-14 days**. Requester must have an approved excavation permit prior to commencement of work and permit must be kept on-site.

b. If utilities or communications have been located in the area to be excavated, hand digging will be used within a 10-foot radius until the exact location of all lines have been determined. It is the responsibility of the requester to maintain the markings after utilities have been located and marked.

c. The Government reserves the rights to have on-site personnel present during any excavation and will specify on this permit under precautionary measures if needed.

d. The requester shall take reasonable precautions to protect from damage all existing improvements, utilities, communications, and vegetation at or near the work site. The requester shall be liable for all damages to persons or property that occurs as a result of the requester's fault or negligence.

* e. Emergency requests are delivered directly to Public Works Work Reception Office and/or FMS Utilities Shop for expeditious action. Requester is still required to contact Miss Utility, G-6, Ameresco, and IDX-1 Security (where applicable).

f. Any questions regarding this excavation permit may be directed to the PWB Requirements Section at (703) 784-1405. **Any utility emergency encountered during excavation must be reported to the Base Trouble Desk (24/7) at 703-784-2072.**

g. A **Water Distribution System Permit** is required in addition to this excavation permit for any and all connections to the MCB potable water distribution system. Contact Patty Creek, Commodities Engineer, at (703) 432-2466, or in person at 2004 Barnett Avenue in the 2nd deck Engineering/Planning Suite.

"I HAVE FULLY READ AND UNDERSTAND THE ADVISORIES AND REQUIREMENTS NOTED ABOVE".

Signature of requester/POC

Date

General Paragraph – Appendix “B1”

**Public Works Branch, Requirements Section
 MCB Quantico, VA**

MCBO 11000.3

EXCAVATION PERMIT REQUEST FORM – Updated 11 Apr 11

5. **REQUIRED ACTION:** **PLANNED MOBILIZATION DATE:** _____ **PERMIT#:** _____
ESTIMATED DEPTH OF EXCAVATION: _____ **Ft**
- a. Requirements Office _____
 Work Order # _____
- b. FMS M&R Utilities Shop
 Pipefitters _____ Date: _____
 Marked No Conflict
- Linemen _____ Date: _____
 Marked No Conflict
- c. Ameresco (Mainside, MCAF, OCS)
 Marked No Conflict
- d. G-6 _____ Expires: _____
 Marked No Conflict
- e. HMX-1 Physical Security (MCAF) _____
 Marked No Conflict
- f. Miss Utility Work Order # _____
- g. NREAB (NEFA Action)
 Approved
 Disapproved _____
- h. PWB Planning Office
 Approved _____
 Disapproved _____
- i. PPV - Lincoln Property Company
 Marked No Conflict

DIRECTIONS FOR REQUESTER ACTION:

1. **Requirements** 3252 Barnett Ave.; Submit excavation permit applications to Requirements
 (703) 784-1405 Section for processing at least **14 days prior** to commencement of work.
 Requester **MUST** obtain an **APPROVED** permit prior to commencing work.
2. **FMS** 3252 Barnett Ave.; contact Maria Self if there are concerns or
 (703) 784-1405 questions about Base-owned utilities prior to excavation.
3. **Ameresco** 7 Zeilin Rd (south end). POC: Alix Hidalgo or Jim McCoy.
 (703) 630-0363 Emergency contact (571) 221-0153
4. **G-6** 1999 Elliot Rd.; obtain signature from Assistant Chief of Staff,
 (703) 784-2500 G-6, Telephone Branch. G-6 clearance must be updated every 10 days.
5. **HMX-1** MCAF, Hangar 2134, Room W-127; obtain signature @ Physical Security
 (571) 494-4959 Office
6. **Miss Utility** Call Miss Utility at least **3 WORKING DAYS IN ADVANCE** of excavation.
 Call 811 Provide them an address of the area to be excavated; they will issue a
 ticket number to the requestor. Each prime contractor and each
 subcontractor **MUST** have their own Miss Utility Ticket Number, regardless
 of who holds this Quantico permit. Miss Utility clearance must be
 updated every 15 days.
7. **NREAB/PWB** DGR Office will forward all excavation permit applications to the
 Planning/PPV Natural Resources & Environmental Affairs Branch (NREAB) for
 National Environmental Policy Act (NEPA) review, to the Public Works
 Branch (PWB) Planning Office for site approval and/or architectural
 review, and to Lincoln Property Company for approval in Public Private
 Venture (PPV) military housing areas, as applicable.

APPROVED: _____	DISAPPROVED: _____	AUTHORIZING OFFICIAL: _____
_____ HEAD, PWB Requirements Section		_____ DATE

General Paragraph – Appendix “B2”

WORK REQUEST (MAINTENANCE MANAGEMENT) PW Department see Instructions in NAVFAC MO-321
 NAVFAC 9-11014/20 (REV. 2/94 (EP)) (New S/N number pending)

Requestor see Instructions on Reverse Side

This is the permit # assigned by the PWB Requirements Section example "9-001"

PART I--REQUEST (Filled out by Requestor)

1. FROM COMPANY NAME		2. REQUEST NO. PERMIT NUMBER	
3. TO AC/S G-6, TELECOMMUNICATIONS BRANCH		4. DATE OF REQUEST 2008 04 03	
5. REQUEST FOR <input type="checkbox"/> COST ESTIMATE <input checked="" type="checkbox"/> PERFORMANCE OF WORK		5a. REQUEST WORK START 2008 04 10	
6. FOR FURTHER INFORMATION CALL POC'S NAME AND PHONE NUMBER		7. SKETCH/PLAN ATTACHED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

8. DESCRIPTION OF WORK AND JUSTIFICATION (Including location, type, size, quantity, etc.)

***EXAMPLE

LOCATE AREA FROM LIVERSEDGE ROAD TO GRAVEL ACCESS ROAD BEHIND BLDG 15 FOR INSTALLATION OF NEW SANITARY LINES AND MANHOLES.

SAMPLE REQUEST

9. FUNDS CHARGEABLE 703	10. SIGNATURE (Requesting Official) SUBMITTER'S SIGNATURE
----------------------------	--

PART II--COST ESTIMATE

(Filled out by Maintenance Control Division if estimate requested)

11. TO		12. ESTIMATE NO.	
13. COST ESTIMATE		14. SKETCH/PLAN ATTACHED <input type="checkbox"/> YES <input type="checkbox"/> NO	
a. Labor		15. <input type="checkbox"/> APPROVED PROGRAMMING TO START IN _____	
b. Material		<input type="checkbox"/> APPROVED PROGRAMMING TO START IN _____	
c. Overhead and/or Surcharge		PROGRAMMING TO START IN _____, IF	
d. Equipment Rental/Usage		AUTHORIZED BY 25TH OF _____ AND FUNDS ARE MADE AVAILABLE.	
e. Contingency		<input type="checkbox"/> DISAPPROVED. (See Reverse Side)	
f. Total		16. SIGNATURE	17. DATE

PART III--ACTION (Filled out by Requestor)

18. TO		20. WORK REQUESTED	
19. AUTHORIZATION TO PROCEED IS ATTACHED (Check one if other than PW funds are involved)		<input type="checkbox"/> HAS BEEN CANCELLED <input type="checkbox"/> HAS BEEN DEFERRED <input type="checkbox"/> WILL BE PERFORMED BY OTHERS	
<input type="checkbox"/> NAVCOMPT 140 <input type="checkbox"/> OTHER			
21. SIGNATURE		22. DATE	

(See Part IV on Reverse Side)

Contractor's Signature

General Paragraph – Appendix “C”

MCB FIRE PREVENTION BRANCH WELDING AND CUTTING PERMIT		DATE PERMIT ISSUED	TIME PERMIT ISSUED
<input type="checkbox"/> FACILITY	<input type="checkbox"/> AIRCRAFT	INSIDE _____	DATE PERMIT EXPIRE
NO. _____	TAIL NO. _____	OUTSIDE _____	
<input type="checkbox"/> OPEN AREA			
OPERATION TO BE PERFORMED			
<input type="checkbox"/> FIRE WATCH IS REQUIRED DURING OPERATION AND 30 MINUTES AFTER			
<input type="checkbox"/> AN AFTER OPERATION INSPECTION IS REQUIRED			
CALL _____ AFTER COMPLETION OF OPERATION			
SPECIAL PRECAUTIONS			
THE LOCATION WHERE THIS WORK IS BE DONE HAS BEEN EXAMINED. NECESSARY PRECAUTIONS TAKEN TO PROVIDE A FIRE SAVE ENVIRONMENT, AND PERMISSION IS GRANTED FOR THIS WORK. SIGNATURE OF FIRE INSPECTOR ISSUING THE PERMIT:			
I AM FULL QUALIFIED TO PERFORM THIS OPERATION AND UNDERSTAND MY RESPONSIBILITIES AS OUTLINED IN MCB P11320.1. SIGNATURE OF OPERATOR OR ON SCENE SUPERVISOR:			
<input type="checkbox"/> AN AFTER OPERATION INSPECTION HAS BEEN PERFORMED AND THE AREA IS DECLARED SAFE.			
SIGNATURE OF FIRE INSPECTOR		DATE	TIME
NAME AND ORGANIZATION OF CALLER		DATE	TIME
CHECKLIST FOR OPERATIONS			
1. PROVIDE ADEQUATE VENTILATION 2. KEEP AREA CLEAN AND NEAT 3. DO NOT PERFORM OPERATION: A. IN SPRINKLERED FACILITIES WHEN SPRINKLERS ARE INOPERABLE B. IN EXPLOSIVE ATMOSPHERES C. WITHIN 35 FEET OF COMBUSTIBLES UNLESS PROTECTED D. IN OXYGEN ENRICHED ATMOSPHERES E. IN THE VICINITY OF FLAMMABLE LIQUIDS, GASES OR VAPORS F. ON A CONTAINER OR PIPE CONTAINING FLAMMABLES OR COMBUSTIBLES			
MCB FORM 11320/7 (6/98) (EF)		Designed Using FormFlow 2.1 MCB/REA JUNE 1998	

General Paragraph – Appendix “D” ODS Service Order Form

Marine Corps Base, Quantico Refrigerant Service Form

Please Fax to NREA Air Program Manager at (703) 784-4953 within 24 hours

Work Order #: _____ Date Issued: _____ Building #: _____ Specific Location: _____ Technicians: _____ _____ Completed: _____	PW #: _____ Manufacturer: _____ Model: _____ Serial #: _____ Refrigerant Type: _____ Charge: Circuit 1: _____ Circuit 2: _____ Circuit 3: _____
---	---

Reason for Dispatch

Service Description <input type="checkbox"/> Confirmed Charge <input type="checkbox"/> Non-Major Maintenance <input type="checkbox"/> Upgrades Performed <input type="checkbox"/> Major Maintenance <input type="checkbox"/> Disposed Unit <i>If disposed unit then complete the following boxes:</i> <input type="checkbox"/> Refrigerant Recovered <input type="checkbox"/> Unit Tagged - "Refrigerant Recovered"	<input type="checkbox"/> Isolated Leak <input type="checkbox"/> Refrigerant Conversion Recovery Unit: _____ Vacuum Level: <input type="checkbox"/> 0 <input type="checkbox"/> 10 <input type="checkbox"/> 15 <input type="checkbox"/> 28.2 Inches
<input type="checkbox"/> Recovery Terminated (Air) <input type="checkbox"/> Transferred to Receiver/Condenser, or Pump Out Unit <input type="checkbox"/> Unit Flat at "0" psi Could Not Recover	

Service Description Notes

	Refrigerant	Cylinder ID	Type	Condition	Quantity
Recovered					
	Total Recovered:				
Added					
	Total Added:				

Accidental Release Occurred Estimated Amount Released: _____
 Description: _____

Leaks **Leak Notes:**
Exact location of leak and description of how repaired.

Leak Found Date: _____
 Leak Type: _____

Leak Repaired Date: _____

Initial Leak Verification Test Date: _____
Test done after repair before charging.
 Method: _____

Follow-up Verification Test Date: _____
Test done with unit running under normal load.
 Method: _____

Leak Audit Date: _____

Trace Gas Used
 Refrigerant: _____
 Cylinder ID: _____ Quantity: _____

NREA Processing: Date received: _____ Equipment verified Entered in RCM Annual Leak Rate: _____

General Paragraph – Appendix “D1” ODS Equipment Reporting Form

Marine Corps Base, Quantico, ODS Equipment Reporting Form

Please Fax to NREA Air Program Manager at (703) 784-4953 within 24 hours

Company:
 Building #:
 Specific Location:

- New unit installation
 Replacement unit
 If a replacement unit, please complete the disposal section.
 Unit disposal

Date installed:
 PW #:
 Manufacturer:
 Model:
 Serial Number:

Appliance type:
 Chiller, Air Cooled Condenser, Heat Pump, Window A/C, etc.
 Horsepower:
 Lubricant:
 Capacity:
 Volts/Ph/Hz:

Duty Type: Comfort Industrial Process Under 50 Lbs.
 Commercial Other Refrigeration Other

Circuits

Circuit	Refrigerant	Charge	Class 1, II, or Non-ODS
#1			
#2			
#3			

General Installation Notes:

Date disposed:
 PW #:
 Manufacturer:
 Model:
 Serial Number:

By:
 Refrigerant Recovered
 Unit tagged “Refrigerant Recovered”
 Amount of Recovered Refrigerant

 Recovery Vacuum Level Achieved

Unit Status:
 Operational
 Non-Operational

General Disposal Notes:

NREA Processing: Date received: _____ Entered in RCM

General Paragraph – Appendix “E” MCBO Contractor Screening Policy



UNITED STATES MARINE CORPS
MARINE CORPS BASE
QUANTICO, VIRGINIA 22134-5001

MCBO 4200.3
B033
28 Jul 10

MARINE CORPS BASE ORDER 4200.3

From: Commander
To: Distribution List

Subj: CONTRACTOR SCREENING POLICY

Ref: (a) MARADMIN 533/08 Installation Access Control
(b) DTM 09-012 Interim Policy Guidance for DoD Physical Access Control

1. Purpose. To establish policy for contractor screening aboard Marine Corps Base, Quantico (MCBQ).

2. Applicability. This policy applies to all commands, organizations and tenant activities that employ contractors on MCBQ. Implementation will commence upon issuance of this Order (applied prospectively to any new contracts commencing on or after 1 October 2010), in which contract employees require physical access to MCBQ. Duration of contract, contract source, or length of time that employees will perform services/work on MCBQ does not diminish or effect applicability of this policy. This policy does not apply to contracted Role Players or Commissary Baggers, which fall under separate screening policies.

3. Definitions

a. Contractor: Any individual gaining access to MCBQ for the purpose of performing services under a government contract or subcontract who is not a member of the Armed Forces or a direct employee of the U.S. Government.

b. Identity Proofing: The process of reviewing federally authorized acceptable documentation to ensure authenticity of an individual.

c. Vetting: An evaluation of an individual's character and conduct, for approval, acceptance or denial onto the installation as a contractor employee.

General Paragraph – Appendix “E1” MCBO Contractor Screening Policy

MCBO 4200.3
28 Jul 10

4. Background. Pursuant to reference (a) and (b), contractor screening of employees is a part of the overall installation access control and security program and requires that contractors doing business aboard MCBQ are screened to determine:

- a. Identity.
- b. Citizenship or legal alien status.
- c. Eligibility for access.

5. Policy

a. All contractor employees performing services on MCBQ requiring physical access to the installation shall be properly screened in accordance with the standards set forth in this policy.

b. Contracting Officers shall provide notice of this policy in all contract solicitations and awards for all contracts to be performed on MCBQ.

c. Contractor screening consists of identity proofing and vetting.

(1) Identity Proofing. The following are acceptable source documents to establish the identity of a contract employee. The source documents must not show evidence of tampering, counterfeiting, or other alteration or appear questionable (e.g. having damaged laminates):

- (a) U.S. passport or U.S. passport card.
- (b) Permanent resident card or Alien Registration card (Form I-551).
- (c) Foreign passport with a temporary (I-551) stamp or temporary (I-551) printed notation on a machine readable immigrant visa.
- (d) Foreign passport with a current Arrival - Departure Record (Form I-94) bearing the same names as the passport and containing an endorsement of the alien's nonimmigrant status, if that status authorizes the alien to work for the employer.
- (e) Employment authorization document that contains a photograph (Form I-766).

General Paragraph – Appendix “E2” MCBO Contractor Screening Policy

MCBO 4200.3
28 Jul 10

(f) In the case of a nonimmigrant alien authorized to work for a specific employer, a foreign passport with Form I-94 or Form I-94A bearing the same name as the passport and containing an endorsement of the alien's nonimmigrant status, as long as the endorsement has not yet expired and the proposed employment is not in conflict with any restriction or limitation identified on the form.

(g) Driver's license or identification card issued by a State or outlying possession of the United States, provided it contains a photograph and biographic information such as name, date of birth, gender, height, eye color, and address.

(h) Identification card issued by Federal, state or local government agencies, provided it contains a photograph and biographic information such as name, date of birth, gender, height, eye color, and address.

(i) School identification card with a photograph.

(j) U.S. Coast Guard Merchant Mariner card or Transportation Workers Identification Card.

(2) Vetting. Vetting is an evaluation of a contractor employee that includes verifying employment eligibility (citizenship or legal alien status) and conducting a background check to determine fitness for employment on MCBQ.

(a) Employment Eligibility. Federal contractors are required to use the E-verify program (www.dhs.gov/e-verify) to instantaneously verify employment eligibility of both U.S. citizens and non-citizens. Executive Order 13465, the Immigration and Nationality Act, and Federal Acquisition Regulation (FAR) Subpart 22.18 require Federal contractors to abide by the immigration laws of the United States and to employ only individuals who are eligible to work in the United States.

(b) Criminal Records Check. Contractors shall, upon request of the contracting officer or MCBQ security officials, provide a list of all employees requiring physical access to MCBQ. Installation government representatives shall then query authoritative data sources to vet the claimed identity and to determine fitness using biographical information including, but not limited to, name, social security number and date of birth.

6. Denial of Access. Contractor employees will be prohibited from performing services on MCBQ, if the employee:

General Paragraph – Appendix “E3” MCBQ Contractor Screening Policy

MCBQ 4200.3
28 Jul 10

- a. Is on the National Terrorist Watch List.
- b. Is illegally present in the United States.
- c. Is subject to an outstanding warrant.
- d. Knowingly submitted an employment questionnaire with false or fraudulent information.
- e. Has been issued a debarment order and is currently banned from any military installation.
- f. Is on a prisoner work-release program, or currently on parole.
- g. Is a registered sexual offender.
- h. Has been convicted of a felony offense within the past 2 years.

7. Appeals

- a. A contractor that wants to employ an individual that cannot meet the vetting process in paragraphs 5 and 6 above may submit an appeal to the Commander, MCBQ for special consideration. Appeals will be in writing and processed through the contracting officer.
- b. An individual that cannot meet the vetting process in paragraphs 5 and 6 above may submit an appeal to the Commander, MCBQ for special consideration. Individual appeals will be in writing and processed through the MCBQ Inspector General.

8. Enforcement

- a. Contractors with employees performing services on MCBQ shall, upon request, provide a list of employees requiring base access to the contracting officer or MCBQ security officials. Government officials will validate the employee list to ensure individuals meet access control standards. Contractors shall provide immediate updates to employee lists upon change (i.e. adding a new or additional employee that requires base access).
- b. Contractors and their employees are subject to the Random Antiterrorism Measures being employed at Installation Access Control Points to include identification verification and screening against law enforcement and other databases.

General Paragraph – Appendix “E4” MCBO Contractor Screening Policy

MCBO 4200.3
28 Jul 10

c. Contractors and their employees are subject to random security sweeps of work sites to verify contractor identification and eligibility.

d. Contracting officers shall provide notice of this policy in all contract solicitations and awards for all services to be performed on MCBQ commencing on or after 1 October 2010. Contracting officers should consider modifying existing contracts as appropriate to ensure contractors understand this policy.

e. Contractors may be subject to a wide range of contract and administrative actions for failure to comply with this policy to include termination of their contract and suspension or debarment from doing future business with the Federal Government. Contractors are responsible to ensure subcontractors are notified of and comply with this policy.

9. The Regional Contracting Office-National Capital Region, Marine Corps Systems Command contracting officers, and the MCBQ Resident Officer in Charge of construction shall include a copy of this policy in their contracts and provide a copy to other contracting offices/officers in other Federal agencies that are soliciting and awarding contracts that may be performed on MCBQ in an effort to ensure maximum compliance.

/s/
D. J. CHOIKE

DISTRIBUTION: A

General Paragraph – Appendix “F” MCBO Contractor Screening List of Employees Form

List of Employees or Representatives

Contract: _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
PLACE OF BIRTH: _____
DATE: _____
CITIZENSHIP: _____
DOCUMENTATION PROVIDED (Type and its number if applicable): _____
HOME ADDRESS: _____
SOCIAL SECURITY # (Last 4): _____
CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

List of Employees or Representatives (cont.)

General Paragraph – Appendix “F1” MCBO Contractor Screening List of Employees Form

NAME: _____
 PLACE OF BIRTH: _____
 DATE: _____
 CITIZENSHIP: _____
 DOCUMENTATION PROVIDED (Type and its number if applicable): _____

 HOME ADDRESS: _____

 SOCIAL SECURITY # (Last 4): _____
 CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
 PLACE OF BIRTH: _____
 DATE: _____
 CITIZENSHIP: _____
 DOCUMENTATION PROVIDED (Type and its number if applicable): _____

 HOME ADDRESS: _____

 SOCIAL SECURITY # (Last 4): _____
 CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
 PLACE OF BIRTH: _____
 DATE: _____
 CITIZENSHIP: _____
 DOCUMENTATION PROVIDED (Type and its number if applicable): _____

 HOME ADDRESS: _____

 SOCIAL SECURITY # (Last 4): _____
 CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

NAME: _____
 PLACE OF BIRTH: _____
 DATE: _____
 CITIZENSHIP: _____
 DOCUMENTATION PROVIDED (Type and its number if applicable): _____

 HOME ADDRESS: _____

 SOCIAL SECURITY # (Last 4): _____
 CURRENT BASE PASS EXPIRATION DATE (If applicable): _____

I hereby certify that all personnel on this list are either born U.S. citizens, naturalized U.S. citizens with the naturalization number shown, or legal aliens with the alien registration number indicated.

