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CHAPTER 01  CONSTRUCTION QUALITY MANAGEMENT

01-1  FORWARD

South Atlantic Division (SAD) is a multi-functional Division that has responsibility for execution of projects under both civil works and military programs. The Construction Divisions within SAD provide full construction management services for commercial, industrial, and water resources projects. SAD has established, and is dedicated to the continuation of, its excellent reputation for quality performance and pursuit of customer satisfaction.

This manual is part of the SAD Quality Management System (SADQMS) and defines Construction Division’s (CD’s) policies and objectives’ regarding the application of the principles of controlled quality to ensure that all rendered services are of the required quality and comply fully with the customer’s stated requirements and expectations.

Savannah District’s Construction Division and the SAD Quality Assurance PDT are responsible for the development and implementation of the SAD Quality Assurance Field Guide (QAFG). This manual as well as the entire SADQMS will be reviewed periodically and updated as needed.

The master controlled copy of this manual will be maintained electronically and posted to the SAD Regional Construction Website to provide access to team members at all locations. SASCD will maintain one controlled hard copy of the manual. Any other copies of this manual are uncontrolled and as such there are no provisions for control of their currency.

This manual is structured so that Chapter 01 provides a general overview of Construction Quality Management and identifies QA related requirements that are not project specific (such as the annual QA plan). Chapter 02 through Chapter 06 cover project specific QA requirements for each phase of a typical construction contract. The remaining chapters provide detailed information on related topics. Each chapter may also include annexes, exhibits and template files applicable to the covered content. Appendices to this manual include a glossary, checklists of requirements and Recommended Best Practices, and a topical index.
01-2 SAD QUALITY ASSURANCE FIELD GUIDE (QAFG)

01-2.1 Purpose
The purpose of this manual is to provide guidance to Construction Division employees that will assist them in achieving one of the primary goals of USACE - Quality Construction. Managing and achieving quality construction is vital to the Corps' reputation and future. This manual provides the general policy and guidance for establishing quality management procedures in the execution of construction contracts. It defines the related responsibilities and roles of both the contractor and the government in the management of quality in the construction of facilities.

01-2.2 Applicability
This manual applies to all SAD elements, districts, and field operating activities (FOA) responsible for awarding and supervising construction contracts. The QAFG, and supporting documents, is applicable to all CD and Project Delivery Team (PDT) members and shall be observed and implemented by all personnel as applicable to their activities. This manual specifies both requirements and “Recommended Best Practices (RBP)” related to quality assurance and quality control. No deviation is permitted from stated requirements without written consent from CD Management in the relevant District Office. Recommended Best Practices (RBP) should be followed if possible but implementation may vary depending on the size and type of project. Any variances from the QAFG must be documented by local procedure and approved at the appropriate level.
01-2.3 Regulatory Publications

a. **Federal Acquisition Regulation (FAR).** The FAR is the primary regulation for use by all federal executive agencies in their acquisition of supplies and services with appropriated funds. The FAR system has been developed in accordance with the requirements of the Office of Federal Procurement Policy Act of 1974; as amended by Public Law 96-83. The FAR is issued by the Administrator for Federal Procurement Policy. Link to [Air Force FarSite](#).

b. **Federal Acquisition Circular (FAC).** The FAC supplements the FAR and is approved by the Administrator for Federal Procurement Policy.

c. **Department of Defense FAR Supplement (DFARS).** The DFARS is issued by the Undersecretary of Defense for Research and Engineering. The DFARS establishes uniform DOD policies and procedures, implementing and supplementing the FAR.

d. **Defense Acquisition Circular (DAC).** The DAC supplements DFARS and is approved by the Defense Acquisition Regulatory Council.

e. **Army Federal Acquisition Regulation Supplement (AFARS).** AFARS are issued by direction of the Secretary of the Army pursuant to FAR Subpart 1.3. The AFARS supplements and implements the DFARS and FAR.

f. **Engineer Federal Acquisition Regulation Supplement (EFARS).** EFARS is issued by the Corps of Engineers to implement FAR, DFARS, AFARS, and establish uniform policies for contracting and administration of Corps contracts.

g. **Code of Federal Regulations (CFR).** The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal regulation.

01-2.4 References

a. **FAR, part 46, clause 46.312 – Construction Contracts**

b. **FAR, part 52, clause 52.246-12 – Inspection of Construction**

c. **ER 415-1-11 – Biddability, Constructability, Operability, and Environmental Review**

d. **ER 1180-1-6 – Construction Quality Management**

e. **ER 415-345-38, Construction: Transfer and Warranties**

f. **ECB 2007-18, Construction Warranty Management**
01-2.5 Responsibilities
Authority and responsibility for implementing and maintaining the quality system within the field offices is delegated to the head of each field office.

01-2.6 Definitions

a. **Command Management Review (CMR)** – Quarterly review held by the Chief of Engineers to review selected CMR indicators from all HQ Directorates and discuss issues. Attended by all HQ senior leader and MSC Commanders.

b. **Consolidated Command Guidance (CCG)** – This guidance document strives to issue both the strategic and tactical guidance required for major and recurring matters of significance Command-wide. This document resides on the USACE INET website: [https://corpsinfo.usace.army.mil/rm/ccg.htm](https://corpsinfo.usace.army.mil/rm/ccg.htm).

c. **Contractor Quality Control (CQC)** - is the construction contractor's system to manage, control and document their own, their supplier's, and their subcontractor's activities to comply with contract requirements.

d. **Controlled Document** - any procedure, policy, practice, standard manual, or work instruction used to support the CDQOS. Any document whose use is mandatory to perform a function within Construction Division must be controlled. Examples include ASTM’s, NEC, QA Plans, project specific drawings and specifications.

e. **External Document** - documents that are produced outside of Construction Division. (ER’s, DR’s, FAR’s, etc). Documents may be either controlled or uncontrolled.

f. **Internal Documents** - documents that are produced and maintained by construction division or a field office (CQP's, SOP’s, Quality Plans, etc). Internal Documents may be either controlled or uncontrolled.

g. **Memorandum of Agreement (MOA) / Memorandum of Understanding (MOU)** – documented agreement between the field office and the customer outlining transfer and warranty procedures. Agreement should also cover other key items of interest with the customer.

h. **Process Improvements** – In addition to defining and managing quality of the services and products we provide to our customers, the USACE Business Process challenges us to use best practices and seek continuous improvements. To meet the challenge of continuous improvement, we must periodically evaluate our processes, assess our success in meeting customer expectations, compare our performance to other organizations performing similar functions, and change our processes to achieve improvements. This is by definition a quality management process corresponding to the Plan-Do-Check-Act (PDCA) cycle that is the foundation of our quality management practices.
i. **Quality** - conformance to properly developed requirements. In the case of construction contracts, these requirements are established by the contract specifications and drawings. Consistent with ER 5-1-11, quality will be defined as meeting the customer’s goals and expectations, consistent with compliance with legal requirements, public policy (including Administration policy; as well as DoD, Army, and USACE policy and guidance) and professional standards.

j. **Quality Assurance (QA)** - is the system by which the government fulfills its responsibility to be certain the CQC System is functioning and the specified end product is realized.

k. **Quality Management (QM)** - is all control and assurance activities instituted to achieve the quality established by the contract requirements.

l. **Uncontrolled Documents** - information that may be used as a reference, yet that use is not mandatory (i.e. NEC Handbooks, Civil Engineers Handbook, U.S. Gypsum Handbook, etc...).
01-3 QUALITY MANAGEMENT OVERVIEW

01-3.1 General
Obtaining quality construction is a combined responsibility of the construction contractor and the government. Their mutual goal must be a quality product conforming to the contract requirements. A cooperative and professional working relationship should be established in order to realize this common goal. The contract documents establish the level of quality in construction contracts. The contractor controls the quality of the work and the Government, in separate but coordinated efforts, assures that the level of quality set by the plans and specifications is achieved.

01-3.2 Contractor Quality Control (CQC)
FAR Clause 46.312 establishes a requirement for CQC in construction contracts.

The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work (including but not limited to, materials, workmanship, and manufacture and fabrication of components) performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government.

Contractors shall be made responsible for all activities necessary to manage, control, and document work so as to ensure compliance with the contract plans and specifications. The contractor's responsibility includes ensuring adequate quality control services are provided for work accomplished on and off-site by his/her organization, suppliers, subcontractors, technical laboratories and consultants. The work activities include safety, submittal management, and all other functions relating to the requirement for quality construction.

It is the contractor's responsibility to carefully examine the contract requirements for CQC and provide personnel capable of complying with the CQC requirements of the contract clauses and technical provisions. The CQC staff must be of sufficient size and have the qualifications necessary to ensure contract compliance, whether work is performed by the prime contractor or by subcontractors or vendors. The size and composition of the CQC organization may vary as the job progresses. At all times it should be compatible with the level of effort and capability required by the contract and construction schedule.

Where required by contract, Contractors will prepare a Contractor Quality Control Plan (CQC Plan). CQC Plans are covered in Chapter 04, Part 4, of the QAFG.

RBP - The requirement for the use of the Quality Control System (QCS) software shall be inserted in all contracts.
01-3.3 Government Quality Assurance

Quality Assurance (QA) is the procedure by which the Government fulfills its responsibility to be certain that the CQC system is functioning and the specified end product is realized. QA is required on all construction contracts. The extent of assurance shall be commensurate with the value and complexity of the contracts involved and the requirements of ER 1180-1-6.

The QA process starts well before construction and includes reviews of the plans and specifications for biddability, constructability, operability and environmental responsibility, plan-in-hand site reviews, coordination with using agencies or local interests, establishment of performance periods and quality control requirements, field office planning, preparation of QA plans, reviews of quality control plans, enforcement of contract clauses, maintenance of quality assurance and quality control inspection and work records, and acceptance of completed construction.

RBP - The Resident Management System (RMS) will be utilized for all projects.

01-4 RESPONSIBILITIES AND AUTHORITIES

01-4.1 Responsibilities

The foundation for fulfilling our goal of quality products and services is our team members. They are responsible for the duties contained in their individual job descriptions. Supervisors in CD -- Area/Resident Engineers, Section Chiefs, Branch Chiefs, Division Chief and other members of the Quality Management Team -- are responsible for selling the vision, informing the team members, providing proper training, and continuously improving procedures to allow the CD members to maximize their contribution to quality output. Everyone must understand and respect the responsibilities and authorities of every CD member.

01-4.2 Management Responsibilities and Authorities

CD’s management personnel consist of the Chief, Branch Chiefs, and Section Chiefs of CD as well as the heads of the field offices. Division, Branch, Section and field office mission and function statements are defined by applicable District Regulations. Responsibility and authority levels of CD staff are covered in Chapter 05 of this manual. Senior management has the responsibility to review, analyze and insure corrective and preventive action takes place to correct and preclude nonconforming service. All team members have the responsibility to report nonconforming work and initiate corrective action for those items normally under their authority. Authorities are defined in the mission and function statements, job descriptions, and by specific delegation from higher authority.
In regards to quality management, CD Field Office Management (Area/Resident Engineer) has the overall responsibility for the performance of the following activities:

1. Prior to Construction –
   a. Develop a written Quality Assurance Plan and the Project Specific Supplemental Plan (see Section 01-5, Quality Assurance Plans).
   b. Participate in pre-award activities (acquisition strategy meetings, design charrettes, concept design reviews, design review conferences, BCOE reviews, site plan-in-hand reviews, develop the estimate for liquidated damages, establishing the contract CQC requirements and other Division 01 input) as members of the PDT.
   c. Review field office workloads and staffing needs.
   d. Assure team members have a clear understanding of QA/CQC responsibilities and are appropriately trained.
   e. Identify training needs.
   g. Accept the CQC plan subject to satisfactory performance and reserve the right to require revisions to correct unsatisfactory performance.
   h. Conduct the Preconstruction Conference.

2. Implementation and Enforcement During Construction –
   a. Utilization of RMS.
   b. Maintain an updated Quality Assurance Plan and the Project Specific QA Supplements (see 01-5, Quality Assurance Plans).
   c. Meeting of Mutual Understanding (MMU) on Quality Control
   d. Meeting of Mutual Understanding (MMU) on Safety
   e. Enforce completion of the MMU and submittal and acceptance of at least the interim CQC Plan prior to allowing start of construction.
   f. Require revision of the CQC Plan and its execution as necessary to obtain quality.
   g. Verify adequacy and calibration of test equipment, application of specified test standards and computation of test results.
   h. Submittal Management – verification of CQC submittals.
i. Review of contractor’s daily quality control reports (QCR). QA personnel will not alter, sign, initial, or approve the QCR.

j. Hold periodic coordination meetings and/or partnering meetings.

k. Enforce the implementation of the three-phase control process.

l. Conduct QA testing.

m. Monitor contractor’s deficiency tracking system.

n. Ensure that new work is not placed on unacceptable work and that progress payments do not include the value of non-conforming construction.

o. Ensure that QA Reports (QAR) have the required documentation.


q. Monitor contractor’s updates of As-Built conditions on a weekly basis.

3. Performance of Acceptance Inspections. Subsequent to CQC completion inspections, acceptance inspections of completed construction are a government responsibility.
01-5 QUALITY ASSURANCE PLANS

Construction Division must develop effective quality assurance plans for construction services that show how the technical, schedule, industry, and cost requirements for the project will be met. Quality assurance plans are developed in accordance with USACE regulations and the requirements specified in this manual. These plans fall under (are subordinate to) the Quality Plans/Manuals developed at the Division and District levels. Quality Assurance Plans are considered controlled documents and should be addressed as required by Section 01-6, Document Control Requirements.

01-5.1 Field Office QA Plans

All Field Offices will be covered by a written QA Plan developed at the Resident or Area Office level that addresses the overall QA operations for the office. These plans provide the framework for the QA operations for the fiscal year and should be developed in conjunction with the budget. Plans should be developed prior to the start of the fiscal year and updated no less than annually. In order to be an effective management tool, the plan must be kept current and adjusted for changes in workload, staffing, etc. Each office will maintain a copy of the plan at the office in hardcopy or electronic copy that is accessible by all staff members.

RBP – The office QA Plan can be posted in RMS, Groove, or a network directory that is setup for office plans, work plans, or implementation plans used by the office. It is recommended that the QA Plans are posted as a word document in RMS under Office Plans and kept up to date. This will allow CD Management access to the subordinate plans.

Each field office will develop a plan that reflects its own organizational staff and workload. QA Plans should address projected workload, organization, staffing, job responsibilities, training, pre-award activities, post-award activities, testing, and documentation. The baseline requirement for the plan must include the elements outlined in exhibit 01-9.1. In addition, a sample QA Plan is posted with this chapter. This is not a required format, but is intended as a guide to help in the development of your own plan.

01-5.2 Project Specific QA Supplemental Plans

Project Specific QA Supplements address specifics related directly to the project. The requirements for these supplements are discussed Chapter 04 of the QAFG.
01-6 DOCUMENT CONTROL REQUIREMENTS

It is extremely important that field offices develop and maintain a system to control internal documents that are needed to perform construction management services. Any document whose use is mandatory to perform a function within Construction Division must be controlled. For example: QA Plans, Project Specific QA Supplements, Drawings and Specifications. Each office will develop a written procedure on how these items are to be controlled. The controlled copy of the document must be marked as a “Controlled Document” and be kept current. In addition, Field Offices must have a way of tracking changes to the contract drawings and specifications so that all office personnel know what is posted to the drawings and specifications. A simple log sheet on the front of the drawings and specs is sufficient (see exhibit 01-9.4).

RBP – The procedure for document control can be outlined in the Office QA Plan. Procedure should identify who is responsible for maintaining the drawings and specs and where the controlled copy will be kept. Modifications, field changes, clarifications, etc… should be posted to the controlled set. The controlled set will be used to validate as-built submittals at the end of the project.

01-7 CUSTOMER RELATIONS

It is critical that all CD team members recognize the value of developing close working relationships with all customers, both internal and external. The perspective that the “customer is always right” may or may not be true, but we must all recognize that “IF IT IS IMPORTANT TO THE CUSTOMER, IT IS IMPORTANT TO US!” We must not loose focus on the things that are important to our customer.

01-7.1 Memorandum of Understanding

For offices with military construction responsibility, each Area/Resident Engineer will set up a written MOU with the Directorate of Public Works (DPW) / Base Civil Engineer (BCE) at their installation. The MOU will cover procedures to be followed for transfer of completed facilities and responsibilities on warranty enforcement. The MOU should also address any special requirements for joint occupancy and will describe how contract specific information for warranty points of contact will be transferred to the DPW/BCE. A procedure will be established to provide a specific contract point for prime contractors with complete address and telephone number. If the contact for warranty action is other than the prime contractor, other specific procedures will be addressed. This agreement should be reviewed periodically for changes or needed improvements. The MOU must be updated anytime the parties to the agreement change (ie, new RE, DPW, etc…). Reference ECB 2007-18, Construction Warranty Management for additional guidance and the process flowchart. A sample MOU is included in exhibit 01-9.3.
01-8 CONSOLIDATED COMMAND GUIDANCE (CCG) AND COMMAND MANAGEMENT REVIEWS (CMR)

The Consolidated Command Guidance (CCG) summarizes USACE’s strategic direction, resource guidance, and performance requirements for the upcoming fiscal year and out years. The Command Management Review (CMR) and other types of performance review sessions (e.g., Command Strategic Reviews) provide mission execution feedback to USACE Commanders.

The Command Management Review (CMR) is a quarterly review and analysis used by senior leaders of USACE to assess the operational condition of the Corps. Guidance for FY07 included ten CMR metric tables that covered the military program, civil works, research & development, resource management, human resources, corporate information, logistics, safety, contracting, and the small business program. Information on the current CCG and previous fiscal years can be found at https://corpsinfo.usace.army.mil/rm/ccg.htm. Complete information on each of the metrics can be accessed by downloading Chapter 3 for the FY of interest on the above mentioned website.

Current CMR data can be accessed through PPDS and WebCMI. Performance can also be tracked through RMS via the “USACE Construction CCG Metrics” report. Metrics of primary concern for Construction Division’s Military Program are MP-6, MP-7, MP-8, MP-9, and MP-10. Below you will find an abbreviated summary of these metrics:

**MP-6 Construction Contract Cost Growth**
Goal: Complete and accept construction with no more than 5% total contract cost growth.

**MP-7 Construction Contract Time Growth**
Goal: Complete and accept construction with no more than 10% total contract time growth.

**MP-8 Beneficial Occupancy Date (BOD) Time Growth**
Goal: Deliver all projects to customer with no more than 10% BOD time growth based on NTP to original BOD.

**MP-9 Construction Timeline Parameters (NTP to BOD)**
Goal: >= 95% Construct and deliver projects to customer within the PA and construction timeline parameters.

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**MP-10 Project Financial Closeout**
Goal: >=90% financially closed out
- CONUS – 12 months after BOD
- OCONUS – 15 months after BOD
Detailed information on the purpose of the metric, how it is defined, what is measured, how it is calculated, and the rating criteria can be accessed at the above mentioned website. Criteria for MP06 through MP10 for FY07 have been included in exhibit 01-9.2.

Project Engineers must keep these metrics in mind throughout the life cycle of the project. The overall success of each District depends on how well we manage and execute our construction management program. While it is understood that time and cost growth is often the result of differing site conditions and design errors, these metrics can still be impacted by the effectiveness of our negotiations and how quickly we react to remediate the impact.

Area/Resident Engineers need to make sure each of their project engineers are fully aware of any and all metrics (civil, military, safety, environmental, etc…) impacted by the work handled by the office.
01-9 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page:

a. Office QA Plan Template (RMS Macro – template pending)
b. Controlled Document Log sheet (RMS Macro)
c. MOU Template (RMS Macro – template pending)
01.9.1 Suggested Field Office QA Plan Outline

NOTE: This outline is provided for guidance only - It is not intended to limit or restrict individual initiative in the development of QA plans. Plans will be dated.

I. Purpose and Scope
   A. Establishes QA annual operating plan
   B. Period covered (i.e., FY_)
   C. Applicability

II. Workload
   A. Contracts underway
   B. Anticipated contracts

III. Organization
   A. Description
   B. Chart

IV. Staffing
   A. Current
   B. Required (keyed to workload)

V. Responsibilities
   A. General
   B. Specific

VI. Training
   A. Needs analysis
   B. Planning

VII. Pre-Award
   A. Design review conferences
   B. Input to CQC specifications, schedule requirements, etc.
   C. BCO reviews
   D. Plan-In-Hand reviews

VIII. Post-Award
   A. QA surveillance
      1. Participation in phases
      2. Problem solving
      3. Deficiency monitoring
   B. QA testing
      1. Policy
      2. Facilities
      3. Schedule
   C. Reporting
IX. Supplements

NOTE: Job Supplements (Project Specific QA Plans) will contain the following items as a minimum:

A. Staffing
B. QA surveillance responsibilities
C. Job specific QA testing to include type and frequency
D. Definable features of work
MILITARY PROGRAMS

MP06 - CONSTRUCTION PROJECT COST GROWTH

PROPONENT: CEMP-I, CECW-CE, RBCs & All Customers

VISIBILITY LEVEL: HQUSACE, RBCs and customers.

DATA SOURCE(s): P2/C-RMS

RATED: Quarterly

PROGRAMS/PROGRAM CODES (PC) (Formerly Type Funds)

Army Programs: TF 10, 12, 40, & 42
Air Force Programs: TF 20, 21, 26, & 21
DOD Programs: TF 30, 32, 41, 46, 48, 51, 54, 56, 57, 58, 4A, 4B, 48 & 69
BICAC Programs: PC 00, 06 & 01

PROGRAM YEARS (PY) MEASURED: FY02, 03, 04, 05 & 06

GOAL: Manage on-going MILCON Project construction through contract completion with no more than 5% total project cost growth.

PURPOSE: To provide a forward-looking view on Projects still in construction to facilitate construction management to meet the 5% cost growth goal and a lagging indicator for Projects completed in the previous rolling 12-month window, as well as to provide a comparison of cost growth data between selected PVs.

DEFINITIONS and DETERMINATIONS: The metric applies to MILCON work only and excludes multi-year incrementally funded projects (i.e. separate DD 1391 for each year). Project cost growth is the sum of all construction cost growth from MILCON funded contracts executing a project. Construction cost growth excludes pre-priced options (RMS Mod Reason Code 5) exercised after award but includes cost modifications after award and user changes (RMS Mod Reason Code 4). The ‘primary flag’ on the cc820 Milestone “Construction Contract Complete” and Scheduled or Actual completion date will be used to determine if the project is in the ‘Completed’ or ‘On-going’ status. Contract Complete is defined as the date the KO receives construction from the contractor, with or without deficiencies, and liquidated damages (LDs) stop. Where a Project is executed by multiple contracts the “Primary (P) flag” on the selected primary/main contract’s cc820 Contract Complete milestone will be used to determine the Project’s ‘On-going’ or ‘Completed’ status and cost growth from each contract will be ‘totaled’ to the Project level even if one or more of the secondary contracts is still “on-going” or “completed,” as the case may be. When a single contract is used to construct multiple Projects, the contract’s Completion Date will be used for both Projects (unless separate contract completion dates are identified) and contract cost growth applied to each Project, as appropriate. This metric is applicable to Projects constructed using the design-bid-build as well as design-build methods.

RELATIONSHIP of DATA to WHAT IS MEASURED: Project Cost Growth is the sum of all cost growth on contracts used to execute the Project and reflects the quality of scope development, quality of design, construction management, impact of user changes, and customer satisfaction. Data shown for information, analysis and development of lessons learned to improve execution performance will be: Cumulative Cost growth for Options, User Changes, and Other Mods for each of Pys 02 through 06 individually and cumulatively for On-going Projects and Projects determined to be completed in a previous 12-month rolling window.

METRIC CALCULATION: The metric rating is expressed as a percentage of the sum total of number of On-Going Projects in Pys 02-06 meeting the 5% Cost Growth goal. Average sum total of Project Cost Growth for On-Going Projects and Cost Growth for Projects Completed in the preceding 12-month rolling window for projects in Pys 02-06 will be shown for information only. The metric excludes multi-year programmed and incrementally funded projects (i.e. separate DD 1391 for each year).

Metric: Percentage of On-going Projects in Pys 02-06 meeting the 5% Cost Growth goal:

Numerator: Total number of On-going Projects in Pys 02 - 06 with Cost Growth equal to or less than 5%
Denominator: Total number of On-going Projects in Pys 02 - 06.

Information/Comparison: Average Cost Growth for projects in Pys 02-06 for On-going Projects and Project completed in the last 12 months shown separately:

Numerator: Sum Total of Project Cost Growth (User Changes plus Other Mod Days) for On-going or Completed Projects in Pys 02 - 06.
Denominator: Sum Total of the Projects original Contract(s) Value(s) at award (Original Contract Amount(s) plus Option Amounts) for On-going or Projects completed in the last 12 months for projects in Pys 02 - 06.