 Printed name

 Signature

 Company Name

Documents acceptable for proof of citizenship:

- Birth registration card
- Certificate of live birth, birth certificate
- Certificate of Naturalization
- Certificate of Registration
- DD-214 (Must cite birthplace)
- DD Form 4 (Contract for enlistment, must cite birthplace)
- DD 1966 (Application for enlistment)
- Military discharge papers, (Must cite birthplace)
- Hospital birth certificate
- Marriage license certificate
- Merchant Marine certificate
- Military officer ID card
- Notification of birth registration
- USA Passport

*****End of General Requirements*****

STATEMENT OF WORK

ADVANCED METERING INFRASTRUCTURE, PHASE 4: WATER METERING
FOR THE PUBLIC WORKS BRANCH
MARINE CORPS BASE QUANTICO
QUANTICO, VIRGINIA

SPECIFICATION BY: PUBLIC WORKS BRANCH
WORK REQUEST NUMBER: PWB# 2011237
HQMC PROJECT NUMBER: QU1239M

1. GENERAL INTENT / DESCRIPTION:

This project is Marine Corps Base Quantico (MCBQ) Advanced Metering Infrastructure (AMI), Phase 4: Water Metering. The intent of this project is to meet Federal energy metering mandates and enhance the base's energy monitoring capabilities via the MCBQ AMI System.

To meet this intent, the Contractor shall design, procure, install, integrate, and warrant (132) water meters into the MCBQ AMI System. This Statement of Work contains requirements for the site visits, site surveys, field measurements, design/engineering, procurement, installation, testing, commissioning, information assurance (IA) accreditation updates, maintenance, training development, training implementation and documentation for this project.

The Contractor shall provide all labor, material, equipment, transportation and supervision necessary to perform the work detailed herein. The Contractor shall coordinate all work with the government and shall comply with all other requirements listed herein. This project will be awarded to only one contractor. The Contractor shall perform all work as necessary to complete the contract in a satisfactory and acceptable manner and adhere to all applicable federal, state and local regulations.

2. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK:

The Contractor shall be required to commence work under this contract within 21 calendar days after the date the contractor receives Notice of Award. The 21 calendar-day period after Notice of Award is for the Contractor's submission of the Work Plan, as identified in Section 7, Deliverables.

The Contractor shall be required to prosecute the work diligently, and complete the entire work within 18 months after the commencement of work. The time stated for completion shall include final cleanup of the premises.

3. PROJECT PROCESS:

3.1. TASKS:

This project shall have six (6) main tasks:

- Task 1. Site Surveys
- Task 2. Design
- Task 3. Installation & Accreditation Updates
- Task 4. Training
- Task 5. Testing and Commissioning

Task 6. Warranty

The scope of work, requirements, and meetings for each of these activities are defined in Section 6. The deliverables are identified in Section 7.

3.2. POINTS OF CONTACT:

The Contractor shall make arrangements to contact the project's Points of Contacts only through the Contracting Officer and/or designated representative.

POC for Project Customer:	Stefanie Kivelin Bldg 2004 Quantico, VA 703-432-2590
---------------------------	---

POC for Contracting Officer (KO):	Jaime Friedel Building 2004 Quantico, Va. 703-432-1795
-----------------------------------	---

4. EXISTING CONDITIONS:

4.1. MCBQ AMI SYSTEM:

The MCBQ AMI system has a central Data Acquisition System (DAS) and a meter communication server located in Building 3098: Diamond Hall, the Network Operations Center (NOC). The system architecture has three major components:

- Field Measurement Systems (meters) & Connectivity
- Communication Infrastructure (wired network, wireless solution, intrusion detection).
- DAS Applications (acquisition software, meter-specific software, data presentation)

The meters communicate with the MCBQ AMI system using the following communication networks.

- Gigabit Passive Optical Network (GPON)
- Marine Air Ground Task Force (MAGTF) Regional Area Network (MRAN)
- Abstract Syntax Description Language (ASDL) modems over the existing copper base telephone lines
- Wireless w/ connectivity to the closest facility that has a wired connection for point-to-point connectivity via a 2.4 gigahertz (GHz) wireless bridged network infrastructure

Local workstations are provided to access the DAS and view/manage the data acquired from the meters. The local workstations / laptops also are used to configure the meters.

4.2. PHASE 4: WATER METERING:

Limited site surveying was conducted to determine the current extent of metering capabilities on the buildings to be metered in this project. It is estimated that only 10% of the buildings have existing water meters. In the case that there is a meter installed, it is unlikely that the existing meter is an advanced, automated meter. If a meter exists, the current meter and infrastructure may be retained in the AMI

system design if advantageous to the government. The use or non-use of pre-existing installation components will be addressed during the design review of the Contractor's Preliminary Design Package (PDP).

4.3. DESIRED SITUATION:

It is the intention of this effort to provide additional meters to the MCBQ AMI System, which collects commodity metering data and transports that information back to a centralized point. It is desired that the MCBQ AMI System collect hourly reads for mechanical meters and that the data is sent to the MCBQ AMI System at least one time per day. The solution identified to integrate additional meters into the MCBQ AMI System shall be both scalable and interoperable amongst other products from industry to accommodate future requirements.

4.4. MAPS, DRAWINGS, AND ATTACHMENTS:

All attachments are provided in Section J. These attachments include information such as the base maps (Attachment B) and the meter schedule (Attachment C).

Drawings and other information concerning the base streets, roads and base facilities will be made available upon request.

The government will provide what is available, subject to the Contractor signing any applicable non-disclosure agreements (NDA), and subject to approval from the activities that have ownership of such information. This information is furnished for reference only, and the Government makes no guarantee as to the accuracy, legibility, or content of this information. All information of this nature is provided "as is", with the burden of verification falling on the Contractor in the context of relevant site surveys. The Contractor shall not assume that the government possesses accurate or up-to-date GIS and/or AutoCAD data. Refer to Section J, Attachment B for a base map.

5. PROGRAM AND PERSONNEL MANAGEMENT:

5.1. GENERAL:

The term management, used herein, relates to the overall contract as well as specific management functions that pertain to the contract.

5.2. PERSONNEL SERVICES AND MATERIAL REQUIREMENTS:

The Contractor shall provide the complete services necessary for mechanical meter design, acquisition, integration and installation, training, and warranty support at MCBQ. The Contractor shall function under an organizational structure that supports the design, fielding, and support of this automated metering systems. All drawings and technical documents must be signed by a Licensed Professional Engineer.

5.3. PROGRAM MANAGEMENT:

The Contractor shall implement a Program Management structure to efficiently and effectively administer this project. The Contractor shall be prepared to engage in substantive communication with the Government on all related tasks.

The Contractor shall develop and implement a detailed plan for the overall management of this contract, and shall obtain government approval of the plan. The plan shall include a comprehensive overview of all

aspects of the program. The Contractor shall use a program scheduling software package to develop and maintain schedules. These schedules shall be updated on a regular basis to accurately reflect the schedule at any given time. MCBQ shall have access to all project data.

5.4. CLEARANCES:

The Contractor shall have personnel with clearances at the classification level of "SECRET". The Contractor shall identify appropriate individuals performing work under this contract that will require access to classified information and locations within 10 work days after contract award (if applicable). Applications for new personnel requiring security clearances shall be submitted within 10 work days of assignment to work under this Contract. The Government reserves the right to have the contractor provide documentation to verify compliance with these security requirements.

5.5. ADDITIONAL SECURITY REQUIREMENTS:

In addition to the security requirements defined in the General Paragraphs Section 34, the following security requirements shall apply:

- Contractors shall check the DoD Infocon level and comply with all pertinent security procedures relative to the AMI installation and operation.
- Security escorts will be provided by the Government for facilities where they are required.
- The Contractor shall be responsible to initiate requests and submit all required documentation for necessary badges, vehicle permits, camera passes, and equipment permits (e.g. for heavy machinery, transmitters and receivers, etc.). Multiple badges may be required per person in some areas. The Contractor is required to clarify with the government the requirements for all badges, permits. The Contractor shall not assume that a camera is permissible on site, although the government may (at its option) issue a camera permit or provide a government photographer for support. Cellular phones may be prohibited on site if they contain built-in cameras, or they may be disallowed entirely.
- Only government owned computers, workstations, servers and laptops, are allowed to be connected to government networks. Contractors requiring access to a network for installation and testing must request and use government supplied computers or computers purchased for the government as part of the contract.
- Once a networked device is connected to the government network it may not be removed from the government installation without written permission from the ACO.
- Appropriate background check levels should be at the NACLIC or higher level for all contractor personnel performing programming functions.
- No 'backdoor' access shall be installed on any government systems or systems installed by the Contractor. No internet or non-government network connection is allowed to be made to any government systems. Laptop and workstation wireless access cards, including Bluetooth, WiFi, and cellular modems, must be removed or disabled to prevent a bridge between any government network and an external network.
- Flash memory (including thumb drives) is not authorized for use on government networks and computers.
- All the Contractor-provided computers, databases, servers, notebook laptops, and workstations shall be configured by the Contractor, by installing required software and patches, to meet IA and security requirements. Workstations shall have CAC-card read capability, including ActivIdentity ActivClient software.

6. SCOPE OF WORK & REQUIREMENTS:

The Contractor shall provide **(132) water meters** that tie into the accredited MCBQ AMI System (see Attachment C). For buildings that do not have an existing electric meter with communication to the MCBQ AMI System (~32 meters), the Contractor shall be responsible for providing all new network equipment to tie into the MCBQ AMI System. For buildings that do have an existing electric meter with communication to the MCBQ AMI System (~100 buildings), the Contractor shall be responsible for using the existing electric meter communication system to tie into the MCBQ AMI System. All new hardware and the network equipment must meet Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) approval for security standards. The Contractor shall be responsible for providing the DIACAP documentation to tie the new meters into the MCBQ AMI System.

6.1. TASKS:

6.1.1. **Task 1. Site Surveys:** The Contractor is responsible for conducting site surveys to verify existing system infrastructure and capture all commodities / network information necessary to provide a design solution that meets the requirements of this contract and maximizes the use of available infrastructure. Site surveys will be authorized prior to deliverable due dates. The Government will provide support personnel for site surveys. The Contractor shall identify all support requirements to the Government no less than fifteen (15) business days in advance of the requirement. The Contractor shall submit a *Site Survey Support Requirement Request* to the Project Manager. The Contractor shall specify the number of required personnel, their required areas of expertise, and expected work hours (i.e., time of day, number of hours per day per person, duration of the requirement) in the request for support. At no time shall the Contractor assume that support personnel are available outside of normal working hours, unless the Contractor requests and is given assurance by the Government beforehand regarding a specific timeframe and level of support that is available.

Within ten (10) business days of the conclusion of the first site survey for each meter, the Contractor shall provide an *Existing Deficiencies Document*. The Contractor will coordinate all site visits with customer contacts (end-user) via the Administrative Contracting Officer (ACO). Any adjustments, as a result of incorrect standard assumptions stated herein, will be addressed through the authority of the Changes Clause via contract modification.

Should the site surveys encounter and identify suspect Asbestos/Hazmat materials, the Contractor shall refer to General Requirements Para. 8.3 and Para 16.1. The Contractor will not start any additional work in the facility until a written report of the asbestos and lead paint tests has been submitted to the Contracting Officer. The Contracting Officer shall identify when work can proceed.

If the Contractor is, at any point and for any reason, required by the Government to interface with other Government personnel or contractors (including but not limited to security contractors, staff support contractors and Base Operating Services “BOS” contractors), the Contractor shall make diligent efforts to coordinate work efforts and logistics with these personnel and contractors. In the case that such personnel or contractors do not provide the level of support necessary for the work effort, the Contractor shall inform the Contracting Officer as soon as possible by phone and by email.

The Contractor shall provide a *Site Survey Report* upon completion of the site surveys, as defined in Section 7.

- 6.1.2. Task 2. Design: The Contractor is responsible for providing all equipment and design and engineering services to fully integrate all new metering and metering network infrastructure into the MCBQ AMI System according to the Unified Facilities Guide Specifications for Metering and other requirements identified in Appendix G and other text herein . This shall include but shall not be limited to identification of the location for all meters, equipment/software design & selection, NEPA submittals, and information assurance (IA) accreditation updates for all equipment and systems, programming, equipment integration, software, programming, etc., to fully integrate the new equipment with the accredited MCBQ AMI System. Equipment to be supplied may include but shall not be limited to meters, pulse kits, modems, GPON ONTs, switches, cables, conduits, radios, repeaters, antennae, servers, routers, other network devices, software, etc.

If additional site surveys are required during the design phase, the Contractor shall follow the guidance herein for scheduling additional surveys.

The Contractor shall provide a Preliminary Design Package (PDP) upon approximately 75% completion of the design. The PDP shall be reviewed and approved by the government. The Contractor shall provide the Final Design Package (FDP) upon 100% completion of the design. Approval of the FDP will initiate the Site Approval Request (SAR) process. All of these documents, as well as other permit, safety, and other required construction documents, shall be approved prior to the government providing authorization to construct. Documentation requirements are provided in Section 7.

- 6.1.3. Task 3. Installation & Accreditation Updates: The Contractor shall commence construction work upon receiving government approval. The Contractor shall provide the complete planning, installation, configuration, programming, integration, shipment, storage, and accreditation documentation updates to provide fully functional integration of the meters with the accredited MCBQ AMI System. The Contractor shall assume that the existing AMI system is already accredited, so the Contractor shall only be responsible for providing the IA documentation / accreditation documentation to expand the accreditation to cover the systems/equipment being installed under this contract into the existing AMI system. The Contractor also shall be responsible for the operational performance of all components and systems installed and/or modified, and shall verify performance by testing the installed AMI systems (see Task 5). During this process, the Contractor shall provide various deliverables, to include, but not be limited to, Outage Requests, Safety Documentation (Activity Hazard Analysis, Accident Prevention Plan), IA documentation, etc., as defined in Section 7.
- 6.1.4. Task 4. Training: The Contractor shall provide a full program of training for operation and system administration of the installed meters and software. Acceptance of the design at a particular Government site shall be contingent upon the completion of the training program. The Contractor shall conduct training for designated personnel in the operation and use of the AMI equipment, materials, and systems. The Contractor shall provide an AMI Training Plan, an AMI Training Schedule and an AMI Training Module as deliverables (see Section 7) for the new meters and equipment installed under this contract. Training requirements are defined in Section 6.2.
- 6.1.5. Task 5. Testing & Commissioning: The Contractor shall test and commission all equipment and systems installed and integrated into the MCBQ AMI System. Prior to testing and commissioning, the Contractor shall provide a Testing and Commissioning Plan to the Government for review and acceptance. The plan shall detail start-up, testing, and interactive performance assurance standards for all Contractor-installed and Government-owned equipment

impacted by the AMI system installed. Commissioning shall be completed and documented in accordance with the approved plan.

The Contractor shall provide a System Manual to serve as a complete description of each piece of equipment / system provided by this scope of work, including O&M Manuals, and modules describing the functions of the technical systems such as the hardware, software, operating systems, and applications.

Upon receipt of all required documents and acceptance of field testing and verification, the Contractor shall provide five (5) calendar days to arrange final inspection as described in General Paragraphs 14- Final Acceptance Inspection. Signature of the Final Acceptance Inspection will signify acceptance of the project and will serve as the beginning of the warranty period.

- 6.1.6. Task 6. Warranty: The Contractor shall provide a five (5) year warranty on the equipment, software, and all other systems installed under this contract. The warranty shall provide repairs, preventative maintenance, obsolescence management, and other logistics support services as defined in the Section 6.2.

6.2. REQUIREMENTS:

- 6.2.1. Interoperability: It is imperative that the MCBQ AMI System be interoperable. It must allow a diverse mix of meters and communication systems to work together as an integrated whole. Interoperability of metering system components, communication systems, and MCBQ data collection systems is a key design requirement for this contract and requires the use of premise devices and communication technologies that are designed with open standards and agreements of interoperability from suppliers of components and communication systems. It is anticipated that there will be multiple meter manufacturers and communications equipment manufacturers that may be utilized for this effort during the different phases of the MCBQ AMI System development. The Contractor shall design and install the additional meters and integrate it with the existing MCBQ AMI system utilizing robust infrastructure that is capable of being diagnosed and corrected in the case of component and network failures. The meter choice will be made to also reduce the variety of meters, both in terms of manufacturer and functionality, throughout MCBQ. All components must be interoperable with each other at a network level, to allow data to be collected at a centralized location. All meters selected for AMI system design shall have common communication capability consistent with the requirements of the MCBQ AMI System.
- 6.2.2. Scalability: The Contractor shall design, install, and integrate new meters into the existing AMI system. The MCBQ AMI System incorporates open standards and prevalent protocols to the maximum extent possible. The Contractor shall ensure that AMI system equipment proposed supports the addition of increased metering capabilities while in compliance with all throughput, latency, and connectivity requirements.
- 6.2.3. Equipment Ratings, Reuse and Wiring: All equipment shall be rated for the possible environmental hazards that it has a probability of being exposed to. This potentially includes, but is not limited to, relative humidity levels up to 100%, direct sunlight, and submersion.

Any existing infrastructure that is permitted to be used or reused under the scope of this contract is provided "as is", and must meet and be able to conform to all contractual requirements in order for the Contractor to utilize such infrastructure in the execution of this award. The burden of inspection is on the Contractor. Inspection shall be performed during the site surveys, unless any guarantees or assurances by the government (concerning the usability of such infrastructure)

preclude the need for inspection. Tacit or implied guarantees and assurances shall not be considered valid. All wiring shall be performed in a professional manner with the wire bundled and supported. Install wire markers on each end to identify the destination and origin of each individual wire.

- 6.2.4. Meter Quantities: This project shall provide **(132) water meters**. Quantities of meters specified in this document are provided based upon the best internal government projections of the metering requirement. During the site survey process, differing site conditions may range from missing buildings, missing meters, and missing feeds, to additional meters and/or feeds on the same buildings. The Contractor will be expected to record such differences and survey the existing infrastructure on the provided facility list (including additional meters and/or feeds), even in the absence of a change-order or modification. The government will review and decide on final quantity changes after site survey data has been submitted.

The Contractor shall be prepared to execute this contract with modified quantities of meters, ranging from -30% to +20% of the combined total of all different meter types, and costs shall be outlined in the proposal with unit prices not subject to change given such variation. In the event that different quantities of meters are incorporated into the design and execution, as decided and approved by the government, a contract modification will be issued to cover the relevant scope change and financial consideration. In light of this, the Contractor shall propose burdened pricing for the addition and subtraction of meter quantities from the task requirement (this can be broken down by meter type and service size). Such burdened pricing will be used by the government for either additive or deductive contract modifications, with highly irregular circumstances subject to negotiation.

Refer to Attachment C for the metering schedule.

- 6.2.5. Water Meters: Disc/Compound non-interval data meters shall be used for applications involving less than 50,000 gallons/day of water flow. Turbine/Positive Displacement/Compound meters interval data meters are required if the water flow may exceed 50,000 gallons/day. Existing meter installations shall require modification, if necessary, to support the requirements of the system, to include changing communications module to allow interoperability with the new system. Meters shall be required at facilities using the following prioritization:

- 1) Existing sites with no metering and estimated load is greater than 50,000 gallons per day
- 2) Existing sites with consumption meters only and historical data is greater than 50,000 gallons per day
- 3) All new construction sites
- 4) Renovation sites where the installed cost is greater than \$200,000

For tenant billing sites, when the site does not meet the criteria for an interval meter, the installation of non-interval meters for billing purposes may be required. A bypass shall be installed on water meters whenever possible, to enable maintenance personnel to work on meters without disrupting service to the customer.

- Meter Types. Water metering will consist of meters (Magnetic Drive, Turbine or Compound type meters) measuring water flow. The Contractor shall incorporate a selection of new water meters including communications systems per the requirements specified below. Designs and installation shall account for all components required for complete system and meter operability. Task Orders will specify any changes in these requirements for particular locations, if any.

- Manufacturer. All meters for MCBQ shall be provided from one metering manufacturer, to optimize the effort of creating configuration programs and software management. Any alterations to this specification shall not be implemented unless reviewed and approved by the government.
- Standards. Meters shall have the ability to accurately measure and display water consumption, and shall be compliant with all standards and specifications given in Appendix G: References. Meters shall not pose any danger when operating under rated conditions. In terms of safety, performance, and reliability, the meter design, construction, and operation shall conform to the standard meter requirements established in applicable ANSI/AWWA standards. Installation of meters must comply with Unified Facilities Guide Specifications. Water meter fittings must conform to standard industry sizes and comply with ASME B16.5-2003 standards.
- Meter Selection. Any meter considered for installation, shall have been in use in a commercial/industrial application for a minimum of two years. Additionally, at least 1000 meters identical to those being installed under task orders from this contract shall be in use in a similar application as part of one or more functioning AMI's in the field. Each model quoted should have at least three approvals from recognized, independent electricity meter labs or approval bodies. Pulse initiators, modems and other communications, and other components associated with the meter shall be approved for use with the meter. Each model quoted should have at least three approvals from recognized, independent meter labs or approval bodies. Pulse initiators, modems and other communications, and other components associated with the meter shall be approved for use with the meter.
- Meter Design & Communication. Designs and installation shall account for all components required for complete system and meter operability for meters with connectivity to the MCBQ AMI Network (i.e., meter, meter base, wiring, labor, enclosure boxes, fiber for connectivity to telephone closets, conduit, trenching, etc...). Meters shall be capable of remote communications to the MCBQ AMI System. Electricity meters shall be used as relaying devices for communications from other commodity meters, provided that the necessary capabilities outlined in this document are not compromised. The Contractor shall include, in all designs, every component required for complete functionality.
- Meter Identification. Meters shall have an identification plate (ID) affixed to the meter body. The minimum information listed on the ID plate shall be the manufacturer name, meter model name and/or model number, serial number, maximum rated flow capacity, maximum allowable operating pressure (MAOP), and the measured volume for one complete meter cycle.
- Meter Register. Water meters shall be fitted with a registering device that reflects the metered volume of water and conforms to the ANSI standard for that class of meter. The register indicators may be a single mechanical pointer or a direct reading digital counter of mechanical or electronic design. The register must be marked with the unit of measure equating one revolution. Meter units shall be in gallons or multiples of gallons.
- Meter Display. Meter displays shall provide clearly visible digits under all light conditions. The legibility of the displays shall not be adversely affected by environmental conditions such as ultraviolet and infrared radiation or from ambient temperature extremes.
- Meter Accuracy. Meter accuracy and functionality shall have the capability to withstand adverse environmental conditions, including total underwater submersion for indefinite periods of time. Meter accuracy shall be in compliance with the respective ANSI or ASME standard governing that class of meter.