RATING CRITERIA: Green = ≥ 95%; Amber = 85% to < 95%; Red = < 85%

Chapter 3 Table 1 Pg - 6 (15 Aug 06)
MILITARY PROGRAMS

MP07 - PROJECT CONSTRUCTION CONTRACT TIME GROWTH

PROPONEES: CEMP-I, CECW-CE, & Customers
DATA SOURCE(s): P2/C-RMS

VISIBILITY LEVEL: HQUSACE, RBCs and Customers.
RATED: Quarterly

PROGRAMS/PROGRAM CODES (PC) (Formerly Type Funds)

| Army Programs: | FF 10, 12, 40, & 42 |
| Air Force Programs: | FF 20, 21, 26, & 2L |
| DOD Programs: | FF 30, 32, 41, 46, 48, 51, 54, 56, 57, 58, 4A, 4B, 4S & 69 |
| BRAC Programs: | PC 0F, 0G & 0H |

PROGRAM YEARS (PY) MEASURED: FY02, 03, 04, 05 & 06

GOAL: Manage on-going Project construction through contract completion with 10% or less cumulative time growth for all contracts associated with the projects.

PURPOSE: To provide a forward-looking view on Projects still in construction to facilitate construction management to meet the 10% time growth goal and a lagging indicator for Projects completed in the previous rolling 12-month window, as well as to provide a comparison of cost growth data between selected PYs.

DEFINITIONS and DETERMINATIONS: The metric applies to MILCON funds only and excludes multi-year incrementally funded projects (i.e., separate DD 1391 for each year). Project contract time growth is the sum of all time growth from contracts executing a project. Construction time growth excludes pre-priced options (RMS Mod Reason Code 5) exercised after award but includes other cost modifications after award and user changes (Mod Reason Code 4). The ‘primary flag’ on the cc820 Milestone “Construction Contract Complete” and Scheduled or Actual completion date will be used to determine if the project is in the ‘Completed’ or ‘On-going’ status. Contract Complete is defined as the date the KO accepts construction from the contractor, with or without deficiencies, and liquidated damages (LDS) stop. Where a Project is executed by multiple contracts the “Primary (P) flag” on the selected primary/main contract’s cc820 Contract Complete milestone will be used to determine ‘on-going’ or ‘completed’ status and time growth from each contract will be ‘totaled’ to the Project level even if one or more of the secondary contracts is still “on-going” or “completed”, as the case may be. When a single contract is used to construct multiple Projects, the contract’s Completion Date will be used for both Projects (unless separate contract completion dates are identified) and contract time growth applied to each Project, as appropriate. This metric is applicable to Projects constructed using the design-build method as well as design-build methods.

RELATIONSHIP of DATA to WHAT is MEASURED: The sum all contract time growth for all contracts used to execute the Project reflects quality of construction management, procurement and execution strategy, impact of user changes, contractor performance, and, ultimately, customer satisfaction. Data shown for information, analysis and development of lessons learned to improve execution performance will be: Cumulative number of days for Options, User Changes, Other Mods for each of PYs 02 through 06 individually and cumulatively for On-Going Projects and Projects determined to be completed in a previous 12-month rolling window.

METRIC CALCULATION: The metric rating is expressed as a percentage of the sum total of number of On-Going Projects in PYs 02-06 meeting the 10% Time growth goal. Average sum total of Project Time Growth for On-going Projects and Time Growth for Projects Completed in the preceding 12-month rolling window for projects in PYs 02-06 will be shown for information only. This metric excludes multi-year programmed and incrementally funded projects

Metric: Percentage of On-going Projects in PYs 02-06 meeting the 10% Time Growth goal:

Numerator: Sum total of the number of On-going Projects in PYs 02-06 with Time Growth equal to or less than 10%
Denominator: Total number of On-going Projects in PYs 02-06.

Information/Comparison: Average Time Growth shown for On-going Projects and Project completed in the last 12 months for projects in PYs 02-06 shown separately:

Numerator: Sum Total of Time Growth (User Changes plus Other Mod Days) for On-going or Completed Projects in PYs 02-06.
Denominator: Sum total of the Original Contract Baseline Days at award (Original Contract Days plus Option Days) for On-going or Projects completed in the last 12 months for projects in PYs 02-06.

RATING CRITERIA: Green = ≥ 95%;  Amber = 85% to < 95%;  Red = < 85%
MILITARY PROGRAMS

MP08 - PROJECT BENEFICIAL OCCUPANCY DATE (BOD) TIME GROWTH

PROPONEE: CEMP-I, CECW-CE, RBCs & All Customers

VISIBILITY LEVEL: IQUSACE, RBCs and customers.

PROGRAM/PROGRAM CODES (PCs) (Formerly Type Funds)
Army Programs: TF 10, 12, 40, & 42
Air Force Programs: TF 20, 21, 26, & 2L
DOD Programs: TF 30, 32, 41, 46, 48, 51, 54, 56, 57, 58, 4A, 4B, 48 & 69
BRAC Programs: PC 0F, 0G, & 0H

DATA SOURCE(s): P2/C-RMS

RATED: Quarterly

PROGRAM YEARS (PY) MEASURED: FY(02, 03, 04, 05 & 06)

GOAL: Deliver MILCON Projects to customer with no more than 10% BOD time growth based on the NTP Actual Date to the Original BOD.

PURPOSE: To provide visibility on Project delivery (BOD) commitments to the customer for “On-going” Projects and those Projects “Completed” within the previous 12 month rolling window. Further, to accumulate similar BOD data for projects in selected PYs for comparison and lessons learned and improve processes.

DEFINITIONS and DETERMINATIONS: Beneficial Occupancy Date is the date the facility will be ready for useful occupancy as agreed to by the Corps and customer. The BOD Original (P2/RMS Milestone cc850) must be established no later than Construction Award_Actual (cc600). The BOD Original date can be revised, with customer agreement, at ‘Notice to Proceed (NTP) Acknowledge_Actual’ (P2 Milestone cc810) but not changed afterwards. BOD_Actual is determined by the customer accepting the entire complete Project for useful occupancy and can be prior to or after Construction Contract Completion (Milestone cc840). Partial facility occupancy by the customer with the acceptance of the DD 1354 may constitute Actual BOD for the project, if appropriate. Where a Project is executed by multiple contracts, the “Primary (P)” flag on the selected contract’s NTP Acknowledged Milestone (cc810), possibly an ancillary contract, and BOD Milestone (cc850) assigned to the primary/main or another ancillary contract, will be used to determine the Project’s Original, Scheduled and Actual BOD Time Growth. The “Primary (P)” flag on the selected contract’s BOD milestone will be used to determine ‘On-going’ or ‘Completed’ status of the Project. Care must be exercised in establishing the Primary (P) and Secondary (S) flags on the NTP Acknowledged and BOD Milestone dates when multiple contracts are used to execute an authorized project and/or multiple projects are being executed by the same contract or contracts to ensure total time is captured from NTP to BOD.

RELATIONSHIP of DATA to WHAT is MEASURED: BOD Time Growth reflects the on Corps’ ability to meet its commitment to deliver the project to the customer on time. Projects not meeting BOD time growth goals will be readily identifiable for intensive management, corrective action and lessons learned. Data shown for information as leading and lagging indicators will be: Cumulative BOD time growth for comparison for “On-going” and “Completed” projects in each of PYs 02 through 06 individually and number of individual Projects meeting the Green, Amber and Red Ratings.

METRIC CALCULATION: Rating is expressed as a percentage of the number of “On-going” Projects in PYs 02-06 meeting the 10% BOD time growth goal. BOD Time Growth is calculated as the difference in days between the Primary Milestone (cc850) BOD_Scheduled and BOD_Original divided by the number of days between Primary Milestone (cc810) NTP_Actual (or Scheduled) and BOD_Original. Average sum total BOD Time Growth for each PYs will be shown for information for On-going Projects and projects completed in the preceding rolling 12-month window. Negative time counts as zero time. The metric excludes incrementally funded projects (i.e. separate DD 1391 for each year).

Metric: Percentage of “On-going” Projects in PYs 02-06 meeting the 10% BOD Time Growth goal:
Numerator: Sum total number of “On-going” Projects in PYs 02-06 with BOD Time Growth equal to or less than 10%
Denominator: Sum total of “On-going” Projects in PYs 02-06;

Information/Comparison: Average Project BOD Time Growth in PYs 02-06 for On-going Projects and Projects Completed in the last 12 months:
Numerator: Sum total of BOD Time Growth days (BOD Original minus BOD_Scheduled) for On-going Projects or Completed projects (BOD_Actual).
Denominator: Sum total of days from NTP Sched or Actual to BOD Original for all On-going or Completed Projects.

RATING CRITERIA: Green = ≥ 95%; Amber 85% to < 95%; Red = < 85%
MILITARY PROGRAMS

MP09 - PROJECT CONSTRUCTION TIMELINE (CONSTRUCTION DURATION)

PROPONETS: CEMP-I, CECW-CE, RBCs & All Customers

VISIBILITY LEVEL: HQSACE, RBCs and customers.

PROGRAMS/PROGRAM CODES (PC) (Formerly Type Funds)
- Army Programs: TF 10, 12, 40, & 42
- Air Force Programs: TF 20, 21, 26, & 21
- DOD Programs: TF 17, 30, 32, 41, 46, 48, 51, 54, 56, 57, 58, 4B, 4S & 69
- BRAC Programs: PC 9F, 0G & 0H

DATA SOURCE(s): P2/C-RMS
REMOTE: Quarterly

PROGRAM YEARS (PY) MEASURED: PY 02, 03, 04, 05 & 06

GOAL: Construct and deliver Projects within the Construction Timeline (i.e. NTP to BOD) “Target Parameters” below.

<table>
<thead>
<tr>
<th>Programmed Amount (PA)</th>
<th>CONUS</th>
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<tr>
<td>&lt; $5M</td>
<td>365 Days</td>
<td>455 Days</td>
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<td>≥ $5M and &lt; $20M</td>
<td>540 Days</td>
<td>620 Days</td>
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<td>≥ $20M</td>
<td>730 Days</td>
<td>820 Days</td>
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PURPOSE: To provide visibility on the execution of Projects in PYs 02 -06 meeting or exceeding the construction timeline targets for “On-going” Projects and Projects “Completed” in the preceding 12 month period and to provide a comparison of actual and scheduled timeline data by PA for analysis and lessons learned to improve construction processes and execution performance.

DEFINITIONS and DETERMINATIONS: The Construction Timeline is a measure of the construction duration between the Primary (P) Notice-to-Proceed (NTP) Date (Milestone cCc80) and the Primary (P) Beneficial Occupancy Date (Milestone cCc550). Beneficial BOD. Actual is determined by the customer accepting the entire complete Project for useful occupancy and can be prior to the Construction Contract Completion (Milestone cCs40). Partial facility occupancy by the customer with the acceptance of the DD 1354 may constitute Actual BOD for the project, if appropriate. Care must be exercised in establishing the Primary (P) and Secondary (S) flags on the NTP. Acknowledged and BOD Milestone dates when multiple contracts are used to execute an authorized project and/or multiple projects are being executed by the same contract or contracts to ensure total time is captured from NTP to BOD. Where a Project is executed by multiple contracts, the “Primary (P) flag” on one contract’s NTP, Acknowledged Milestone (cCc80), which may be an ancillary contract, and a “P” assigned to the BOD Milestone (cCc550) on the primary/main or another ancillary contract finishing later, will be used to determine the total construction Timeline. The “Primary (P) flag” on the selected contract’s BOD milestone will also be used to determine ‘On-going’ or ‘Completed’ status of the Project, even if other ancillary contracts may still be in progress.

RELATIONSHIP of DATA to WHAT IS MEASURED: The Construction Timeline metric measures the frequency with which the Corps constructs and delivers its projects at or below the specified ‘Target Days’ based on Project PA. This metric is applicable to design-bid-build as well as design-build contracts.

METRIC CALCULATION: The metric will be expressed as a percentage of the number of “On-going” projects in PYs 02 -06 meeting each Construction Timeline parameter. Construction Timeline metric for projects completed in the last 12-months based on the BOD. Actual date will be shown for information and comparison only. The metric excludes multi-year programmed and incrementally funded projects (i.e. separate DD 1391 for each year).

Metric: Percentage of On-going Projects meeting the PA/Timeline Parameter goal:
- Numerator: Total number of On-going projects in PYs 02-06 in each PA parameter meeting the NTP to BOD Timeline goals
- Denominator: Total number of On-going projects in PYs 02-06.

Information/Comparison: Percentage of Projects in PYs 02 – 06 Completed in the last 12 months that meet the Timeline goals:
- Numerator: Total number of Projects in PYs 02-06 Completed in the last 12 months for each PA parameter meeting the NTP to BOD Timeline goals
- Denominator: Total number of Projects in PYs 02-06 Completed projects in the last 12 months.

RATING CRITERIA for EACH TIMELINE PA PARAMETER: Green: ≥ 95% ; Amber: 85 to < 95% ; Red: < 85%

Chapter 3 Table 1  Pg - 9  (15 Aug 06)
MILITARY PROGRAMS

MP10 - PROJECT FINANCIAL CLOSEOUT

PROPOGENTS: CEMP-L, CECW-CE, CERM-F, & Customers

DATA SOURCE(s): C-RMS/P2

VISIBILITY LEVEL: HQUSACE, RBCs and customers.

RATED: Quarterly

PROGRAMS/PROGRAM CODEUS (PC) (Formerly Type Funds)
Army Programs: TF 10, 12, 40, & 42
Air Force Programs: TF 20, 21, 26, & 2L
DOD Programs: TF 17, 30, 32, 41, 46, 48, 51, 54, 56, 57, 58, 4A, 4B, 4S & 69
BRAC Programs: PC 0F, 0G & 0H

PROGRAM YEAR(s) MEASURED: All Active PYs

GOAL: Financially close all MILCON Projects in CONUS and OCONUS within 12 and 15 months, respectively, based on the latest BOD of all construction contracts executing any portion of the Project.

PURPOSE: To provide visibility on the Corps’ ability and effectiveness to financially closeout Projects and meet the Chief Financial Officer’s (CFO) goals.

DEFINITIONS and DETERMINATION: Project Fiscal Closeout (P2 Milestone ML260) requirements are satisfied when: release of claims has been sign by all contractors and contracts paid (RMS data element c880); all obligations liquidated and construction funds returned; all obligations liquidated and bills final paid; applicable CEFMS Work items closed; Final DD Form 1354 with design and construction costs annotated and accepted by the customer; and the CEFMS Construction-in-Progress (CIP) asset account transferred to the customer by Resource Management. In instances where multiple contracts are used to execute the Project and/or a "follow-on" contract is required after the Project has been turned over (e.g., landscaping, correction of deficiencies, scope changes, etc.), the “Required” Project Fiscal Complete Date will be based on the latest BOD date of all contracts associated with the Project to begin the 12 month CONUS or 15 month OCONUS closeout period. Projects with pending claims, on-going litigation, changes after Project BOD, delays awaiting foreign or domestic government agency action, completion of follow-on construction items, and/or “Long-Term-Commissioning or Maintenance” identified by RMS delay codes F1, F2, F3, F4, F5, F6, F7, FC & FF are Excluded from the metric calculation but will be shown separately to maintain visibility.

RELATIONSHIP of DATA to WHAT is MEASURED: Timely Project Fiscal Closeout relates to effective management and execution of the project closeout process and meeting customer and CFO goals. Projects without a Project Fiscal Completion Date_Actual in the previous 12 months selection period will be counted as a fiscal open regardless of reason. Data shown for information, and intensive management will be: number of projects meeting the fiscally closed goals; those remaining fiscally open in the 12 or 15 months and > 24 or 30 months after the required fiscal completion date; and number of projects fiscally open beyond required fiscal completion date in a Claims or other delaying status with RMS delay codes F1, F2, F3, F4, F5, F6, F7, FC, & FF.

METRIC CALCULATION: The Project Financial Closeout rating is expressed as the percentage of Projects meeting the Project Fiscal Closeout goal. The P2 Milestone “Project Fiscal Completion_Actual Date is compared to a calculated “Required” Project Fiscal Complete Date based on the latest BOD_Actual Date for the contract or contracts constructing the Project plus the 12 or 15 month fiscal closeout periods for CONUS and OCONUS projects, respectively, to determine if the project met or missed its closeout goal. Projects with an RMS Delay Code of F1, F2, F3, F4, F5, F6, F7, FC, & FF are excluded.

Numerator: Number of MILCON Projects with ML260 Milestone “Project Fiscal Completion_Actual” within the prior 12 month selection period
Denominator: Number of Projects with a Required Project Fiscal Complete Date within the prior 12 month selection period plus Projects where the Required Project Complete Date is less than the 12 month selection period and the Project Fiscal Complete_Actual is null or blank.

RATING CRITERIA: Green: ≥ 90%; Amber: 80% to <90%; Red: < 80%
01-9.3 Sample Format for Memorandum of Understanding with the Using Agency
Adjust to match internal procedures within your District and your installations.

MEMORANDUM OF UNDERSTANDING
TRANSFER AND WARRANTY OF CONSTRUCTION

FORT ____ DIRECTORATE OF PUBLIC WORKS (or ____ AFB BCE)
US ARMY CORPS OF ENGINEERS, ____________ AREA/RESIDENT OFFICE

I. PURPOSE:

This Memorandum of Understanding (MOU) defines responsibilities and procedures to follow for the acceptance, transfer, and any warranty work for facilities constructed under the supervision of the ______________ Area/Resident Office (hereinafter referred to as A/RE) for the Fort __________ Directorate Of Public Works (or ________ AFB Civil Engineer (hereinafter referred to as DPW/BCE). This MOU will clarify the responsibilities of all parties involved in this process in order to provide a smooth transfer of facilities and provide the user with better service on repair of warranty items.

II. REFERENCES:

AR 415-15, App K-29, Transfer of Completed Construction

AFR 89-1

DA Pamphlet 405-45, Real Property Management and Accountability

ER 415-345-38, Inspection and Transfer of Completed Construction

III. ACCEPTANCE OF FACILITIES:

A. User Training. The A/RE will assure that the contractor performs user training, as required by the contract, in advance of the final inspection. The A/RE will coordinate between the DPW/BCE and the contractor to schedule an acceptable time to hold training sessions. The DPW/BCE will notify the necessary users and maintenance personnel of the training sessions as necessary.

B. Prefinal Inspection. Upon completion or substantial completion of construction or a phase of construction, the A/RE will perform an inspection to assure the facility is ready for a joint prefinal inspection. Once the A/RE has determined that the facility is ready for inspection they
will notify the DPW/BCE of the date and time of the prefinal inspection, giving the DPW/BCE at least 5 working days notice.

The DPW/BCE will notify the applicable users and DPW/BCE personnel of the date and time of inspection and request that they attend.

Prior to scheduling a prefinal inspection the A/RE will assure that the lock & key list has been sent by registered mail directly from the lock manufacturer to the DPW/BCE Key Shop.

Upon completion of the prefinal inspection the A/RE will develop a punch list and provide a copy to the DPW/BCE and the contractor.

C. Final Inspection. Prior to scheduling the final inspection, the A/RE will assure that all items on the punch list which affect occupancy of the facility have been completed. Once the A/RE has determined that the facility is ready for occupancy, he will notify the DPW/BCE of the date and time of the final inspection, giving the DPW/BCE at least 5 working days notice.

The DPW/BCE will notify the applicable users and DPW/BCE personnel of the date and time of inspection and request that they attend.

(This may vary) Prior to the final inspection, the A/RE will assure that all keys are properly labeled and arranged as follows. All interior keys will be placed in the locks so that they can be checked for proper operation during the inspection. Keys for exterior doors will be available for checking operation of locks during the inspection; however these keys are not to be left in the door. At the completion of the inspection, the interior door keys will be left in the doors and the A/RE will retain the exterior door keys until receipt of a copy of the executed DD Form 1354 from the DPW/BCE.

At the beginning of the inspection, the A/RE will provide the DPW/BCE with a final list of items remaining to be completed. A walk through of the facility will be performed and any deficiencies found will be added to the punch list. If the facility is found to be ready for occupancy, the A/RE will accept the facility from the contractor and proceed with transfer of the facility to the DPW/BCE. If it is found that the facility is not ready for occupancy, the A/RE will assure that all items on the punch list affecting occupancy are completed, and then schedule another final inspection.
IV. TRANSFER OF FACILITIES:

A. DD Form 1354. Prior to the final inspection, the A/RE will prepare a Transfer DD Form 1354, to include the total (estimated) Construction Cost, S&A Cost, E&D Cost, Real Property Cards, and List of Installed Equipment. Upon acceptance of the facility, the A/RE will notate on the back of DD Form 1354 any remaining deficiencies. The A/RE will then give the DD Form 1354 to the DPW/BCE for signature. The DPW/BCE will immediately sign and return a copy of the executed DD Form 1354 to the A/RE. The A/RE will immediately forward a copy of the jointly signed DD Form 1354 to appropriate POC in the District Office for dropping of the project from the USACE Construction in Progress (CIP) Account. Simultaneously, receipt of the jointly signed DD Form 1354 by the installation authorizes the capital asset to be recorded on the installation's accounts.

No later than 14 days after the final inspection, the A/RE will provide the DPW/BCE a written plan of action for resolution of any deficiencies noted on the DD Form 1354. This plan will include a schedule for correction of the deficiencies. It should also include a plan and identify funds needed for correction of any deficiencies or user complaints, which are beyond the construction contract requirements.

B. Keys. Once the DPW/BCE has provided the A/RE with a copy of the executed DD Form 1354, the exterior door keys will be given to the DPW/BCE thereby transferring responsibility for the facility to the DPW/BCE.

C. O&M Manuals. Prior to the final inspection, the A/RE will provide the DPW/BCE with all O&M manuals and spare parts lists as required by the construction contract.

D. Spare Parts. At the time of transfer, or prior to transfer, the A/RE will coordinate with the DPW/BCE for the proper disposition of any spare parts, specialized keys, handles, or tools required for operation of equipment within the facility.

E. Manufacturers' Warranties. Prior to, or at the final inspection, the A/RE will provide a list of manufacturers' warranties and warranty certificates for equipment and items installed within the facility to the DPW/BCE.

F. Submittal Data. Upon completion of the contract under which the facility was constructed, the A/RE will provide the DPW/BCE with all submittal data, including test results, which was submitted by the contractor during the course of construction.

G. As-Built Drawings. Within 30 days of acceptance of the facility, the A/RE will provide the DPW/BCE a set of contract drawings with all as-built conditions marked there on. Upon completion of drafting of the as-built drawings, the A/RE will provide the DPW/BCE with a set of reproducible as-built drawings and 35-mm cards or CADD disks when available.

H. Joint Occupancy. If it is deemed necessary for a facility to be occupied prior to completion, a joint occupancy agreement (JOA) which clearly defines and states all of the responsibilities and areas of operations of each party involved will be developed by the A/RE. The JOA must be
signed by the Area or Resident Engineer, the Director of Public Works or Base Civil Engineer, and an Official of the Contractor prior to beginning the acceptance phase of the applicable portions of the facility. A JOA is not required for normal punch list work and cases where a project has multiple buildings and each building is being accepted as complete.

V. WARRANTY:

A. Commencement. All facilities have a one-year warranty for defective materials or workmanship. Some specific elements of the work may have longer warranties as specified in the contract, or as provided by individual manufacturers. The warranty periods will commence the day after final acceptance of the facility from the contractor by the A/RE. The A/RE will provide the DPW/BCE a listing of the start and completion dates of specific warranty periods.

B. Maintenance. After transfer of the facility has been completed the DPW/BCE will perform all required periodic maintenance and preventative maintenance so that the warranty will not become null and void due to lack of maintenance.

C. Identification. The DPW/BCE is to instruct the users of the facility in the procedures to follow when repairs to the facility are needed. The DPW/BCE will investigate problems to determine if they are warranty issues before contacting the A/RE.

D. Notification. Once the DPW/BCE has determined that repairs are covered by the warranty they will notify the contractor of the details of the problem to have the necessary repairs performed. For items, which have a manufacturer's warranty longer than the contract specified warranty, the DPW/BCE should contact the manufacturer as described in the warranty certificate. The A/RE can be called upon for assistance when the contractor is non-responsive.

E. Follow-Up. In the event of required A/RE involvement, follow-up shall be coordinated with the DPW/BCE to assure that the contractor provides a timely and complete repair of the problem.

F. 4 & 9 Month Inspections. The A/RE will keep a suspense log or tracking system for 4 and 9-month warranty inspections. Approximately 4 and 9 months after acceptance of the facility, the A/RE will schedule a joint warranty inspection with the DPW/BCE and contractor. The DPW/BCE will notify necessary DPW/BCE personnel and the users of the facility of the date and time of inspection and request that they be represented.

During these inspections the A/RE will ask DPW/BCE and user personnel to identify any known problems. A walk through of the facility will be performed to identify warranty-related problems or design related problems. Upon completion of the inspection a punch list will be developed by the A/RE and a copy furnished to the DPW/BCE and Contractor. The A/RE will follow up to insure a timely and the contractor accomplishes complete repair of warranty problems. Upon completion of all necessary repairs the A/RE will notify the DPW/BCE. Any design related problems will be forwarded by the A/RE to the appropriate POC in the District Office for their investigation.
VI. CERTIFICATION:

I. M. DONE, PE
Camp Readiness Area Engineer

Date

I. M. PLEASED
Director of Public Works (or BCE)

Date
## 01-9.4 Sample Controlled Document Revision Log

W9122804-C-0026, SOF 96-Man Barracks

**CONTROLLED DOCUMENT REVISION LOG**

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<th>PLATE/SHEET, SPEC/PAGE/</th>
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CHAPTER 02 PRE AWARD CONSTRUCTION MANAGEMENT

02-1 PRE AWARD CONSTRUCTION BEST MANAGEMENT PROCESSES

02-1.1 Purpose
This chapter provides the general policy and guidance for establishing construction management procedures during the **Pre-Award phase** of the PMBP in the execution of construction contracts. It addresses Construction Division’s responsibilities during the pre-award phase of a project. As members of the PDT, all Construction Division Team Members must be aware of the acquisition process and be able to provide critical information thru design reviews and the source selection process to assure that the contract can be executed in an efficient manner.