- Enclosures & Hardware. The Contractor shall provide, install, and connect metering enclosures (if needed). The enclosures shall be NEMA Type 3R. All enclosures/ sockets shall be UL approved.
- Meter Reading. All meters must read “zero” on their consumption displays when installed. Any kind of data as of result of prior tests on the meter shall be cleared or reset prior to installation.
- Pulse Recorders. A pulse recorder shall be utilized to send mechanical meter data to the central data management system if a new AMI meter connected to the MCBQ AMI system existing in the building and the following requirements are met. A pulse recorder is a recording device or an electric meter with pulse input ports and totalization capability that receives mechanical (KYZ) pulses from consumption meters (electrical or mechanical) and records the consumption values. The recorder shall have at least two channels of pulse inputs to receive Form C (three-wire) and/or Form A (two-wire) KYZ pulses. The recorder shall have software for the purpose of configuration programming. The device shall be programmable to assign various channels to the inputs. The recorder shall be able to store all data for at least 65 days. The recorder shall be able to calculate maximum demand based on the KWHr data and time. The device shall have a LCD (liquid crystal display) to show various registers: the number of received pulses, total consumptions, demand, and date and time. The unit shall also be equipped with a backup battery and shall be able to communicate through the unit’s onboard Ethernet port.
- High Voltage Surge Protection. Metering equipment such as pulse recorders shall withstand high voltage AC line surges in accordance with the requirements of ANSI/IEEE C62.41 (at 6KV limit). This requires the device having passed the “effect of high voltage line surge” test in accordance with ANSI C12.1-2001 Standard, Section 4.7.3.3. Also, transmitters, receivers, RTUs, repeaters, related communication equipment, and related power supplies shall be equipped with appropriate accessories to protect the circuit in cases of high voltage or high current transients due to lightning, switching, or fault in the circuit to meet requirements of IEC 61000-4-5 or similar industry standards.
- Shadow Metering. The utility company(ies) at MCBQ may have meters located near or on systems that will be metered through this contract. It is the responsibility of the Contractor to identify any opportunities for shadow metering for this project. If there is a need/opportunity for shadow metering, the Contractor shall evaluate the feasibility of tying into the existing meters using a pulse to a recorder and/or adding an additional meter. That recorder or additional meter shall be connected to the MCBQ AMI system. Negotiation with the utilities should be performed through the official government representatives, as determined by the Contracting Officer. In order for the government field activity to perform utility allocations, and as the meter reading by the utility may not happen at the same time as the Navy needs data, it’s necessary to have metering data related to utility main feeds (service supplies to the base) for various commodities. Usually, the utility or the energy service provider (ESP) companies are the only parties who generate, obtain, and keep this information through their own meters. This information shall be collected in one of the following methods:
 - Pseudo-Shadow Metering. In this method, Marine Corps retrieves data from utility-owned meters. Negotiation is required with the utility/ESP representatives in order to obtain a means of communication with their meter on the main supply or data system. The utility/ESP may provide a set of KYZ pulses from their meters; so the Navy can feed the pulses to a recorder or another meter. That recorder or meter, then, shall be connected to the AMI system. Negotiation with the utilities should be performed through the official government representatives, determined by the region.

- Redundant Metering. Working with the utilities to establish “pseudo-shadow metering” as described is a preferred method to access the metering data. If that method does not succeed for any reason, “redundant metering” needs to be implemented where determined by the government.
- Meter Testing. For accuracy, all meters shall be tested by the manufacturer. A Manufacturer Test Results Report shall be obtained by the Contractor and provided to the Government for record. All meters shall be tested for accurate, reliable, and repeatable “communication” with the DAS after installation.
- Meter Programming. Every meter shall be configured (programmed) by the Contractor using the manufacturer’s configuration tool (software). The configuration program shall include all registers/constants/alarms/events required. For every meter, coordinate with the designated Contracting Officer Representative (COR) to ensure the correct constants and registers are programmed in the meters. In addition, the Contractor shall coordinate with the COR to determine what registers are programmed as Normal Mode, Alternate Mode, and Test Mode for the meters. If applicable, disable the feature that modifies meter configuration parameters using switches on the face of the meter. Programming shall be password protected. All meters shall be programmed to record both delivered and received consumption totals in time-of-use periods. The multiplier for the meter shall be applied at the DTS and not at the meter itself.
- Ethernet and Serial Communication Ports. In addition to the required Ethernet port, meters shall be equipped with an RS-232 serial communication port with DNP 3.0 level 2 protocol.
- Time Zones. Meters shall be programmed with “Date” and “Time” at the activity’s local time. Time shall be adjusted with Daylight Saving Time, if applicable to the activity. The data is time-stamped and reported to the DAS. At the DAS, format for date shall be MM/DD/YYYY and format for time shall be HH:MM (24 Hour). Example: 07/19/2010, 16:06. Data analysis at the DAS, such as monitoring and reporting will be at local time. The output of the DAS to the enterprise Meter Data Management (MDM) shall be time stamped with Coordinated Universal Time (UTC).
- Registers & Meter Display. The registers identified in the table below will be required to be retrieved from the meters and transmitted to the DAS. At the minimum, registers, load profile data, and metering alarms and events will be transmitted from meters to the DAS once every four hours for electric metering data and once every twenty four hours for mechanical metering data. If a mechanical meter is read through an electric meter, its data will be read and transmitted along with the host meter. Meter display scroll shall display per the below table in the Normal, Alternate, and Test modes and shall include time-of-use data where applicable (peak time period kWh delivered and received, semi-peak time period kWh delivered and received, off-peak time period kWh delivered and received, total kWh delivered and received, meter number, current date and time, and any errors. Meter display shall have identifiers. The meter also shall offer a “disk emulator” on the display that moves from left to the right for “delivered power”, with speed proportional to the power going through the meter. All display options shall be programmable.

Electric meters are expected to have three modes of data register displays: normal mode, alternate mode, and test mode. The three modes are expected to be programmed in accordance with the table below. Displays 70 to 75 shall be programmed whether or not mechanical meters are reporting pulses to the electric meters; if no mechanical meter is reporting, “0” will be displayed. If more than one of any mechanical commodity is reporting to an electric meter, extra displays can be added (076, 077, 078 ...).

ADVANCED METERING INFRASTRUCTURE, PHASE 4: WATER METERING
FOR THE PUBLIC WORKS BRANCH

Display Code	REGISTER	NORMAL	ALTERNATE	TEST
888	ALL SEGMENTS	Yes	Yes	Yes
-	DISK EMULATOR	Yes	Yes	Yes
001	DATE	Yes	Yes	No
002	TIME	Yes	Yes	No
010	RATE A TOTAL KWH	Yes	No	No
011	RATE A MAXIMUM KW	Yes	No	No
012	RATE B TOTAL KWH	Yes	No	No
013	RATE B MAXIMUM KW	Yes	No	No
014	RATE C TOTAL KWH	Yes	No	No
015	RATE C MAXIMUM KW	Yes	No	No
016	RATE D TOTAL KWH	Yes	No	No
017	RATE D MAXIMUM KW	Yes	No	No
018	TOTAL KWH	Yes	Yes	Yes
019	MAXIMUM KW	Yes	Yes	No
020	TOTAL KVARHr	Yes	No	Yes
021	CUMULATIVE DEMAND (KW)	Yes	No	No
030	BATTERY CARRYOVER TIME	Yes	Yes	No
031	DEVICE ID	Yes	No	No
032	METER BASE ID	Yes	No	No
033	METER MULTIPLIER (CT, PT ratio)	No	Yes	No
041	INSTANTANEOUS APPARENT POWER (KVA)	No	Yes	No
042	VA (voltage magnitude)	No	Yes	Yes
043	VB (voltage magnitude)	No	Yes	No
044	VC (voltage magnitude)	No	Yes	No
045	IA (current magnitude)	No	Yes	No
046	IB (current magnitude)	No	Yes	No
047	IC (current magnitude)	No	Yes	No
048	CURRENT ANGLE PHASE A	No	Yes	No
049	CURRENT ANGLE PHASE B	No	Yes	No
050	CURRENT ANGLE PHASE C	No	Yes	No
051	INSTANTANEOUS POWER FACTOR	Yes	Yes	Yes
052	INSTANTANEOUS POWER (KW)	No	Yes	No
060	KH OF METER	No	Yes	No
070	NUMBER OF PULSES RECEIVED FROM GAS METER	No	Yes	No
071	CONSUMPTION OF GAS METER	Yes	No	No
072	NUMBER OF PULSES RECEIVED FROM WATER METER	No	Yes	No
073	CONSUMPTION OF WATER METER	Yes	No	No
074	NUMBER OF PULSES RECEIVED FROM STEAM METER	No	Yes	No

075	CONSUMPTION OF STEAM METER	Yes	No	No
080	TOTAL KWH PULSES	Yes	No	Yes
090	INTERVAL LENGTH IN MINUTES	Yes	No	No
	(any other required display / register)			
	(any other required display / register)			

The following scenarios are considered “special cases:

- More than one gas meters report to an electric meter
- More than one water meters report to an electric meter
- More than one steam meters report to an electric meter
- An electric meter functions as “bidirectional”: metering and indicating both “delivered” and “received” values
- An electric meter functions as “net” meter: indicating net registers for billing/reporting purposes
- One or more [shadow] electric meters report to a host electric meter through KYZ pulses.

The displays/registers listed in the following table are to be programmed, in addition to general registers listed above, only if one or more of the above special cases exist:

Display Code	REGISTER	NORMAL	ALTERNATE	TEST	<i>Special Case</i>
170	NUMBER OF PULSES RECEIVED FROM GAS METER 2	No	Yes	No	<i>A</i>
171	CONSUMPTION OF GAS METER 2	Yes	No	No	<i>A</i>
270	NUMBER OF PULSES RECEIVED FROM GAS METER 3	No	Yes	No	<i>A</i>
271	CONSUMPTION OF GAS METER 3	Yes	No	No	<i>A</i>
172	NUMBER OF PULSES RECEIVED FROM WATER METER 2	No	Yes	No	<i>B</i>
173	CONSUMPTION OF WATER METER 2	Yes	No	No	<i>B</i>
174	NUMBER OF PULSES RECEIVED FROM STEAM METER 2	No	Yes	No	<i>C</i>
175	CONSUMPTION OF STEAM METER 2	Yes	No	No	<i>C</i>
022	KWHR RECEIVED	Yes	No	No	<i>D</i>
023	KVARHR RECEIVED	Yes	No	No	<i>D</i>
027	NET KWHR	Yes	No	No	<i>E</i>
028	NET KVARHR	Yes	No	No	<i>E</i>
081	CLIENT KWHR DEL	Yes	No	No	<i>F</i>
082	CLIENT KWHR REC	Yes	No	No	<i>F</i>
083	CLIENT KVARHR DEL	Yes	No	No	<i>F</i>
084	CLIENT KVARHR REC	Yes	No	No	<i>F</i>

- Labeling and Numbering the Meters (MeterBase, Device ID). Naming, labeling, and numberings (such as the Device ID and Meter Base ID) shall be completed in accordance with the requirements provided in Attachment D: CIRCUITS UA Naming Standard.

- Data Acquisition System (DAS). The Contractor shall connect and test the new metering/ metering infrastructure with the existing DAS. The DAS shall be programmed to provide two-way communication to the meters. The DAS will retrieve meter data information as well as information about the meters. The Contractor's responsibilities regarding the DAS shall include, but not be limited to, the following:
 - Software Upgrades. The Contractor shall perform the installation and configuration of all relevant software or software upgrades required to tie into the existing DAS and its software system. This shall include any software specified for provision by the government to fulfill any of the functionalities of the overall AMI system.
 - Testing. After meter installation, the connectivity of all meters shall be tested individually back to the DAS. This requirement means that the DAS equipment must be fully installed along with all pertinent communications infrastructure prior to meter connectivity testing. This should be reflected in the Contractor's proposed schedule.
 - DAS Privileges. Contractor personnel shall possess or obtain IAT2 certification in order to have a privileged account on the DAS, workstations, or laptops after they have been turned over to the Government. All the following items are required for this certification:
 - Single Source Background Investigation (SSBI)
 - Security Plus or GSEC
 - Operations System Certification (MCSA)
 - DAS Capabilities. Once the system has been installed, tested and commissioned, it shall provide real time data on consumption, flow, and trending. It shall also provide billing reports and hourly/ daily/ weekly/ monthly/ yearly basis in line with UFGS standards and ANSI/EIA/TIA/NEMA/NFPA-NEC through a system server at Building 3098: Diamond Hall, the Network Operations Center (NOC).
 - DAS Communication with Workstations. All meter data collected shall be capable of communicating to workstations using the existing software. The workstations must be able to maintain response time of 5 seconds to an operator request at any workstation. A one megabyte data file containing the meter data or waveform shall be downloaded to the workstation within 5 seconds as the DAS is polling the meters and 2 workstations are being utilized. The Contractor shall test that the new meters installed are communicating with the workstations.
 - New Meter & DAS Configuration Requirements. A complete meter image shall be retrieved by the DAS over the network. The new meters also shall be programmed to provide the following integration with the DAS:
 - The DAS shall allow configuration over the network of the parameters in the meter except for CT ratio, PT Ratio, password, meter name or device ID.
 - The DASs shall store the collected data for a minimum of 13 months.
 - The DASs shall be programmed to retrieve metering data automatically, once every four hours from electric meters; and once a day from non-electric (mechanical) meters. Allowable ports and protocols are: port 22/900 – SHTTP, port 443 –HTTPS, port 1521, port 1526.
 - The DAS shall communicate with operator workstations, and all meter data from newly installed meters shall be displayed.
 - Two-way communication with all meters, generating logs, indicating powered-down meters, and showing alarms/events shall be parts of post installation tests.

- The DAS needs to include an archive section to keep some information about the removed/replaced electrical and mechanical meters as noted below. The Contractor shall test this capability for the new meters installed.
- The DAS shall be programmed to monitor the trend of consumptions for the meters, and report any sign of unusual surge or activity in the account, as a sign of potential outages, leakages or losses.
- Meter Decommissioning & DAS Configuration Requirements. In the future, if the new meters need to be removed, the following is the minimum information to be kept after a meter is removed. The Contractor shall verify that this data can be input into the DAS for all new meters installed under this contract.
 - Manufacturer, type, commodity, and form of the meter.
 - Installation point (region, base, building/facility #)
 - Metering data for the last month of meter's service.
 - Reason of the removal/replacement of the meter
 - Date/Time of installation; Date/Time of removal.
 - The MeterBase of the new meter.
 - The data shall be accessible by the unique MeterBase.
- Data Output. The existing MCBQ AMI DAS is a computer-based system with attached workstations that provide two-way communication to the meters. The DAS retrieves meter information and meter data information from the meters (complete ANSI C12.19 table). A complete meter image is retrieved by the DAS over the network. In addition the DAS allows configuration over the network of the parameters in the meters except for CT ratio, PT Ratio, password, meter name or meter id. The DAS shall be programmed to provide the same data output format shall as the MCBQ AMI data format. DAS Channel Mapping (Data to be transmitted to the DAS) and DAS Data Output Format requirements are provided in Attachment E.
- DAS to Update the MDM. The Data Acquisition Systems (DAS) collecting meter information shall be required to generate feeder information files whenever a new meter is brought online, changed, or removed and recorded in to the DAS that will be used by the MDM. Additionally DAS shall generate configuration feeder information files whenever the configuration of an existing meter is modified within the DAS (e.g. multiplier change, device id change, etc.). Generation of the meter creation/update feeder files shall happen automatically upon creation/update in the DAS. Feeder files shall be in delimited text format and shall consist of a header row followed by subsequent configuration rows for each "Meter/Service Point", "Meter Device", "Recording Device" and/or "Channel" configured. Created meter creation/update feeder files shall be automatically placed into an operator configurable DAS server file system directory. The Contractor shall test this capability for the new meters installed.
- Data Interface. The government desires to utilize a single consistent data interface specification between the meter data management system and all data acquisition systems for all transfers of data between these systems. This specification will include meter reads from the AMI, event/alarm notifications from the AMI, periodic status reports from the AMI, the synchronization of meter related information between the systems, and on-demand read requests from the MDM to the AMI. The Contractor shall match the data interface specifications with the current MCBQ AMI System DAS.
- Data Integration Server. The DAS also shall provide the collected data from the newly installed meters to the Data Integration Server (Government furnished) at

- a user selected time period, with an allowable frequency range of once per hour to once per day using government approved/allowable ports and protocols.
- Timing. The DAS when querying the meters shall compare the meter time with the DAS time (which is synchronized with a network time source), report when the meter is more than 15 seconds off, and correct the time at the meter. The DAS data will be output to the Enterprise in Zulu-UTC time.
 - Networking Solution: The contractor shall provide software applications, communications networks, enhancements to the data acquisition systems, and local area networks that collect the information from each of the commodity meters identified in this statement of work. Information shall be uniformly captured and managed utilizing the methods/formatting/programming of the MCBQ AMI System. All metering/communication/networking equipment as well as all system/network designs shall be submitted for review and approval by the Government. As identified previously, approximately 80 of the meters will have existing communication networks available through the electric meters. 20 meter sites will require new communication system designs. The communications system design will be driven by the available communication networks at MCBQ. Communication system requirements include, but shall not be limited to, the following:
 - GPON, MRAN, ASDL, and Wireless. The Government does not guarantee connectivity via any of these options at any locations. The decision as to which communication infrastructure shall be used for each segment shall be made during the design process. The collected site survey data shall support the ability of the Contractor to change the communications method and/or pathway to hardwire without resurveying the location. The Contractor must be prepared to defend their design choices to critique from the government upon preliminary design submittal. Requirements for networking via the communication network options identified shall be identified to the Contractor during the design phase of the project.
 - Networking Requirements. The Contractor shall assume that he will have to design, purchase, install, provide accreditation documentation (as needed), program and test all equipment, networks, fiber, cabling, and software to connect at the MCBQ G-6 interconnection point. Each networking solution will have a unique set of requirements that will be defined during the design phase of this project to assist the Contractor identify the best solution for each site. Wireless requirements are more stringent, so requirements are identified later in this section.
 - System Interface Requirements. The metering data, as well as metering configuration program (or meter's "image") shall be transferable and downloadable in the data acquisition system – even if the data is collected by using the metering manufacturer's software. Additional formats may be required to maintain compatibility with preexisting systems. It is the responsibility of the Contractor to identify these requirements and provide all equipment and services necessary to ensure the data fully interfaces with the MCBQ AMI System.
 - Fiber Availability. The Contractor is responsible for building the network LAN in a wired and/or wireless manner up to and including the connection to the DAS. The AMI site surveys shall include diligent effort to identify the existing dark fiber that can be incorporated into the metering network to reduce costs. If there is existing dark fiber that can be used to be part of the metering network, then it may be incorporated into the network upon approval from the ACO.
 - Networking Equipment/Accreditation Updates. It is the responsibility of the Contractor to develop a communication infrastructure that ties in seamlessly to

the existing, accredited MCBQ AMI network for the buildings that do not have an existing MCBQ AMI System connection point. Information assurance requirements include, but shall not be limited to, the following:

- All new network equipment installed must meet Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) approval for security standards. All additions and changes to the communication network must meet the IA and local security manager and spectrum coordinator (RF) requirements. As a part of the IA requirements, the system shall meet the requirements for Authentication and Encryption, as well as Network Intrusion Detection System. Proposed network switches, routers, and firewalls shall be on the current G-6 approved equipment list, unless otherwise approved by the Contracting Officer. If another device is approved by the Contracting Officer, the Contractor will be responsible for accrediting the proposed alternative device.
 - The Contractor shall provide the necessary information on the system, hardware, software, network, ports, protocols, services, and security measures for all new equipment/systems installed to develop the DIACAP documentation for the system. The AMI system is considered a Platform IT (PIT) with a Mission Assurance Category III (MACIII), sensitive. Information concerning Information Assurance and the DIACAP process can be found at <http://iase.disa.mil>.
 - The Contractor shall create and develop all documentation and provide services to obtain the necessary DoD network certifications and authorizations to operate with the new equipment on the accredited MCBQ AMI System.
- Ethernet Switches. Requirements shall use: 1) Layer II or Layer III managed Ethernet Switches that conform with Defense Information Systems Agency (DISA) Security Technical Implementation Guides (STIGs) (where Ethernet switches are required); and 2) network equipment that is compatible with the existing AMI system and infrastructure with which it will be integrated.
 - Switch / Routers Upgrades. Switch and router purchases and upgrades as well as cable and installation may be necessary to extend the infrastructure covered under this contract. Switch equipment shall be designed to work in substation environment and shall have copper ports rated for 10/100/1000 Mbit speeds. Switches shall be installed in Contractor provided locking ventilated cabinetry, or in existing locking cabinetry if available and authorized for this function by the Contracting Officer.
 - Environment Control. All network equipment proposed for installation in outdoor or non-environmentally controlled spaces shall be industrial temperature-rated (-40°C to +85°C) or shall be installed in environmentally controlled enclosures. Alternatively, the network equipment may be installed in an environmentally controlled space and associated cabling run to meters and/or other equipment installed outdoors or in a non-environmentally controlled space.
 - Security. All Ethernet ports (and any other data ports) on access points and firewall devices shall be physically secured (physical security could be accomplished in a variety of ways, such as having the equipment in a locked enclosure, or providing Ethernet locking port devices).
 - Network Capacity. Network LAN design for this project shall ensure that the operational throughput capacity shall not exceed 30% of the baseline capacity to ensure future growth and capacity for management stability.