Construction Division must be aware and provide input on site specific requirements of the project and be sure the PDT is aware of local installation/sponsor requirements that could effect construction during the pre award process. It is imperative that the user has a complete understanding of the proposed facility to assure that their expectations are clearly articulated.

To be successful Construction Division Team Members must be involved in the pre-award process to assure the success of the project. Efforts during the pre-award phase can significantly improve the execution of the construction.

02-1.2 References
FAR Part 46.312 – Construction Contracts
FAR Part 52.246-12 – Inspection of Construction
ER 415-1-11 – Biddability, Constructability, Operability, and Environmental Review
ER 1180-1-6 – Construction Quality Management

02-1.3 Responsibilities
Authority and responsibility for implementing and maintaining the quality system within the field offices is delegated to the head of each field office.
02-1.4 Definitions

a). **BCOE** – Biddability, Constructability, Operability, and Environmental Reviews.

b). **Constructability and Biddability** – the ease with which a designed project can be built and the ease with which the contract documents can be understood, bid, administered and executed.

c). **Environmental Review** – refers to the protection of air, water, land, animals, plants and other natural resources from the effects of construction and operation of the project as stated in the Environmental Impact Statement or Assessment.

d). **Operability** – the ease with which a project can be operated and maintained.

e). **P2** - an Automatic Information System (AIS) that enables Project Management to implement its business processes and to change to its desired Project Management Business Process (PMBP) culture. Specifically, P2 is a suite of commercial off the self software applications configured to support project execution in the Military, Civil Works, Environmental, R & D, Interagency and International Services (IIS) missions.

f). **PDT** – Project Delivery Team.

g). **Project Management Business Process (PMBP)** - an integrated set of processes that follow a project from cradle to grave. The project manager (PM) is responsible as the key member of the Project Delivery Team to coordinate the program requirements from inception to final acceptance.
02-2 PRE AWARD MANAGEMENT OVERVIEW

02-2.1 General
Obtaining quality construction is a combined responsibility of the PDT during the entire PMBP process. No longer can construction division just wait for the award of a construction contract and then execute in accordance with the contract specifications and drawings. Construction Division must be aware and involved during the entire PMBP process. Critical input during the acquisition planning, design and RFP development are critical to the success of a project. Additionally, Construction Division personnel must be capable of serving as the lead working with the PM in the development of small O&M type projects generated at the installation level to be executed through IDIQ, SATOC or MATOC contracts. Knowledge of acquisition methods, funding restraints, environmental issues and construction processes are critical to the PMBP process.

02-2.2 PMBP/P2
PMBP/P2 - It is critical that Construction Division personnel be fully integrated in to the Program Management Business Process (PMBP). As a key member of the PDT the Area/Resident/Project engineer must coordinate with the PM to assure critical information is provided during the programming, planning, construction and closeout process of a project. Construction Division must work through the PM to support the project during the program, engineering, acquisition and construction process.

1. **PMBP** - Program Management Business Process (PMBP) is an integrated set of processes that follows a project from cradle to grave. The program manager (PM) is responsible as the key member of the Product Delivery Team to coordinate the program requirements from inception to final acceptance.

The program manager is required to develop a Project Management Plan (PMP) for every project. This plan is developed in coordination with all members of the PDT. Key information is provided from construction for incorporation into the PMP. During the transition to contract award the Area/Resident/Project engineers must be provided the most current copy of the PMP.

2. **P2** - P2 is an Automatic Information System (AIS) that enables Project Management to implement its business processes and to change to its desired PMBP culture. Specifically, P2 is a suite of commercial off the shelf software applications configured to support project execution in the Military, Civil Works, Environmental, R & D, Interagency and International Services (IIS) missions.
P2 is an integral part of the PMBP process which allows all programs and projects to be managed. Key benefits to the P2 system include the following:

- Establish of a single project/program Management Database
- Single Point of data entry
- Support PDT
- Establishment of consistent tools and processes
- Increase efficiency and coordination
- Increase visibility of resources
- Higher quality Projects/ On time/ within Budget
- Shared management of projects by all PDT members

The District Program Management is responsible for maintaining P2. P2 has a shared database with RMS data and CEFMS. In the program development phase key data from P2 is downloaded into RMS. During the construction phase key data such as milestones and progress are uploaded into the P2 database that allows real time monitoring of the construction project. Ultimately, key components of the P2 database will be available to the user/customer to allow the customer critical planning data.

P2 – Pre award Construction Planning Data:

- Downloaded to RMS
- Future projects
- Program Amounts
- Milestones of project
- Schedules of Project.

RMS will not allow future projects to be loaded without a P2 link. Area/Resident offices must assure projects are linked from P2 to RMS to allow placement forecasting. Area/Resident Office must coordinate with PM to assure place holders are loaded for any potential civil works, OMA, work for others or similar projects that are not specified construction. Place-holder projects are needed for 2 fiscal years beyond the current FY.

This information is critical for Construction Division to schedule future placement for the manpower resourcing. It is critical that the information be downloaded into RMS because it will be the primary tool for resourcing the future requirements for construction division.

Close coordination will be necessary between the Area and Resident Office to assure that Installation O&M projects are set up in advance in P2 to allow for the capturing of financial data for manpower. Place Holder projects must be put in P2 for the installation. The Area/Resident must work directly with the PM to assure O&M projects are put in the system to assure data is downloaded to RMS and that accurate placement projections are made for manpower planning.

P-2 During Construction – After the award of a contract critical data from RMS is uploaded into P2. The following data must be kept current to assure data being uploaded is accurate. The following data must accurate in RMS for data integrity:
- Milestone DATA – must be updated bi monthly at a minimum
- Status updates – must be updated bi monthly at a minimum
- Schedule – must be updated monthly at a minimum
- Modifications and Change Orders – updated automatically

**P2 interface problems:**

Funding: If funding is not properly input into P2 a modification cannot be completely processed in RMS. CEFMS, RMS and P2 must be in agreement to allow the complete processing of a modification.

Data Integrity: Before a contract is awarded, P2 will overwrite any changes in RMS.

Coordinate with PM on issues associated with the interface between RMS, SPS, P2 and CEFMS

**Summary:** P2 is the program manager’s equivalent to RMS for the Area/Resident engineer. It is the critical database for upward reporting is accurate, and it is imperative that the data integrity be maintained.

**02-2.3 Programming of Projects**

Programming of project begins at the installation master planning level. The installation conducts master planning in order to identify their future needs. Local planning boards set priorities of projects. Once a project is approved at the local installation planning board, the installation develops a 1391 programming document with is forwarded as part of the installation 5 year program or (FYDEP). At this stage the projects are staffed through the ACSIM, IMA and Department of Army for approval. Once a MILCON project is approved by DA the project is included as part of the Army budget and presented to Congress for approval.

**1391 PROCESS:** The initiation of the project is accomplished thru the master planning or the installation with assistance when requests from the geographic district. The 1391 form is generated by the installation. The 1391 ultimately is submitted to congress for approval. The scope of work of the 1391 sets forth the requirements of the contract. The 1391 is part of the 5-year FYDP Program where projects are submitted and approved by Congress. Once approved the 1391 serves as both the authorized funding and authorized scope of the program. The documentation of the 1391 can be critical in the event of unusual change order requests to a project (i.e., an extra parking lot, more square footage to a building and etc.). A building cannot exceed the authorized 1391 without reprogramming.

Programs and projects can be funded in numerous ways. All government program funds are subject the FAR. Each fund source has a set of rules and regulations concerning how the funds can be utilized. The Area/Resident/ project engineers must be aware of the funding constraints in order to understand their limitations to keep from encountering possible CFO violations. When every there is a funding question the PM should be...
contacted to assure proper coordination with RM, CT and OC prior to any obligation of funds.

The basic funding information is as follows:

**MILCON Funds** – These funds that are congressional approved for a specific project or program. These funds can only be used on the specific project in which they were approved by congress. These funds are normally 5-year funds. These funds cannot be utilized for any obligation upon their expiration.

**O&M Funds** - These funds are normally referred to as SRM funds. These funds are utilized for Operational and Maintenance funding at the installation level. The funds can only be obligated in the year they were approved, but can be utilized for modifications to contracts obligated and obligation for up to 3 years. Fund expiration dates must be coordinated prior to the issuance of any modification to the contract. There are limitations to the utilization of SRM dollars in CONUS for construction as follows:

- **K type funds**
  - New Construction is limited to $750 K.
  - Life, Health & Safety Limited to $1,500 K
  - Force Protection limited to $1,500K

  (Document from user any determination of Life, Safety, and Health or Force protection before obligations)

- **L type funds** - Normally, limited to $3,000 K at installation level. These funds are for major renovations of an existing facility. Above $3,000 requires MACOM approval.

Mixed funded contracts - a contract can consist of a mixture of the 2 funds types. In this case the two funds types must be tracked to assure that a statutory limit is not exceeded by any modification to the base contract

**BRAC – Base Realignment and Closure funds** – Similar to MILCON funds but must be utilized for appropriated purpose.

**CG – Construction General** – Funds appropriated by congress. This type funds are normally utilized in new civil works projects. Normally they are to be obligated in the year of their appropriation.

**Civil O&M** - Funded by congress in categories such as dredging, levee and etc. Funds are to be obligated in the year of their appropriation.

**DERP – Defense Environmental Restoration Program** - Funded by congress and fenced for appropriated purpose.

**NAF – Non Appropriated Funds** – Funds that are specifically designated for Child Care Centers, shoppettes, craft and arts centers, etc. Funds are normally generated from sales
or services on an installation. Funds are normally managed from a central location and on a direct reimbursement basis.

Summary: Area/Resident/Project engineers must be aware of funding constraints in order to advise and manage the customer’s expectations without inadvertently creating a CFO violation. Whenever funding is an issue, consult with the PDT.

02-2.4 Funding for Pre-Award Activities

Pre-award activities are funded in a variety of ways. If the work is in direct support of a contract such as planning, preparing QA plans and etc then is funded by the normal S&A funds. Planning and Design (P&D) funds must be used for all pre-award activities up to and including the award of the construction contract. The Corps must maintain accountability of our design and construction processes and avoid any perception of supplementing funding for one process from another. For additional information on funding of pre-award activities, refer to the latest USACE Policy for Planning and Design (P&D), Construction Supervision and Administration (S&A) and Post-Award Engineering and Design (DDC) Services posted at http://www.hq.usace.army.mil/cemp/files/usace%20policy-pd%20sa%20ddc.pdf.

Work done in direct support of the contract should be separately funded. Design reviews, plan in hand reviews, BCOE reviews or participation in the source selection boards; all must be direct labor funded. Coordinate directly with the PM to assure a fund cite is provided.

On projects where the field office is negotiating contracts such as 8A set asides, the pre-award activities must be funded by a direct labor cite.

On O&M projects where the field is supporting the installations thru IDIQs or MATOC task orders the pre award activities must be funded upfront through a MIPR from the installation (Installation Support Funds (ISF) at the Division could be used for some). The Area/Resident Engineer must coordinate directly with the PM, RM and CD to assure funding has been allocated for the pre award activities. On this type of work the district PM normally establishes the pre award rates for the different methods of acquisition.

The Geographic district will establish the acquisition deadlines for the installations on O&M work.
02-2.5 Acquisition Process

Acquisition Process – As a member of the PMBP PDT the Area/Resident/Project Engineer must be familiar with Acquisition planning. The Federal Acquisition Regulations (FAR) and Defense Federal Acquisition Regulations (DFAR) are the basis for all Acquisition planning. The FAR is a set of regulations on how service, supplies and construction contracts are planned, awarded and executed. The FAR designates how contracting authorities are delegated from the Head of the Agency (USACE Commander) to the Principal Authority Responsible for Contracting (PARC) to District Contracting Officers (CO) and ultimately to the Administrative Contracting Officer (ACO) and Contracting Officer’s Representative (COR).

Acquisition Planning starts at the original inception of the project/program. The Area Resident/Project engineer as part of the PDT must be aware of the different methods available for the acquisition of services, supplies and construction. The PM working with CT and the PDT works to develop the most effective and efficient method of acquisition to meet the requirement. There are three basic categories of acquisition based on threshold values. They are as follows:

1. Micro-purchases – normally credit card type purchases of less than $2,500 for supplies and services and $2,000 for construction
2. Simplified Acquisition – Normally purchase orders of individual contracts less than $100K
3. Major Acquisitions – contracts greater than $100K

There are two basic methods for Major Acquisitions:
1. IFB – Invitation for Bids – (Sealed bid) Open Competition
2. RFP – Request for Proposal (Negotiated)

There are 2 major categories of contracts (Fixed Price and Cost Reimbursable) and numerous types of each:
- Fixed Type contracts – Preferred method of Contracting
- Cost Reimbursable – Cost Plus type contracts. They can be fixed fee, incentive fee or award fee type
- Incentive Contracts
- Indefinite Delivery Contracts
- Time and Material Agreements

Currently, the following type of construction contracts are being utilized in SAD:

Fixed Price Contracts:
- IFB – Invitation for Bids - open competition – award based on lowest price or lowest price technically acceptable (LPTA).
- RFP – Competitive Bid – awarded based on best value. Selection is based on approved source selection plan. Plan typically is based on past experience, technical capabilities and management along with pricing.
**RFP – Sole Source negotiated** – Typically a negotiated contract with an 8A contractor that is proposed by the Small and Disadvantaged Business Advocate (SADBU).

**IDIQ/DB - Indefinite Quantity Indefinite Delivery/Design Build** – Basic contract awarded based on Source Selection Plan with task orders negotiated and issued as needed.

**SATOC – Single Award Task Order Contract** – Task order contract awarded to a single contractor.

**MATOC – Multiple Award Task Order Contract** – Task order contract awarded to multiple contractors. Task orders are competitively bid to the group of contractors.

**Service Contracts**

**Cost Reimbursable Contracts:**
These types of contracts are rarely used in normal business but may be utilized in cases such as emergency operations for disaster relief or similar work. Types are as follows:
- Cost Plus Fixed Fee
- Cost Plus Incentive Fee
- Cost Plus Award Fee

**Rental Contracts:** These contracts are typically utilized by Operations Division for simple, small scale, defined work.

**Time and Material Contracts:** These types of contracts are rarely used in normal business but may be utilized in certain circumstances. For example, critical O&M work, disaster relief, etc. Contracts are controlled through the use of limited Work Authorization Directives (WADs). For example, the first WAD is used to prepare the work plan (fixed amount) and the second WAD is used for construction after negotiating firm fixed amount.

**DISCLAIMER:** The aforementioned information concerning Acquisition is for information purposes only. The Area/Resident/Project Engineer must be aware of the acquisition processes to be involved in the Acquisition Planning process. The FAR should be consulted for additional information. The FAR is available on the Internet at [http://acqnet.gov/far/current/pdf/FAR.book.pdf](http://acqnet.gov/far/current/pdf/FAR.book.pdf)
02-2.6 Source Selection

Source Selection Plan – On construction contracts procured by RFP, the PDT is responsible for the development of a Source Selection Plan that has to be approved by the Source Selection Official. During the RFP development the Area/Resident/Project Engineer will assist the PM in the source selection criteria part of the overall plan. The plan also details the manner in which a contractor will be selected. This type of procurement can be part of a one or two step process. On acquisitions that will result in a significant cost to the contractor during the preparation of a proposal, the two step process is used to pre-qualify contractors based on technical merit in order to reduce the contractor’s initial proposal preparation costs.

Construction Division personnel will be a part of the source selection group to evaluate contractor’s technical proposals. It is critical that Construction Division assigns a senior Project Engineer, Resident Engineer and Area Engineer to support the source selection process through representation on the technical review process in the evaluation of the contractor’s proposals. The PM will establish a labor cost to cover all review costs associated with the technical reviews. Contractor’s past performance is a critical element in the Technical Review during the source selection process. Past performance information may be obtained from CCASS ratings, past performance questionnaires, owner surveys, etc.

Acquisition Processes - There are 2 basic forms of contracts for construction:

1. Design-Bid-Build – This is the traditional process where Engineering Division completes the design either in-house, acquires design from another USACE District, or contracts with an A&E firm for design services. The complete design is then advertised and contractor’s solicited to perform the work.

2. Design-Build Contracts are a form of procurement with a firm fixed price to perform both design and construction using performance specifications utilizing one of the aforementioned contract types. The contractor is then responsible for both the design and construction components.

There are 3 basic types of Design-Build contracts utilized:
- Traditional = Separate NTPs issued for Design and Construction each with a specified duration.
- Two Phase = Single NTP issued for both Design and Construction with design phase being 100% completed prior to construction.
- Fast Track = Single NTP issued for entire contract. Construction can start once the design for an identifiable phase of work is completed and accepted (i.e., site work package, structural package, completed design, etc.).
02-3 **OVERVIEW OF THE DESIGN REVIEW PROCESS**

The program manager is responsible for coordinating the design of projects. Construction Division is responsible for constructability reviews and periodic design/plan in hand reviews. Construction Division elements must maintain awareness during the design process and participate in the design charrette out-brief or during the Civil Works planning process/study briefing. The out-brief/study briefing can be very informative to the field office in maintaining knowledge of future construction requirements. During the RFP development the Area/Resident/Project Engineer will assist the PM in the source selection criteria.

02-3.1 **Design Charrettes/Planning Studies**

Preliminary Design/Study completed by the PDT, normally 2 to 3 years before the program year of execution, in order to refine the 1391 or develop a concept design. During the process, the design entity develops a concept design after working with the users or sponsors.

02-3.2 **Design Reviews**

As part of the PMBP the PM will establish and schedule the design reviews for a project. The program manager will establish a direct labor funds cite for design reviews. Mandatory BCOE reviews by construction are at the 95% and 100%. The actual design is managed by the Program Manager with Construction Division supporting the design to assure the project includes the lessons learned from previous projects and that the projects is constructible. Typically on Design-Bid-Build (DBB) the following designs are scheduled:

- 35% - Concept
- 65% - Preliminary
- 95% - Final
- Value Engineering
- 100% - Corrected Final - RTA

The PM is responsible to:

1) Inform the Area Office of future projects.
2) Furnish design documents to the Area Office for review in a timely manner.
3) Provide funding for design reviews.
4) Schedule Design Review conferences.
5) Insure incorporation of design review comments into the design process.
02-4 PRE-AWARD DATA/INFORMATION REQUIRING CD INPUT

02-4.1 Front End Contract Requirements

The following data must be provided to PM by Construction Division during the RFP/IFB development:

a). Liquidated Damages (LDs) – field, district, and customer costs, as applicable.

b). CQC Requirements (See form in exhibits section used to provide requirements to EN, PM, CT, A/E, etc…)

c). NAS Requirements

d). Pre-proposal Conference Info

e). Agreement on construction duration (SAD Guidance) – Summary Schedule from designer

f). Special Requirements (i.e., project office trailer, etc…)

RBP – Through participation in the design review conferences, the field office needs to provide all of the criteria for the “blanks” in the Division 01 specifications. By early incorporation into the contract documents, the field office will be able to verify the “edits” as part of the BCOE reviews and not end up finding surprises in the awarded documents.

02-4.2 A-E Special Requirements

Title II services required to assist the field office shall be coordinated directly with the PM to agree on the A-E services needed during construction. The PM shall be responsible for coordinating the requirements with A-E and arranging the A-E services.

General Procedure:

A-E contracts are awarded by the District through Engineering Division, Contracting, or other responsible organization depending on the District. The Project Manager will generally manage the contract administration with Contracting Officers Representative (COR) authority vested in Engineering Division. Area/Resident Engineers will have COR authority in areas concerning design errors and/or omissions and in submittal review. The Contracting Officer will provide COR Designation letters to the Area/Resident Engineers as applicable. Area/Resident Engineers should acquaint themselves with the provisions in the A-E contracts to become familiar with the scope of work and services scheduled during construction.
Troubleshooting Services During Construction:
During the construction period, the AE shall furnish such advice, as may be required. Area/Resident Engineers may contact the AE directly to obtain clarifications, interpretations, or general guidance concerning the designer’s intent or to resolve conflicts in the drawings or specifications. The AE's liability for correction of errors or deficiencies in his design is covered by General Provision of the Architect-Engineer Contract entitled "Responsibility of the Architect-Engineer". Telephone calls to AE's shall be documented. If field visits are required for correction of errors or deficiencies, the telephone call shall be followed by a Memorandum to the Engineering Division AE COR citing the proper paragraph in Appendix A - Section 1: General, Specific Instructions to the Architect-Engineer, and outlining the details of the error or deficiency for use by the Engineering Technical Manager in documenting the problem in a letter to the AE. Area/Resident Engineers are not authorized to direct the AE to perform additional or new work. Engineering Division should be provided notice of any suspected AE liability for errors, in accordance with applicable District Regulations. The AE should report initially to the field office when making any visits to the project site after construction contract award. Field offices will keep track of AE visits. This information may be used to validate payment due at a later date.

Submittal Review Services During Construction:
EN will negotiate modifications to the appropriate AE contracts to include review of all designated GA/D submittals in the corresponding construction contracts. In addition, Area/Resident Engineers may wish to have selected GA/F or FIO submittals reviewed by the AE designer. Such requests should be made to the PM during the bid solicitation period, or at the earliest practical date. This request will identify the appropriate submittal by specification, paragraph number, submittal type, description, and man-day estimate for the review. ENG Form 4288 may be used for this purpose. The cost of reviewing these submittals by the designer will be charged to the requesting Area/Resident Office S&I account. The PM will coordinate with Engineering Division to modify the AE contract to include the requested review or to arrange for District review of the submittals. After the Area/Resident Engineer receives notice from the Project Manager that the AE contract has been modified and Notice to Proceed issued on the modification, the Area/Resident Engineer may then send submittals directly to the AE for review. The Area/Resident Engineer will be requested to review and report on AE progress for payment purposes based on invoices submitted by the AE through the COR in Engineering Division. Non-responsiveness by AE's shall be reported promptly to the Project Manager for resolution by the Contracting Officer or Contracting Officers Representative.
02-5  CONSTRUCTION DESIGN REVIEW MANAGEMENT

02-5.1 Typical Roles and Responsibilities
Representatives of Construction Division, Engineering Division, Contracting, Office of Council, and Project Management will serve as members of the “Design-Build Management Team”.

Project Management and Engineering Division is responsible for overall planning, preparation of technical requirements (including Invitation for Bid as in the case of two-step procurement), establishing proposal evaluation standards, technical review and evaluation of proposals and technical review and approval of final design.

The Engineering Division will: prepare the RFP or RFTP packages; advertise for proposals; receive, review and evaluate proposals, conduct negotiations and prepare contract documents for award to the successful proposer.

Construction Division and Field Offices are responsible for biddability, constructability, operability and environmental reviews of design submittals and all normal supervision and administration functions of the design and construction phase with special emphasis on close coordination with PM and EN from the time of proposal evaluations through negotiation, award, and approval of design.

A Field Office representative designated by the Area/Resident Engineer will be the single point of contact for the project throughout the design phase of the project. It will be his/her responsibility to act as liaison with the many different groups involved in the design process and to ensure the overall quality of the end design product.

02-5.2 In-house/A-E Design Packages:
It is the responsibility of PM to ensure that the established Points of Contact (POC) for PDT elements receive copies of the design package and that their reviews are completed in a timely manner. The Using Agency and field office personnel (Project Engineers, QARs, and Technical Support personnel) will perform design reviews, enter their comments in PROJNET (DRChecks), and attend design review conferences.

The customer should provide the PM with any special warranty requirements, specific interior design package requirements, or other contract requirements such as phasing, training, or follow-on maintenance.
Design reviews include both the plan-in-hand review performed by the field office and the BCOE review performed at the District or Field Office level or both. It is the responsibility of the individual responsible for signing the BCOE certificate to verify that all review comments have been incorporated into the plans and specs and/or resolved/addressed satisfactorily.

**RBP** – Hold design review conferences (where practical) at the field locations to allow maximum participation of the user.

### 02-5.3 Design Build RFP Packages

The administration of the design portion of a Design Build (DB) project differs significantly from that of a Design Bid Build contract. The contract development process follows the normal DBB build process with the exception that there is not a complete design developed. Therefore, it is critical during the review process that the 01010 and 01012 specification sections of the RFP be as complete as possible. These requirements establish the design requirements for the design/build contractor. Once the contract is awarded the Area/Resident/Project engineers is responsible for coordinating with the PM on the design review schedule. EN will be a critical member of the PDT to assure RFP reviews are completed in a timely manner. The PM is responsible for coordinating the RFP reviews with the user and will provide notification of the review conferences to the Area/Resident Engineer.

The PM and CD shall jointly chair all design review conferences. Design reviews will normally be conducted on site to allow for maximum participation by the user.
02-6 BCOE REVIEW:

The following is a brief clarification of some of the step-by-step procedures for BCOE reviews as summarized in the flow chart.

a. CD Tasked With BCOE Review.
PM is responsible (may vary by District) for providing the reviewing organizations with a tasking document and the design review documents for the BCOE review. The tasking document will include relevant project data such as the review suspense date, total funds allocated, and funding charge numbers.
b. Individual responsible for coordinating the BCOE reviews (BCOE Coordinator) negotiates funding and review times with PM. In the event of inadequate funding and/or reviews cannot be accomplished within the assigned time frame, the BCOE Coordinator will negotiate additional time and/or funds with the Project Manager. Schedules for concept and final design reviews will be based on scope of project, project priority, and current workload, not a standard period especially at year end.

c. BCOE Coordinator Assigns Project For Review.
The BCOE Coordinator assigns the project for review to the designated Field Office. A rule-of-thumb guideline for the determination of man-hours per discipline is to use one man-hour per sheet per discipline of the plans being reviewed. A good rule-of-thumb for the assignment of man-hours in the field offices is to use 1/2 man hour per sheet to be reviewed. The coordinator must use his best judgment in assigning projects and negotiating the suspense date by evaluating the scope of the project, project priority, and the current workload.

d. CD Performs BCOE Review.
Concept and final design review comments will be entered into DrChecks found on the ProjNet website https://www.projnet.org/projnet/binKornHome/index.cfm User ID’s and passwords for access are provided by EN. The final design documents for review should consist of completed and checked drawings, technical specifications, Bidding Schedules and Special Contract Requirements in regard to phasing, work constraints, occupancy during construction, Government Furnished Equipment (GFE) and salvage of useable equipment and materials.

When CD determines that the submitted final design documents contain too many omissions and/or discrepancies for a meaningful BCOE review, they shall be returned immediately to PM/EN for resubmission. A request for resubmission should be made in written form and contain examples of problems with the documents.

e. EN and Designer Work to Incorporate Comments.
Once the project review has concluded, the Designer must address each comment and return the corrected documents with annotated review comments for a final confirmation review (corrected final) prior to signing the BCOE Certification.

f. CD Tasked With Corrected Document Review.
When the Designer has made all the corrections to the design documents, and provided annotations to all previous comments, PM/EN will deliver the corrected final design and tasking documents to the BCOE Coordinators.

g. CD Performs Corrected Document Review.
The BCOE Coordinator tasks the designated reviewers with reviewing the corrected documents to insure that all previous comments have been addressed.
A draft of the specification Bidding Schedule and Special Contract Requirements will be reviewed at this time to ensure that the scope of work is adequately and appropriately described and that Special Contract Requirements include all conditions unique to that particular project, such as limitations imposed upon construction, condition of occupancy, phasing, etc. Comments that have not been satisfactorily addressed will be returned to the designer, through the BCOE Coordinator for further corrective action.

When all comments have been addressed satisfactorily and the construction documents are acceptable for bidding purposes, EN will prepare a BCOE Certification letter for the Chief, CD and the Chief, EN signatures, or their designated representatives. An example of a BCOE Certification Letter can be found in ER 415-1-11.

h. Plan-in-hand Site Reviews.
Field office personnel shall perform the plan-in-hand review on-site to confirm the physical features of the work, site, and conditions. These field comments shall be included as part of the BCOE review comments.

g. BCOE review checklists have been prepared that greatly assist in reviewing design packages for common errors, omission, and key items of interest. See Exhibit 02-9.2.

**02-7 OTHER CONSIDERATIONS**

**02-7.1 Environmental considerations**
Construction Division field personnel must remain cognizant of all environmental issues pertaining to future projects. The entire PDT must consider environmental concerns/requirements during the design process. Failure to obtain the proper environmental permits will adversely affect the construction phase. Depending on the project and acquisition method, the responsibility for obtaining these permits may reside with the DPW, BCE, District, or contractor. If environmental permits are properly processed, the construction phase can be severely compromised by the issuance of a State or Federal Notice of Violation (NOV).

Environmental Impact Statements and/or Environmental Assessments must be prepared for all construction projects. These may be long lead items and careful planning for obtaining them must be coordinated with installations or sponsors. On military projects, the installation is responsible for obtaining the necessary National Environmental Policy Act (NEPA) documentation. For civil works project, the NEPA documentation is normally obtained by the District as part of the project study process.
02-7.2 Permits Required

Permit requirements vary from State to State. Typically, on traditional D-B-B projects, the permits are obtained by the District (or possibly the Installation) prior to award. On D-B projects many of these permits are obtained by the contractor after award. Regardless, Construction Division personnel must be aware of all required permits and the status of each. A lack of coordination will result in significant construction delays.

The following permits and requirements are often encountered on military and civil works projects:

1. – Air permit – if boilers and generators are in project (installations track Title V air permit requirements)
2. – National Pollutant Discharge Elimination System (NPDES) Permitting
   a. Erosion Control
   b. Water Quality
3. – Water Permit – if extension of installation or municipal water line is required or installing an oil water separator with a direct discharge.
4. – Sewer Permit – if tying into base or municipal sewer system
5. – Wetland Permit – If disturbing or working in the vicinity of streams or wetlands
6. – Asbestos Abatement Permit – typically acquired by contractor
7. – Demolition permit - typically acquired by contractor
8. – Housing and Urban Development (HUD) Agency - Notification/Clearance (McKinney-Vento Act) - prior to demolition of buildings the installation is required to notify HUD and list buildings in the federal register proposed for demolition.
9. – State Historical Preservation Office (SHPO) Permit – if dealing with structure that is over 50 years old and on the Historical Register
10. – Underground Storage Tank (UST) Permit – If installing a underground storage tank
11. - Lead Abatement Permit – typically acquired by contractor
12. - Other Federal, State, and local Environmental permits

It is imperative that the field construction personnel be fully aware of the specific requirements of all permits. A contract should not be awarded until all permits are on hand. The AE as part of the preconstruction conference must verify with the installation and EN that all permits are on hand prior to the start of work.

**RBP** – Maintain an Environmental Permit Checklist during the design review process and insure receipt of pre-award permits during transfer of the Transition Documents.
02-7.3 Design Build environmental permits.

On design build contracts, the installation is responsible for the EA and EIS permits. However, the remaining permit requirements must be approved in the design phase as stated in the contract requirements. Construction Division and the ACO must assure that all permits are in hand prior to the start of any construction affected by a permit.

02-7.4 Timber Harvesting

On larger installations there is normally a real estate activity associated with harvesting trees. If merchantable trees are on the project site, an agreement must be in place for the disposition of the merchantable timber. If the installation is to harvest the timber it must be accomplished prior to the award of the contract. Normally an AE surveyor must mark the clearing limits so the timber may be harvested. On D-B contracts, the harvesting of merchantable timber must be addressed in the RFP. The PM/EN is responsible for assuring the clearing limits are marked.

02-7.5 Base Access

Installations have different requirements for contractor access. A special clause must be coordinated with PM, the installation, and Field CD Office to assure that the special clause is included in the contract provisions.

02-7.6 HUD Notifications

HUD is responsible for the administration of the McKinney-Vento Act. On any project requiring the demolition of a government building there must be proper notification to allow an agency or institution the opportunity to salvage the facility to support the Homeless. The process requires the installation to publish their intentions to demolish a building in the Federal Register for a period of 60 days and to support any agency requesting salvage materials.

02-8 WORK FOR OTHERS

Due to recent policy changes there are numerous doors to support the customer’s needs. Field office personnel must be aware that other Districts, Centers, or agencies may award contracts in another District’s area of responsibility that will require field office support. Examples include work for MEDCOM, HNC, LRL, NWO, and etc. The geographic District should be notified of the pending work early in the pre-award stage. A Memorandum of Agreement or Interagency/Support Agreement (ENG Form 4914-R) must be negotiated for services provided by the geographic field office. Examples of both are included in Exhibit 02-9.3.
02-9 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page.
02-9.1 Form Used to Specify CQC System Requirements

<table>
<thead>
<tr>
<th>CQC SYSTEM FRONT END REQUIREMENTS</th>
<th>Based on criteria in UFGS 01 45 04.00 10 (April 2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project:</td>
<td></td>
</tr>
<tr>
<td>Location:</td>
<td></td>
</tr>
</tbody>
</table>

CQC System Manager

CQCSM shall be:

- A graduate engineer, graduate architect, or a graduate of construction management with a minimum of ___ years construction experience on construction similar to this contract.
- A construction person with a minimum of ___ years in related work.

CQCSM shall be:

- Assigned no other duties.
- Assigned as System Manager but may have duties as project superintendent in addition to quality control.

CQC Staff/Personnel

Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas:

- Civil
- Mechanical
- Electrical
- Structural
- Architectural
- Environmental
- Submittals Clerk
- Occupied Family Housing
- Concrete, Pavements and Soils
- Testing, Adjusting and Balancing (TAB) Personnel
- Design Quality Control Manager

These individuals:

- Shall be directly employed by the prime and may not be employed by a supplier or sub on this project
- May be employees of the prime or subcontractor

These individuals:

- Shall have no other duties other than quality control
- May perform other duties but must be allowed sufficient time to perform their assigned QC duties

- A single person may cover more than one area provided they are qualified to perform QC activities in each designated area and that workload allows.
02-9.2 BCOE Checklist

Items to be checked and verified:

- Accurate depiction and adaptation of design structures and features to site conditions and restrictions such as access, utility availability, drainage, storage, existing underground utilities, and general configuration.

- Appropriateness of contract sequencing, relationship to other work, contract performance time, contractor quality control (QC), submittal requirements, and network analysis system provisions for the specific project.

- Adequacy of working area and storage space and access for all site contractors as well as provisions for coordination to preclude on-site conflicts.

- Clarity, simplicity, and essentiality of the bid schedule.

- Local availability of special materials and labor skills.

- Have special installation requirements been addressed?

- Are the drawings and specifications free of ambiguities?

- Are essential details and proper verbiage included?

- Do the specifications include the list of submittals as required by ER 415-1-10? Does the list include only those submittals which are required to effectively administer the contract?
02-9.3 MOA / ISA Examples of Work for Others

11 Dec 2007

MEMORANDUM OF UNDERSTANDING FOR QUALITY/SAFETY INSPECTION AND ASSURANCE SERVICES BETWEEN SAVANNAH DISTRICT, U.S. ARMY CORPS OF ENGINEERS AND MOBILE DISTRICT, U.S. ARMY CORPS OF ENGINEERS For Miscellaneous Projects and the WRESP Clinic at Winn Army Community Hospital (WACH), Fort Stewart, Georgia

1. PURPOSE:

The objective of this document is to establish the requirements for the quality assurance and safety inspection services needed for Miscellaneous Projects and the WRESP Clinic at Winn Army Community Hospital (WACH), Fort Stewart, Georgia.

2. BACKGROUND

The contract for the Medical Facilities Remediation is developed and administered by the U.S. Army Corps of Engineers, Mobile District Office. The repair activities to be performed by the Contractor, Syska Hennessy shall be in accordance with the approved work plan for Task Order Number 0025 as part of Contract Number W91278-06-D0073. The task order repair amount has been negotiated in the firm fixed priced amount of $2,012,684.77 and that includes demolition and hazardous material abatement.

3. QUALITY CONTROL

The Contractor is responsible for developing a site specific Quality Control (QC) Plan to ensure that the work complies with the standards established for this work order. The site specific QC Plan is included in the approved work plan. Prior to the start of work, the Government Quality Assurance Surveillance (QAS) team will meet with the Contractor's QC manager to develop a mutual understanding of the interrelationship and coordination between the Contractor and Government quality efforts. The Government QAS team will monitor the Contractor's operations to ensure implementation of the QC plan.

4. QUALITY ASSURANCE

The Contracting Officer is responsible for ensuring that the Contractor's work complies with the specified requirements. To fulfill this responsibility the Health Facilities Planning Agency has procured the services of CESAS, which has agreed to provide on site Quality Assurance (QA)
services for this task order. The CESAS QA Representative shall be responsible for monitoring the contractor's performance and insuring established standards for timeliness, quality and cost are met in accordance with the approved final work plan. The QA Representative shall insure the contractor complies with the approved site specific Quality Control Plan and the site specific Safety and Health Plan.

5. QUALITY ASSURANCE SERVICES:

The QA Representative shall be responsible for performing the following services:

a) Furnish to Mobile District Office copies of any correspondence pertaining to this task order between the QA representative and the contractor, or between the Department of Public Works (DPW) representatives and the contractor. The contract number and task order number should be reflected on all correspondence.

b) Maintain coordination with the contractor, Facility Manager, and the DPW. Issues that affect the design, contract cost, or performance period shall be referred to the Technical Manager at Mobile District Office for action.

c) Perform all communications with the contractor or his authorized representatives and not with the subcontractors.

d) Not waive contract provisions, make or authorize changes to the contract, dictate the contractor operations, allow the contractor to perform in an unsafe manner, or accept work not meeting contract requirements.

e) Work with the Mobile District Office staff to clarify any technical requirements of the final work plan.

f) Review system/equipment test reports, material samples, operations and maintenance manuals, as-builts, and manufacturer's certificates for conformance with provisions prescribed in the contract. Recommend approval or disapproval as applicable for each item submitted to Mobile District Office. The Mobile District Office will also perform review of the contractor's submittals, and the Contracting Officer will be the final authority on approval.

g) Participate in coordination meetings, joint inspections, and final inspection of the work and perform unscheduled inspections deemed necessary. Insure the contractor conducts all preparatory meetings and initial inspections and attend each. Forward a copy of the minutes of each such meeting to the Mobile District Office.

h) Notify the Mobile District Office the date the contractor begins work at the work site. Should the contractor fail to commence work as provided for in the contract, immediately report all essential facts to the Mobile District Office.
i) Keep necessary equipment and supplies for taking photographs, with installation security concerns being considered. Photographs shall be taken of the project at various stages of completion when; changed site conditions have been encountered, removal of work in place has been ordered due to non-compliance with plans and specifications, the work activity is of technical interest, or damages to property or materials have occurred. Take photographs of the work progress at 0%, 25%, 50%, 75%, 100% completion.

j) Immediately notify the Mobile District Office of any situation that may result in a contract dispute, require a modification to the contract, or require issuing a stop work order to the contractor. In any event, a complete record of the facts shall be developed and submitted to the Mobile District Office.

k) Provide input to the Mobile District Office concerning the contractor’s performance at the end of the project in a written and signed report. The report shall specify the contractor’s performance in maintaining schedule, quality, and degree of overall effectiveness.

l) Document the results of all inspections, insure minutes are prepared for all attended and maintain a record of telephone and other important conversations with the contractor. Provide periodic reports to the Mobile District Office on the project status and immediately report any unusual happenings or situations.

m) Be familiar with and ensure compliance with contract Data Item Descriptions, Work Plan requirements and applicable codes and criteria.

6. TECHNICAL REQUIREMENTS

The QA Representative shall be technically capable of performing quality/safety inspections including ability to perform the following requirements:

a) Monitoring the remediation contractor’s progress and progress reporting. The QA Representative shall review the remediation contractor’s submitted schedule for practicality, adequacy in identifying work activities, and inclusion of approved changes. The QA Representative shall recommend approval or disapproval of the remediation contractor’s proposed schedule to the Mobile District Office. If the contractor falls behind schedule, all facts concerning the progress, delays (excusable and controllable), laxity on the part of the remediation contractor, estimated time due for extension of contract period, and revised estimate of completion date shall be reported in writing to the Mobile District Office.

b) Monitoring and acting on deficiencies of the contractor’s site specific Quality Control Plan and the site specific Safety and Health Plan.

c) Ensuring materials and equipment installed meet contract and work plan requirements.
d) Being continually on the alert for deficiencies in the contractor's performance. Immediate action is required when deficiencies are noted. The Mobile District Office shall be promptly informed if the contractor refuses to correct a deficiency. A complete record of the facts relating to the deficiencies and efforts to correct them shall be made.

7. INVOICE PAYMENTS

The QA Representative will review and verify all requests for progress payments to ensure the request accurately represents work satisfactorily completed. The QA Representative shall complete and sign the pay request certification form that will be forwarded to the Mobile District Office for payment. The final request for payment shall contain, in addition to a completed and signed pay request form, a listing which depicts the final document submittals (i.e. as-buils, operational and maintenance manuals, etc.) made to the installation as well as the date of acceptance of these documents. The listing shall be dated and signed by the contractor and the QA Representative.

8. CONTRACT ADMINISTRATION:

The Mobile District will administer the contract including engineering and design during construction and award of all firm fixed price modifications. Copies of all submittals, comments, 4025 approvals, and contract documents will be provided to the Resident Office for information.

9. COST:

The cost for the Quality Assurance and Contract Administration for this project will be paid for on a reimbursable basis. The CESAS and CESAM will share the S&A funding, initially determined to be 70% and 30% respectively. This equates to CESAS receiving 4 1/2% of the construction award amount or $90,571 and SAM receiving 2% or $40,254 for Project Management effort, for a total S&A cost of 6-1/2% or $130,825. The total amount of $90,571 will be provided to CESAS at initiation of construction activities. Both parties agree to revisit and adjust the sharing ratio as necessary to accommodate actual costs incurred by CESAS in performance of their responsibilities under supervision and inspection for this project—see Appendix I—attached. As a result of SAM’s work for others being on a reimbursable basis, SAS will notify SAM once it appears the QA funds (S&A) will be depleted and work is still to be accomplished. SAM will then coordinate with the customer to provide additional funds. SAS will not use funds out of the SAD checkbook account.
10. QUALITY ASSURANCE TEAM:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Phone Number</th>
<th>Fax Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gene L. Curtis</td>
<td>Contracting Officer</td>
<td>(251) 441-6511</td>
<td>(251) 690-2675</td>
</tr>
<tr>
<td>Stan Dowdy</td>
<td>CESAM Technical Manager</td>
<td>(251) 694-4061</td>
<td>(251) 694-4057</td>
</tr>
<tr>
<td>Brent Rose</td>
<td>Facility Manager</td>
<td>(912) 435-6833</td>
<td>(912) 435-6971</td>
</tr>
<tr>
<td>Michael Welch</td>
<td>USAHFP A</td>
<td>(706) 831-1333</td>
<td>(706) 787-0585</td>
</tr>
<tr>
<td>David Warren</td>
<td>Resident Engineer</td>
<td>(912) 767-6878</td>
<td>(912) 767-5075</td>
</tr>
<tr>
<td>David Vaughn</td>
<td>Quality Assurance</td>
<td>(912) 767-0127</td>
<td>(912) 767-5075</td>
</tr>
</tbody>
</table>

PREPARED BY: Stan Dowdy, Technical Manager  
U.S. Army Corps of Engineers  
CESAM-EN  
109 Saint Joseph St  
Mobile, AL 36602-3630  

AGREED TO BY: Mr. Michael Welch  
SERMC Project Integrator  
Fort Gordon, GA

AGREED TO BY: David Warren  
Fort Stewart Resident Engineer  
PO Box 558, Building 1140  
Fort Stewart, GA 31315

APPROVED BY: Gene L. Curtis, Contracting Officer  
U.S. Army Corps of Engineers  
109 Saint Joseph St  
Mobile, AL 36602-3630
CESAM-CT-C/MEDCOM TEAM
MEMORANDUM FOR OC/

Jenkins/441-5598/11 December 2007

SUBJECT: Review for Legal Sufficiency

1. Request the following document(s) be reviewed for legal sufficiency:

MEMORANDUM OF UNDERSTANDING FOR QUALITY/SAFETY INSPECTION AND ASSURANCE SERVICES BETWEEN SAVANNAH DISTRICT AND MOBILE DISTRICT, CORPS OF ENGINEERS

2. Please review and return to Jacalyn M. Jenkins, CT-C. CALL LEIGH AT X3791 or KAISHONTA AT X2629 for PICKUP.

Encl

JACALYN M. JENKINS
Contract Specialist

OC 1st End

DATE: 12 Dec 07

FOR CT-C

CONCUR X NONCONCUR

COMMENTS (if any):

Encl

nc

(Signature)
U.S. ARMY CORPS OF ENGINEERS
INTERAGENCY/SUPPORT AGREEMENT

(ER 1140-1-211)

1. AGREEMENT NO.

2. INITIAL AGREEMENT
   AMENDMENT NO._

3. PROJECT TITLE

Project No. 619-07-117ES FCA- Elec "F" Expand High Voltage

4. EFFECTIVE DATE

14 February 2008

5. COMPLETION DATE

31 October 2009

6. NAME AND ADDRESS OF USACE ORGANIZATION

U.S. Army Corps of Engineers Mobile District
109 St. Joseph Street
Mobile, AL 36602-3630

7. NAME AND ADDRESS OF OTHER AGENCY

Department of Veterans Affairs
CAVHCS - West Campus
215 Perry Hill Road
Montgomery, AL 36109

8. SCOPE OF WORK

This construction project will replace existing metal clad switchgear with new equipment. Replace two 1000 kVA transformers and one 225 kVA transformer and replace existing primary underground cable with new 15 kV shielded copper with 133% EIPR insulation and re-terminate existing and new equipment. Also project will provide additional sectionalizing switches to replace existing splice/junctions where required. The design has been completed for this project.

USACE will perform the following services:
1. All Contracting Officer and COTR duties for construction procurement and award.
2. All Contracting Officer and COTR duties during construction period.
3. All record maintenance.
4. Contract audits

Department of Veteran Affairs - CAVHCS will provide the following: Supply any government furnished property for this contract.

Construction award must be made by 31 May 2008. Estimated construction completion date is 365 days from NTP.

Contract type to be used: To be determined.

Estimated Construction Cost - $3,500,000
Construction Contingency (5% of Project) - $175,000
Estimated Corps of Engineers In-House Costs - $291,077. (see attached estimate)

9. SPECIAL PROVISIONS

   a. All rates expressing the unit cost of services provided in this agreement are based on current rates which may be subject to change for uncontrollable reasons, such as legislation, DoD directives, and commercial utility rate increases. The receiver will be notified immediately of such rate changes that must be passed through to the support receiver.
   
   b. This agreement may be cancelled at any time by mutual consent of the parties concerned. This agreement may also be cancelled by either party upon giving at least 180 days written notice to the other party.
   
   c. In case of mobilization or other emergency, this agreement will remain in force only within supplier's capabilities.

10. USACE PROJECT OFFICER

   Jasper D. Tutwiler
   251-694-4455

11. OTHER AGENCY PROJECT OFFICER

   Elcine Adams
   334-272-4670 x4873

ADDRESS

U.S. Army Corps of Engineers Mobile District
109 St. Joseph Street
Mobile, AL 36602-3630

ADDRESS

CAVHCS - West Campus
Engineering Sv. 138P
215 Perry Hill Road, Montgomery, AL 36109
12. REPORTS (Requirements and Frequency)

USACE will provide monthly project status report and SF1080 billing.

Above cost figures are based on VA required services known at the time this Support Agreement was prepared. As stated in the MOA, all costs incurred by the Corps of Engineers will be on a reimbursable basis by VA.

USACE will enter the Facility Code for the Central Alabama VHCS into FPDS as the funding and budgeting facility for the contract that results from this Support Agreement.

13. FUNDS

(Funds with cost breakdown may be attached as necessary)

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<thead>
<tr>
<th>SOURCE</th>
<th>PREVIOUS AMOUNT</th>
<th>AMOUNT THIS ACTION</th>
<th>AMENDED TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$3,966,077.00</td>
<td>$3,966,077.00</td>
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<tr>
<td>OTHER AGENCY AMOUNT</td>
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<tr>
<td>TOTAL PROJECT COST</td>
<td>$3,966,077.00</td>
<td>$3,966,077.00</td>
<td>$3,966,077.00</td>
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</table>

14. FUNDING

Funds will be provided by:

a. ☐ Transfer Appropriation (SF 1151, Now-Expenditure Transfer Authorization)
   ☐ Reimbursable Order (37 USC 1535 - Economy Act)
   ☒ Other (describe) IPAC Agency Location Code 00008796 (R2)

b. Appropriation: 0162X5/ESTPANE002640

c. Appropriation: 0162X5/ESTPANE002640

15. BILLING

a. Request for payment will be made by:
   ☐ SF 1080 ☐ SF 1081 ☒ Other (describe)

Corps will submit monthly accounting reports to Ms. Bessie Cooper Harris and Ms. Elaine Adams.

b. Frequency ☐ Monthly ☐ Quarterly ☐ Upon work completion ☒ Other (describe)

Corps will submit monthly accounting reports to Ms. Bessie Cooper Harris and Ms. Elaine Adams.

c. Request for payment will cite the following accounting information (describe necessary documentation):

d. Submit to:
   Financial Management, ATTN: Melanie Lunsford-Johnson, 2400 Hospital Road, Tuskegee, AL 36083

16. AUTHORITY

MOA between USACE and VA Dated 27 September 2007

17. APPROVALS

a. NAME AND TITLE OF AUTHORIZING OFFICIAL FOR USACE
   Bryan G. Jorns
   Colonel, Corps of Engineers, Commanding

b. NAME AND TITLE OF AUTHORIZING OFFICIAL FOR OTHER AGENCY
   Sherida Berry, Contracting Officer

(Reverse of EVG Form 4914-A)
VA Project No. 819-117ES, Elec "F" Expand Hig Voltage, Central Alabama East VAMC

Estimated Corps of Engineers In-House Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Pre-award, award, and manage construction</td>
<td>$1,722</td>
</tr>
<tr>
<td>Review of A-E Design prior to advertisement (16 hours @ $107.60/hour)</td>
<td>$10,000</td>
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<tr>
<td>Prepare Pre-award contract documents (Fixed Cost)</td>
<td>$15,000</td>
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<tr>
<td>Best Value Selection Board (Fixed Cost)</td>
<td>$14,105</td>
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<tr>
<td>Advertise and Award (Fixed Cost)</td>
<td>$175,000</td>
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<tr>
<td>Construction Contingency (5%)</td>
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<td>Construction Management (6.5%)</td>
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Hourly Review Rate Calculation
Rates for COE GS 12/10 Employee Incorporating all factors:

- Base Hourly Rate: $40.69
- Effective Rate (Leave/benefits factor) 156%: $63.48
- Departmental OVHD (each Dept) 55.5%: $8.25

Total Burdened rate: $107.60
CHAPTER 03 - PRE NTP FUNCTIONS ............................................................... 03-1

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SAD QAFG – Chapter Version Control

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<th>Change Description</th>
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<td>1.10</td>
<td>03 Mar 08</td>
<td>Final Draft for Signature</td>
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CHAPTER 03 - PRE NTP FUNCTIONS

03-1  PRE NTP FUNCTIONS

03-1.1 Purpose
This portion of the manual defines Construction Division’s (CD’s) policies and objectives’ regarding the functions field construction offices responsibilities after the award of a contract in preparation for a Notice to Proceed (NTP).