- Two-Way Network Communication. The meters shall be accessible via two-way communications. Two-way communication for electrical meters is defined as the DAS being used to remotely retrieve the metering data/logs/alarms/events, as well as to program the meters or modify their configuration programs.
 - Static Communication Security Requirement. As a part of communication security requirements, the IP addresses, network addresses, and hardware addresses shall be in “static” format. Blocks of IP addresses will be provided by the government.
 - Wireless Solution. In the event that a wireless network is employed, the requirements identified in Appendix F shall apply. The Contractor shall be prepared to execute this contract with modified quantities of wireless devices. The cost of wireless communication from one meter to the central MCBQ AMI System shall be outlined in the proposal with unit prices not subject to change. In the event that different quantities of wireless devices are incorporated into the design and execution, as decided and approved by the government, a contract modification will be issued to cover the relevant scope change and financial consideration. In light of this, the Contractor shall propose burdened pricing for the addition and subtraction of wireless quantities from the task requirement. Such burdened pricing will be used by the government for either additive or deductive contract modifications, with highly irregular circumstances subject to negotiation.
- Software Requirements (if required): The new meters must integrate into the existing MCBQ AMI System. If additional software is required to provide full integration into the existing MCBQ AMI system, software requirements include, but shall not be limited to, the following:
- The Contractor shall provide the government with all software updates and patches for Contractor-provided software and firmware (if-applicable) for the contract warranty period.
 - The Contractor’s provided solution shall permit the Government to install radio and meter firmware and software updates remotely (i.e. from the DAS and workstations), throughout the lifetime of the system.
 - For all software items that are part of the solution conveyed to the government, but are not part of a Commercial Off-The-Shelf (COTS) product (for example, non-COTS products include scripts, one-off applications, configuration files, customized displays, etc.), the Contractor’s provided solution shall permit the Government to modify and distribute any such items within the Department of the Navy along with any changes, throughout the lifetime of the system.
 - All networking/IT equipment and software shall be in the Marine Corps name for licensing purposes and warranty support. The Marine Corps will be the registered owner of all software licenses. The Marine Corps will be the registered owner of all network and workstation hardware. Under the license agreement, a DOD contractor (third-party contractor) shall be allowed to maintain and operate the system (Third-Party License Agreement). The price proposal shall include the AMI system license agreement. Further, offerors shall clearly indicate the type of license rights (e.g. GPLR, unlimited, etc.) for all software provided.
 - All software, network hardware and workstation logins and passwords will be turned over to the government.

6.2.6. Installation: The following defines installation practices that shall be followed at MCBQ:

- Coordination. The Contractor shall cooperate with all the government and utility authorities throughout this project.
- Qualified Team. The Contractor shall provide the services of a qualified team of installation professionals with the necessary experience to install the equipment with minimal disruptions to the day-to-day operations of the facility.
- Licenses and Permits. The Contractor is responsible for acquiring all licenses and permits, as defined in the General Paragraphs, required for the installation of AMI equipment/systems.
- Timetable. Facilities Maintenance Service (FMS) at each site will provide ready access to all designated workspaces per a negotiated timetable.
- Standard and Reference Compliance. The Contractor shall ensure that all work performed under this contract is compliant with applicable UFC standards, especially those listed in Appendix G: References that are related to metering and telecommunications requirements. No requirement of this contract shall supersede applicable regulations, local codes and/or standards. Any violation of such regulations and standards shall be brought to the attention of the Contracting Officer for clarification prior to proceeding with the work. If conflicts between designated applicable codes and/or standards exist, the Contracting Officer's Representative and applicable authority having jurisdiction shall determine the appropriate code to follow.
- Interfacing. The Contractor shall be responsible for interfacing with any existing metering or other associated equipment required to make the MCBQ AMI System functional. Projects that interface with NMCI shall require compliance with UFC 3-580-10. Interfacing with existing systems and equipment shall in no way reduce or impede the functionality and capabilities of the systems or equipment. The Contractor shall be responsible for working with the proper Government representatives to coordinate a seamless integration.
- Removal and Disposal. The Contractor is responsible for removal and disposal of all waste material, including but not limited to removed equipment, tools, etc., and shall conduct the installation process in accordance with the General Paragraphs and all applicable Unified Facilities Guide Specifications. The Contractor may be subject to fines by the local authorities if it does not comply.
- New Installations. For new metering installations, the Contractor is responsible to determine the most suitable location for the meter, using data collected during post-award site surveys. The Contractor shall in all cases (including where existing meters are located outside) evaluate placement of meters indoors and/or inside utility rooms, based on the possibility of easier communications wiring within the facility. The Contractor shall include, in any preliminary design submittals, the general physical locations of each meter, and the justification for that decision.
- Installation. The Contractor or their subcontractors shall be capable of providing complete installation of all system hardware, software, firmware, interconnecting wiring and communications interfaces necessary for the complete operation of the system.
- Installation Tools and Permits. The Contractor shall supply all tools and equipment necessary to perform installation and maintenance tasks, and is responsible for working with the proper facility representatives in order to obtain all permits and permissions associated with the AMI system installations.
- Installation Site Surveys, Design and Implementation. The Contractor shall be responsible for all the steps of implementation and installation process. For example, performing site surveys at every installation point, RF surveys (to support any wireless solutions), erecting poles, installation of antennas, obtaining digging permit, digging, obtaining fire permit, obtaining approvals from security management and public-works,

installation of conduits and cables (where required)... To install antenna or poles, site approval needs to be granted from the site PWO on a case-by-case basis.

- Installation Scheduling. The Contractor shall coordinate meter installations/replacements with the base Public Works personnel responsible for metering/billing via the designated government representative. The Contractor shall provide a schedule indicating the cutover dates from existing meters to the new AMI meters to enable the government to obtain a final read on the existing meters.
- Metering Timelines. The Contractor shall ensure that existing meters remain in service until the new AMI meters are ready for cutover. Buildings shall not go unmetered for more than 4 hours during cutover without the previous approval of the contracting officer.
- IA Equipment Installation. The installation of equipment shall be limited to the metering, instrument transformers, communication-related hardware, and DAS related hardware, until all approvals are obtained for IA from designated authorities. During this period, the meters can be connected and operating, with no communication between the meters or between the DAS and the meters.

6.2.7. Training: The Contractor shall be capable of providing a full program of training for operation of the meters / other equipment installed under this contract. Acceptance of the design at a particular Government site shall be contingent upon the completion of the training program. The training shall be oriented to the specific equipment installed. Training instructors shall be proficient in teaching the topics for the various courses and have direct experience with the installed equipment.

The training shall be provided following installation of the equipment but prior to the acceptance tests.

The training shall be including but not limited to:

- The functionality and operation of the meters
- The definition and use of various metering data
- The AMI communication methods applied in various locations
- Applicable metering software (if installed)
- Demonstrate how the metering data was tied into the existing MCBQ AMI Data Acquisition System and MDM system.

The Contractor shall deliver an AMI Training Manual to each attendee of each training session. The manual shall include the text, graphs, charts, and images to effectively guide the trainees through the training course. The manuals also shall include an agenda, defined objectives for each lesson, and a detailed description of the subject matter for each lesson. The Contractor shall furnish audiovisual equipment and other training materials and supplies, as required for each training session. Where the Contractor presents portions of the course by audiovisual material, copies of the audiovisual material shall be delivered to the Government either as a part of the printed manuals or on the same media as used during the training sessions. There shall be complete training modules on stand-alone CD format for various categories of AMI equipment and systems.

Up to 20 personnel will be trained. The training shall be for 1 day for at least 8 class hours.

The training material shall be approved by the government prior to the beginning of the training program. For approval, the Contractor shall provide an AMI Training Plan and a copy of the AMI Training Manual for Government Review at least eight (8) weeks prior to the desired start date

for training. Training manuals and handouts shall be provided and distributed by the Contractor during the training sessions. The Contractor shall propose a suggested AMI Training Schedule for approval no less than four (4) weeks prior to the start of that schedule. Development and approval of the timeframe and logistics must be done in coordination with the government, to allow for employees to plan in their schedules to attend the training.

- 6.2.8. Testing & Commissioning: The following defines testing and commissioning requirements:
- General. The Contractor shall be responsible for the operational performance of all components and systems installed and/or modified, and shall verify performance by testing the installed AMI systems.
 - Coordination. The Contractor shall cooperate with all the government and utility authorities throughout this project.
 - Installation and Test Plan. Post installation testing shall be performed in accordance with the Statement of Work and the Contractor's approved Installation and Test Plan. The Contractor shall submit to the Contracting Officer, or authorized representative, a copy of the proposed testing plan necessary to prove the system/equipment meets the operating requirements of the design. The plan shall be submitted sixty (60) days prior to completion of installation. As a minimum, the testing plan shall contain:
 - Project nomenclature
 - System/Equipment description
 - Specific requirements for system/equipment testing
 - Measurements to be taken indicating methods, means, and sensitivity/accuracy
 - Any specific component testing required by applicable Guide Specifications to equipment being installed
 - After approval of the test plan by the Contracting Officer, or authorized representative, the Contractor shall schedule testing to ensure that the SOW and standards are met. The Contractor shall provide the following:
 - A list of outside organizations, such as testing laboratories, architects, and consulting engineers that will be employed by the Contractor, and a description of the services these firms will provide
 - Procedures for reviewing all shop drawings, samples, certificates, or other submittals, including the name of the person(s) authorized to sign the submittals for the Contractor.
 - An inspection schedule, keyed to the installation schedule, indicating necessary inspections and tests, the names of persons responsible for the inspections and tests, and the time schedule for each inspection and test
 - The procedures for documenting quality control operations, inspection, and testing, with a copy of all forms and reports to be used for this purpose
 - The Contractor shall include a status log listing all submittals required by the inspection plan and stating the action required by the Contractor or the Government.
 - The Contractor shall also prepare and maintain a testing plan that shall contain a list of all tests required by the contract.
 - The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing.
 - Contractor-Provided Testing Equipment. Commercially available equipment that is necessary for the configuration and troubleshooting of all system components, including, but not limited to, licensed software and hardware shall be provided by the Contractor. This may practically consist of a laptop computer, cable interfaces, and necessary software, with all required licensing.

- **Testing.** The Government will select a number of meters from each base for the Contractor to conduct a Government witnessed for Post Installation Testing. Besides the tests being witnessed, the Contractor shall provide the Government with all required paperwork that indicate the post installation operation and communication checks/tests have been completed by the Contractor and have been passed. This shall include:
 - **Pre-Installation Testing.** The Contractor shall completely test and certify all components prior to installation. Manufacturer factory test certification of components may be provided in lieu of component field testing. Every meter shall be tested for accuracy by the Contractor or the metering vendor prior to shipment. The *Manufacturer Test Results Report* shall be submitted to the Government for review and approval. If requested by the project representatives, the Contractor shall perform a calibration test on any meter upon the installation. The Contractor shall perform pre-installation testing, post installation testing, and adjustment of the completed AMI system and all subsystems prior to requesting approval of the installed system.
 - **Post Installation Testing.** The Contractor shall completely test and certify all installed systems prior to final acceptance. The Contractor shall be responsible for ensuring that the installed hardware and software components comply with the RFP, statement of work, and all applicable reference documents. The Contractor shall perform post installation testing and adjustment of the completed AMI system and all subsystems. Post installation testing shall include the following: remote firmware upgrades (if any), system polling at the maximum rated frequency, and simulation of system element failures and network failures to show the system's ability to be recovered. The *Post Installation Testing Report* shall be submitted for Government review and approval. The testing shall include:
 - Verification of communication between the meters, DAS, and workstations
 - Accuracy test on meters
 - Verifying the workmanship in the construction work and wiring
 - Simulation of various failures in order to ensure alarms/caution code/error code is generated by meter and read by the DAS
 - Communication failure simulation to ensure log registration of the DAS and self-healing of the system
 - Reading various registers at the DAS and comparing them to the meters' display information
 - Verification of functionality of wireless intrusion detection system (WIDS)
 - Verify that meter data can be downloaded to the handheld meter reading devices within 4 minutes.
- **MCBQ AMI System Testing & Acceptance.** A copy of the test results shall be provided to the Government for review and approval. All the meters selected must pass the Post Installation Test as described prior to formal acceptance of the system. If any meter fails any of the tests, the Government can select unlimited number of metering points in that base for new tests to be performed.

6.2.9. **Warranty:** The Contractor shall provide all post installation services and equipment necessary to maintain the installed system equipment and software in an operational state. The warranty period shall be for five (5) years or for the length of the Original Equipment Manufacturer's warranty, whichever is greater. The warranty period shall begin after formal written acceptance of the system.

The word “acceptance” as used herein means signing of the post installation form by the designated Government representative.

Notwithstanding inspection and acceptance by the Government or any provision of this contract concerning the conclusiveness thereof, the Contractor warrants that, all supplies and installation services furnished under this contract:

- shall conform to the design and manufacturing requirements in the contract and amendments thereto
- shall be free from all defects in material and workmanship, that the product is reliable, and that the Contractor will, without charge or further consideration, repair or replace defective parts
- shall conform to the essential operational capability or other characteristics identified as an essential performance requirement necessary for the supplies/services to fulfill the requirements for which they were designed and installed.

With respect to GFP, the contractor’s warranty shall extend only to its proper installation, unless the Contractor performs some modification or other work on such property in which case the contractor’s warranty shall extend to such modification or other work.

The Contractor warrants that all corrective action shall be completed and design materials tendered for redelivery to the Government within either (i) 15 calendar days from the date of contractor receipt of incorrect materials at the contractor’s plant or original point of delivery or (ii) a schedule pursuant to a plan of action approved in writing by the Contracting Officer. If the Contractor is unable to provide corrective action within the applicable timeframe, the Contractor shall request an extension, in writing, from the Contracting Officer.

The word “defects” as used herein means any condition or characteristic in any materials furnished by the Contractor under this contract that is not in compliance with the requirements of the contract.

The word “correct” as used herein means to eliminate any defects. Corrective action may include redesign, development, and qualification of a modification to eliminate the defect.

This warranty will not be voided by system modifications. Any materials replaced pursuant to this warranty are subject to the provisions of this contract in the same manner as materials initially delivered. The Contractor shall, notwithstanding any disagreement regarding the existence of corrective action, comply with the Contracting Officer’s direction to correct the end item. If after the Contractor undertakes correction, it is determined that a breach of warranty did not occur, the affected provisions of this contract will be modified to reflect actions taken pursuant to this action. The rights and remedies of the Government and the Contractor provided in this SOW are in addition to, and do not limit, any rights and remedies the Government and the Contractor may have under any other clause or provision of this contract. The Government’s rights under this contract because of latent defects, fraud, and such gross mistakes as amount to fraud are not limited by this description. The warranties expressed herein are in lieu of any implied warranty of Merchantability or Fitness for a particular purpose.

Warranty services shall include all work and costs associated with maintaining the project, including but not limited to calibrations, preventative maintenance, and repairs. The Contractor

shall provide and perform these requirements in accordance with the System Manual as well as the requirements detailed below.

- Automated Warranty Plan. The Contractor shall implement an automated computer based warranty program. As applicable, the Contractor shall integrate this into the existing MCBQ AMI System. The system shall track integrated logistics information such as maintenance, warranty, training, installation data packages, and configuration management information. The system shall provide the Government and Contractor with information pertaining to the extended maintenance agreements and maintenance schedules and activity on all systems and components, preventative maintenance requirements, perform repair histories, track repair costs, and generate reports.
- Hardware Maintenance. The Contractor shall provide warranty services for all hardware components utilized in AMI systems, for the purpose of ensuring functionality and reliability. This shall include support services for the maintenance and operation of the designed system. All maintenance actions shall be tracked via the Maintenance Tracking System (MTS). The Contractor shall use only the equipment that is appropriately calibrated. The calibration must be traceable to “The National Institute of Standards and Technology (NIST)”. The calibration test result for any equipment shall be submitted upon the Program Manager’s request. The calibration date shall be clearly shown on a sticker on the equipment.
- Preventive Maintenance Schedules. The Contractor shall perform preventive maintenance on systems and components installed under this contract. Preventive maintenance services are those services applied during and between operations to keep the hardware and software components operating properly. Preventive maintenance inspections shall be performed no less frequently than recommended by the Original Equipment Manufacturer. Preventive maintenance schedules shall include the running of diagnostic programs according to all applicable service manuals, lubricating, cleaning, and making corrective adjustments as necessary. The Government reserves the right to revise the frequency of preventive maintenance schedules.
- On-call Maintenance. The Contractor shall perform on-call or unscheduled maintenance, as required, to place a component, system, or sub-system back in service after a failure or breakdown has occurred. On-call maintenance shall be performed after notification that equipment is inoperative. The Contractor shall provide the Government with a designated point of contact and make arrangements to enable its maintenance representative to receive such a notification, or provide an answering service or other continuous telephone coverage to permit the Government to make such contact. On-call maintenance service shall continue until the inoperable equipment is restored to an operable condition.
 - The Contractor shall provide response capabilities to service calls reporting malfunctions or maintenance problems. A service call shall consist of prompt, on-site response between two (2) hours and forty-eight (48) hours, depending on a site’s requirements (program standard for response time). A service call is a verbal request (by telephone, or otherwise) from the Administrative Contracting Officer or authorized representative as designated by the RFP.
 - Service calls will usually require response by the Contractor at hours other than those identified as site operating hours. The Contractor shall commit the appropriate resources necessary to accomplish the repair within the allotted timeframe. A service call shall be completed within forty-eight (48) hours from the time the service call is issued to the Contractor. If a service call cannot be resolved within the specified time period, the Government may grant a waiver of the time requirement, provided the Contractor has submitted a written explanation. The Contractor shall submit a written request that gives: (1) an

explanation of the delay; (2) the estimated action needed, plus the time for completion of the service call; (3) evidence showing an effort to comply with the time requirement. If immediate repairs cannot be made, the Contractor shall take all actions or measures necessary to protect the health and safety of the public and Government property.

6.3. PERIOD OF PERFORMANCE

The proposal's schedule shall include a "period of performance". This time period shall not exceed **eighteen (18) months** from the award of the contract.

6.4. MEETINGS:

The Contractor shall be responsible for scheduling, planning, and attending metering program meetings at MCBQ. The prime Contractor, major subcontractors (when required), and the Government representatives (which may include other contractors) will attend. The meetings will be held to conduct review and discussion of the major aspects of the contract operation. This includes past period performance and next period performance.

- The "Kickoff Meeting" shall be held no later than thirty (30) calendar days after contract award. Contractor personnel shall include the relevant program manager, administrative persons, contractor personnel responsible for the performance of the contract, contracting representatives and project managers/engineers.
- "Working Meetings" shall occur at least once a month but can occur as necessary as agreed upon by the Contractor and the Government.
- "Contract Program Review Meetings" shall be conducted once every three (3) months (quarterly) and shall include the Program Manager, administrative personnel, contracting representatives and project management personnel.
- The Contractor shall prepare and submit minutes for all meetings attended by the Government. The Contractor shall disseminate such "minutes" to every attendee via email, on the day of the meeting, documenting all meeting outcomes, actions, and responsible action designees. In the case that this results in a discrepancy between the government and the Contractor, with regard to the perceived outcomes of the meeting, a follow-up meeting will be scheduled by the Contractor at a time and date acceptable to the government.
- The Contractor and the Program Office will agree upon agenda. Draft briefing material and or presentation shall be provided to the Program Office five (5) working days before a meeting for approval.
- The Government shall be able to call the Contractor to attend unscheduled in-process meetings to review AMI system status and progress. The Contractor will be given sufficient advance notification of time and place of meetings

7. DELIVERABLES:

The Contractor shall submit the various deliverables in accordance with the list below, unless a change is approved by the Contracting Officer. Additional submittals may be required as determined during implementation of the project. All submittals require the approval of the Contracting Officer. Proposed material submittals required of the Contractor shall be made allowing sufficient time for processing, reviews, approval, and procurement before the Contractor is ready to use the material. No material shall be used prior to written approval. The Contractor shall certify on all submittals that the material being proposed conforms to contract requirements.

Meeting minutes shall be delivered to the Government electronically. All other documents, unless otherwise informed during project implementation, shall be provided in both electric (Word and PDF) format to the Contracting Officer and an additional ten (10) hard copies shall be deliverable to the Contracting Officer for distribution to stakeholders throughout the installation.

Initial Deliverables:

- Program Schedule (a.k.a. Design & Construction Schedule) – Reference General Paragraph 15. Provide within 21 days of Notice of Award
- Work Plan – Referenced in Statement of Work, Section 2. The Contractor shall submit a work plan within 21 days of the Notice of Award. The work plan is a narrative document that explains the Contractor's intended methods and resources for performing the proposed tasks in accordance with the Program Schedule. As part of the work plan, the Contractor shall identify major milestones and critical path items.. A detailed Work Plan shall identify the following elements:
 - All major tasks
 - Work elements and products of each task
 - Scheduled task start and completion date
 - Task dependencies
 - Resources assigned to each task
 - Resources scheduled for each task
 - Time allotted to each task
 - Deliverable items to be produced
 - Critical path to project completion
 - Baseline
 - Utilize a Gantt chart to show project, task and time relationship
 - Budget
 - List of subcontractors, if any
- Certificate of Insurance - Per General Paragraph 15.
- Surety bonds - Per General Paragraph 15.
- Contractor Employees or Representatives List - Per General Paragraph 12.2.10.1.1.
- Asbestos and Lead Paint Tests Written Report - Per General Paragraph 15 and referenced in General Paragraphs 8.3 and 16.1

- Waste Management Plan – Per General Paragraphs 15 and 25 and referenced in General Paragraph 12.2.1

Recurring Deliverables:

- Monthly Progress Reports. The Contractor shall submit monthly progress reports that shall contain as a minimum the following information:
 - Performance issues
 - Schedule/status
 - Contract Data Requirements Lists (CDRL) and Contract Line Item Numbers (CLIN) delivered
 - Dollars obligated and expended
 - Maintenance and inventory status
- Licenses & Permits - Per General Paragraphs 12, 15, and 25
- Material Safety Data Sheets (MSDS) - Per General Paragraphs 15 and 25 and referenced in 12.2.7, provide MSDS for all paints, thinners, cleaners, sealants, refrigerant or other hazardous materials proposed for use on this project.
- Outage Requests - Per General Paragraphs 12.2.4 and 12.2.4.1 “Utility Outage/Utility Connection Requests”, the Contractor shall request outages at least twenty (20) days in advance of a desired outage date.