03-1.2 References
FAR Part 46.312 – Construction Contracts
FAR Part 52.246-12 – Inspection of Construction
ER 415-1-11 – Biddability, Constructability, Operability, and Environmental Review
ER 1180-1-6 – Construction Quality Management

03-1.3 Responsibilities
a. The Deputy District Engineer for Project Management is responsible for the overall management and execution of project transition from Design to Construction.

b. The project managers are each responsible to initiate and complete transition checklists on their assigned projects in a timely manner. They are also responsible for scheduling transition meetings with the Field Office.

c. AE/RE are responsible to make the appropriate field engineers available for transition meetings.

d. The Construction Division field engineers are responsible to participate in complete reviews of the transition checklists and to accept or reject all or parts of the checklists, based primarily on completeness.

e. The Project Managers are responsible to maintain a suspense system and to follow-up in a timely manner on any needed additional information or documents as part of the project transition.

f. The PM shall be responsible for coordinating directly with Contracting Division on the Project ACO, alternate ACO and COR in order for CT to issue the appropriate Letters of Delegation of Authority.

g. AE/RE is responsible for coordinating with the PM and the user to establish the BOD. This is a key responsibility; and each AE/RE will be held responsible by Chief, Construction Division for total compliance with this requirement.
03-1.4 Definitions

a). NTP – Notice to Proceed.
03-2  TRANSITION PLANNING

Immediately after the award of a contract critical transition planning needs to be initiated to assure the orderly transition in to the execution phase of PMBP. At this time the AE/RE needs to coordinate directly with the PM to assure that all critical information generated in the acquisition and engineering design phases are transferred to the field office. The AE/RE will be responsible for scheduling a transition meeting with the PDT to capture all information relevant to the execution phase of the project. On all MILCON projects the PM will prepare and turn over a transition notebook/document.

03-2.1 Project Transition from Design

Shortly after construction award, but no later than Notice to Proceed, the following procedure will be used to assure smooth and complete transition of all new construction contracts from the design to the construction phase.

  a. The Project Manager in Program Management Division prepares a Transition Checklist – complete with all required enclosures, specific statements describing the essential aspects of any missing documents and scheduled dates for any such documents to be provided.

  b. The Project Manager conducts a transition briefing with the appropriate Construction Division field office. These briefings should be face to face at the field office but not at the expense of undue delay.

  c. The Project Manager will establish a suspense system for each contract which will log:

     • Date of the transition meeting
     • List any missing or incomplete actions
     • Schedule dates for completing above actions

Upon completion of the transition meeting, the project manager and the field engineer will each sign the transition checklist. The need for any additional information or documents will be established at this meeting. The project manager and the field engineer will each retain one copy. The field engineer's copy will be filed in the working files in the field office.

The following pages provide a recommended checklist that contains critical elements for the transitional planning (format may differ depending on the District):
CHECKLIST FOR TRANSITION OF NEW PROJECT

Project: Title: ___________, FY: ___
L.I. ___________, Base: ___________.
IFB No. ___________.
Construction Contract No. ___________.

A.E. or RFP Preparer: Name: _________________.
Address: _________________________________.
Telephone No. ___/___/___.
Facsimile No. ___/___/___.
A.E. Contract No. ___________.
POC: _________________.

1. GENERAL

   _ An architectural rendering of the building's exterior is/is not available, or is required and
   _ will be furnished by _________________.

   _ Color boards or designer/user color selections for exterior/interior finishes.

   _ This project will require special handling procedures for classified contracts.

   _ All outstanding Real Estate actions have been completed.

   _ Government Furnished Equipment (GFE/GI) will be furnished for this project.

Points of Contact during construction of this project are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Project Manager</th>
<th>Phone</th>
<th>Alternate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>________________</td>
<td><em><strong>/</strong></em>/___</td>
<td>________________</td>
</tr>
<tr>
<td>EN</td>
<td>________________</td>
<td><em><strong>/</strong></em>/___</td>
<td>________________</td>
</tr>
<tr>
<td>User</td>
<td>________________</td>
<td><em><strong>/</strong></em>/___</td>
<td>________________</td>
</tr>
<tr>
<td>Command</td>
<td>________________</td>
<td><em><strong>/</strong></em>/___</td>
<td>________________</td>
</tr>
</tbody>
</table>

2. DRAWINGS AND SPECIFICATIONS:
Revised Contract Drawings and Specifications have been furnished. Successful Bidder CD and
hard copies of Drawings/Specifications have been mailed to the following:
CHECKLIST FOR TRANSITION OF NEW PROJECT

3. CHANGES.

__ There are no known changes.

__ Known changes are attached. Funds in the amount of $_______ are reserved. Mod package will be available by ________________.

__ Outstanding Value Engineering issues and costs are as follows:

-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------

4. A-E INVOLVEMENT

__ A-E review of shop drawings is not required.

__ A-E review of shop drawings and/or site visitation is required and a modification to the A-E contract for Title II Services is in process. FM-__ will provide CD-__ a copy of all A-E Title II Services contracts with an attached list of A-E submittal review and site visitation requirements. See Tab __.

__ Area/Resident Engineer Letter of COR designation with respect to design error/omission and/or Construction Phase Services is attached. Reference Tab __.

__ Construction modifications requiring A-E design efforts will be handled through PM-__ (POC: _________)

__ A-E assistance required outside the scope of the A-E contract will be handled through PM-__ (POC: _________)

5. FUNDING

__ Copy of CWE.

__ Contingency Funds in the amount of $_______ are available for this project. Reference Tab __.

__ EDC Funds are available for this project. Reference Tab __.

__ Communications funding in the amount of $_______ has been identified in the CWE. Reference Tab __.

__ EMCS/UMCS is in this project. $_______ has been set aside for tie-in of facilities to the central system at a later date.
CHECKLIST FOR TRANSITION OF NEW PROJECT

6. ENVIRONMENTAL (N/A work on existing buildings)
   __ Action on all necessary permits, site classifications and HTW issues has been completed.
   *Specific clearances are individually itemized in Tab __.
   __ Environmental permits (wetlands, cultural, endangered species) are attached at Tab __.
   __ Asbestos and lead paint surveys have been performed by __________. Reference Tab __.
   __ State approved erosion plan is attached at Tab __.

7. DOCUMENTATION
   __ A-E certification that design of arms vault conforms to criteria set forth in AR 190-11 has
     been received. See Tab __.
   __ Annotated final review comments have been furnished by the A-E and copies furnished to
     Construction Division's district and field offices. Reference Tab __.
   __ Designer's NAS was required and is applicable for this project. Reference Tab __.
   __ DA Form 337 - Request for Approval of Disposal of Buildings and Improvements is not
     applicable. Reference Tab __.
   __ ENG Form 4288 - Shop Drawing Submittal Register is included with contract
     specifications. Electronic copy must be provided for import into RMS.
   __ Government Estimate for this project was furnished on ________, included in Tab __.
   __ Draft DD Form 1354 for this project was coordinated with the DPW/BCE on __________.
     Reference Tab __.
   __ Man-day estimates for "GA/D" Level Submittals are attached. Reference Tab __.
   __ Design analysis is attached at Tab __.
   __ Contract award document with prices is attached at Tab __.
   __ Pre/Post BCM for negotiated contracts is attached at Tab __.
   __ Engineering Considerations is attached in TAB.

8. CERTIFICATION

This transition document has been jointly reviewed as indicated by the following:

<table>
<thead>
<tr>
<th>Project Manager</th>
<th>Date</th>
<th>Area/Resident Engineer</th>
<th>Date</th>
</tr>
</thead>
</table>
03-2.2 Critical Transition documents

Environmental permits and requirements will be turned over to Resident Office.

EIS/EA (Environmental Impact Study or Environmental Assessment) approval – performed by USER during planning stage must be completed prior to Contract Award.

Erosion Control Plan approved by State – Erosion Control permit is normally approved by the State on Design-Bid-Build projects. Plans show all erosion control measures during construction. Permit must be on hand at all times during construction. No ground disturbing activities can begin before permit is issued. On Design-build projects, the plan must be submitted by A&E under signature of the responsible party.

Water Quality Permit/Plan approval – Water Quality Permit is completed in most states along with the Erosion Control Permit. The Plan details how the water control measures are implemented and how offsite discharges will be monitored. Permit must be in hand before ground disturbing activities start.

Water/Sewer Permits – Permit normally is obtained through the State for sewer and water distribution systems. Permit must be in hand prior to the start of work. Permit is for water or sewer distribution system extensions; not normal tie-ins.

Wetland permits – A Federal permit is required whenever a project impacts streams or wetlands. If the wetland impact is less than 0.5 acres or stream impact is less than 300 LF then it can be applied for under the nationwide permit process. If impact is more than nationwide permit, a complete 404 permit application must be processed through the authority having jurisdiction. The permit application is normally done by A&E prior to award on Design-Bid Build and by the contractor A&E on Design Build Projects.

Air Permits (for boilers and diesel generators) – On installations with a multipoint Title 5 Air Permit, amending is required for adding boilers and diesel generators over a certain threshold before installation of the equipment. Individual point source permits may be required on facilities not covered by a Title 5 Air Permit.

Demolition/Asbestos Abatement Permit/Reports – Prior to the start of any demolition, State Permits are normally required. If ACM (Asbestos Containing Materials) is present, the demolition plan will include a separate Asbestos Abatement Plan. No work can start unless the contractor has the permit on hand. Government provided ACM records will assist with the permit application.

Other Environmental Issues – Some projects could be located on previously contaminated sites which may require additional remediation and permits (i.e., old site where fuel storage tanks removed).
Obtain information on Type of Funds and limitations:

- O&M Type L
- O&M Type K
- OPA
- MILCON
- CIVIL
- Direct Reimbursable
- FUDS/DERP
- Other Funding

Special Considerations

- LEED – (documentation of points obtained during design)
- ACO/COR Letters from Contracting
- Final Annotated Design review & BCO comments (access to Dr. Checks)
- Electronic drawings available for as-builts in *.DGN Format
- Electronic File of A&E Submittal Register in RMS Format
- Submittals contracted for A&E review
- Review P2 Construction Milestones.
- Determine BOD with PDT

03-2.3 Transition Planning – Design Build

Transition planning for a Design build project is significantly different from that of a Design Bid Build contract. In the early planning stages it is critical the AE/RE obtain a copy of the contractor’s proposal. The proposal contains additional information that will be required during the design and construction phases. Typically the proposal will contain information not included in the RFP that was the basis of the technical evaluation.

a.) PROPOSAL TECHNICAL DRAWINGS AND INFORMATION: The proposal may contain the concept of design architecturally, mechanically and additional design parameters. The proposal may contain specific equipment types. The proposal was the basis of the technical evaluation and must be incorporated in the project. The proposals technical information is considered a part of the RFP requirements.

b.) BETTERMENTS: The contractor’s proposal may include betterments. These are features included in the proposal that were above and beyond the RFP requirements. These betterments are considered to be contract requirements after the award of the contract and must be included in the final design.

c.) ORDER OF PRECEDENCE: On design build projects there is an order of precedence that must be utilized during the design processes. The order of precedence is typically the RFP, Proposal and Betterments. This will be clearly indicated in the RFP. This basically means that if there is a conflict between the
information it shall be evaluated accordingly, i.e., if something is included in the proposal that is in violation of a RFP requirement; the RFP is the controlling document.

On design build projects it is critical that the PDT properly coordinate the roles of PM, EN and CD during the design portion of the projects. On MILCON projects the PM and RE normally work together to assure the design is properly coordinated. Either party can chair the design review.

**QA Design Plan:** In transition planning a QA Design Plan should be developed outlining the responsibilities during design. The plan must take into account the design method of execution, i.e, Fast Track versus the 2-Step process.

In the QA Design Plan, the PDT should identify specific individuals from Engineering, PM, and Construction who will be responsible for design reviews and how they will be accomplished. It is critical that the PM establish a funding strategy for the design reviews. Design review funds should be allocated for the design reviewers. These activities are not funded from S&A funds.

**Critical items to include in the QA Design Plan:**

- Partnering
- LEED reviews/compliance
- Design review: 60%, 90% 100% and Corrected Final
- Design review durations, i.e., 2 weeks
- User POC for Design Reviews
- Environmental Review: erosion control permits, water/sewer permits, HUD notifications and etc.
- Method of furnishing comments: Dr Checks (permissions required)
- Processing Request for Information (RFI).

Once the design is complete, the same PDT should be actively involved in partnering and the construction RFI process.
03-3 COORDINATION PRIOR TO ESTABLISHING THE NTP DATE

The AE/RE shall be responsible for coordinating with PM and CT for issuance of the NTP. After award of a contract, the contractor is responsible for obtaining the appropriate payment and performance bonds. The bonds are submitted directly to CT along with proof of insurance. Once the bonds are submitted and reviewed by OC, the NTP can legally be issued. The AE/RE shall coordinate directly with the user and PM to assure that the project is ready for NTP. Proper coordination can mitigate the costs associated with delays to the project. It is critical to be sure there are no user delays that could adversely affect the contractor’s performance period. Possible delays that could adversely affect NTP:

- User still occupying facility
- Timber Harvesting
- Lack of Environmental permits/plans
- Work by others not accomplished: Demolition of bldg in foot print incomplete
- HUD Notification not accomplished
- Base functions not coordinated on: outages, road closures and etc.

03-4 DRAFT PROJECT SPECIFIC QA SUPPLEMENTAL PLANS

A Draft QA Plan should be developed by the field office prior to scheduling the NTP. This plan must include critical PDT members such as PM, RE, PE, user POC and salient features of work. See CHAPTER 4 for complete QA Plan Supplemental requirements. Any special requirements should be identified in this plan for open discussions in the Pre construction conference
03-5  PARTNERING POLICY

It is the Corps of Engineers’ Policy to maximize the use of Partnering during the construction execution phase of a project. Simply put, Partnering is just people working together - a voluntary system of handling normal, everyday jobsite construction problems in a mutually agreeable manner before they turn into major issues that create lawsuits. There is no mystery about partnering; it is simply an attitude change. All stakeholders resolve that issues be settled by employing a positive and cooperative attitude.

See Chapter 4 for details.

03-6  RFI SYSTEM

Pre-NTP considerations should be made on how RFI’s will be processed during construction. The RMS system should be used for processing RFI’s. This system allows the contractor and the field office to track the RFI’s in RMS. Other electronic systems may be utilized by the A&E in Design Build contracts.

03-7  RMS SETUP

RMS is the critical construction management software on all construction projects. The field office must coordinate directly with the RMS administrator to assure the critical data from CEFMS and P2 are downloaded into RMS. Milestone dates and contract/contractor information must be validated. Critical milestone dates for BOD must be coordinated with PM and the user to properly manage the project expectations. See paragraph 03-10.1 for BOD determinations. Reference the SAD CA Manual for detailed information on contract setup.

03-7.1 RMS Milestone Calculations:

All elements shall be updated after the initial download from P2. This DATA becomes the basis of the District METRIC Management reviews. Offices will establish policy on local milestones (see sample below).
<table>
<thead>
<tr>
<th>Order No</th>
<th>Type</th>
<th>Event Phase</th>
<th>Milestone Event</th>
<th>Original Calculation for Scheduled Dates</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>System</td>
<td>Construction</td>
<td>Contract Award (CAWD)</td>
<td>CAWD + 14</td>
<td>Driven by P2 until Award - Setup by CD-TE</td>
</tr>
<tr>
<td>2</td>
<td>District</td>
<td>Construction</td>
<td>Pre-Construction Conference</td>
<td>CAWD + 14</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>District</td>
<td>Construction</td>
<td>Construction NTP issued (NTPI)</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>System</td>
<td>Construction</td>
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<td>NTPI + 1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>District</td>
<td>Construction</td>
<td>Commence Work</td>
<td>NTPI + 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>52 211-10</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Local</td>
<td>Construction</td>
<td>Accident Prevention Plan Acceptec</td>
<td>PreCon + 30</td>
<td>APP &amp; CQC Plan submitted at precon - 30 days for review/acceptance</td>
</tr>
<tr>
<td>7</td>
<td>Local</td>
<td>Construction</td>
<td>CQC Plan Accepted</td>
<td>PreCon + 30</td>
<td>APP &amp; CQC Plan submitted at precon - 30 days for review/acceptance</td>
</tr>
<tr>
<td>8</td>
<td>District</td>
<td>Construction</td>
<td>Mutual Understanding Conf</td>
<td>PreCon + 31</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Local</td>
<td>Construction</td>
<td>Initial Project Schedule Approved</td>
<td>NTPA + 60</td>
<td>Check Spec 01320A for duration of preliminary schedule. This is the baseline schedule for the contract. At approximately 85% complete. Adjust once you have the contractor's schedule. NLT 30 days after BOD per SOP 04-06. Allow time for review prior to training.</td>
</tr>
<tr>
<td>10</td>
<td>Local</td>
<td>Construction</td>
<td>RedZone Meeting</td>
<td>CC - 60</td>
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<tr>
<td>11</td>
<td>Local</td>
<td>Construction</td>
<td>Last O&amp;M Manual to User</td>
<td>CC-35</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Local</td>
<td>Construction</td>
<td>Last O&amp;M School Held</td>
<td>CC-21</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>District</td>
<td>Construction</td>
<td>Pre-Final Inspection</td>
<td>CC - 7</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>System</td>
<td>Construction</td>
<td>Construction Completion (CC)</td>
<td>CRC</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Local</td>
<td>Construction</td>
<td>As-Built Redline Drawings Rec'd</td>
<td>CC</td>
<td>As-builts should be submitted prior to Contract Completion</td>
</tr>
<tr>
<td>16</td>
<td>District</td>
<td>Construction</td>
<td>Final Inspection</td>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>System</td>
<td>Construction</td>
<td>Contract Required Correlation (CRC)</td>
<td>NTPA + Duration</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>District</td>
<td>Construction</td>
<td>Final BOD 1354 Signed by AE/RE</td>
<td>BOD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(B1354)</td>
<td></td>
<td></td>
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<tr>
<td>19</td>
<td>Local</td>
<td>Post Construction</td>
<td>Real Property Cards to User</td>
<td>B1354</td>
<td>Goal - Same time as 1354 is turned over</td>
</tr>
<tr>
<td>20</td>
<td>Local</td>
<td>Post Construction</td>
<td>Installed Equip List to User</td>
<td>B1354</td>
<td>Goal - Same time as 1354 is turned over</td>
</tr>
<tr>
<td>21</td>
<td>System</td>
<td>Post Construction</td>
<td>Contractor Evaluation Date</td>
<td>CC + 28</td>
<td>AO complete within 30 days. Eval finalized with 60 days (30 day comment period). If applicable, AO complete within 30 days. Eval finalized with 60 days (30 day comment period). If applicable.</td>
</tr>
<tr>
<td>22</td>
<td>System</td>
<td>Post Construction</td>
<td>AE Evaluation Date</td>
<td>CC + 28</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>District</td>
<td>Post Construction</td>
<td>Contractor Eval to District</td>
<td>CC + 60</td>
<td>NLT 60 days</td>
</tr>
<tr>
<td>24</td>
<td>District</td>
<td>Post Construction</td>
<td>A-E Eval to District</td>
<td>CC + 60</td>
<td>NLT 60 days</td>
</tr>
<tr>
<td>25</td>
<td>System</td>
<td>Post Construction</td>
<td>Physical Completion (PC)</td>
<td>CC + 60</td>
<td>Per CD-TE guidance - CRC + 60. CC makes more sense.</td>
</tr>
<tr>
<td>26</td>
<td>Local</td>
<td>Post Construction</td>
<td>Final As-builts to User</td>
<td>CC + 60</td>
<td>SOP 04-04. NLT 60 days</td>
</tr>
<tr>
<td>27</td>
<td>System</td>
<td>Post Construction</td>
<td>Beneficial Occupancy Date</td>
<td>CRC + Buffer</td>
<td>Calculate BOD Buffer - SOP 04-02 (30 to 150 days)</td>
</tr>
<tr>
<td>28</td>
<td>District</td>
<td>Post Construction</td>
<td>Final BOD 1354 Signed by User</td>
<td>B1354 + 25</td>
<td>Cannot change event phase to “post construction”. BOD + 29</td>
</tr>
<tr>
<td>29</td>
<td>Local</td>
<td>Post Construction</td>
<td>Shop Drawings Given to User</td>
<td>BOD + 30</td>
<td>NLT 30 days after BOD. BOD + 30</td>
</tr>
<tr>
<td>30</td>
<td>District</td>
<td>Post Construction</td>
<td>Final BOD 1364 to District</td>
<td>B1354 + 20</td>
<td>SOP 04-06. Cannot change event phase to “post construction”</td>
</tr>
<tr>
<td>31</td>
<td>Local</td>
<td>Post Construction</td>
<td>4-Month Warranty Inspection</td>
<td>CC + 119</td>
<td>CC versus BOD</td>
</tr>
<tr>
<td>32</td>
<td>Local</td>
<td>Post Construction</td>
<td>0-Month Warranty Inspection</td>
<td>CC + 206</td>
<td>CC versus BOD</td>
</tr>
<tr>
<td>33</td>
<td>Local</td>
<td>Post Construction</td>
<td>Final Pay Est to Contractor</td>
<td>PC + 45</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Local</td>
<td>Post Construction</td>
<td>Final Pay Est Returned by Hr (FPK)</td>
<td>PC + 60</td>
<td>Equals 120 days after CC</td>
</tr>
<tr>
<td>35</td>
<td>Local</td>
<td>Post Construction</td>
<td>Release of Claims Signed</td>
<td>FPRK + 5</td>
<td>SOP 03-01</td>
</tr>
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03-12
03-8 BENEFICIAL OCCUPANCY DATE (BOD) DETERMINATION

Beneficial Occupancy Date (BOD) is the date promised to the customer for completion of a project. This date must include anticipated delays and should be changed as little as possible.

03-8.1 Preliminary BOD
A preliminary Beneficial Occupancy Date (BOD) is initially established early in the planning phase of each project based on the projected award schedule. During the Design Criteria Review Conference, phasing requirements and BOD expectations will be discussed and documented by the PM and the user. CD representatives may provide input at that time. Later, at the Final Design Submission, the PM will assure that BOD expectations are clearly understood by the user and by the CD representative.

03-8.2 Calculated BOD
Shortly after contract award, the field office will calculate the buffer period that will be added to the contract completion date to establish the actual scheduled BOD. This calculation includes an allowance for experience and job history of the contractor; therefore, it cannot be done earlier. The intent at this point is to come up with a date that the field can reasonably meet, and that is reasonably consistent with the BOD expectations established during earlier phases of the project. The calculation will be done in accordance with the formula presented in paragraph 03-10.1. Buffer periods longer than 180 days may be established with the permission of the Chief of CD and PM.

Prior to entering the calculated BOD into RMS, the field office will coordinate the date with the PM and user. Any failure to agree on a BOD date will be elevated to the Chief of CD. Once entered into RMS, the established BOD date cannot be changed by the field office. Any revisions to the BOD must be coordinated and agreed upon by the CD, PM, and the user.

03-8.3 BOD Change Requests
AE/RE’s are to prepare a written request for proposed changes in the BOD to CD. The written request will be in the format shown in paragraph 03-10.2. The written request must include the reason for delays, efforts to overcome the delay, and coordination made with the user. The AE/RE will coordinate with the appropriate PM both of whom will indicate their coordination and concurrence by endorsement on the written request.