Task 1: Site Surveys

- Site Survey Support Requirement Request - The Contractor shall submit a Site Survey Support Requirement Request to the Project Manager no less than fifteen (15) business days in advance of the requirement and identify all support requirements within the request. The Contractor shall specify the number of required personnel, their required areas of expertise, and expected work hours (i.e., time of day, number of hours per day per person, duration of the requirement) in the request.
- Existing Deficiencies Document - Within ten (10) business days of the conclusion of the first site survey for each meter, the Contractor shall provide this document to the Government identifying any incorrect assumptions stated in the contract that were identified in the field.
- Site Survey Report. “Site Survey Report” shall be submitted for government review. The purpose of this submittal is to aid the government in its Quality Assurance role by conveying what information has been collected during site surveys. The report should include all (as practicable) information recorded by the Contractor. This shall include, but is not limited to:
 - Building number and name
 - Latitude and longitude of site
 - Service Information (Substation ID, Circuit # ID, Transformer Pad #, Transformer KVA, Service Type, Distribution Voltage, Service Voltage, Service Feed, Transformer Type, Transformer Ratio, Infrastructure Details/Condition, Peak Load (if available), conductor size, other comments)

- Identify if there is an existing meter, the meter type, access to CTs, etc. (existing & proposed), and proposed meter location
- Provide pictures of existing meter and proposed meter locations and layout of conduit, fiber, etc., if known.
- Preliminary ideas and reasoning supporting a particular solution for each particular point (if any are developed while the Contractor is on site)
- Identify any known concerns
- Identify probable communication solution(s) and describe any issues observed that might affect particular point, such as communication pathway concerns and pre-existing conditions. Information obtained relevant to existing communications infrastructure and its usability.
- Any other information listed as a site survey requirement elsewhere in this document.

Task 2: Design

- Preliminary Design Package (PDP) – The PDP shall be submitted for government review and approval prior to the development of the Final Design Package (FDP), the Site Approval Request (SAR), and the procurement/installation of equipment. All drawings shall be submitted in both hard copy and digital formats. Hard copies shall be size “D”, and digital versions shall be submitted in both AutoCAD 2006 and PDF formats. The package shall contain, but is not limited to, the following information:
 - Date. The installation package due date will be specified in reporting requirements checklist.
 - Professional Engineer. The installation package shall be certified by a registered professional engineer to ensure compliance with applicable building codes and Federal design standards, or other standards as may be required at the specific installation where the work is to be performed
 - Manufacturer's Data. For all AMI equipment to be installed, the Contractor shall provide the manufacturer's descriptive literature of equipment including drawings, diagrams, performance specifications, characteristic curves, and catalog cuts. The Contractor shall submit any calculations with its data submission package.
 - Design Specifications: The Contractor shall identify and reference design specifications applicable to proposed equipment and network designs. Site / Meter Drawings and Equipment Specifications / Technical Notes.
 - Design details for the design of all meters , with identification of all equipment necessary to provide functional, integrated meters to the MCBQ AMI System. The Contractor shall include applicable edited Guide Specifications pertinent to the types of equipment being installed, including Technical Notes. The Contractor is responsible for the technical adequacy of its work. Acceptance of the design and construction package by the Government is required, but shall not relieve the Contractor from the responsibility for adequacy of its installation work.
 - One typical drawing of each type of “metering installation” and each type of “removal” task.
 - Maps for every geographical location where meters shall be installed. The Contractor shall mark the maps for the location of any added/new equipment, such as meter, radio, antenna, pole, and so on. The markings shall indicate the location of new equipment relative to the buildings/facilities. The maps shall also indicate the locations that are considered for trenching, digging, excavation, or wall penetration.

- Besides the maps and drawings, separate documents in the form of tables or spreadsheets shall be prepared for each geographical location to indicate above information (location of new equipment, location of digging/trenching, etc.). These documents shall also include the exact geographical location (longitude, latitude, and elevation) of the AMI meters. These tables/spreadsheets shall include, but not limited to, all information provided in the Site Survey Report.
- Drawings identifying the installation (i.e., form, fit, and attachment details) of the interface between new AMI equipment being installed and existing Government metering or AMI equipment, and installation systems and utilities.
- Location of installed equipment on building floor plans and installation's geographic information system (GIS) compatible system where applicable.
- Detailed description of the solution, including the locations of communication equipment, configuration requirements, expected data throughput between meters, DAS, operating systems, and workstations.
 - All applicable calculations
 - Software Licenses
 - Manuals, Catalog cuts, System Description, Metering Configuration file
 - Maps of areas covered by wireless network, and maps of areas covered by wireless intrusion detection system (WIDS).
- Certification of equipment and material compliance with appropriate Building Codes and Standards.
- The Contractor shall provide registered engineer certification that the equipment installation complies with all applicable building codes and standards. Installation plans submitted to the Contracting Officer without evidence of the professional engineer (PE) certification shall be returned as incomplete and will need to be resubmitted.
- National Environmental Policy Act (NEPA). The Contractor shall complete government provided NEPA Request Forms to include, but not be limited to, identification of all trenching to install fiber / conduit to bring metering data to communication closets or wireless signals. Other NEPA relevant requirements shall be included as deemed necessary during the design period. NEPA documentation shall be approved by the NEPA review team prior to the start of construction.
- Planned Service Interruptions: Utility services will require disruption in order to install building and primary meters. Since disruptions will be required to perform work, such interruptions shall be described and indicated in the PDP so that the government can begin planning. The description shall include the length of the interruption, its time (date, day of week, time of day, etc.), and a justification. The request for an outage shall be submitted at least 4 weeks in advance. The required outages may be scheduled in nights or weekends by the FEC authorities.
- Site Plan and Compliance with Federal Site Exterior Architectural Plan: for all new installations and equipment installed on exterior structures, the Contractor shall provide a site plan showing its location, or show its location on the Government's existing GIS. The Contractor shall also provide a plan and elevation drawings of the facility or exterior structure showing its size and exterior appearance.
- Acquisition of Permits: for any AMI equipment installation requiring permits from regulatory agencies (i.e., hot-work permit for welding), the Contractor shall provide its plan and schedule for acquiring such permits.

- Removal and Demolition of Equipment. Any work requiring removal of existing equipment and/or construction, the Contractor shall submit a plan for the removal and demolition.
- Solution Description. Detailed description of the solution, including the locations of communication equipment, expected data throughput between meters, DAS, and workstations.
- Final Design Package (FDP) - The Contractor shall implement all of the government's comments on the preliminary package, and submit a "Final Design Package" for review and approval in accordance with the CDRL deliverable requirement. As part of the Final Design Package, the Contractor shall submit the following information to obtain approvals for Information Assurance (IA) and Security, and Spectrum Coordinator (if the solution includes wireless technology) to tie into the existing accredited MCBQ AMI system. The following information shall be provided, as needed, to update the accreditation documentation:
 - **IA information:** Including but not limited to System Architecture description, System Architecture diagram, accreditation boundary, interfaces and data flows, hardware list, software list/licenses, server administrative software, and IA approvals request.
 - **Security information:** Including but not limited to type of network, ports and protocols, and encryption description.
 - **Spectrum Coordinator information:** Including but not limited to location (facility number as well as GPS coordinates) of all radios, transmitter power, antennae gain, and plan for preventing interference with other systems. There may be more than one Spectrum Coordinator (or Frequency Coordinator) for this Activity.
- Site Approval Request – Per Statement of Work, section 6.1, the Contractor shall provide all information required to produce the Site Approval Request (SAR). The Contractor shall also support the government in the Site Approval process through revisions of provided information as needed and technical clarifications.

Task 3: Installation & Accreditation Updates

- Quality Control Plan including the Submittal Register - Per General Paragraph 15 and referenced in General Paragraphs 20, 24, and 31.
- Site Specific Safety Plan – Per General Paragraph 15
 - Accident Prevention Plan (APP) – Per General Paragraph 41
 - Activity Hazardous Analysis (AHA) – Per General Paragraph 9.
- Schedule of Prices - Per General Paragraphs 25 and 33

Task 4: Training

- AMI Training Plan: Per Statement of Work, Section 6.2, submit the training plan to the Government for review & approval at least eight (8) weeks before desired training start date.
- AMI Training Manual – Per Statement of Work, Section 6.2, provide a copy of the training manual to the government for review and approval with the training plan, at least eight (8) weeks before the desired training start date. Provide electronic copies of the Training Manual

to the Contracting Officer at the start of the training program. Provide hard copies of the manual to all class participants as well as five (5) additional copies to the Contracting Officer.

- AMI Training Schedule - Per Statement of Work, Section 6.2. Submit to Government for review & approval at least four (4) weeks before desired training start date.

Task 5: Testing and Commissioning (includes final deliverables)

- Testing and Commissioning Plan - Per Statement of Work, Section 6.1.
- Manufacturer Test Results Report – Per Statement of Work, Section 6.2 and referenced in Section 6.2.7.
- Post Installation Testing Report - Per Statement of Work, Section 6.2.
- Post Installation Acceptance – Per Statement of Work, Section 6.1, this will signify as the delivery date and will serve as the beginning of the warranty.
- Final Acceptance Inspection - The Contractor shall provide five (5) calendar days to arrange final inspection as described in General Paragraphs 14-.
- As-Built Drawings – Per General Paragraph 18, and any requirements herein, the Contractor shall submit the As-Built drawing package following the completion of the installation and testing process, Documentation of the specifications of every new installation and reused equipment (for example: meter number, make, model, programming parameters, instrument transformer ratio, tap) will also be expected as a part of the As-Built package. Applicable to all packages: The drawings shall be submitted in both hardcopy and electronic formats. The electronic format shall be submitted in both AutoCAD-2006 and PDF formats. Two hardcopy paper sets shall be submitted in Standard Size D. The Contractor shall request the government for a set of drawing numbers to be used for any new drawing; the government-provided drawing numbers shall then be used.
- MAXIMO Tagging and Equipment Record Submission Form – Per General Paragraphs 15 and 16.2.
- CADD GIS Deliverables - Per General Paragraph 15 and the requirements herein:
 - If available, the Government will furnish ArcGIS shape-files for the Contractor to update. The Contractor shall update the files with the meter information on the metering layer in accordance with SDSFIE Standard for meters (more info: <http://www.sdsfie.org>). The Contractor shall provide the ArcGIS database information for each meter.
 - If available, the Government will furnish the existing GIS drawings in AutoCAD2006 format and hard copies of the existing drawings of the complex. The Contractor shall mark up all the modification (removal and installation) on these drawings and provide the marked drawings to the Government on the Friday of every other week during the project, as follows.
 - One copy of the drawing shall be marked up to show all removed meters and the final visual reading(s) from the meter. If the meters register TOU rates, the final readings shall include the peak, semi-peak, off-peak, and base-line (monthly) consumption readings.

- Another copy of the drawing shall be marked up to show all the newly installed meters depicted in their location on the GDIS distribution system representation and the following data for each new meter:
 - Device ID
 - MeterBase
 - Meter Manufacturer's serial number
 - Initial reading and meter multiplier
 - What Circuit, Pad, Feeder, it is located on
 - What facility or facilities it feeds
 - Installation Date
 - Information about meters shall be programmed into the DAS in accordance with Attachment E.
- DD Form 1354 – Per General Paragraphs 15 and 17.
- System Manual – Per Statement of Work Section 6.2, the Contractor shall provide a System Manual for all equipment / systems installed/integrated into this project. The manual shall be submitted to the Government for review and approval. The system manual shall be comprehensive, and shall cover the complete functionality for every component.

The System Manual shall contain step-by-step methods for operating each separate component and for operating the system as a whole. Each manual shall show the location of the item being described, and provide a clear and concise narrative description of the item, its operating function, characteristics, and its interrelationship with other system components. The maintenance portion of each system manual shall provide comprehensive details of complex components and parts, with instructions on how the components and parts are systematically arranged, and instructions on how to locate them. The maintenance instructions shall prescribe the manufacturers' recommended schedule for preventative maintenance plans. The instructions shall clearly identify preventative maintenance requirements and state the recommendations and limits on frequencies of all maintenance and/or operations. Each system manual shall contain the following modules specific to each individual AMI system:

- Operation and Maintenance (O&M) Manual. The O&M Manual shall include manufacturers' data for all materials and equipment provided under this specification. Each manual shall include each component's manufacturer, model number, service manual, and parts list for each major system component and subcomponent. The Operation and Maintenance Manuals shall be provided in a bound document, which is clearly tabbed, indexed, and marked for easy use.
- Maintenance Plan. The Maintenance Plan shall be at the program level, detailing all aspects of providing maintenance for the AMI system and its warranty program. The plan shall, at a minimum, address the issues in the following subparagraphs and be tailored to the specifics of the individual site.
 - General Technical Module. The Contractor shall provide a full technical system description identifying all functions the system will perform and a list, statement, table, or other document which identifies each of the stated requirements of the system and gives a description of how the system design will meet those requirements. Descriptions and calculations shall show how the equipment will operate with connected systems to meet the performance requirements. The manual shall identify the operational requirements for the system/subsystem and explain the theory of operation, design philosophy,

and specific functions. A description of hardware functions, interfaces, and requirements shall be included for all system operating modes. The Contractor shall provide complete system and component documentation. Documentation shall include device specifications, descriptions of the used and unused portions of the system capacity, and operations and maintenance manuals. The technical module shall include, as a minimum, the following:

- System/subsystem block diagram.
 - System/subsystem installation, block diagrams, and wiring diagrams.
 - System/subsystem physical layouts and schematics.
 - Details of interfaces to other systems/subsystems.
 - Details of connections to power sources, including grounding.
 - Details of surge protection device installations.
 - Details of cable splicing and connector installations and terminations.
 - Details of underground, aerial, and messenger cable installation on poles, cable entrance to buildings.
 - Detailed device wiring installation. All manufacturers' certifications shall be included with the manual
- *Hardware Module.* The hardware portion of the manual shall describe all equipment furnished and shall include, as a minimum:
- General description and specifications
 - Installation and check out procedures
 - Equipment schematics and layout drawings
 - Data and video transmission system schematics
 - Alignment and calibration procedures
 - Manufacturer's repair parts list indicating sources of supply
 - Interface definition
 - System/subsystem schematics and wiring
 - System/subsystem setup
 - Retrofit information
 - Hardware metrology firmware upgrade information.
- *Operating System Software Module.* The system software shall support the application programs. The software module shall describe the functions of all software and shall include all other information necessary to enable proper loading, testing, and operation. The software module shall include, as a minimum, the following:
- Definitions of terms and functions
 - Proper use of system and applications software
 - Procedures for system initialization, startup, and shutdown
 - Report generation
 - Database format and data entry requirements
 - Directory structure of all disk files
 - Descriptions of all communications protocols, including data formats, command characters, and a sample of each type of data transfer
 - List of known glitches
 - Software firmware upgrade information
- *Application Software Module.* The application software shall support the overall functioning of the system and sub-system components. The

application software module shall describe the functions of all application software modules, and shall include all other information necessary to enable proper loading, testing, and operation. The module shall contain, as a minimum, the following:

- Definitions of terms and functions
- Proper use of applications software and the integration with the system software and the security system hardware.
- Procedures for application software initialization, startup, and shutdown
- Data base format and data entry requirements
- Directory structure of all disk files.
- Descriptions of all communications protocols, including data formats, command characters, and a sample of each type of data transfer between software and hardware components

Task 6: Warranty

- *Equipment Warranty* and *Warranty Tagging List*– Per General Paragraphs 16 and 16.3 and referenced in Statement of Work 16.1.6.

8. REFERENCES / USE OF STANDARDS:

The use of applicable codes, standards, and regulations, is a requirement for this contract. All systems and subsystems shall, to the maximum extent practicable, be designed using open standards and de facto open standards. The Contractor shall provide justification and obtain approval for any use of any proprietary technology or standards in AMI systems designs. General references that apply to standard installations are provided in Appendix G. The most current version of references and standards will apply.

Contractors shall meet all requirements of DoD information assurance required by applicable Security Technical Implementation Guides. Contractors shall refer to website <http://iase.disa.mil/index2.html> for specifics on Information Assurance requirements.

9. REQUEST FOR PROPOSAL:

The contractor shall provide a technical schedule to include deliverables and price proposal with all RFP requirements addressed. This proposal shall include identification of meters and other hardware and software required to integrate the identified building and primary metering locations into the MCBQ AMI System. This shall include a preliminary system layout and one line drawings. The proposal shall also provide a detailed price proposal specifying all equipment costs, installation labor costs, overhead and indirect costs, and profit. The Contractor shall be responsible for the installation of the meters to connect to the MCBQ AMI system per this SOW and all applicable attachments.

- Program Schedule (a.k.a. Design & Construction Schedule): The Contractor shall provide a preliminary program schedule showing the order in which the Contractor proposes to perform the work and the dates on which the Contractor contemplates starting and completing all major milestones (including acquiring materials, equipment, permits, and utility service connections). The schedule shall be in the form of a progress chart of suitable scale (Microsoft Office compatible) to indicate the amount of work scheduled for completion by any given date, constraints, and any prior steps needed before continuing during the installation period.
- Work Plan: Provide a preliminary work plan, as described in Statement of Work, Section 7: Deliverables. Proposals shall also include an estimated timeframe with milestones for the work plan.
- Technical Data Package (TDP): The Contractor shall prepare a preliminary site specific Technical Data Package (TDP) which shall provide a detailed bill of materials (BOM) listing all of the equipment, materials, systems hardware, and software required to meet integrate the new meters into the existing MCBQ AMI System. The TDP shall be comprehensive in identifying the technical steps required to design and integrate metering and communications equipment to achieve a fully functional system in accordance with the stated performance requirements. The TDP shall provide the sequence of installation of system components and subsystems and shall identify any constraints and dependencies based on required changes to the site, which are the responsibility Government. The TDP shall include drawings in sufficient detail (schematics, single line, physical layout, wiring diagrams, etc.) of each meter and its associated equipment as required, including details how to install, maintain, and integrate the new system and its components with existing systems at each site. The TDP shall be incorporated as part of the contract award shall be certified by a registered engineer to ensure compliance with applicable building codes and Federal design standards, or other standards.
- Other Offer Document Requirements: The Contractor's offer shall:
 - Identify proposed equipment and include the following information: manufacturer, model, and specifications, and pricing of the equipment considered for purchase.
 - When breaking out equipment pricing, provide proposals that separate out the costs associated with any potential hazmat removals and construction services.
 - Provide details describing the Contractor's in-house ability, experience, and expertise with regards to the installation (retrofit) of existing meters with registers and pulse outputs. Details should include the types, brands, and product ranges which the Contractor is prepared to utilize if it would result in significant cost savings.
 - Be based on the information provided in this document and the assumptions provided below.

9.1. Assumptions:

For water meters, assume:

- **60%** of the water meters will be installed indoors and within 100 feet of the electrical meter and telephone room.
- **40%** of the water meters will be installed outdoors, **20%** of which will be located near the building (<100 foot run to the mechanical or telephone room) and **20%** of which will be located over 500 feet from the nearest building. **20%** of the water meters to be located outdoors will be located in a vault.
- **None** of the total required building water meters can be reused from the existing ones.
- New Flanges are required for **all** meters.
- **100** water meters will tie into the existing advanced electric meters at the building via pulse kits and use the existing communications solution.
- **32** meters will require new advanced metering infrastructure equipment and a communications solution, including all communication hardware and software (to include, but not be limited to, fiber, Ethernet cabling, switches, GBIC/SFP connectors, etc.).
- **5%** of the meters will be required to be able to measure bi-directional flow.
- **10%** of the meters will have a 8" service pipe diameter (outside diameter in inches)
- **20%** of the meters will have a 6" service pipe diameter
- **50%** of the meters will have a 4" service pipe diameter
- **10%** of the meters will have a 3" service pipe diameter
- **5%** of the meters will have a 2" service pipe diameter
- **5%** of the meters will have a 1.5" service pipe diameter

For the networking / communication system, assume:

- The MCBQ AMI system is installed and operating. The Contractor shall be responsible for installing the new meters, running the communication cable to the appropriate connection point / telephone closet, and installing the pulse kits / networking devices/wireless devices, etc. needed to provide the data feed to the MCBQ AMI System.
- The Contractor shall be responsible for investigating the existence and usability of communications infrastructure on site, via site surveys after contract award, for the purpose of consideration for inclusion of existing infrastructure in AMI designs. The government retains the right to impose the requirement that any particular segment of existing communications infrastructure be used, at no additional cost to the government. Assume that for the 20 meters that require a communication solution that:
 - **70%** of the new building meter connections to the MCBQ AMI System will be connected via G-PON
 - **10%** of the new building meter connections to the MCBQ AMI System will be connected via MRAN
 - **10%** of the new building meter connections to the MCBQ AMI System will be connected via ASDL Modem
 - **10%** of the new building meter connections to the MCBQ AMI System will be connected via Wireless.
- The Contractor shall develop a cost per wireless communication for a meter to the central data management system in the event that additional wireless devices are needed to satisfy the requirements of this contract.