AE/RE’s are responsible for monitoring approaching BOD dates and requesting BOD changes from CD in a timely manner, but in no case later than 30 days before the current BOD.
03-9 **PRE-CONSTRUCTION CONFERENCES**

After project transition, the AE/RE shall be responsible for scheduling the Pre-Construction conference. Normally it is at this conference that the NTP will be issued to the contractor. The conference shall be scheduled in such a manner to allow maximum representation from the District Office, USER, Construction field office personnel and PDT. The AE/RE will inform the PM of preconstruction conferences for coordination with the PDT members. It shall be the AE/RE responsibility for coordinating with PM and CT for the issuance of the NTP. The NTP should not be issued until all bonds are in place and copies of the drawings are provided to the field office. Normally it is CT objective to issue a NTP within 14 days of the contract award. Reasons to delay a NTP beyond 30 days shall be submitted in writing to the PM and CT representatives.

Preconstruction conferences will be held at the AE/RE Office as early as practicable after the award of construction contracts. Items to be discussed are shown in paragraph 03-10.3.

**03-9.1 Conference Purpose**

The purpose of the preconstruction conference is to:

1. Instruct the contractor(s) regarding their contractual responsibilities
2. Discuss plans and specifications
3. Define Quality Assurance requirements
4. Plan tentative schedule of work
5. Review safety requirements
6. Discuss labor and administration matters
7. Identify and discuss any other subjects of joint interest to the parties of the contract

**03-9.2 Setting up the Conference**

Immediately after award of a construction contract and prior to actual commencement of work at the site, the AE/RE will coordinate the date of conference and notify the contractor(s) and user by letter. This letter shall set forth the requirements of a preconstruction conference, establish the time, date, and location for the meeting, and cite the general scope of matters to be discussed. The AE/RE will inform CD and SO of preconstruction conferences by furnishing a copy of the letter to the contractor.

**03-9.3 PreConstruction Conference**

The AE/RE will normally conduct the conference according to the outline in paragraph 03-10.3. The AE/RE should also call specific attention to any changed or new clauses in the Contract Clauses, as well as to the EEO and minority or small disadvantage business concerns clause.
Specific items to be discussed concerning coordination with the user are shown in paragraph 03-10.4. When necessary, the District may be represented by the Legal Labor Advisor, SO, CD, PM, and CT.

Contractor(s), and subcontractor(s) when required, should be represented by a principal of the firm, CQC, and the project superintendent. Prime contractors will be charged with determining which of their subcontractors, if any, should attend.

03-9.4 Preparing the minutes
The minutes will be typed addressed as a MEMORANDUM FOR RECORD with copies furnished to all in attendance. If the conference covers more than one contract, a separate copy of the minutes should be furnished for each contract.

The body of the Memo will contain all items of importance, which were discussed, including discussions of a controversial nature, specific instructions given to the contractor, and the ACO/COR's response to any questions raised by the contractor. This part of the minutes will address safety, EEO, and Minority Business Enterprise (if MBE is a factor in the particular contract).

Copy of Contractor's Orientation Checklist is to be enclosed with a copy to the contractor. This document was designed primarily to use as an attachment to the minutes; however, its use may be expanded as an outline in conducting the preconstruction conference. Responsibilities for the document's application, accuracy, and administration are addressed below:

- ACO/COR is responsible for screening the document and deleting paragraphs by marking and initialing those that are not included in the contract.

- If a contractor has had previous satisfactory Government construction experience and is familiar with the Special Contract Requirements, complete coverage of these paragraphs in the minutes is not necessary. However, a statement to this effect should be noted in the minutes.
03-10  ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.
03-10.1 Calculating the BOD Buffer

1. The original estimated BOD will be determined by the field offices and input into RMS. The BOD buffer can be calculated using the excel Buffer Calc program. This "buffer time" is calculated based on the formula presented on the following pages. The "buffer time" is to be added to the completion date to establish the original estimated BOD. A minimum of 30 days and a maximum of 150 days will be used as the "buffer".

2. The buffer computation considers and ranks several factors which normally impact construction. Those factors are then assigned multipliers which are used in a formula for the buffer calculation. The calculation program limits the BOD buffer to a minimum of 30 days and a maximum of 150 days (limited/rounded to multiples of 30). Longer periods may be estimated.

FACTORS:

A = CONTRACT PERFORMANCE PERIOD
B = KNOWN CHANGES
P = COST FACTOR = a multiplier from 1.0 to 1.1 as the contract cost varies from less than $1 million to greater than $15 million.

E = TYPE JOB FACTOR = multiplier for job complexity as follows:
   Simple............... 1.00
   Average............... 1.05
   Difficult............... 1.10

Q = CONTRACTOR FACTOR = multiplier for contractor reliability as follows:
   Reliable............... 1.05
   Unknown............... 1.08
   Problem Prone.... 1.10

J = SPECIAL CONDITIONS = total number of the following sub-factors:
   Special Funding
   Special User
   New Unproven Design
   Many “GA” Level Shop Drawings
   Government Furnished Equipment
   Excessive Number of Review Comments
   Asbestos Removal Required
   Other Factors that may extend the Contract Time

FORMULA:

\[ \text{BOD Buffer} = (A+B)(P*E*Q)(1+J/40) - A \]
EXAMPLE:

ESTIMATED COST...................... $5,000,000
CONTRACT DURATION............... 365 Days   >> A = 365
KNOWN CHANGES..................... None      >> B = 0
COST FACTOR....................... $5M        >> P = 1.05
TYPE JOB FACTOR................... Simple     >> E = 1.0
CONTRACTOR FACTOR............... Unknown   >> Q = 1.08
SPECIAL CONDITIONS.............. New Design,
                                Asbestos Renoval >> J = 2

BUFFER = ( A + B)(P * E * Q )(1 + J/40) - A
= (365+0)(1.05*1.0*1.08)(1 + 2/40) -365
= (365)(1.134)(1.05) -365
= 435 - 365 = 70 >> 60 DAYS
03-10.2 BOD Change Request Memo (Sample)

CESAS-CD-Field 1 February 1996

MEMORANDUM TO CD-QM

SUBJECT: Change in BOD, Contract No. DACA21-96-C-0001, New Troop Barracks, Fort Readiness, GA

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<th>Initial BOD: 24 Dec 95</th>
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<td>Last CCD: 30 Nov 95</td>
<td>Last BOD: 16 Feb 96</td>
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<tr>
<td>Current CCD: 15 Dec 95</td>
<td>New BOD: 15 Mar 96</td>
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Reason - Contractor is experiencing a delay in receipt of a pump needed for the automatic fire suppression system.

Efforts to Overcome Delay - The pump will not be ready for shipment until 16 Feb 96, due to delays to correct a manufacturing defect. The manufacturing process is being expedited as much as possible to meet the 16 Feb target. The automatic fire suppression system cannot be made to operate reliably without the correct pump; and the barracks cannot be occupied without this safety system. Therefore, the BOD must be revised to 15 March 1996.

Coordination with User - The local user and the DPW have been briefed on this development and concur.

I. M. Able, PE
Resident Engineer

CONCUR:

CONSTRUCTION DIVISION

PROJECT MANAGEMENT DIVISION

File
03-10.3  Preconstruction Conference – Items to be Discussed

PRECONSTRUCTION CONFERENCE AGENDA
CONTRACT NO._____
NAME OF PROJECT

1.  INTRODUCTION
   a. Personnel Introductions
   b. Contract Number and Descriptions of Contact
   c. Purpose of Conference

2.  GENERAL
   a. Notice of Award (acknowledged)
   b. Notice of Proceed (acknowledged)
   c. Section H  Clauses Incorporated by Reference
   d. FAR 52.236-5 Material & Workmanship
   e. FAR 52.236-6 Superintendent by Contractor
   f. DFARS 52.236-7008 Superintendence by Subcontractor
   g. FAR 52.236-7 Permits & Responsibilities
   h. FAR 52.236-3 Site Investigation & Conditions Affecting the Work
   i. FAR 52.236.9 Protection of Existing Vegetation, Structures, Utilities, Improvements
   j. FAR 52.236-10 Operation & Storage Area
   k. FAR 52.248-3 Value Engineering Incentives
   l. Section I  Commencement, Prosecution, & Compliance of Work
   m. Section I  Liquidation Damages
   n. Section H, Availability of Utility Services
      FAR 52.236-14
   o. Section H  Post Regulations
   p. Section H  Haul Routes
   q. Section H  Erection of signs
   r. Section I  Performance of Work by Contractor
   s. Section H  Required Insurance
   t. 2X1  Environmental Protection
   u. 1581  Seismic Protection
   v. Section I  Physical Data
   w. DFARS 52.236-7005 Salvage Material & Equipment
3. DRAWINGS
   a. FAR 52.236-21 Specifications & Drawings
   b. Section I Contact Drawings, Maps, & Specifications
   c. Section H As-Built Record Drawings

4. SCHEDULING
   a. FAR 51.236-15 Schedule for Construction Contracts
   b. Section H Construction Restraints
   c. Section I Contractor-Prepared Network Analysis

5. PAYMENTS
   a. FAR 52.232-5 Payments under Fixed-Price Construction
   b. Monthly Cut-off Date (20th of each month varies)
   c. Section H Payment for Materials Delivered On-Site & Off-Site
   d. Section H Prompt Payment to Contractor

6. LABOR PROVISIONS
   a. FAR 52.222-26 Equal Opportunity
   b. FAR 52.219-8 Utilization of Small Business & Small Disadvantaged Business
   c. FAR 52.219-9 Small Business & Small Disadvantaged Business Subcontractor Plan
   d. FAR 52.219-13 Utilization of Women-Owned Small Business
   e. Section I Davis-Bacon Act
   f. Section I Payrolls & Basic Records
   g. Section I Disputes Concerning Labor Standards
   h. Section J Wage Rates
   i. Section H Inclusion of Labor Provisions in Subcontracts
   j. Section I Contract Work Hours & Safety Standards Act-Overtime
   k. Section I Apprentices & Trainees
   l. Section I Withholding of Funds
   m. Section I Subcontracts
   n. Section I Contract Termination: Debarment

03-21
7. CONTRACT ADMINISTRATION
   a. Correspondence
   b. FAR 52.243-4 Changes
   c. FAR 52.239-2 Differing Site Conditions
   d. FAR 52.249-10 Default
   e. FAR 52.233-1 Disputes
   f. FAR 52.236-11 Use & Possession Prior to Completion
   g. FAR 52.212-12 Suspense of Work
   h. FAR 52.249-2 Termination for Convenience of Govt.
   i. FAR 52.225-5 Buy American Act
   j. FAR 52.203-30 Gratuities
   k. DFAR 52.236-7003 Modifications, Proposals
   l. FAR 52.246-21 Warranty of Construction
   m. Section H Color Boards
   n. Section H Time Extension of Weather-Monthly

8. SAFETY
   a. FAR 52.236-12 Cleaning up
   b. FAR 52.236-13 Accident Prevention & EM 385-1-1
   c. EM 385-1-1,A.05 Activity Hazard Analysis
   d. EM 385-1-1,A.03 Contractor’s Accident Prevention Plan
   e. FAR 52.236-13 Mutual Understanding Meeting
   f. FAR 52.223-3 Hazardous Material Identification & Material Safety Data
   g. Section H Frame Ground of Welding Machines & Generators

9. CONTRACTOR QUALITY CONTROL
   a. FAR 52.246-12 Inspection of Construction
   b. Section H Shop Drawings & Material Submittals
   c. Section H Contractor Quality Control, SAD Lab, Field Office Operation
   d. Section H Coordination Meeting
   e. Section I Certificate of Compliance
   f. FAR 52.236-7003 Shop Drawings
03-10.4  Preconstruction Conference – Agenda for Coordination with User

1. Item for Discussion
   a. Coordination with user
   b. Points of Contract
   c. Contractual Authority

2. Identification of Contract Personnel for Security/Control
   a. Limits of construction (utilize barrier if applicable)
   b. Restricted areas
   c. Contractor’s proposed work hours/days per week

3. Privately-owned Vehicle Operation & Parking on Government Property


5. Utilities Outages/Users
   a. Advance Notice for Outage
   b. Actual Operation to discontinue/restore utility
   c. Method of payment for utilities
   d. Availability (Electric, water, sewage, telephone, compressed air, etc.)

6. Use of Government-owned Equipment (if specified)
   a. Cranes
   b. Other

7. Fire Reporting (local Fire Department/User)

8. Accident Reporting (ambulance, hospital, and doctor)

9. Use of two-way radios on Government property
## CHAPTER 04 POST NTP FUNCTIONS

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### 04-1 POST NTP FUNCTIONS

1. **Purpose**
2. **References**
3. **Responsibilities**
4. **Definitions**

### 04-2 QA MEETING OF MUTUAL UNDERSTANDING (MMU) & COORDINATION MEETING

1. **Critical MMU Checklists**
2. **Contractor Quality Control Plan**
3. **Submittals and Submittal Register**
4. **Environmental Plan**
5. **Environmental Safety Supplement**

### 04-3 ACCIDENT PREVENTION PLAN / SAFETY

1. **Activity Hazard Analysis**
2. **Contractor’s Safety Meetings and Inspections**

### 04-4 PRELIMINARY PROJECT SCHEDULE;

### 04-5 AS-BUILT DRAWINGS PROCEDURES

### 04-6 GENERAL OFFICE QUALITY ASSURANCE PLAN

### 04-7 QA PLAN SUPPLEMENT

### 04-8 TRAINING

### 04-9 EQUIPMENT LISTS

### 04-10 INSTALLATION SPECIFIC REQUIREMENTS:

### 04-11 Notice of Intent (demolition):

### 04-12 REQUEST FOR INFORMATION (RFI) system:

### 04-13 Capturing Lessons Learned

### 04-14 RMS Setup

### 04-15 ANNEXES, EXHIBITS, AND TEMPLATES

1. **Meeting of Mutual Understanding Minutes (SAMPLE)**
2. **Preconstruction Conference Agenda for Coordination with the User**
3. **Checklist for Project Transition from Design to Construction Phase**
4. **QA Plan Area/Resident Office**
5. **Quality Assurance Plan Supplement**
6. **RMS Procedures**
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CHAPTER 04 POST NTP FUNCTIONS

04-1 POST NTP FUNCTIONS

04-1.1 Purpose
This portion of the manual establishes Construction Division’s (CD’s) policies and objectives regarding the field construction offices’ responsibilities after issuance of the NTP but prior to the start of construction.

04-1.2 References
a. ER 1180-1-6 – Construction Quality Management

04-1.3 Responsibilities
a. AE/RE has overall responsibility for Post NTP functions.

04-1.4 Definitions
a. NTP – Notice to Proceed.

04-2 QA MEETING OF MUTUAL UNDERSTANDING (MMU) & COORDINATION MEETING

The ACO will be responsible for scheduling a Meeting of Mutual Understanding with the Contractor and PDT to capture all information relevant to the execution phase of the project. See DRAFT Agenda and Checklist in paragraph 04-15.

Before construction starts, a meeting of mutual understanding will be held between the field office and the contractor to discuss the contractor's quality control system. During this meeting, details of the CQC plan will be reviewed. CQC activities discussed will include procedures for the three phase inspection system, QA and QC testing, administration of the CQC system, forms used for recording CQC activities, and the interrelationship and coordination of CQC and Government QA field activities. The contractor's safety plan should also be discussed. At this time, the field will ensure that all testing labs utilized have been approved within the last two years for the type of work intended. Otherwise, an inspection must be requested to validate the proposed commercial laboratory (see Chapter 14).
Minutes of the meeting shall be prepared by the government, signed by both parties, and become part of the contract files. There may be occasions when subsequent meetings will need to be held to reconfirm understandings. These should also be documented, and become part of the contract file.

In preparation for this meeting the contractor must complete and submit drafts of the following documents:

- CQC Plan
- Submittal Register
- Environmental Protection Plan
- Accident Prevention Plan
- Preliminary Project Schedule (first 90 days)

See part 04-15 of this Chapter for Sample MMU Minutes

04-2.1 Critical MMU Checklists
At the MMU the actual field personnel for the contractor and COE shall review the Transitional Planning Checklist:

- Environmental permits and requirements are turned over to Resident Office
- EIS/EA approval
- Erosion Control Plan approved by State
- Water Quality plan approval
- Water/Sewer Permits
- Wetland permits
- Air Permits 9 (for boilers and diesel generators)
- Asbestos Abatement reports
- Other Environmental issues
- Copies of Drawings & Specifications distributed Contractor and COE
- Copies of Design comments from dr. Checks
- On Design/Build obtain a copy of the contractors proposal.
- Validate if there are any Known Changes.
- Payment and performance Bonds are on hand
- Contract drawing and specifications have been distributed
- Coordinate with PM on A&E involvement (submittal review and etc.)
- Special Engineering Considerations
- SPIRIT/LEED – (documentation of points obtained during design)
- ACO/COR Letters from CONTRACTING
- Final Annotated Design review & BCO comments (access to Dr. Checks)
- Electronic drawings are available for as-builts
- Transition Notebook on hand (See Appendix A)
04-2.2 Contractor Quality Control Plan

Contractor quality control (CQC) is the construction contractor's system to manage, control and document his own, his suppliers', and his subcontractors' activities to comply with contract requirements. FAR part 46.312 establishes the requirement for CQC in construction contracts.

The contractor is responsible for quality control and shall establish a quality control system for work accomplished on and off site by his organization, suppliers, subcontractors, technical laboratories, and consultants. Contractors will be required to prepare a quality control plan which includes the features described in the appropriate section of the Unified Facilities Guide Specifications (UFGS) for each project.

The field office should review the CQC Plan and assure that the following items, as a minimum, are included in the plan:

- A description of the quality control organization, including a chart showing lines of authority and acknowledgment. The name, qualifications, duties, responsibilities and authorities of each person assigned a CQC function.

- The contractor’s method for implementing the 3-phase quality control system for all aspects of the work.

- The documentation of the qualifications of the CQC staff shall meet the qualification requirements in the contract specifications. In addition to those requirements, the CQC system manager or the principal member of the CQC staff shall have completed the courses entitled "Construction Quality Management" and "Quality Verification- Construction Safety" if required. These courses are available through the geographic districts.

- A copy of the letter to the CQC system manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC system manager. This includes authority to stop work which is not in compliance with the contract.

- Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers and purchasing agents.
- Identify the industry recognized Validated testing laboratory.

- A list of all tests to be performed and the control, verification and acceptance testing procedures for each specific test to be performed.

- Procedures for tracking construction deficiencies from identification through acceptable corrective action.

- Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

- Contractor's daily CQC report shall be furnished to the Field office within 24 hours.

- A list of the definable features of work.

The Definable features of work are critical to both the QC and QA process. This is a comprehensive listing of critical features of work. Generally, the Definable features of work coincide with critical specification sections of the contract, however the critical elements should be analyzed to assure that Preparatory, Initial and follow up inspections are properly scheduled. The agreed listing of Definable features of work will be tracked throughout the project in RMS or other means and reviewed no less than monthly to assure the CQC system is properly documenting required inspections.

The Contractor QC testing plan, along with Definable Features of work, must be mutually agreed upon. QC test frequency must be agreed upon and scheduled to assure adequate testing is provided in accordance with the contract requirements. The contractor must plan and document required tests. A tracking system for testing and documentation must be mutually agreed upon. RMS shall be utilized as a method of documenting test requirements to the fullest extent.

The contractor's CQC plan, or at least an interim plan, must be conditionally accepted prior to the start of construction. Acceptance of the plan is subject to satisfactory performance, and the Contracting Officer reserves the right to require the contractor to make changes in his CQC Plan and operations including removing personnel, as necessary, to obtain the quality specified.

CQM Requirements: Per the contract specifications QC personnel must have the required training prior to acceptance. Districts conduct the CQM classes throughout the geographic region. If personnel have met all other requirements of the QC position, a temporary waiver may be provided as long as they are scheduled for the next available CQM training class.
04-2.3 Submittals and Submittal Register

At the MMU, a Draft Submittal register of the first 90 days of work must be provided and mutually agreed upon. The final submittal register should be provided NLT 30 days after NTP. The submittal register must be reviewed by the field office at least monthly to assure critical submittals are being submitted on time. This review is normally done concurrently with the monthly schedule review. The use of RMS, the QCS module, is highly recommended to assure that submittal data is being properly tracked. As part of the PM Transition meeting a completed electronic version of the Submittal schedule should be provided by the in-house designer or A&E. It is the PM’s responsibility to assure this file is provided to the field office. Submittal procedures for a specific contract should be reviewed in detail during the MMU.

Submittal Register: At the end of specification section there will be the ENG Form 4288, Submittal Register, listing each item for which submittals are required by the specifications The contractor shall verify the accuracy of the submittal register. Columns "c" through "o" will be completed by the designer. The contractor will complete columns "a", "b", and "p" through "u" and return two copies to the Contracting Officer for approval within 30 days after Notice to Proceed.

Submittals: Submittal descriptions and procedures are outlined in the UFGS. Submittals are classified as Government Approved /District (GA/D) or Government Approved/Field (GA/F) level or For Information Only (FIO). Government approved submittals can be either GA/D - reviewed by the designer, or GA/F - reviewed by the field office. All submittals not requiring Government approval will be for information only (FIO).

Contractors will transmit submittals to the Government on ENG Form 4025, Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance.

All submittals are the responsibility of the contractor. The approval by the Contracting Officer Representative (COR) shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval is not required on information only submittals. Quality assurance reviews of information only submittals will be performed to assure that the contractor's quality control program is properly reviewing and approving submittals. A minimum of 10% of all information only submittals should be reviewed.

Test reports shall be 100% reviewed by the QA staff in the early stages of each definable feature of work to ensure testing is being done properly, and reporting is in compliance. Once confidence in the testing program has been demonstrated, the 100% oversight requirement can be reduced, as appropriate. A tracking system must be employed to assure testing is performed both at the required frequency and to assure that the testing is dispersed enough to be representative of the project work.

SEE CHAPTER 12 for Details on the SUBMITTAL PROCESS.
04-2.4 Environmental Plan:
At the MMU, a draft of the project Environmental Protection Plan (EPP) must be provided prior to the start of construction. This plan must address all erosion control requirements specifically included in the contract drawings along with any local environmental requirements. If applicable, copies of permits will be provided to the contractor on sediment control and water quality. The contractor’s plan shall address at a minimum the following items:

- Company policies and environmental policy and plans
- Site Specific Spill Prevention Plan (SSSPP)
- Erosion control Inspection plan (Depending on the permit requirements) Normally weekly with documented inspections)
- Water Quality Management Plan (Weekly inspection and at each event)
- Pollution Prevention POC and emergency contact lists
- Plan to address project specific requirements such as Asbestos removal, lead abatement and etc.
- Water and Sewer Permit construction certifications

04-2.5 Environmental Safety Supplement
Hazardous, Toxic, and Radioactive Waste (HTRW) Sites: Hazardous waste sites pose a multitude of health and safety concerns, any one of which could result in serious injury or death. Sites that are classified as HTRW sites include Underground Storage Tank (UST) removals, sites with known or unknown chemical or petroleum product contamination, sites prone to explosion or fire, etc.

Contractor personnel working on HTRW sites as well as all QAR personnel entering the site must have an initial 40 hour training class, 24 hours of supervised on the job training, and an annual 8 hour refresher course. This training is required by 29 CFR 1910.120 (OSHA Regs) BEFORE the employee is allowed to enter an HTRW site. Copies of the training certificates shall be maintained in the field office and be available for review.

Asbestos Abatement & Lead Abatement: Quality assurance personnel inspecting or supervising asbestos abatement projects are required to have successfully completed an initial 40 hour training course which has been approved by EPA to meet Asbestos Hazard Emergency Response Act (AHERA) accreditation requirements. Annual 8 hour refresher courses are also required. There is a one year grace period, however, during this grace period, the QAR is not AHERA certified for abatement projects in schools. If two years elapse without taking the refresher, the 40 hour class must be repeated. Regulations specifically designed for lead hazards are found in the OSHA General Industry Standards and are not provided for in Construction Industry Standards. Current guidance is to treat lead based paint as a hazard if structures coated with lead paint will be blasted, sanded, burned or welded. However, disposal of lead containing debris from demolition is still a
question and concern. If this situation is encountered in the field, the QAR should coordinate with their construction technical manager and Safety Office.

SEE CHAPTER 09 ENVIRONMENTAL FOR DETAILS

04-3 ACCIDENT PREVENTION PLAN / SAFETY

The Contractor is required to comply with the Occupational Safety and Health Act (OSHA) standards as well as the current edition of the Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1. QA Personnel, however, do not have enforcement authority regarding OSHA standards. All Corps personnel are authorized to stop any activity which poses an immediate danger to life or limb.

Prior to starting work, the Contractor must submit an acceptable Accident Prevention Plan. The plan is usually submitted at the Pre-Construction Conference and should be prepared in the format specified by EM 385-1-1, Appendix A.

The Contractor's plan will be job specific and will include work to be performed by subcontractors, and measures to be taken by the contractor to control hazards associated with materials, services, or equipment provided by suppliers. The contractor will have an alcohol/drug abuse prevention program. The APP should address, as a minimum, the following:

a. Identification and accountability of personnel responsible for accident prevention.
b. Local requirements.
c. Coordination of work with subcontractors.
d. Plans for layout of temporary construction buildings and facilities.
e. Plans for initial indoctrination, continued safety education, and training.
f. Plans for traffic control and marking of hazards.
g. Plans for maintaining continued job cleanup, safe access and egress.
h. Plans for fire protection and dealing with emergencies. Contractor should coordinate with local hospitals, emergency services, etc. in advance.
i. Plans for inspections of job sites. A responsible person shall be designated by name.
j. Procedures for accident investigation and reporting.
k. Details of fall protection.
l. Description and sketch of temporary power distribution
m. Description of safe clearance procedures.
n. Description of office trailer anchoring system.
o. Contingency plan for severe weather.
p. Personal protective equipment plan.
q. Plan outlining sanitation facilities, including drinking water, eating areas, toilet facilities, etc.
r. Activity Hazard Analysis section. (See Chapter 8 for details)

**RBP:** The APP may be reviewed by the field office within 14 days of receipt and comments provided to the contractor for interim acceptance. The contractor must submit an acceptable plan before beginning work. The plan is also forwarded to the Safety Office for review and/or comment. Subsequent District comments will be provided before final acceptance. Revisions to the plan may be necessary during the course of the contract.

Any asbestos abatement plans, site safety and health plan for hazardous and toxic waste (HTW), lead abatement plan, or plan for other environmentally related issues, will also be reviewed by the District Safety Office. See Chapter 8 for details.

**04-3.1 ACTIVITY HAZARD ANALYSIS**

The contractor will provide an Activity Hazard Analysis (AHA) for all definable features of work. The AHA shall be submitted for review and acceptance prior to the scheduling of the preparatory meeting. EM 385-1-1 provides guidance in preparing the AHA. The use of "canned" AHA’s, shall not be permitted. The contractor shall develop job specific AHA’s to address those hazards expected in the activity. The AHA will address the following major points:

- Principal steps
- Potential safety/health hazards
- Recommended controls
- Equipment to be used
- Inspection requirements
- Training requirements
- Competent/qualified person.

The AHA will be discussed by the contractor and QA personnel at the preparatory phase and work will not proceed on that phase until the AHA has been accepted by the Government. A copy of each AHA should be kept with the minutes of the preparatory phase or QA report. See Chapter 8 for example of an AHA.

**04-3.2 CONTRACTOR'S SAFETY MEETINGS AND INSPECTIONS**

As part of the contractor's accepted Accident Prevention Plan, each of the contractor's employees shall receive an initial safety indoctrination based on the safety program required by the contract. The contractor should maintain a record of employees who have received this indoctrination. The contractor shall conduct safety meetings for all supervisors at least once a month to review past activities, plan ahead, and establish safe working procedures for anticipated hazards. Minutes of these meetings shall be submitted to the Field Office.

At least one safety meeting shall be conducted weekly by field supervisors or foremen for all workers. This is commonly known as the "Weekly Tool Box Safety Meeting."
Minutes of the meeting will include date, time, attendance, subject discussed, and who conducted the meeting. A copy of the minutes shall be furnished to the Field Office

SEE CHAPTER 8 FOR SAFETY REQUIREMENTS

04-4 PRELIMINARY PROJECT SCHEDULE;

When required by the contract, the contractor shall prepare a network analysis system (NAS) to schedule time and costs. The requirement for the NAS is included in the contract to assure adequate planning and execution of the work, to assist the Government in evaluating progress, and to enable the Government to make payments. The contractor will bring a completed or draft NAS to the Preconstruction conference and it shall be reviewed in detail at the MMU. The initial schedule must be in compliance with the RMS/QCS format to facilitate the processing of the monthly pay estimates.

The initial NAS is for the first 60 to 90 days of the contract.

The final NAS will be submitted in complete detail NLT 60 days after the NTP.

The preliminary schedule will incorporate critical lead time submittals and items of procurement that must be ordered early in the contract performance period. The contractor will participate in the review and evaluation of the proposed NAS. With each request for progress payment, the contractor will submit an updated NAS with his invoice. A narrative report will also be submitted, which will include descriptions of problem areas, both current and anticipated, delaying factors and their impacts, and an explanation of corrective actions taken or proposed by the contractor. If the critical path of the updated network changes from the original schedule, this should be clearly marked on the update.

SEE CHAPTER 5 FOR NAS REQUIREMENTS

04-5 AS-BUILT DRAWINGS PROCEDURES

The COE Standard is Micro Station CADD file drawings. As part of the transition package, PM is responsible for providing the original CADD drawing files to the field office. Upon receipt of the files the contractor and Field Office must assure they are properly formatted and are useable. Lessons learned have shown that on occasions incomplete or non-useable files have been furnished and it was not realized until the end of the project.
During the MMU it is critical that the As-Built drawing procedures are reviewed in detail. Most changes to the As-Built drawings occur in the first 30% of construction when utilities and site work is being installed. If critical deviations are not captured, it is almost impossible to update the as-built drawings at the end of the project. At the MMU the Field construction office must agree on periodic reviews of the As-built drawings. At a minimum monthly review of the red line drawings must be conducted by the field office to assure correct as-built information is being captured. The As-built drawing requirements may vary between installations and must be clearly indicated in the special clauses of the contract.

SEE CHAPTER 5 FOR AS-BUILT DETAILS AND PROCEDURES

04-6  GENERAL OFFICE QUALITY ASSURANCE PLAN

Quality Assurance (QA) is the procedure by which the Government fulfills its responsibility to be certain that the CQC system is functioning and the specified end product is realized. ER 1180-1-6 dated 30 September 1995, provides the general policy and guidance for establishing quality management procedures. An example of a QA plan is included in paragraph 04-14.4

Each area/resident engineer will develop a written QA organizational plan that addresses the overall QA operations of the field office. After initial development, the plan will be reviewed and updated as often as necessary, but not less than annually. This is not the only acceptable QA Plan Format, but is intended as a guide. Each field office will develop a plan that reflects its own organizational staff and workload. Standard RMS reports shall be utilized in the development of the Quality Assurance Plan.

04-7  QA PLAN SUPPLEMENT

A QA Plan Supplement should be developed for each individual project which addresses the specific requirements. An example QA Plan Supplement is included in paragraph 04-14.5 which can be used to summarize pertinent information on one sheet.

These supplements will include information such as:

* Personnel assigned to the project
* Project description and information
* Special training needs to properly administer the contract - this can include required HTW training, asbestos certification, lead paint removal training, etc.
* A schedule of QA tests to be performed
* Unique scheduling and phasing requirements
* Any other items specific to the contract
The QA plan supplement is a working document and each member of the QA staff should be familiar with it.

After the MMU, the field office shall prepare a written QA test plan. Based on the contractor’s QC Test Plan, the Project Engineer shall develop a QA test plan to assure at least 5% to 10% of QA tests are taken to substantiate the QC test plan. A tracking system for testing and documentation must be mutually agreed upon and normally entered into RMS.

04-8  TRAINING

For all employees with quality assurance as a primary duty, it is imperative that a minimum level of training is completed. Before somebody is placed in responsible charge of a project or a specific phase of a project, the person must have satisfactorily completed the respective training. In addition, a record must be kept for those who have received training.

Minimum training for most projects will typically consist of the following two exportable courses: Construction Quality Management and QV: Intro to General Construction. Additional training shall be provided prior to specific phases of work (masonry, concrete etc.). Exportable courses offer a cheap, readily available source for accomplishing this training.

SEE CHAPTER 5 and 13 FOR TRAINING PROGRAM

04-9  EQUIPMENT LISTS

At the MMU a clear plan for tracking equipment must be mutually agreed upon. The Contractor is required to provide an installed equipment list to the Contracting Officer not later than 30 days prior to the contract completion date. The list, submitted in original and four copies, shall include the item description, capacity, model number, manufacturer's name, telephone number, and address, including local supplier and cost. Equipment shall include all major items of electrical, mechanical and specialty equipment provided in the contract.

04-10  INSTALLATION SPECIFIC REQUIREMENTS:

At the MMU Installation/project specific requirements must address the following items are examples of critical criteria that must be addressed
EXCAVATION
Installation utility/digging permits. The contractor is responsible for requesting digging permits per the installation requirements. Any excavation prior to the receipt of a installation permits shall be the responsibility of the contractor and should be coordinated with the utility provider.

Installation Fire Permits:
Welding/burn permits must be obtained by the contractor prior to the use of a significant ignition source. It shall e the responsibility of the contractor to comply with installation fire protection requirements.

State and Installation Environmental Permits:
The installations, Federal (EPA) and States reserve the right to perform compliance inspection on environmental compliance. Special emphases of environmental agencies are on wetlands and stream bank mitigation projects along with Erosion Control permits. Additionally it is not uncommon to have state compliance visits for demolition and asbestos removal work. The contractor shall be responsible for coordinating with State on Installation on all compliance inspections. Any Notices of Violation on Environmental issues may be grounds for the issuance of an Interim unsatisfactory performance rating.

Site Layout plans:
Prior to the start of work the contractor shall submit site layout plans detailing the critical locations of admin, storage and lay down areas necessary for the contract.

Temporary Utility Plans:
The contractor shall submit for approval for all temporary electrical work required by construction activities.

Installation/Project Access Requirements
The contractor must be made aware of the specific installation/project access requirements. Individual have different SOPs concerning access personnel and vehicles. Installations/project may have the rapid gate system or a similar system that requires the Contractor to pay a fee for individual badges. This system normally requires a background check of individuals. Any individual with an unfavorable report may be denied access to the installation. Installation requirements vary. The contractor must be aware of these requirements. Special consideration may be needed in regards to the delivery of time-sensitive supplies such as concrete or asphalt. Direct coordination may be necessary with the security office for time-sensitive supplies. The current requirement is for all delivery trucks to be routed to a specific gate and may be searched thru a side scan/x-ray system or a physical search.

The contractor needs to be made aware of the installation Threat COM levels and emergency notification system. i.e. Installation closed due to adverse weather is normally broadcast on commercial radio or TV.
04-11 NOTICE OF INTENT (DEMOLITION):

Individual states have different requirements for demolition and asbestos abatement. Consult the individual states for Permit requirements. All states have a permit requirement for notification of demolition. Lessons-learned, in NC a specific permit must be applied for designating the building location and the testing of materials to be demolished. A demolition permit is required and failure to obtain a permit constitutes a NOV based on RCRA regulations. If testing indicates ACM is present an Asbestos abatement plan will have to be filed with the permit. The permit is site specific and time specific. Work must not proceed prior to the specified demolition date or a NOV may be issued. State inspectors do randomly visit sites with permits. Amending permit start dates are generally easy and can be done thru electronic means fax or e-mails. Be sure to notify the state of any changes in the demolition schedule.

04-12 REQUEST FOR INFORMATION (RFI) SYSTEM:

During the normal process of a project there must be a system in place for the contractor to request clarifications to the contract documents. There is a RMS System for tracking these RFI’s. In the absence of a formal tracking system a system must be developed for tracking when questions were asked and when the response was provided by the government. This tracking system must be mutually agreed upon at the MMU. It is critical the government provide timely responses to RFIs to the contractor. An untimely response could lead to delays in construction and ultimately claims to the government. As an example, some field offices have developed other methods to track RFI actions.

The Field Office shall utilize RMS to Track RFIs and their responses. This system allows for RFIs to be tracked and can be tracked by the contractor through the QCS module.

It shall the responsibility of the field Resident and Project Engineer to coordinate responses to contractor RFI’s. To the maximum extent possible the response shall be made by the field office in consultation with district personnel as necessary. The responses will be made at 3 levels as follows:

- Routine – The Resident/Project Engineer researches contract documents and makes interpretations.
- Intermediate – On design issues involving A&E the RE shall forward RFI to PDT and A&E/Designer of record and coordinate responses.
- Emergency – On issues involving contract delays – RE shall immediately get PDT together and complete response NLT 72 hours. Telephone and televideo conferences shall be utilized to resolve issue to prevent or mitigate delays.
Design comments

A RFI may have been addressed during the design process which relates to the contractors’ RFI. A complete listing of design review comments is available thru Dr Checks. The project engineer should utilize the Dr. Checks system as a reference to answering RFIs.

04-13 CAPTURING LESSONS LEARNED

Certain RFIs may result in systemic problems on future designs. These RFI’s shall be captured in the SAD Lessons Learned program.

04-14 RMS SETUP

RMS is the critical construction management software on all construction projects. The Area Resident Office must coordinate directly with the Construction Division RMS administrator to assure the critical data from CEFMS and P2 are downloaded into RMS. At the MMU the initial critical QCS downloads must be verified. All RMS data should be validated after it is downloaded. SEE RMS/QCS Guide
04-15 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.
04-15.1 Meeting of Mutual Understanding Minutes (SAMPLE)

MEETING OF MUTUAL UNDERSTANDING

OF

QUALITY CONTROL AND SAFETY

CONTRACT NUMBER: ________________________________________________

CONTRACT NAME: _________________________________________________

DATE OF MEETING: ________________________________________________

1. Definitions:

   a. QC is the contractor's Quality Control organization which has the responsibility to ensure that the work is in compliance with the contract plans and specifications and to ensure that all safety requirements are met.

   b. QA is the Corps of Engineers representative that has the responsibility to ensure that the contractor maintains a functional and effective Quality Control organization which will ensure that contract compliance is met.

2. 3 Phase Method of Inspection:

   a. Preparatory Inspections will be held prior to commencing work on each separable phase of construction. The QA will be given 48 hours notice prior to the preparatory inspection. It is the responsibility of the QC to schedule and hold the inspection. The minimum persons present will be the QC and foreman in charge of that phase of work. Prior to or at the inspection, the QC will verify that all required submittals have been submitted and approved. The preparatory inspection will be documented on the QC daily report or by checklist attached to the daily report. The job hazard analysis will be completed at this time.

   b. Initial Inspections will be held jointly between QC and QA and will take place as each separable phase of construction progresses enough to determine if workmanship is acceptable. The QA will be given 24 hours notice of the initial inspection by the QC. The initial inspection will be documented on the QC and QA daily reports.
c. **Follow-up Inspections** will be held jointly and separately by the QC and QA. These inspections will be held daily to ensure that the workmanship complies with contract requirements. These inspections will be documented on the QC and QA daily reports.

3. **Erosion Control Inspections:**
   
a. The contractor shall install and maintain the erosion control measures on site in accordance with the approved erosion control plan. Any deviations from the approved erosion control plan will not be made until a written request has been submitted and approved by our office.

b. Erosion control shall be monitored at a minimum on a weekly basis and immediately after a rainfall. A weekly report shall be submitted with the following information: contractor, contract name, contract number, location, week ending, general discussion, status of site, permanent control measures, temporary measures, problem areas, corrective actions, remarks, signature of the contractor superintendent (See the attached form).

c. Any necessary repairs or maintenance will be made as soon as possible after the weekly inspection.

4. **Daily Reports:**
   
a. **The QC and QA** will fill out daily reports on a daily basis. The QC will turn in his report over to the QA no later than that following work day (10:00 a.m.). A system will be worked out between the two.

b. **QC reports** will indicate all contractors and subcontractors present on site and what work was performed. The report must show all instructions given and deficiencies noted by the QA to the QC, and corrective action to be taken. If delays are incurred, the QC must state the cause of delay.

c. **Safety Surveillance** will be performed daily and daily comments will be made on both the QC and QA report. Reports will not be accepted if they do not contain comments on safety.

d. **Documentation** is very important to the Corps of Engineers and the Contractor. It is the contention of the Corps of Engineers that if it is not documented, it probably did not occur.

5. **Safety**
a. EM 385-1-1, Safety and Health Requirements Manual will be complied with and it will be the QC's responsibility to ensure this compliance. The QC will perform a daily surveillance.

b. Monthly Supervisor's Safety Meetings will be held with all supervisors that have work-in-progress present. This meeting will be documented by letter to the Contracting Officer's Representative and on the QC daily report. The meeting will be held on ________________ (day and time) (01.B.03, paragraph a).

c. Weekly Tool Box Safety Meetings will be held by the QC with all employees on site attending. This meeting will be documented on the QC daily report. The meetings will be held on ________________ (day and time) (01.B.03, paragraph a).

d. Weekly Electrical Safety Inspections of temporary power will be performed by QC and documented on the daily report or by attaching a checklist to the daily report (Attachment 1 to Section 00800, "List of Attachments").

e. First Aid List will be maintained by the contractor at the site. The list should site names, injuries, and type of first aid given for all injuries (01.D.04).

f. SAD Form 1666-R will be filled out by the QC prior to placing any equipment into use. Deficiencies found will be corrected prior to operation. If equipment is taken off site and then moved back on site, it must be inspected again before use. SAD Form 1666-R will be maintained at the construction site (16.A.01).

g. Accident Reporting: All lost-time injuries, injuries requiring stitches and no lost-time, and property damage accidents in which the property damage exceeds $2,000.00 will be reported immediately to the QA and ENG Form 3394 will be completed and turned into the Contracting Officer's Representative within 48 hours (01.D.01).

h. Safety Notebook: A safety notebook dedicated only to safety shall be maintained on site at the contractor's trailer with tabbed sections for each item following: Meeting of Mutual Understanding, Weekly Tool Box Meeting, Monthly Supervisor's Safety Meeting, Weekly Temporary Electrical Inspection, Worker Indoctrination, First Aid Log, and 1666R. Any additional items required by the QAR must be included.

i. Hazardous Communications Notebook: A tabbed notebook shall be maintained at the contractor's on site trailer which will be utilized for hazardous communications only. The items included in the notebook shall include training, current inventory of hazardous chemicals and MSDS sheets (01.B.04).
6. **Monthly Progress Payments**
   
a. The QA will meet with the contractor on or about ________________ (date) of each month to agree on the amount of progress the contractor will claim that month.

   b. Stored materials will be verified at the time of the above meeting.

   c. Delays due to abnormally severe weather will be discussed at the time of the above meeting. The NAS will be checked to ensure that any delays thought to be incurred are critical activities. After the contractor and QA have come to an agreement on the number of delays, the contractor will note this on his monthly narrative accompanying his request for progress payment.

7. **As-Built Drawings**
   
a. The contractor will maintain a set of prints and/or a CD file at the project site exclusively for use as as-builts.

   b. The contractor will update the as-built drawings no less than on a weekly basis.

   c. The QA will verify that the as-builts are up to date at the monthly progress update. Retainage will be held if it is found that the contractor is not keeping as-builts up to date.

8. **Submittals**
   
a. All submittals except for insurance papers, purchase orders, Accident Prevention Plan, Quality Control Plan and NAS will be submitted using a properly completed ENG Form 4025. Three (3) copies will be submitted for FIO submittals and five (5) copies for GA approved submittals.

   b. The QC will review all submittals for compliance with the plans and specifications and then indicate compliance by signing and coding the ENG Form 4025. Any contract deviations must be notated clearly.

   c. ENG Form 4288 Submittal Register will be kept up to date by the QC and the QA will verify this monthly.

8. **Superintendent and Quality Control**
   
a. At all times when work is in progress, the contractor shall have on-site a superintendent and QC organization.
b. Using Agency representatives may at all times visit the site. Be courteous and answer questions; do not take instructions until checking with the QA.

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04-15.2 Preconstruction Conference Agenda for Coordination with the User

1. Item for Discussion
   a. Coordination with user
   b. Points of Contract
   c. Contractual Authority

2. Identification of Contract Personnel for Security/Control
   a. Limits of construction (utilize barrier if applicable)
   b. Restricted areas
   c. Contractor's proposed work hours/days per week

3. Privately-owned Vehicle Operation & Parking on Government Property


5. Utilities Outages/Users
   a. Advance Notice for Outage
   b. Actual Operation to discontinue/restore utility
   c. Method of payment for utilities
   d. Availability (electric, water, sewage, telephone, compressed air, etc.)

6. Use of Government-owned Equipment (if specified)
   a. Cranes
   b. Other

7. Fire Reporting (local Fire Department/User)

8. Accident Reporting (ambulance, hospital, and doctor)

9. Use of two-way radios on Government property
04-15.3 Checklist for Project Transition from Design to Construction Phase

Project: Title: __________________________________________, FY _____
L.I. ____________, Base: ____________________________________________
IFB No. ______________________
Construction Contract No. ________________
A-E: Name: ______________________________________________________
Address: _________________________________________________________

Telephone No.: Area Code____/____-_______
Facsimile No.: Area Code____/____-_______
A-E Contract No.: DACA21-___-C-________
POC: ____________________________________________

1. GENERAL.
An architectural rendering of the building's exterior is available, or is required and
will be furnished by ____________________.
This project will/will not require special handling procedures for classified
contracts.
All outstanding Real Estate actions have been completed.
Government Furnished Equipment (GF/GI) will be furnished for this project.
Points of Contact during construction of this project are as follows:
Project Manager Phone Alternate
PM_________________________________ __________________________
EN_________________________________ __________________________
User________________________________ __________________________
Command____________________________ __________________________

2. DRAWINGS AND SPECIFICATIONS.
Revised Contract Drawings and Specifications have been furnished.

3. CHANGES.
There are no known changes.
Known changes are attached. Funds in the amount of $__________ are
reserved. Mod package will be available by__________________________.
Outstanding Value Engineering issues and costs are as follows: _____________
________________________________________________________________
________________________________________________________________
________________________________________________________________

4. A-E INVOLVEMENT.
_____ A-E review of shop drawings is not required.
_____ A-E review of shop drawings and/or site visitation is required and a
modification to the A-E contract for
Title II Services is in process. PM-M will provide CD-____ a copy of all A-E Title II
Services contracts with an attached list of A-E submittal review and site visitation
requirements.
_____ Area/Resident Engineer Letter of COR designation with respect to design
error/omission and/or Title II Services is attached. Reference Tab_____.

04-24
______ Construction modifications requiring A-E design efforts may be handled through PM-M Project Manager or the Resident Office.
______ A-E assistance required outside the scope of A-E contract will be handled through PM-M Project Manager.

5. ENVIRONMENTAL
Action on all necessary permits, site classifications and HTW issues has been completed.
Environmental permits (wetlands, cultural, endangered species) are attached.
Asbestos and lead based paint surveys have been performed.
State approved erosion control plan is attached at Tab______.

7. DOCUMENTATION.
A-E certification that design of arms vault conforms to criteria set forth in AR 190-l has been received.
Annotated Final Review Comments have been furnished by the A-E and copies were furnished to Construction Division’s district and field offices on ________.
Designer’s NAS is/is not applicable for this project.
DA Form 337 - Request for Approval of Disposal of Buildings and Improvements is/is not applicable.
ENG Form 4288 - Shop Drawing Submittal Register is included with contract specifications.
Final SASPRS Design reports were furnished on __________.
Government Estimate for this project was furnished on ____________.
Draft DD Form 1354 for this project was furnished on ____________.
Man-day estimates for "GA/D"-Level Shop Drawings Submittals are attached.
Design analysis is attached at Tab ________.
Contract award document with prices is attached.
Pre/Post BCM for negotiated contracts is attached at Tab ________.

8. CERTIFICATION
This transition document has been jointly reviewed as indicated by the following:

_____________________  _______  ____________________  ______
Project Manager       Date       Area/Resident Engineer  Date
04-15.4  QA Plan Area/Resident Office

QUALITY ASSURANCE PLAN  DATE PREPARED:___________

I. PURPOSE AND SCOPE:
A. Purpose. The purpose of this Quality Assurance Plan is to develop QA operating procedures to ensure that all contracts are completed in accordance with the requirements of the plans and specifications, and within time and budget constraints. This plan will clarify the duties and responsibilities of Quality Assurance Personnel who are assigned to __________ Office and their interrelationship with Contractor Quality Control.
B. Period Covered. This plan covers the period FY _____ and will be updated as necessary, but not less than annually.
C. Applicability. This plan will apply to all contracts in the area of operations of ______________ office. Supplements will be attached to this plan incorporating project specific requirements for those contracts with unique requirements not covered in this basic plan.

II. WORKLOAD:
A. Contracts Underway. List current contracts underway
B. Anticipated Contracts. List future contracts and anticipated bid opening dates.

III. ORGANIZATION:
A. Description. The quality assurance organization for each contract is monitored by the project engineer who is directly responsible to the Area Engineer for quality assurance. The project engineer is supported by mechanical and electrical personnel as required, for technical assistance. The project engineer may be supported by quality assurance representatives for daily inspections and other duties as assigned, depending upon the size of the contract, workload, and other factors as decided by the Area Engineer.
(PLEASE NOTE: THE ORGANIZATION MAY VARY IN EACH DIFFERENT FIELD OFFICE. EACH FIELD OFFICE SHALL TAILOR THIS PARAGRAPH TO THEIR PARTICULAR ORGANIZATION)
B. Organizational Chart. The organizational chart for ____________ Office follows:

IV. STAFFING:
A. Current Staff. Key your office staff to your current workload, i.e. list your staff, their responsibilities and the projects they are assigned.
B. Required Staff. Give an analysis of staffing needs which will also be keyed to your current and anticipated workload. (i.e. a project engineer handles ___# of projects, etc.)