10. ACRONYMS USED IN SECTION C:

Acronym	Description
AAS	Audio Assessment System
ACS	Access Control System
AMI	Advanced Metering Infrastructure
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATM	Asynchronous Transfer Mode
BACnet	Building Automation and Control Networking Protocol
CAD/RMS	Computer Assisted Dispatch/Records Management System
CCOC	Command and Control Operations Center
CCTV	Closed Circuit Television
CDRL	Contract Data Requirements List
CFR	Code of Federal Regulations
CIRCUITS	Centralized and Integrated Reporting for the Comprehensive Utilities Information Tracking System
CM	Configuration Management
CMS	Configuration Management System
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
COR	Contracting Officer Representative
COTS	Cost Off the Shelf
CPU	Central Processing Unit
CT	Current Transformer
CUBIC	Computerized Utilities Billing Integrated Control
DAA	Designated Approval Authority
DADMS	Defense Application and Database Management System
DAS	Data Acquisition System
DDC	Direct Digital Control
DID	Data Item Description
DIS	Data Integration System
DoD	Department of Defense
EIA	Electronic Industries Alliance
EM	Emergency Management
EMCS	Energy Management & Control System
EMO	Emergency Management Office
EMR	Electromagnetic Radiation
EPAct05	Energy Policy Act of 2005
ESS	Electronic Security Systems
FACMCS	Facilities Monitoring and Control Systems
FDDI	Fiber Distributed Data Interface
FOS	Family of Systems
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFM	Government Furnished Material
GFP	Government Furnished Property
GIG	Global Information Grid
GIS	Geographic Information System

GOTS	Government Off the Shelf
HERF	Hazards of Electromagnetic Radiation to Fuel
HERO	Hazards of Electromagnetic Radiation to Ordnance
HERP	Hazards of Electromagnetic Radiation to Personnel
HVAC	Heating, Ventilation and Air Conditioning
IA	Information Assurance
IATO	Interim Authority to Operate
IDIQ	Indefinite Delivery Indefinite Quantity
IEEE	Institute of Electrical & Electronics Engineers
ILP	Independent Local Processor
ILS	Integrated Logistics Support
IOC	IO Controller
ISO	International Standards Organization
IT	Information Technology
LAN	Local Area Network
LAN	Local Area Network
LSI	Lead Systems Integrator
MAN	Metropolitan Area Network
MCS	Metering and Control System
MDM	Meter Data Management
MOSA	Modular Open Systems Approach
MRS	Meter Reading System
MSDS	Material Safety Data Sheets
MTS	Maintenance Tracking System
MV-90	Itron data collection/management software
NAVFAC	Naval Facilities Engineering Command
NCE	Net-Centric Environment
NDA	Non-Disclosure Agreement
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NFESC	Naval Facilities Engineering Service Center
NFPA	National Fire Protection Association
NICC	Navy Integrated Call Center
NIST	National Institute for Standards and Technology
NMCI	Navy and Marine Corps Intranet
NMCI	Navy Marine Corps Intranet
ODAA	Operational DAA
OS	Operating System
OSHA	Occupational Safety and Health Act
OTS	Operational Training System
PC	Personal Computer
PCB	Printed Circuit Board
PE	Professional Engineer
PIT	Platform IT
PITI	Platform IT Interconnect
PM	Program Manager
POA&M	Plan of Action & Milestones
POC	Point of Contact
POV	Privately Owned Vehicles
PPE	Personal Protective Equipment
PPE	Personal Protective Equipment

PSE	Physical Security Equipment
PT	(=VT) Potential (= Voltage) Transformer
QA	Quality Assurance
RAM	Random Access Memory
RFP	Request for Proposal
RMS	Records Management System
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SCIF	Sensitive Compartmented Information Facility
SIP	System Identification Profile
SOW	Statement of Work
SQL	Structured Query Language
STIG	Security Technical Implementation Guides
TAVMS	Total Asset Visibility Management System
TCP/IP	Transmission Control Protocol / Internet Protocol
TDL	Technical Direction Letter
TDP	Technical Design Package
TIC/M	Toxic Industrial Chemical/Material
TM	Technical Manuals
UFC	Universal Facilities Criteria
UL	Underwriters Laboratories
USC	United States Code
WTS	Warranty Tracking System

SECTION J. APPENDICES

Appendix A. Drawing Requirements

Appendix B. MCBQ Map

Appendix C. Metering Schedule

Appendix D. CIRCUITS UA Naming Standard

Appendix E. Data Acquisition System (DAS) Formatting

Appendix F. Wireless Requirements

Appendix G. References

Appendix A. Drawing Requirements

All drawings shall be submitted in both hard copy and digital formats. Hard copies shall be size "D", and digital versions shall be submitted in AutoCAD 2006, AutoCAD 2011, and PDF formats. Drawings shall be prepared to accurate size with a scale indicated unless other form is required. Drawings shall have dark lines on a white background. Copies of each drawing shall have the following information clearly marked there on:

- a. job name which shall be the general title of the contract drawings
- b. date of the drawings and revisions
- c. name of contractor
- d. name of sub-contractor
- e. name of the item, material, or equipment details thereon
- f. submittal number (e.g. first submittal to last submittal) in a uniform location adjacent to the title block
- g. specification section to which submittal applies
- h. government contract number shall appear in the margin immediately below the title block

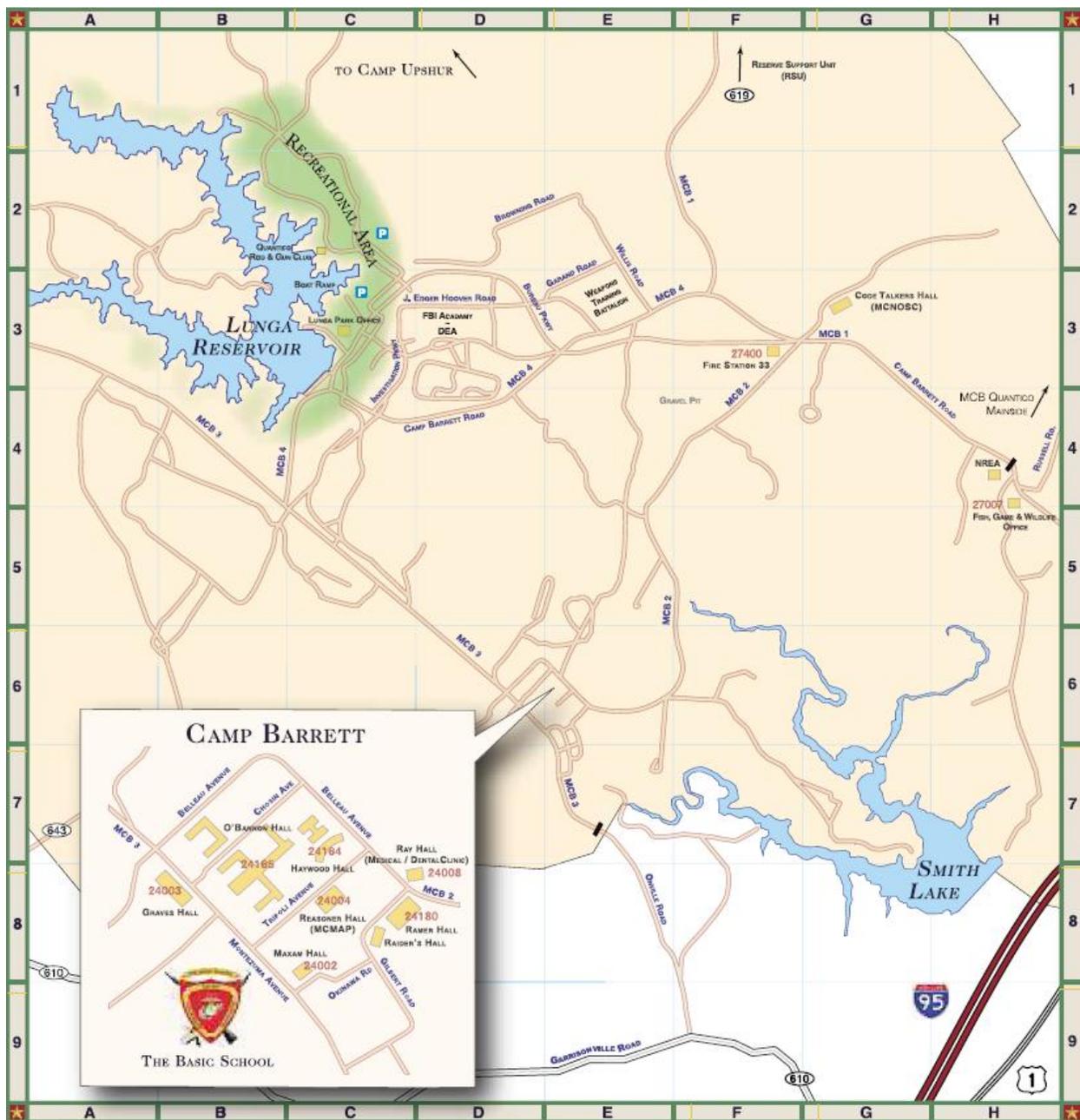
Drawings shall be numbered in a logical sequence. Contractor may use his own number system. A two inch square blank space shall be reserved on the right hand side of each sheet for the government disposition stamp.

The Contractor shall maintain a revised set of drawings, elementary diagrams and wiring diagrams of all newly installed AMI components to be used for "as-built" drawings. This set shall be accurately kept up to date by the Contractor with all changes and additions to the configuration and shall be delivered to the Government with the final acceptance test report. The Contractor shall deliver these drawings to the Government for review and approval. If the as-built work is not complete, the Contractor will be so advised and shall complete the work as required. After completion of installation and Government acceptance of installed equipment, the Contractor shall submit as-built drawings to the Contracting Officer or his/her designated representative in accordance with agency standards. Drawings shall contain all data pertinent to construction including a bill of material. Details shall be provided to clarify pipe burial methods, elevations, etc. All as-built drawings will be stamped by Registered Licensed Professional Engineer. Additionally, one set of AutoCAD drawings shall be provided with the final as-built submittal.

Appendix B. MCBQ Map



HQMC No. QU1239M
ADVANCED METERING INFRASTRUCTURE, PHASE 4: WATER METERING
FOR THE PUBLIC WORKS BRANCH



Appendix C. Metering Schedule

Building #	Bldg Name	Area (SF)	Year Built	Total = 132 Qty. Water Meters (#)
2047	SEWAGE PUMP STATION (SPS 2)	0	2004	1
-	FBI MAIN	-	-	2
2129	OCS HEAD FACILITY	1006	2003	1
3260A	OCS 202K HQ HEAD FACILITY	1080	2008	1
2634	WEIGHT ROOM	1200	1949	1
2635	RECREATION LOUNGE	1200	1949	1
5004	OCS LATRINE	1300	2002	1
5133	AIRCFT WASH RACK PAVE	1467	1964	1
2656	LATRINE	1520	1968	1
3056	EXCH CUST OPER CAR WASH	1589	1968	1
27537	ROD & GUN CLUBHOUSE	1800	1971	1
2351	YOUTH CENTER	1811	1950	1
4320A	ASHURST MOD	1996	1983	1
2633	TROOP HOUSING EMERG	2080	1949	1
659	SEWAGE TREATMENT CONTROL	2394	1976	1
27201	ENLISTED CLUB	2400	1953	1
2657	WATER TREATMENT FAC BLDG	2915	1953	1
26107	LATRINE	3000	1952	1
24144	RANGE OPERATION	3098	1952	1
2015	ADMIN BUILDING	3178	1964	1
660	SEWAGE TREATMENT PROCESSING	3339	1976	1
2201	HEATING PLANT	3484	1940	1
658	SEWAGE TRTMNT PLNT ADMIN BLD	3725	2000	1
27400	FIRE STATION	3750	1984	1
24162	HEATING PLANT	3840	1958	1
24115	ADMINISTRATIVE OFFICE	4000	1952	1
24128	ACADEMIC INSTRUCTION BLDG	4000	1952	1
24143	ENLISTED MENS CLUB	4000	1952	1
26101	GENERAL PURPOSE WAREHOUSE	4000	1952	1
26135	GYMNASIUM	4000	1952	1
2208	SYSCOM TRAILERS #2 (HP)	4320	2008	1
24010	AUSTIN HALL	4624	1987	1
24150	PUMPING STATION, POTABLE WAT	4698	1953	1
69	FIRE STATION	4848	1935	1
26114	CANIDATES CLUB	5220	1952	1
2078	BATH HOUSE	5538	1947	1
1999	TELEPHONE EXCHANGE	5865	1969	1
2045	FIRE STATION	6650	1942	1
24002	MAXAM HALL	6870	1972	1
3048	EXCHANGE SERVICE OUTLET	7452	1989	1
27200	BEQ	7500	1954	1
27218	BEQ	7500	1959	1
3097	ADMIN BLDG	8400	1944	1

2204	ADMIN BLDG	9142	1942	1
3312	YOUTH CENTER	9600	1999	1
3	MUSEUM	9936	1920	1
3500B	PACKAGE STORE	10179	1987	1
1792	BASE STABLES	10240	1975	2
2080	AUTO HOBBY SHOP	10643	2006	1
2300	TECOM HQ ANNEX	10933	2009	1
24004	REASONER HALL	11332	1971	1
24005	LOCATION EXCHANGE	11794	1971	1
3399	MARATHON FACILITY	12100	2005	1
2600	ENL DINING FAC	12496	1947	1
2201A	ADMIN STORAGE (MISC)	12648	1942	1
24193	GONZALES HALL (H&S BN HQ)	13126	2006	1
5172	AIRCRAFT FIRE/ RESCUE STATIO	14638	2004	1
2207	OPQ BFOR 50 ENL	14744	1949	1
3229	SHUCK HALL (BEQ)	15631	1956	1
3083	YECKEL HALL (OCS AIB)	16100	2005	1
3086	MCCTA	16104	1943	1
3087	SPMAGTF	16104	1943	1
3088	CANDIDATE BARRACKS	16104	1943	1
3089	ADMIN BLDG	16104	1943	1
3101	BAKERY	16550	1945	1
2100	HEADQUARTERS, MCAF	17070	1941	1
3034	EXHIBIT FAB. SHOP/MUSEUM	17490	1940	1
5000	BOBO HALL	19197	1983	1
2202	ADMIN OFFICE	19973	1941	1
2000	BRUCE HALL	21289	1976	1
3311	CHILD CARE CENTER	22850	1996	1
2102-A	HANGAR 2102A	22860	1975	1
2042	BARRETT HALL	23518	1941	1
3077	SNCOA AIB	25467	2009	1
2085	EDSON HALL	26097	1954	1
2102	HANGAR 2102	26450	1935	1
2103	HANGAR 2103	26450	1935	1
2104	HANGAR 2104	26450	1935	1
2032	ADMIN BLDG/MARCORSYSCOM	27099	1940	1
2105	HANGAR 2105	29700	1934	1
27266	WHALING HALL (BEQ)	30450	1989	1
2048	DUNLAP HALL	30568	1965	1
2010	ADMINISTRATIVE OFFICE	30725	1929	1
5166	TRNG MOCKUP CRASH FIRE&RESC	31415	1993	1
3036	GEN WAREHOUSE,MARINE CORPS	31556	1941	1
24009	HEAVY VEH COMM FAC (COX)	32140	1985	1
27250	WTBN FLEET ARMORY	33984	2004	1
3035	ADMIN BLDG	34860	1940	1
204034	SYSCOM PM EPV	35456	2010	1
3247	CONFINEMENT FACILITY	37560	1973	1
27410	MCNOC (CODETALKER HALL)	41979	2007	1
3308	BURROWS ELEMENTARY SCHOOL	42442	1990	1

2043	ADMINISTRATIVE BLDG	42695	1941	1
26100	MC RESERVE TRAINING CENTER	43000	2006	1
3301	RUSSELL ELEMENTARY SCHOOL	43299	1953	1
2033	HOCHMUTH HALL	45332	1940	2
2011	GENERAL WAREHOUSE, MARINE COR	47628	1929	1
4320	ASHURST ELEMENTARY SCHOOL	49718	1962	1
17	HARRY LEE HALL	50339	1935	1
2666	SEWAGE DISPOSAL PLANT	52445	1951	1
2101	HANGAR 2101	52580	1941	1
2082	ELLIS HALL	52651	1952	1
3044	MCX SERVICE FACILITY	53374	1979	1
2121	HMX-1 WAREHOUSE	57000	1942	1
2009	GEN WAREHSE, MARINE CORPS	58650	1939	1
1001	GENERAL WAREHOUSE, MARINE COR	62067	1919	1
24164	HEYWOOD HALL	63940	1958	1
2133	AIRCRAFT MAINTENANCE HANGER	66665	2008	1
2076	BRECKINRIDGE HALL	70350	1939	1
2013	AUTO VEH SHOP	73001	1929	1
3076	JORDAN HALL (SNCOA BEQ)	73237	2006	1
2046	KELLY HALL (BEQ)	73647	2002	1
2074	PRUITT HALL (BEQ)	74182	2002	1
24194	MANION HALL (TBS BOQ)	77084	2009	1
3307	QUANTICO MIDDLE/HIGH SCHOOL	80418	1962	2
2106	BACHELOR ENLISTED QUARTERS	80440	1940	1
2008	ADMINISTRATIVE OFFICE	81067	1931	1
2006	YALE HALL	82072	1931	1
3259	PRIMARY CARE CLINIC-QUANTICO	101000	2000	1
24003	GRAVES HALL	109000	1973	1
2200	ADMIN BUILDING	114302	1939	1
2034	LITTLE HALL	121550	1940	1
24192	BURK & ANDERSON HALL	178356	2007	1
2134	AIRCRAFT MAINTENANCE HANGER	211257	2008	1
24165	O'BANNON HALL	225610	1958	1
2089	SEWAGE TREATMENT PLANT	382117	1957	1
1744	BUTLER STADIUM	445500	1926	1
3380	CREDIT UNION	-	-	1
* This list is subject to change, but the quantity of meters will not change for the base contract.				

Appendix D. CIRCUITS UA Naming Standard

The purpose of this document is to specify naming standards for meters and facilities to be used in CIRCUITS UA (currently CUBIC and hereafter called UA in this document) to facilitate standardization in data transfers to and from Single Platform Maximo (SPM), GIS, iNFADS, CIRCUITS MDM (called MDM in this document), CIRCUITS UP (called UP in this document), and CIRCUITS ER (called ER in this document). Standardization of meter and facility names in UA for all FECs will allow:

- Data to be shared with SPM, GIS, iNFADS, MDM, and ER
- Easily identifiable meter and facility names for front-end users and customers of UA, SPM, GIS, MDM, and ER.
- Unique names across all FECs.

Meter Naming Standards

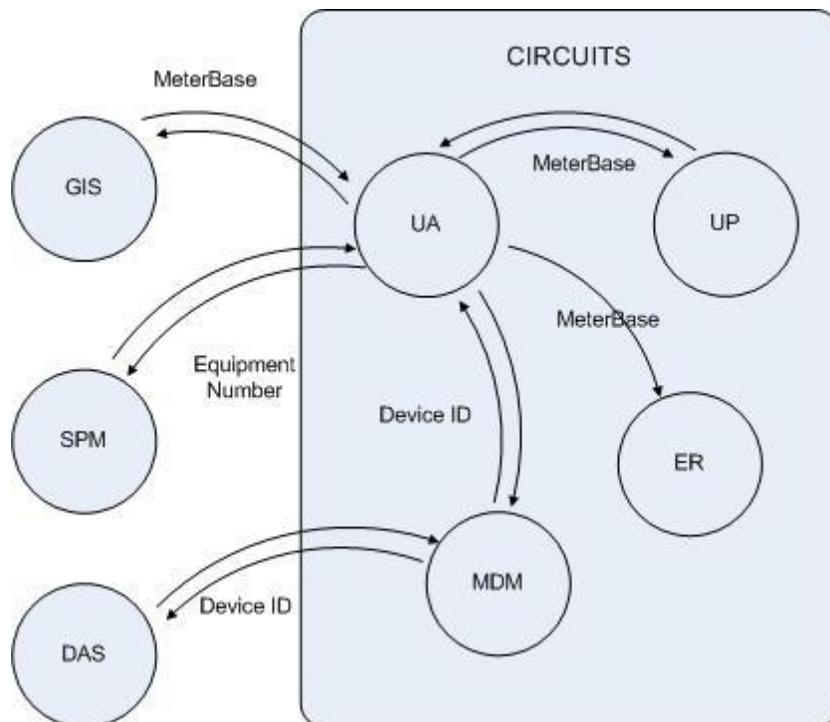
Meters will be identified in UA by their relationship to a MeterBase. A MeterBase can be thought of as the “can” or “socket” into which a physical meter is installed in the distribution system. MeterBases will remain fixed in the distribution system and physical meters, fixed estimate meters, and reference estimate meters will be associated to them as they are installed and removed over time. Fixed and reference estimate meters will be called logical meters from now on in this document. MeterBases will replace what is currently thought of as a “meter” in UA. MeterBase Stub (see footnote on page 4) will replace the current notion of “meter” in the graphical and tabular representations of the distribution systems in UA (CUBIC’s Graphical Data Input System (GDIS) and Meter table).

For each MeterBase there will be an associated SPM Meter Location. The SPM team is determining the naming standards for SPM Meter Locations which will be a type of Location in SPM. SPM Meter Location will be an attribute of MeterBase and should not change over time. The MeterBase and the SPM Locations are fixed locations in the field.

Each MeterBase will have one and only one physical or logical meter associated with it at any given point in time. As the physical or logical meters are installed or removed from the MeterBase over time we will track the following identifiers for the physical or logical meter:

- **Serial Number** – *Needed only for physical meters, empty for logical meters.* The manufacturer’s serial number stamped or labeled on the physical meter used as positive identification of the physical meter. Authoritative data source for Serial Number is the physical meter.
- **Device ID** – *Needed only for advanced meters, empty for all other meters.* The identifier programmed into an advanced meter by which it identifies itself in a data transfer (network, electronic, radio, optical, phone line, Power Line Carrier (PLC) and so on...). Meter data will flow from the physical meter to the local Data Acquisition System (DAS) and then from the local DAS to the regional DAS and then to the corporate MDM identified by the Device ID. Authoritative data source for Device ID is the physical meter.
- **Meter Reading ID** – *Needed only for physical meters read on meter reading routes by human meter readers, blank for all other meters. Might use this temporarily as a reference back to the old meter number until the new naming convention is fully implemented and accepted.* The identifier the meter readers use to identify the meter on manually read meter reading routes. For AMI meters this is not needed and can be blank. Authoritative data source for Meter Reading ID is UA.

- SPM Equipment Number – *All physical and logical meters will have this identifier.* SPM’s unique identifying name for the meter. Authoritative source for Equipment Number is SPM.



Data Flow for Meter Naming

SPM Equipment Number will be used to transfer data between UA, SPM, and GIS. SPM is the authoritative data source for meter asset management. Meters are identified by Equipment Number in SPM. All physical and logical meters will be defined in SPM. The reason for defining logical meters in SPM is to assign an equipment number that can be used as a common identifier with GIS and UA for the meter equipment itself (different from the MeterBase which is just the “can” the equipment happens to be installed in).

MeterBase will be used to link UA data to GIS, ER, UP and MDM. At any point in time a MeterBase will have a one-to-one relationship with a meter. In other words, as physical meters are changed in the field or logical meters are defined in allocations they will be associated with a fixed MeterBase in the UA distribution system representation (currently CUBIC’s GDIS) and GIS. There can be only one meter (physical or logical) associated with a MeterBase at a time but we will track the history of physical and logical meters associated with MeterBases over time.

The MDM also uses MeterBase for the end user (customer, utilities managers, non-meter shop people and so on...) interface to the MDM. However the main identifier for advanced meters in MDM is Device ID.

Device ID Naming Standard

Device ID will be used to transfer meter data from physical IP addressable meters and Meter Interface Units (MIU’s) to local DAS, from the local DAS to the Regional DAS, and then to the corporate MDM, and from the corporate MDM to UA.

Device ID's are associated with IP addressable devices only. This will usually be an electric meter or in some cases a MIU on a mechanical meter.

Device ID must be unique across all FECs in the corporate MDM. Therefore the FECs shall program the device IDs into the meters beginning with the unique FEC Code to prevent duplicate device IDs coming into the MDM from different FECs. Additionally FECs shall program a complex (individual base) identifier into the Device ID for further identifying and sorting advantages. This is particularly important when FEC's have multiple FEAD's administering the AMI contract at different complexes. Using a complex identifier allows the FEC to give a block of Device ID's to a FEAD at a complex and know that there will be no duplicates with another FEAD's Device ID's at another complex.

Device ID has to be numeric considering the fact that some solid state meters cannot be programmed with alpha characters. Standardized Device ID's shall be 9 characters. If a vendor requires a longer Device ID to be programmed into the meter we will pad the Device ID to the left with zeros. In this case the standard described herein would apply to the last 9 characters of the Device ID.

The goal of a Device ID standard is to assign blocks of Device ID's to FECs that insure that each Device ID in the MDM are both unique and identifiable across all FECs.

The Device ID naming standard is:

FFBBnnnnn

Where:

FF = a two number FEC ID from the following list:

- 11 – MidAtlantic
- 12 – Southeast
- 13 – Washington
- 14 – Midwest
- 15 – Northwest
- 16 – Southwest
- 17 – Hawaii
- 18 – Marianas
- 19 – Far East
- 20 – Europe/SWA

BB = a two number designator for base or complex:

- 00 – Naval Amphibious Base Coronado
- 01 – Naval Station San Diego
- 03 – San Clemente Island
- 05 – Naval Medical Center San Diego
- 06 – FISC, Broadway Complex
- 07 – Point Loma Complex
- 08 – Naval Air Station North Island
- And so on...

Note that the existing allocations complex numbers from UA were used in this example. The technical users of the AMI, DAS, Regional DAS, and MDM will instantly recognize which base a

meter is on within the context of their FEC if this standard is used. If a FEC uses alpha characters in their current UA complex numbers than the FEC will have to develop list of numeric complex codes.

nnnnn = the unique identifier for the meter for the FEC and base on which it is physically installed.

Example: **1601nnnnn** - a Device ID for NAVFAC Southwest on Naval Station San Diego. nnnnn would be the unique identifier for the meter at this base.

When an AMI project is being installed a FEC could give the contractor a block of Device ID's for each complex to program into the meters. For example: A thousand new meters are being installed in an AMI project for NAVFAC Southwest at Naval Station San Diego. The contractor would be told to program the meters with Device ID's from **160101001** to **160102000**. The Device ID's in this block have never been used in the Navy so we would be guaranteed to get unique ID's and we would always know that these are for NAVFAC SW and at Naval Station San Diego. When the contractor is installing meters at another base for NAVFAC Southwest, possibly administered by a different FEAD office, the contractor can be given a separate unique set of Device ID's for that complex. There would be no chance of the contractor inadvertently assigning the same Device ID to two different meters at two different complexes or at two different FEC's for that matter.

Note also that the same navy base identifiers could be used at different FEC's since we already have the FEC identifier to make the number unique. For example: Midlant could use "01" for Sewell's Point since having the "11" FEC identifier would make it a unique number anyway. All Sewell's Point Device ID's would then have the format **1101XXXXX**.

If an advanced meter is removed from one base and installed at a different base its Device ID would have to be reprogrammed for the new location.

If an advanced meter leaves the system its Device ID would not be reused for another meter.

Legacy meters that feed the MDM will keep the programmed Device ID that they already have. TWACS Device ID are assigned at the factory and are 12 characters long. They will therefore never duplicate an AMI programmed Device ID. Other known legacy systems also have Device ID's longer than 9, there should be no chance of an AMI programmed Device ID overlapping with a legacy Device ID (famous last words).

MeterBase Naming Standard

MeterBase will be the field that end-users (from allocation technicians to customers) use to look up meter data in UA¹, UP, ER, MDM and GIS. Therefore the MeterBase should:

- Be readable by lay users
- Give as much information as possible to the end user.
- Be unique across all FECs.

Logical meters will have MeterBases.

The naming standard for MeterBase is:

XX_LL_CCC_TT_<facility number>_S

Where:

XX = Two letter FEC identifier. (Letters are more easily recognizable to lay people than the numbering scheme we must use for Device ID)

ML – MidAtlantic
SE – Southeast
WA – Washington
MW – Midwest
NW – Northwest
SW – Southwest
HI – Hawaii
MI – Mariana Islands
FE – Far East
EU – Europe/SWA

LL = The CUBIC complex code. This may differ from the FM Location code. A CUBIC complex code denotes a distribution system.

CCC = Two or three character utility service code.

AIR – Compressed Air
BG – Backup Generation
CR – Condensate Return
CW – Chilled Water
DW – Demineralized Water
EL – Electric
FW – Water
HPA – High Pressure Air
IW – Industrial Waste
LPA – Low Pressure Air
NG – Natural Gas
PR - Propane
SE – Sewage
ST – Steam
STC – Steam, Cogen
STP – Steam, Produced
SW – Salt Water
NPW - Non-potable Water
HDL – Horizontal Day Lighting
VDL – Vertical Day Lighting

TT = Two character MeterBase location type identifier.

BL – Building (square footage based utility consumer)
PR – Pier
QW – Quay Wall
PD – Pad/Unit Substation

SS – Switching Station/Substation/Circuit
ST – Non-Building Structure (non-square footage based utility consumer)
PM – Portable
PU – Purchased (from a vendor, should link to UP, cannot contain a dash)
SH – Shadow or Pseudo-shadow
PP – Plant Production
RP – Renewable Production
CG – Customer Generation
GC – Generation Credit
LL – Line Loss

<facility number> = The facility number that the meter feeds as it is identified on the facility or commonly known. If the meter is used to monitor usage of an entire pad of metered or unmetered feeds or the usage on a circuit than the facility number should be the pad or circuit identifier as it is commonly known.

S – Serialization number starting with **_1** for the first instance (there is always a one to avoid confusion if there is a two part facility number with the two parts separated by an underscore) within a **XX_LL_BB_CCC_TT_<facility number>** grouping. If there is a second MeterBase for the same **XX_LL_BB_CCC_TT_<facility number>** grouping then that serialization will be **_2** and a third Meter Base for the same grouping will be **_3** and so on.

Note: There can be no dashes, spaces, or other special characters except underscores in the MeterBase name. Use all upper case.

Examples:

A MeterBase for an electric meter at NAVFAC MW on the Great Lakes main special area (blank) at building 11 would be:

MW_01_EL_BL_11_1 Note: first or only meter gets the serialization is “_1”

A second MeterBase at building 11 would be:

MW_01_EL_BL_11_2 Note: for the second meter at this location serialization is “_2”

A building number with an extension such as “A” or “1” would be:

MW_01_EL_BL_11_1_1 (where the building number is 11-1)

For a structure at NAVFAC SW Naval Station San Diego Dry Side named “P71” (NFADS Special Area Code DS) :

SW_01_EL_ST_P71_1

For a water riser at a pier at NAVFAC NW Naval Station Bremerton named pier 1 (NFADS Special Area Code BR):

NW_43_FW_PR_1_1 (pier 1)

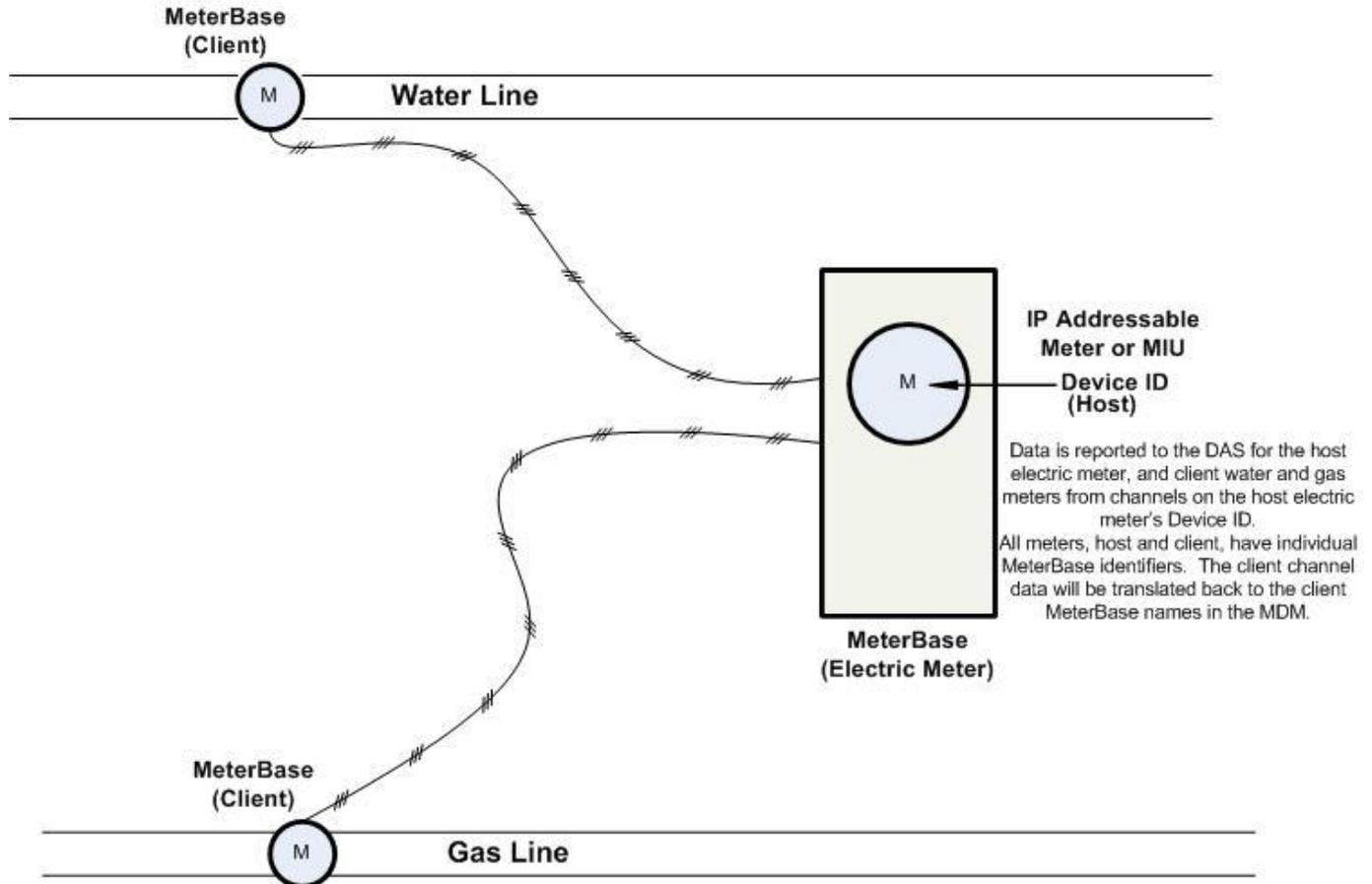
Note: for piers you could also indicate mound or mound and breaker if metering to that level for example:

NW_43_EL_PR_1_A_01_1 for Pier 1, Mound A, Breaker 01.

A physical label specifying the MeterBase should be attached to a location near each meter. For electric meters this can be the meter base that stays in place when the physical meter is replaced. For mechanical

meters this should be a location on the flange or pipe that stays in place when the meter is replaced. The RFTOP for each FEC should specify the labeling media.

Relationship between MeterBase and Device ID:



Note: If a meter has an IP addressable MIU than it will have a Device ID and report the meter data directly to the DAS.

When a physical meter is removed from a meter base its data will be archived in the DAS - for electric meters, it would be archived under its unique Device ID, and for mechanical meters it would be archived under its Serial Number.

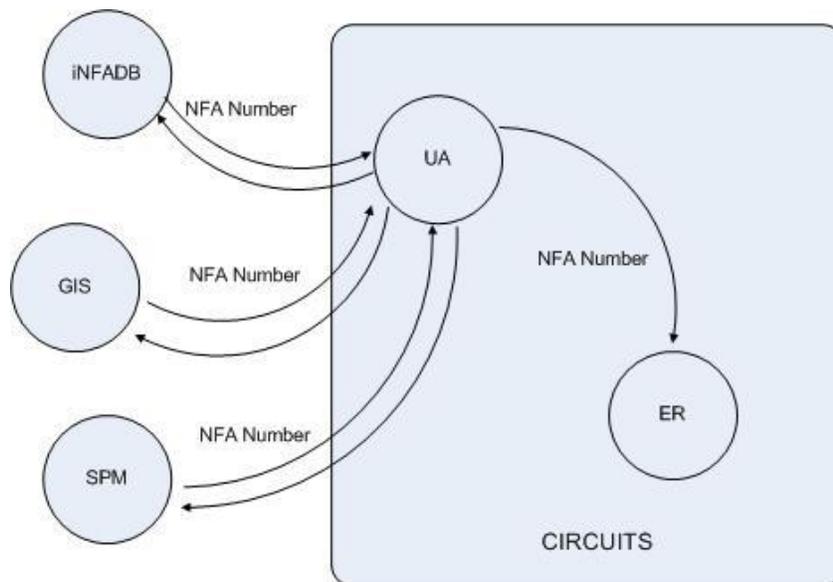
Facility Naming Standards

internet-Navy Facility Assets Data Store (iNFADS) is the Real Property Inventory (RPI) for the Department of the Navy (DoN). This enterprise system includes all of the data necessary to support RPI, Planning, and Acquisition for the Navy and Marine Corps. Real Property is identified in iNFADS by an identifier called Navy Facility Asset (NFA). The Department of Defense (DoD) maintains a database of real property for the entire DoD called the Real Property Unique Identifier Registry (RPUIR). The RPUIR assigns an identifier called Real Property Unique Identifier (RPUID) to all real property assets in the DoD. Soon iNFADS will identify real property assets using the RPUID in addition to the NFA.

Currently facilities in UA (a small subset of the DoD's real property assets) are identified by the facility number or name with which it was labeled by the base personnel when it was built. Typically it is a "building number" which was assigned chronologically as the base was being built. Examples: 1, 12, 272, etc... This is the name the occupants of the facility, the public works staff, and all the other residents of the base use to identify the facility. In UA this identifier is called Facility Number.

Facilities will be identified in UA as the local Facility Number (FACNO123 in CUBIC) but UA will also identify facilities by NFA number and RPUID.

UA will communicate to all other data sources, iNFADS, SPM, GIS, and ER by NFA number since RPUID is not widely used yet or fully implemented in iNFADS. Currently SPM, GIS, and iNFADS are all using NFA number to uniquely identify facilities. We will store RPUID in UA for future use.



Data Flow for Facility Naming

If a facility doesn't have a NFA number a "dummy" NFA number will be automatically generated by UA. This should only be used of logical facilities which will never appear in NFADS. An example of a valid logical facility is Non-Revenue Utilities (NRU) which used to be called line loss (LL) or unaccounted for utilities (UFU) facilities. The "dummy" NFA number will be as follows:

CUAXX<serial number, autogen>

Where:

CUA = CIRCUITS UTILITIES ALLOCATION

XX = Two letter FEC identifier

- ML – MidAtlantic
- SE – Southeast
- WA – Washington
- MW – Midwest
- NW – Northwest

SW – Southwest
 HI – Hawaii
 MI – Marianas Islands
 FE – Far East
 EU – Europe/SWA

<serial number, autogen> is an automatically generated serial number

There can be many UA facilities with the same NFA number.

There cannot be one facility with multiple NFA numbers. If this is found it is an error in iNFADS that must be fixed.

At this time we are not going to address a standard for UA Facility numbers. Instead we are going to address getting all FECs to have NFA numbers for all facilities and to eliminate the "bucket".

Suggested naming standards for UA facility numbers

Facility Type	FACNO1	FACNO2	FACNO3	NFA_ID or CUA
NFADS facility	Building Number as it is known in the field	Blank or extension such as "A"	Blank	NFA_ID
NRU (aka line loss)	NRU	<unique identifier>	Blank	CUA
Balance Point	LABEL	<unique identifier>	Blank	CUA
Irrigation	Building Number the system is fed from	IRRIG	Blank	NFA_ID of the building the system is fed from or the main building the system irrigates
Street Lights	STLTS	<unique identifier>	Blank	NFA_ID of the installation's street lighting system
Piers - Electrical	Pier Number (without the word PIER!)	Mound Identifier (as it is known in the field)	Breaker Identifier (as it is known in the field)	NFA_ID of the pier for all the breaker breakouts
Piers – Mechanical	Pier Number (without the word PIER!)	Riser Identifier (as it is known in the field)	Blank	NFA_ID of the pier for all the riser breakouts
Temporary Structures	<unique identifier>	TEMP	Blank	CUA

ER interface - The facility number in ER will be the looked up in the CIRCUTIS NFADS table that is replicated once a day from the NFADS database based on the NFA number in the UA data.

SPM interface – NFA number looks up the SPM Location Identifier.

Website to get iNFADS data without a log on: <https://nsi.navfac.navy.mil> and click the query button.

Ship Naming Standards (In Progress)

We are not aware of an authoritative data source for ship names.

There are several groupings of ships that connect to piers at Navy bases.

- AF – Atlantic Fleet
- PF – Pacific Fleet
- MSC - Military Sealift Command
- NR- Navy Reserve
- CG - Coast Guard
- FN - Foreign Navy
- CT - Contractor (barges, service connections)

There can be duplicate names across these groups.

Proposed standard – Always use the full name of the ship or contractor in all CAPS with no prefix (a prefix is USS, USNS, HMS, etc.) followed by a dash and the code for the grouping with which the ship or contractor is associated.

Examples:

RONALD REGAN – PF

For foreign navy include the country in parenthesis after the ship name.

Appendix E. Data Acquisition System (DAS) Formatting

DAS Channel Mapping; Data to be transmitted to DAS

The following table provides channel numbering for the metering data, alarms, and events transmitted to and stored in the DAS database. Each meter is identified by a unique MeterBase. Data from the meter is transmitted to the DAS; and from the DAS transmitted to the MDM labeled with the MeterBase.

The following Channel numbering is the same for that will be used in the MDM.

DAS Channel Number	Metering Data Type	Note / Comment
101	KWHr Delivered	15 min use - LP Interval
102	KVARHr Delivered	15 min use - LP Interval
103	KWHr Received	15 min use - LP Interval
104	KVARHr Received	15 min use - LP Interval
110	Water Consumption – meter 1	LP Interval - thru KYZ pulses
111	Water Consumption – meter 2	
112	Water Consumption – meter 3	
120	Gas Consumption – meter 1	LP Interval - thru KYZ pulses
121	Gas Consumption – meter 2	
122	Gas Consumption – meter 3	
130	Steam Consumption – meter 1	LP Interval - thru KYZ pulses
131	Steam Consumption – meter 2	
132	Steam Consumption – meter 3	
140	Avg Instantaneous Demand (KW)	Average during LP interval
150	Temperature (Steam)	
160	Pressure	
201	Total KWH Delivered	Total cumulative register since installation ***
202	Total KVARHr Delivered	Total cumulative register since installation
203	Total KWH Received	Total cumulative register since installation ***
204	Total KVARHr Received	Total cumulative register since installation
211	Rate A KWH Delivered	Total cumulative register since installation ***
212	Rate B KWH Delivered	Total cumulative register since installation ***
213	Rate C KWH Delivered	Total cumulative register since installation ***
214	Rate A KWH Received	Total cumulative register since

		installation ***
215	Rate B KWH Received	Total cumulative register since installation ***
216	Rate C KWH Received	Total cumulative register since installation ***
301	Maximum Demand Delivered	
302	Rate A Maximum Demand Delivered	
303	Rate B Maximum Demand Delivered	
304	Rate C Maximum Demand Delivered	
310	Net KWHr	
311	Net KVARHr	
401	Power Outage Count	Total
402	Date/Time of Last Power Outage	
501	Average Power Factor	Average during LP interval
502	Total Harmonic Distortion	Instantaneous
503	Average Voltage of A,B,C (V)	Average during LP interval
504	Average Current of A,B,C (A)	Average during LP interval
601	Voltage Magnitude for Phase A	Instantaneous
602	Voltage Magnitude for Phase B	Instantaneous
603	Voltage Magnitude for Phase C	Instantaneous
604	Voltage Angle for Phase A	Instantaneous
605	Voltage Angle for Phase B	Instantaneous
606	Voltage Angle for Phase C	Instantaneous
607	Current Magnitude for Phase A	Average during LP interval
608	Current Magnitude for Phase B	Instantaneous
609	Current Magnitude for Phase C	Instantaneous
610	Current Angle for Phase A	Instantaneous
611	Current Angle for Phase B	Instantaneous
612	Current Angle for Phase C	Instantaneous
613	Instantaneous Power	Instantaneous
621	Client 1 KWHR DEL	
622	Client 1 KVARHR DEL	
623	Client 1 KWHR REC	
624	Client 1 KVARHR REC	
631	Client 2 KWHR DEL	

632	Client 2 KVARHR DEL	
633	Client 2 KWHR REC	
634	Client 2 KVARHR REC	
641	Client 3 KWHR DEL	
642	Client 3 KVARHR DEL	
643	Client 3 KWHR REC	
644	Client 3 KVARHR REC	
701	Voltage Sag	Event to trigger an alarm
702	Voltage Swell	Event to trigger an alarm
703	Low PF	Event to trigger an alarm
704	High Harmonic	Event to trigger an alarm
705	High Neutral Current	Event to trigger an alarm
706	Meter Reporting RAM Failure	Event to trigger an alarm
707	Meter Reporting Low Battery	Event to trigger an alarm
708	Loss of Any Phase	Event to trigger an alarm
709	Number of Meter Power Down Exceeds One	Event to trigger an alarm
710	Reverse Power Observed on Any Phase	Event to trigger an alarm

Table (3): DAS Channel Numbering

*** It's recommended to "zero-out"(aka "reset") the meter during installation however, the FEC may prefer to program the display so that it corresponds with the replaced meters registers. However the FEC's want to incorporate the new meters must be coordinated with CUBIC (aka CIRCUITS UA) to ensure billing consistency.

Additional notes:

- Demand "automatic self-reset" takes place once a month: at first midnight of each month.
- TOU displays will be programmed even if only one TOU rate is in effect. In such case, the effective rate would be Rate A; and other rates (B, C, D) will show zero.
- However the meter multiplier (CT Ratio, PT Ratio) will be 'programmed' as 1 (to measure and indicate the 'secondary' values), the real multipliers will be shown on Display # 33.
- KWHr and KVARHr values will be shown with 2 decimal digits (e.g. XX.XX or XXXXX.XX, no need for leading zeros)
 Demand (KW) values will be shown with 3 decimal digits (e.g. XX.XXX or XXXXX.XXX, no need for leading zeros)
- Voltage and Current values will be shown with 2 decimal digits (e.g. XX.XX or XXX.XX, no need for leading zeros)
- It is the government's desire to, if possible, validate the "total KWHr and KVARHr" registers against total values resulted from load profile information by the DAS (e.g. Channel 201 against Channel 101 of the DAS).

DAS Output Data Format

The following is the required ASCII export format from the DAS to an MDM system

Overview

The CIRCUITS Meter Data Management (MDM) module is the primary data repository for enterprise utilities meter data. The MDM consumes data from multiple collection system that include, but are not limited to, AMI, SCADA, DDC and other ICS Systems. Data can be directly reported on or exported for use external to the MDM. This data is then used for utilities billing/allocation, reporting and analysis.

Requirements

The current MDM module core COTS product has functionality to consume multiple data formats that including HHF, MDEF, ASCII text and XML among others.

In order to facilitate a common import format that can be provided to integrators and collection system implementers, this document provides a common, structured text based format for providing data to be consumed by the MDM.

MDM ASCII Format Requirement

The following is a description of the required export format for an ASCII export format from a DAS to an MDM:

Required Fields:

The following fields must be exportable from the Collection System into the ASCII Export Format:

< Meter/DeviceID_OR_Service/MeterPointID >

- Description: An indicator of whether the “Unique Identifier” is a *Meter/Device ID*, or a *Service/Meter Point ID*.
- Allowed Values: {M,S}; M = *Meter/Device ID*, S = *Service/Meter Point ID*.

***NOTE #1: *Meter/Device ID* is the preferred method for importing data, *Service/Meter Point ID* should only be used if *Meter/Device ID* cannot be Identified.**

***NOTE #2: Do not mix *Meter/Device ID* and *Service/Meter Point ID* data in the same export file.**

<Unique_Identifier>

- Description: Unique Device ID of the *Meter/Device ID* or *Service/Meter Point ID*
- Allowed Values: Variable Length alpha-numeric up to 100 characters (Generally Device IDs will consist of numeric values only by convention and direction from the *CIRCUITS Meter Naming Standard* and the *Navy Ami Call for Consistency*).

<Date>

- Description: Date of the reading recorded in the time zone that the meter or device was configured in the MDM.
- Allowed Values: Valid date of the format “YYYY-MM-DD” (Example January 15th 2009 is “2009-01-15”). *Note: Months and Days should always contain a leading zero if required to fill two spaces.

<Time>

- Description: Time the reading recorded in the time zone that the meter or device was configured in the MDM.
- Allowed Values: Valid time, format is 24 Hour “HH:MM” (Example 3:15 AM is “03:15”, 3:45 PM is “15:45”). *Note: Months and Days should always contain a leading zero if required to fill two spaces.

<Interval_Or_Register>

- Description: An indicator of whether the channel reporting data is an interval or register channel.
- Allowed Values: {I,R}; I = Interval Channel, R = Register Channel

<Channel_Number>

- Description: Channel number of the corresponding value
- Allowed Values: Integer (should correspond to the channel for the DAS *Meter/Device ID* or *Service/Meter Point ID*).

<Value>

- Description: Value of the reading or register on the specified channel at the specified interval date/time
- Allowed Values: Decimal

Delimiters:

Acceptable field delimiters are:

- Pipe: {“|”} (preferred)
- Comma: {“,”}

***NOTE: Each file should contain one and only one type of delimiter for the entire file.**

Line delimiter is *next line char* (char “\n”).

***NOTE: Each Line should contain one and only one value.**

Field Order:

Order of the fields within a line are as follows:

< Meter/DeviceID_Or_Service/MeterPointID>

<Unique_Identifier

<Date>

<Time>

<Interval_Or_Register>

<Channel_Number>

<Value>

(Note: Row order is not currently a requirement)

Format:

<Meter/DeviceID_Or_Service/MeterPointID>|<Unique_Identifier>|<Date>|<Time>|<Interval_Or_Register>|<Channel_Number>|<Value>

Sample Lines:

- Example #1: Meter/Device ID; Meter/Device ID 136800021; December 26th, 2010; 9:30 AM; Interval Channel; Channel Number 101; Value 1.339

M|136800021|2010-12-26|09:30|I|101|1.339

- Example #2: Meter/Device ID; Meter/Device ID 136800021; December 26th, 2010; 9:15 PM; Register Channel; Channel Number 201; Value 524.3

M|136800021|2010-12-26|21:15|R|201|524.3

- Example #: Service/Meter Point; Service/Meter Point ID SW_38_EL_BL_2_1; December 26th, 2010; 12:00 AM (midnight); Interval Channel; Channel Number 101; Value 1.339

S|SW_38_EL_BL_2_1|2010-12-26|00:00|I|101|1.339

- Example #1: Service/Meter Point; Service/Meter Point ID SW_38_EL_BL_2_1; December 26th, 2010; 1:15 AM; Register Channel; Channel Number 201; Value 5.243

S|SW_38_EL_BL_2_1|2010-12-26|01:15|R|201|524.3

Sample files can be provided upon award of the contract.

Appendix F: Wireless Requirements

In the event that a wireless network is employed, the following shall apply:

- The wireless network shall be compliant with DoDD 8100.2 – Use of Commercial Wireless Devices, Services, and Technologies in the Department of Defense (DoD) Global Information Grid (GiG)
- The Contractor shall comply with the requirements of National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management January 2008 Edition with the January 2009 Revision (Redbook) which can be obtained from: <http://www.ntia.doc.gov/osmhome/redbook/redbook.html>
- Wherever wireless network components or extensions are utilized, IA requirements for wireless solutions must be met, which includes: meeting IEEE 802.11: IEEE Standard for Wireless LANs / IEEE 802.11i requirements, meeting FIPS 140-2 requirements for Authentication and Encryption on layer 2, and a Network Intrusion Detection System. Part of the wireless STIG requirement requires the wireless solution to be NIAP Common Criteria validated as meeting US Government protection profiles. Validated products, and products undergoing validation, are listed on the common criteria websites, one of which is: <http://www.niap-ccevs.org> . At the present time there does not appear to be any 900 MHz wireless systems listed as validated. There are 2.4 & 5.8 GHz wireless systems listed on common criteria as being validated products.

Other wireless requirements shall include, but shall not be limited to, the following:

- Wireless Data Rate. Data rate for 2.4 GHz wireless network segments shall not be less than 1 Mbps with a link margin of 14 dB. Data rate for 5 GHz wireless network segments shall not be less than 10 Mbps with a link margin of 14 dB.
- Wireless Signal Strength. Wireless signal strength must be a minimum of 50% with a target range of +70 signal strength (the signal strength refers to the strength of signal to the radio device indicating the alignment of the antenna and range, so that it can receive data).
- Antennas. Antennas will be physically placed to ensure mesh connectivity in areas of vehicular traffic (due to line of sight technology), and will be mounted to minimize the likelihood of damage due to vandalism. Site approval requirements apply, with the known caveat that lightning protection requirements at ordnance-related facilities tend to prohibit antenna elevation higher than roof level.
- Points of Failure. The wireless network will be designed in a manner that no single access point failure will cause the entire network to fail.
- Ethernet Connection. Wireless network devices (e.g. radios) shall have a serial and Ethernet connection.
- RF Mesh Technology Requirements.
 - Where security and IA restrictions allow, mesh radio network communication can be utilized as the LAN (local area network) upon receiving required site approvals.
 - Where RF mesh technology is used as the communication method, the RF collectors or repeaters can be mounted on a wall or pole when necessary to ensure adequate coverage. Such installation would require advance categorical exclusion (CATEX) approval from the base PWO. All network interfaces to the RF device shall be physically secured (physical security could be accomplished in a variety of ways, such as having the equipment in a locked enclosure, or providing Ethernet locking port devices). Also, the communication paths between the meters and repeaters to collectors shall form a “self-healing network”, so the network can restore its own broken communication link through other available paths.

- If a bridged wireless mesh is used, the wireless devices must support Spanning Tree or some other Loop Detection and Pruning mechanism. In designing the wireless LAN the Contractor shall ensure that no single link is subject to more than 30% of its baseline capacity when the loop detection and removal technology (e.g. Spanning Tree) has pruned the network to a stable state. This implies that each wireless mesh LAN will connect to the network backbone through a single root path that concentrates all traffic for the mesh.
- The mesh network shall be divided to a number of “sub-mesh networks” in order to reduce the risk of communication blackouts. Each sub-network shall include no more than 25 radios (endpoints). A communication backbone is needed to support the communication from radios to the POP.
- RF Transmitter Requirements. Due to operating restrictions every RF transmitter in the system must be capable of being shut-down remotely within an hour of the user request for a user-specified period of time and be powered on and return to operation after this user-specified period of time has elapsed. This shall be initiated via the DAS from a user having authorized access for this purpose.
- Radio Chains. When radios are arranged as a chain to relay each other, a chain shall include no more than six radios.
- Device Accreditation. Wireless network devices must be currently accredited unless otherwise approved by the Contracting Officer. If another device is approved by the Contracting Officer, the Contractor will be responsible for accrediting any proposed alternative devices.
- Wireless Solution Proposal.
 - For any wireless solution, the proposal shall include details such as: frequency, transmitter power, antenna type, antenna gain, and method to turn off when notified.
 - The Contractor’s proposal shall, in the case of a wireless solution, show in a detailed manner that their solution will not permit a Denial-of-Service (DoS) attack to negatively impact any hardwired network infrastructure past the wireless interface node. The intention of this requirement is to ensure that critical meter communications executed on hardwired infrastructure cannot be interrupted by such attacks. The Contractor shall not install any equipment or infrastructure that permits DoS attacks to impact hardwired pathways.
- Wireless Network Maps. As a result of site surveys and as a part of preliminary design package, the Contractor shall provide maps of areas covered by wireless network. The Contractor shall also provide maps of areas covered by wireless intrusion detection system (WIDS). The latter map should overlay the former. The Contractor shall also test the WIDS and verify its functionality as a part of the final acceptance tests.
- Form DD1494. The Contractor shall complete and submit the DD1494 forms for the RF components of the AMI system for each geographical site according to CDRL requirements.

Appendix G. References

Code of Federal Regulations (CFR)
47 CFR 15/47 CFR 2 Radio Frequency Devices
47 CFR 68 Connection of Terminal Equipment to the Telephone Network (2003)
21 CFR 1020 Performance Standards for Ionizing Radiation Emitting Products
3.1.2 Department of Defense
Access Control STIG V2R1
Database STIG V8R1
Desktop Application STIG V3R1
Enclave STIG V4R1
Network STIG V7R1
UNIX STIG V5R1
Web Server STIG V6R1
NSA Windows 2000 Guide
Windows 2000/XP/2003/Vista Addendum, V6R1
Wireless STIG V5R2
DoD Instruction 6055
3.1.3 OPNAV/CNIC Instructions
Reserved
3.1.4 NAVFAC Documents
E-M 101 to 114 Installation of Typical Metering Forms
PADMDE- 1 to 6 Pad-mounted Transformer Details
GM-01 to 04 Gas metering with typical piping, fittings, supports, clearances, and appurtenances
SMSC-01 to 06 Steam metering specifications
SM-01 to 02 Steam meter with typical flange fittings, and clearances
WMSC-01 Recommended applications and flow ranges for water metering
WM-01 to 08 Water metering specifications
OPNAVINST 5100.23G
3.1.5 Unified Facilities Criteria (UFC)
UFC 3-500-10N Design: General Electrical Requirements
UFC 3-580-01 Design: Telecommunication Systems, Inside Plant
UFC 3-580-10 Design: Navy and Marine Corps Intranet (NMCI) Standard Construction Practices
3.1.6 Unified Facilities Guide Specifications (UFGS)
UFGS-16768A Fiber Optic Data Transmission System
UFGS-16792A Wire Line Data Transmission System
UFGS-16794A Coax Data Transmission System
UFGS-16797A One-Way FM Radio Data Control
UFGS-16798A Two-Way Radio Data Ethernet Transmission
UFGS-16822N Intercommunication System
UFGS-26 27 13.00 20 Electricity Metering (2007)
UFGS-33 63 33.10 20 Steam meter acquisition (2007)
UFGS-33 63 33.11 20 Stream meter installation (2007)

UFGS-33 12 33.10 20 Water meter acquisition (2007)
UFGS-33 12 33.11 20 Water meter installation (2007)
UFGS-33 51 33.10 20 Gas meter acquisition (2007)
UFGS-33 51 33.11 20 Gas meter installation (2007)
3.2 Commercial Documents
3.2.1 American National Standards Institute (ANSI)
ANSI C2 National Electrical Safety Code (latest version)
ANSI C12.1 Code for Electricity Metering (2001)
ANSI C12.7 Requirements for Watt-hour Meter Sockets (2005)
ANSI C12.10 Physical Aspects of Watt-hour Meters - Safety Standard (2004)
ANSI C12.13 Electronic Electrical Meters (1991)
ANSI C12.20 American National Standard for Electricity Meters (1998)
ANSI C12.16 Solid-State Electricity Meters
ANSI C12.18 Protocol Specification for ANSI Type 2 Optical Ports (1996)
ANSI C12.19 Utility Industry End Device Data Tables (1997)
ANSI C12.20 Electricity Meters - 0.2 and 0.5 Accuracy Classes (2002)
ANSI C12.21 Protocol Specification for Telephone Modem Communications (1998)
ANSI C37.90.1 Standard Surge Withstand Capability (Oscillatory and fast-transient waveforms)
ANSI C62.45 Ringing Wave Form
ANSI C62.41 Surge Suppression
ANSI C62.61 Gas Tube Surge Arresters on Wire Line Telephone Circuits (1993)
ANSI/EIA/TIA-232-F Interface Between Data Terminal and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange (1997)
ANSI/TIA/EIA-568-A Commercial Building Telecommunications Cabling Standard (1995; R1998)
ANSI B109.1, Part IV Diaphragm Type Gas Displacement Meter - Under 500 SCFH
ANSI B109.2, Part IV Diaphragm Type Gas Displacement Meter - Over 500 SCFH
ANSI B109.3, Part IV Rotary Gas Displacement Meters
ANSI/AWWA C700-02 Cold Water Meters-Displacement Type Displacement Meter
ANSI/AWWA C706-96 Direct-Reading, Remote- Registration Systems for Cold-Water Meters
ANSI/AWWA C707 Encoder Type Registration Systems for Cold Water Meters
ANSI/AWWA C701-88 Cold Water Meters-Turbine Type
ANSI/AWWA C702 Cold Water Meters-Compound Type
3.2.2 American Society of Mechanical Engineers (ASME)
ASME B16.11 Forged Fittings, Socket-Welding and Threaded (2005)

ASME B16.20 Metallic Gaskets for Pipe Flanges - Ring-Joint, Spiral Wound, and Jacketed (1998; R 2004)
ASME B16.21 Nonmetallic Flat Gaskets for Pipe Flanges (2005)
ASME B16.3 Malleable Iron Threaded Fittings, Classes 150 and 300 (1998)
ASME B16.34 Valves - Flanged, Threaded and Welding End (2004)
ASME B16.39 Standard for Malleable Iron Threaded Pipe Unions; Classes 150, 250, and 300 (1998)
ASME B16.5 Standard for Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 (2003)
ASME B16.9 Standard for Factory-Made Wrought Steel Butt welding Fittings (2003)
ASME B31.1 Power Piping (2004; Addenda 2005)
ASME MFC-3M Measurement of Fluid Flow in Pipes using Orifice, Nozzle, and Venturi (2004)
ASME MFC-4M Measurement of Fluid Flow by Turbine Meters (1986)
3.2.3 American Society for Testing and Materials (ASTM)
ASTM A 106/A 106M Seamless Carbon Steel Pipe for High-Temperature Service (2006)
ASTM A 153/A 153M Zinc Coating (Hot-Dip) on Iron and Steel Hardware (2005)
ASTM A 193/A 193M Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service (2006a)
ASTM A 194/A 194M Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service or Both (2006a)
ASTM A 307 Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength (2004e1)
ASTM A 36/A 36M Carbon Structural Steel (2005)
ASTM A 475 Zinc-Coated Steel Wire Strand (2003)
ASTM A 53/A 53M Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless (2006a)
ASTM D 229 Rigid Sheet and Plate Materials Used for Electrical Insulation (2001)
3.2.4 Institute of Electrical and Electronics Engineers (IEEE)
IEEE Std 100 Dictionary of Electrical and Electronics Terms (2000)
IEEE Std C57.12.80 Terminology for Power and Distribution Transformers (2002)
IEEE C57.13 IEEE Standard Requirements for Instrument Transformers (1993)
IEEE Std C62.11 Metal-Oxide Surge Arresters for Alternating Current Power Circuits (1999)
IEEE C62.41 Surge Voltage in Low-Voltage AC Power Circuits (1991; R1995)
IEEE C95.1 Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields 3kHz to 3GHz (1999)
IEEE Std 802.3 Local Area Networks: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method, and Physical Layer Specifications (1998)

3.2.5 International Electro-Technical Commission (IEC)
IEC 62052-11 General Requirements for Electricity Metering Equipment
IEC 62053-11, 21, 31 Particular Requirements for Electricity Metering Equipment
IEC 60145 VARHr Meters
IEC/TS 60514 Inspection of AC Meters
IEC/TS 62051 Electricity Metering, Glossary of Terms
IEC/TR 62051-1 Data Exchange for Meter Reading
IEC 62054-11 Electricity Metering, Tariff and Load Control
IEC 62056-31 Data Exchange for Meter Reading
3.2.6 International Organization of Standardization (ISO)
ISO 9001 Quality Management System
ISO 9002 Standards and Quality
ISO 10007 Quality Management - Guidelines for Configuration Management
3.2.7 Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)
MSS SP-58 Standard for Pipe Hangers and Supports - Materials, Design and Manufacture (2002)
MSS SP-69 Standard for Pipe Hangers and Supports - Selection and Application (2003; R 2004)
MSS SP-70 Standard for Cast Iron Gate Valves, Flanged and Threaded Ends (2006)
MSS SP-71 Standard for Gray Iron Swing Check Valves, Flanged and Threaded Ends (2005)
MSS SP-80 Bronze Gate, Globe, Angle and Check Valves (2003)
MSS SP-85 Standard for Cast Iron Globe & Angle Valves, Flanged and Threaded Ends (2002)
3.2.8 National Electrical Manufacturers Association (NEMA)
NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum) (1997)
NEMA ICS 1 Industrial Controls and Systems (1993)
3.2.9 Nation Fire Protection Association (NFPA)
NFPA 70 National Electrical Code
NFPA 101 National Life Safety Code
NFPA 471 Recommended Practices for Responding to Hazardous Materials Incidents
NFPA 473 Standard for Competency for EMS Personnel Responding to Hazardous Materials Incidents
3.2.10 Underwriters Laboratories (UL)
UL 96 Lightning Protection Components
UL 96A Installation Requirements for Lightning Protection
3.2.11 International Electrical Testing Association (NETA)
NETA ATS Electrical Power Distribution Equipment and Systems (1999)