V. RESPONSIBILITIES:
A. General Responsibilities. The person with primary responsibility and authority for Quality Assurance is the Contracting Officer, through the Authorized Representative of the Contracting Officer (COR) or the Alternate in the absence of the COR. The primary mission of the ____________ Office staff is to assist the COR in this function.
B. Specific Responsibilities. Every assignment in this office carries with it Project Elements (i.e.), Quality Assurance and Technical Support. The quality assurance element provides the eyes and ears for the COR through daily visits to the sites and daily contact with the contractor. A construction representative will be assigned to each project and will make a daily evaluation of the contractor's quality control system by checking the actual work against the requirements of the contract. The results of these checks are given to the COR by providing Daily Quality Assurance Reports attached to the contractor's Quality Control Daily Report.

The technical support element with appropriate skills (usually electrical, mechanical and/or civil) identifies any defective work in these areas and identifies potential problem areas. The technical support element will also directly assist by reviewing submittals in their area of expertise, by preparing Government estimates for portions of modifications in their area of expertise, by giving the COR technical advise for consideration of claims/mods, and by participating in periodic inspections and prefinal inspections.

The Office Engineer (OE) will assist the COR by accomplishing reporting requirements; processing pay estimates; processing modification packages; providing advise to the COR regarding contract administration; preparing close-out documents and turnover documents; reviewing construction schedules and other administrative items; and monitoring overall progress of the contracts.

These three functions will be used in biddability, constructability, and operability (BCO) reviews of all contracts during the design phase. They will also be responsible for ensuring safety on the job by enforcing the safety and health requirements set forth in EM 385-1-1. Each team member will report any safety violations to the COR and will take corrective action when a condition is noted. In the case of an immediate threat to "life or limb", action may include closing down that portion of the job involved in the threat, but such drastic action will be immediately reported to the COR/Alternate COR.

The field office assistant will assist the COR by preparing correspondence, pay estimates, et cetera, that are drafted by others; logging submittals in and out; maintaining contract files; monitoring contractor's payroll and insurance submissions and checking payrolls for compliance; handling mail and distribution; dispatching vehicles; monitoring radio calls to the Area Office; and providing supplies and maintenance of the vehicles through GSA.

(PLEASE NOTE: THE ABOVE RESPONSIBILITY DESCRIPTIONS ARE GENERAL AND SHOULD BE REVIEWED/REVISED ACCORDING TO THE SPECIFIC POSITIONS AND RESPONSIBILITIES WITHIN YOUR OFFICE!)

VI. TRAINING:

A. Needs Analysis. (Training required by office staff should tie into the current and future workload. List general training that will be required as well as special training such as asbestos removal, HTW, lead paint removal, etc. Prospect courses such as NAS training, construction inspection, etc. may be included. Training should reflect current and future contracts.)

B. Planning. Describe plans for meeting training needs.

VII. PRE-AWARD/PRE-CONSTRUCTION:
A. BCO Reviews. The goal of all pre-award quality assurance activities is to ensure that the Invitation for Bid (IFB) documents are clear, complete, and free of ambiguity so that the number of disputes and modifications will be reduced.

Primary emphasis for reviews by this office will be placed on constructability, Biddability and operability (BCO) reviews of contract construction documents. Reviews begin with a thorough plan-in-hand site review and a general review of the concept design submittal. At the concept stage, the reviewer will look primarily for site conflicts and possible scheduling conflicts. This review will include discussions with the DPWE, Base Civil Engineer, or User to determine construction limitations. At the 60% stage, the reviewer should identify all existing utilities with the master utility drawings and verify them with the DPWE/BCE. At the bid package stage, the reviewer should review items such as access scheduling, physical restraints, special utility outages, joint occupancy requirements, phased construction, and other special conditions identified by the contract documents.

Review comments will be logged in ProjNet/Dr. Checks.

B. Pre-Construction Conference. A preconstruction conference will be held as early as practicable after award of construction, and prior to actual commencement of any construction work. The meeting will be chaired by the Area/Resident Engineer.

The purpose of this preconstruction conference is to enable the Contracting Officer's representative to outline the procedures that will be followed by the Government in its administration of the contract and to discuss the performance that will be expected from the Contractor. This conference will allow the Contractor an opportunity to ask questions about the Government's supervision and inspection of contract work.

C. Meeting of Mutual Understanding. A separate Meeting of Mutual Understanding will be held prior to start of work. The Contractor's Quality Control Plan and inspection system requirements will be discussed as well as the administration of the overall project accident prevention plan. This meeting will be attended by those who have a responsibility or significant role in quality control and in safety and accident prevention.

The meeting shall develop mutual understandings relative to details of the quality control system, including but not limited to: the forms to be used for administering the system, the forms to be used for recording inspections, and the interrelationship of the Contractor and the COR. This meeting will also be used to discuss and resolve deficiencies in the contractor's accident prevention/safety plan. The agreements reached at the meeting shall become a matter of record and minutes of the meeting, including agreements reached and a record of attendance, shall be maintained. Copies of the minutes will be forwarded to the safety office, the Contractor, and also to the official contract file.

VIII. POST-AWARD:
A. QA Surveillance.

1. Safety. Each team member is responsible for ensuring safe completion of all contract work. He/she shall have full authority to stop any unsafe work phase where there is immediate danger to "life or limb." The COR will be notified.
immediately of such an occurrence. The Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 will be enforced at all times. All safety inspections and instructions will be well documented. The QAR shall ensure that safety related reports are submitted to the COR for review and record. The following reports will be submitted:

- Activity Hazard Analysis
- Equipment Checklist ENG Form 1666R
- Accident Report ENG Form 3394
- Tool Box Meeting Record
- Monthly Supervisor Meeting Record
- Temporary Electrical Inspection Record

2. Three Phase Inspection System: The Office will participate in the three-phase inspection system which will be outlined in the Contractor's Quality Control Plan (CQC) and approved by the COR. The three phases will be the preparatory phase, initial phase, and follow-up. A list of preparatory to be held will be provided by the contractor in his CQC Plan. Both the preparatory and initial phases should be performed before any work begins on any definable feature of work. Definable features of work are those items performed by a particular work crew with specific control requirements. As a minimum each specification section is a definable feature of work. A minimum of 48 hours notice by the Contractor to the COR is required. As a minimum, the following will be discussed at the Preparatory:
  a. Contract plans and specifications.
  b. Approved submittals. Materials required for this phase of work have been tested, submitted, approved, and are on site. Shop drawings, and layout drawings have been coordinated between trades and approved.
  c. Compare materials on site to submittals.
  d. All preliminary work is complete and approved.
  e. QC will discuss procedures for accomplishing work.
  f. Specifications will be reviewed.
  g. Activity Hazard Analysis will be discussed as well as other safety related items.
  h. Testing will be discussed. The number of tests, description of tests, and the results will be reviewed.

The Quality Assurance Representative directly responsible for the work will attend the Preparatory and verify that all items reviewed are acceptable and construction on that particular segment of work can begin.

The initial phase will be accomplished at the start of each definable feature of work and at any time new workmen or crews are assigned to the work. The contractor's control system must transfer information on quality requirements specified in this contract to each workman before he starts. Each worker must demonstrate that he can provide the specified quality of work. It is also during this phase that control testing to prove the adequacy of the contractor's CQC procedures shall be initiated and verified. The COR will be notified at least 24 hours in advance of each initial phase. The QAR will strive to attend 100% of the initials. The contractor's CQC team, including all foremen and individuals directly
responsible for the work, will participate in this phase. As a minimum, the following steps shall be followed:

a. Identify full compliance with the contract.
b. Check preliminary work to make sure it complies.
c. Establish level of workmanship.
d. Resolve all differences.
e. Check safety.

The initial phase must continue until full compliance is reached. This is the most important phase, since this is where written requirements are converted to actual acceptance examples by the workers. They can then apply this knowledge to the rest of that definable feature of work.

The follow-up phase will be performed continuously to verify that control procedures are providing an end product which complies with contract requirements. If follow-up inspections show the work to differ from that demonstrated to be acceptable in the initial phase, a new initial may be required. Follow-up inspections will be performed daily by both the QAR and the CQC.

A log of all preparatory and initial inspections will be kept by QA personnel. Follow-up inspections will be documented by the daily reports.

3. Progress Photos. Monthly and quarterly progress photos will be taken by ________________________.

4. Labor Standards Enforcement. This office will enforce the labor standards of construction contracts under its supervision. Payrolls will be reviewed as they are submitted and labor interviews conducted on a regular basis.

5. Evaluation of Weather Delays. QA personnel will be responsible for evaluating weather delays in accordance with CA manual.

6. Submittals. The contractor submittal list will be prepared on ENG Form 4288 and submittals transmitted to the Government on ENG Form 4025. QA personnel will follow procedures outlined in ER 415-1-10 for processing submittals.

7. Monitoring As-Built Drawings. QA personnel will ensure that the contractor maintains a complete set of as-built drawings that are updated at least monthly.

8. Pay Estimates. Prompt payment to contractors for work performed is a high priority. Monthly pay estimates are prepared on ENG Form 93 E, verified by the QA personnel, and approved by the COR. Procedures outlined in CA manual.

9. Problem Solving. Problem solving during the course of construction is the primary responsibility of the project engineer. Technical or interpretational problems discovered shall be reviewed with the contractor's field staff and resolved at that level, if possible. If correspondence is generated regarding a field problem or dispute about contract requirements, it is the project engineer's responsibility to coordinate with the AE or District elements as required. Letters of response to the contractor will be prepared by the project engineer for the COR's approval and signature. All correspondence will be maintained on file.
10. Deficiency Monitoring. Deficiency monitoring will be accomplished by the use of the RMS currently in place. As deficiencies are noted by the CQC organization or QA organization, they will be entered into RMS. This list will be maintained by the project engineer and a copy forwarded weekly to the contractor. As deficiencies are corrected, the date of correction will be entered and a complete record of the actions maintained in the computer program.

B. QA Testing.

1. Policy. Quality Assurance testing is to be used as a regular tool in assuring contract compliance for all contracts administered by the ______________ Office. Each Project Engineer and/or Quality Assurance Rep is responsible for the implementation of a positive and active QA testing program for contracts assigned. The QA testing program will utilize the South Atlantic Division (SAD) Laboratory and the approved testing labs listed below. SAD Form 2032-R shall be prepared by the Project Engineer prior to the start of construction for each contract and submitted to the SAD Lab for their planning purposes. Each SAD Form 2032-R will be approved by the COR and a copy maintained in the QA testing file.

2. Facilities. The laboratories listed below will be utilized for QA testing. Each lab will be inspected by the South Atlantic Division Laboratory at least every two years and the inspection report maintained on file.

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Address</th>
<th>Date Inspected</th>
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3. Schedule. (Provide a tentative schedule of QA testing for each contract for which QA testing will be performed. As a minimum, list the QA tests that will be performed and their number and frequency.)

C. Reporting.

The Contractor shall provide daily reports to the ______________ Office, submitted within 24 hours of the day reported. The report form used by the Contractor shall be the same one approved in the Contractor Quality Control Plan. The QA Representative shall also conduct daily job site inspections and submit daily reports on ENG Form 2538 recording all actions taken, instructions given, safety items, etc. The QA report will be prepared separately, but compared against the QC report. Both reports together should present an accurate picture of all daily events. If the contractor's reports differ from the QA reports, they should be either corrected by the CQC if wrong, or the differences explained on the QA report. Daily reports will be reviewed by ______________ and the COR.

IX. SUPPLEMENTS:

Attach all supplements such as sample forms, and supplements to the QA plan for specific contract requirements.
04-15.5 Quality Assurance Plan Supplement

CONTRACT NO:_________________________ TITLE:_________________________

CONTRACTOR:_________________________ FAX:_________________________

OFFICE MANAGER:____________________ PHONE:_____________________

SUPERINTENDENT:____________________ CQC:_________________________

QA ORGANIZATION:

PROJECT ENGINEER:_________________ ALTERNATE:____________________

QAR:_______________________________ ALTERNATE:____________________

MECHANICAL:_______________________ ELECTRICAL:____________________

SUBMITTALS:

THE SUBMITTAL REGISTER AND TRACKING WILL BE BY:___________________

REVIEWERS ARE:

CIVIL (DIVISIONS 2&3) FIO:____________ GA:_________________________

ARCH (DIVISIONS 4 TO 10 & 12) FIO:________________ GA:_________________

MECHANICAL (DIVISIONS 11, 14, & 15) FIO:________________ GA:_________________

ELECTRICAL (DIVISIONS 11, 14, & 15) FIO:________________ GA:_________________

TITLE II SERVICES ARE AVAILABLE: YES / NO. IF YES, ATTACH A COPY

OF THE TITLE II SCHEDULE OF SERVICES.

INTERNAL OFFICE SUSPENSE TIMES FOR REVIEW ARE

FIO:__________ DAYS; GA:__________ DAYS.

QUALITY ASSURANCE TESTING:

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<th>SPEC SECTION</th>
<th>TEST</th>
<th>FREQUENCY</th>
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PROJECT MEETINGS:

THE QA / CQC MEETING OF MUTUAL UNDERSTANDING WAS HELD ON: ___

WEEKLY COORDINATION MEETING WILL BE HELD EVERY___________ AT __

HRS.

MONTHLY MANAGEMENT MEETING WILL BE HELD ON THE ___TH OF THE

MONTH ___________ AT HRS.

PROJECT ENGINEER TEAM MEETINGS WILL BE HELD ON THE _____TH

OF THE MONTH _______ AT HRS.

ATTACHMENTS:

SAMPLE QA DAILY REPORT

TITLE II SERVICES SCOPE OF WORK
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<thead>
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<th>04-15.6</th>
<th><strong>RMS Procedures</strong></th>
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SAD QAFG – Chapter Version Control

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CHAPTER 05 CONSTRUCTION MANAGEMENT

05-1 GENERAL

05-1.1 Purpose
This chapter prescribes responsibilities and procedures for Construction Management on U.S. Army Corps of Engineers projects. The scope covers the actual construction of the project, after initial Pre and Post NTP functions have occurred. It is intended to provide guidance and reference for Quality Assurance personnel to help define duties, responsibilities, and reference.

05-1.2 References
FAR, part 46, clause 46.312 – Construction Contracts
FAR, part 52, clause 52.246-12 – Inspection of Construction
ER 1180-1-6 – Construction Quality Management
DOD 4161.2-M, DOD Manual for the Performance of Contract Property Administration, dated December 1991

05-1.3 Definitions
a). CQC (CQC) - is the construction contractor's system to manage, control and document their own, their supplier's, and their subcontractor's activities to comply with contract requirements.

b). Quality - conformance to properly developed requirements. In the case of construction contracts, these requirements are established by the contract specifications and drawings. Consistent with ER 5-1-11, quality will be defined as meeting the customer’s goals and expectations, consistent with compliance with legal requirements, public policy (including Administration policy; as well as DoD, Army, and USACE policy and guidance) and professional standards.

c). Quality Assurance (QA) - is the system by which the government fulfills its responsibility to be certain the CQC System is functioning and the specified end product is realized.

d). Quality Management (QM) - is all control and assurance activities instituted to achieve the quality established by the contract requirements.

e). RMS (RMS) – Corps of Engineers’ Construction Management software utilized to record and report project information.
05-2  AUTHORITIES AND RESPONSIBILITIES

05-2.1 Project Manager
The Project Manager is responsible for:
- Preparation of an Acquisition Plan
- Preparation and Implementation of a Project Management Plan
- Input Project into P2 and CEFMS
- Provide S&A and Project funds
- Leads in the processes during Design, solicitation, award, and close-out process
- Responsible for financial close-out
- Lead for final After Action Review (AAR)
- Provide primary input to Customer and User
- Periodically attend the Field Office progress update meetings to review progress, schedules, payments, etc.
- Acts as the Primary Point of Contact with Customer, User, Higher Authority for all issues on the project.

05-2.2 The Area/Resident Engineer
The Area/Resident Engineer is responsible for construction Quality Assurance on all projects within the assigned geographic area. He or she is responsible for:
- Maintaining an effective Quality Assurance System
- Staffing and operational procedures.
- Plan opening and closing of Resident Offices,
- Assignment of workloads to each Resident Office
- Over-viewing and approving staffing levels
- Make definite assignment of responsibilities to his staff
- Assure their duties and authority to act are clearly understood.
- Develop annual budget
- Forecast work placement
- Maintain effective training program

05-2.3 Resident Engineer
The Resident Engineer (RE) shall be responsible to perform the following:
- Maintain an effective Quality Assurance System within the Resident Office.
- Effectively supervise the staff assigned to the Resident Office in their daily quality assurance activities.
- Review a representative sample of the QA/QC reports and initial to document their knowledge and concurrence with content. Their review will consider
accuracy, completeness, and timeliness of documentation. Formal action will be taken when review suggests either lateness of submission, incompleteness of documentation, or other contractor failure in meeting contract requirements.

- Conduct periodic meetings with each prime contractor to jointly discuss construction activities, CQC effectiveness, and areas for improvement and potential problems.
- When construction is found to be in non-conformance with contract requirements in a material way and immediate correction is not anticipated, the RE shall document the condition by a letter to the contractor. The record shall be clearly established by correspondence and any corrections of the noted deficiencies shall be verified by the Government. A copy of this letter should be attached to the applicable QA report and the noted deficiencies added by the QA to the deficiency tracking list in RMS.
- Obtain proper materials for testing at Government laboratories for compliance and will insure reports on such quality assurance testing is placed in the contract files. The AAR and RE will handle the administration work necessary in obtaining the services of commercial laboratories when directed by the Area Engineer and will maintain records of such testing results.
- Review the contractor's transmittals and submittals for compliance of materials, equipment, and proposed installation procedures. The PE will make recommendations for approval action on all appropriate transmittals to the Authorized Representative of the Contracting Officer, or if so designated, he will take approval action within his authority.
- Obtain assistance when necessary from in-house elements of the District to insure timely Government approval actions.
- Review the submittal register for each contract used in determining submittal status.
- Identify potential delay items that need contractor and/or Government attention to prevent impact on timely completion.
- Maintain or have access to a current and complete library of all federal specifications, ASTM's, codes, and industry standards referenced in contract documents for use during QA inspections.
- Ascertain that the staff understands the contract requirements, knows the inspection and test techniques to be used, and realizes the need for timely inspections and tests. Training classes will be conducted regarding this.
- Establish standards for QA personnel's daily reports, and ascertain the reports are pertinent, factual, and complete. Training classes will be conducted regarding this.
- Establish with QA supervisors, QA personnel, and laboratory personnel a clear understanding of the actions to be taken in the handling and correction of deficiencies observed.
- Implement construction standards and QC requirements.
- Construction management activities, including among others, checking adequacy of contractor's control (quality assurance for acceptance), performing specified
tests and inspections as designated in the contract, determining that reported construction deficiencies have been corrected.

- Review/approve progress payments due to the contractor in a timely manner.
- Assure timely contract completion.

**05-2.4 Project Engineer (PE)**

The Project Engineer shall be responsible to:

- Lead team personnel assigned in their daily quality assurance activities.
- Maintain an effective Quality Assurance System on assigned projects.
- Prepare and/or review QA/QC reports and initial to document their knowledge and concurrence with content. Their review will consider accuracy, completeness, and timeliness of documentation. Formal action will be taken when review suggests either lateness of submission, incompleteness of documentation, or other contractor failure in meeting contract requirements.
- Conduct periodic meetings with each prime contractor to jointly discuss construction activities and CQC effectiveness for tracking deficiencies.
- Obtain proper materials for testing at Government selected laboratories for compliance and will insure reports on such quality assurance testing is placed in the contract files. The PE will handle the administration work necessary in obtaining the services of commercial laboratories when directed by the Resident Engineer and will maintain records of such testing results.
- Review the contractor’s transmittals for compliance of materials, equipment, and proposed installation procedures.
- Recommend for approval action on all appropriate transmittals to the Authorized Representative of the Contracting Officer, or if so designated, will take approval action within his authority.
- Obtain assistance when necessary from in-house elements of the District to insure timely Government approval action.
- Review the submittal register for each assigned project. and identify potential delay items that need contractor and/or Government attention.
- Resolve contract issues in a timely manner.
- Process modifications in a timely manner.

**05-2.5 QA Representative (QAR)**

The person designated as the on-site representative who is responsible for daily quality assurance activities and coordination with the contractor’s on-site supervision, is referred throughout this plan as the Project’s QAR (QAR). The responsibilities of the QAR include:

- Be familiar with the drawings and specifications for the assigned project(s).
- Conduct business at the site with the responsible Prime Contractor representative and not deal directly with subcontractors and individual workmen.
• Controversial matters or disagreements between the QAR and CQC representative on contract compliance will be immediately reported to the Area/Resident/Project Engineer. The QAR will not act as final authority in attempting to settle disagreements with the contractor.

• Conduct daily inspections of on-site work and accompany technical staff personnel during their on-site review of the specialty systems. Record the findings and coordinate with the prime contractor QC representative for compliance.

• Maintain a continuing deficiencies list for each contract in RMS where applicable. This list will be discussed monthly with the contractor.

• Review and update submittal register not less than monthly.

• Review the status of submittals with the RE and/or PE and contractor representative to identify potential late submittals and seek the cooperation of the contractor's supervision in taking appropriate action to avoid unnecessary delays.

• Participate in all phases of inspection of the CQC system. The goal should be to attend 100% of all preparatory and initial inspections.

• Make independent follow-up inspections of ongoing work to assure compliance.

• Receive and review the CQC daily reports for completeness and accuracy. QAR is not to sign or make any other notations on the CQC report. QAR is to discuss incomplete and inaccurate reports with the CQC and seek cooperation in correcting the reports immediately. Should there be a need for the QAR to clarify any CQC report, QAR shall include such additional details in the daily QA report.

05-2.6 Technical Staff

Technical assistance is available at many levels within COE. Field elements requiring assistance will contact their responsible POC.

• Resources at USACE see: https://ten.usace.army.mil/TechExNet.aspx
• Resources at Division, see Chapter 16 this manual.
• Resources at District; Coordinate with PM/EN to provide technical support to projects.
• Resources at Field Office: Larger Area/Resident Offices may have technical assistance within their organization. Technical personnel will provide assistance to AE/RE/PE/QAR for job specific problems. Technical assistance should be requested from the nearest available resource.
05-3 **QUALITY VERIFICATION PROCESS**

One of the primary Quality Assurance functions is to verify that the work being produced by the contractor meets the technical standards set in the specifications. Seldom will there be time and resources available to check everything, everywhere. That is inspection, which is the contractors’ responsibility, and is called Quality Control. Quality Assurance is a sampling approach to provide confidence that the work performed meets the requirements. Since it is a sampling approach, the items checked will represent the rest of the work. There is a risk to this approach. This risk may be minimized and the confidence increased that the sample inspected is representative of the rest of the work by adhering to the following:

Define what is critical on a project and direct most of the resources to the critical activities. Critical activities are generally those that are more complex and have a greater affect on the overall success of a project. The QA plan should define the critical activities (prioritize the definable features of work) in the following manner:

- Check critical activities more frequently and at earlier stages to prevent significant amounts of non-conforming work being accepted.
- Establish early that non-conforming work and all work built upon non-conforming work will not be paid in periodic progress payments.
- Assure that key submittals for critical activities are made and are thoroughly checked.
- Assure that the three phase inspection system is adhered to.
- Assure that the submittals and all referenced standards that affect the quality of the work are available.
- Know what the requirements are so that they can be emphasized at the preparatory and specific checks made at the initial and follow-up inspections.
- Do not let the contractor dictate what is to be checked by you. Check work which is representative of the work done since the last check of that activity.
- Perform independent QA testing. See Chapter 14 on Testing. A deficient result is to be considered representative of all the work performed since the last check until proven otherwise.
- Record what you find. Assure that QC does the same. If it is not documented, it didn’t happen.
- Action must be taken early on to preclude problems and if/when some occur, take immediate action to solve the problem. Merely evaluating and reporting is unacceptable.
- Ensure the contractor’s production staff and QC staff are implementing measures to achieve the contract quality requirements. It is their job to check everything and actually control the quality. Do not do their job for them! You do not have the time.
This is the barest outline to provide an idea of what quality verification is about. If you have additional questions, ask your supervisor.

05-4 THREE PHASE INSPECTION PROCESS

The Three Phase Inspection Process is the heart of CQC. The Three Phase Inspection System consists of the preparatory phase, initial phase, and follow-up. Each is separate, distinct, and essential for the proper working of the CQC system. The CQC is a contract requirement the same as for 3,000 psi concrete or for a 13.8 kva electrical system. The full cost has been included in the contract bid price under overhead and distributed to every line item on the contract. The Government shall strictly enforce the contract requirements for CQC. The QAR and PE do not have the authority to waive the contract requirements.

05-4.1 Preparatory Inspection

The preparatory phase shall be performed before any work begins on any definable feature of work. A minimum of 48 hours notice by the Contractor to the RE/PE is required. Personnel to attend will be all QC staff, production staff, applicable subcontractors at all levels, affected trades, and the Government representatives. As a minimum, the following will be discussed at the Preparatory Inspection:

- Review contract plans and specifications.
- Transmittals involved for approvals, items not approved, materials on hand for the work to be performed
- Compliance with approved submittal required by contract,
- Check that all equipment to be used has been inspected for safety.
- Compare materials on site to submittals.
- All preliminary work is complete and approved.
- QC will discuss procedures for accomplishing work.
- Review any samples, sample panels, materials.
- Activity Hazard Analysis will be discussed as well as other safety related items to include language barriers.
- Testing and certifications will be discussed. The number of tests, description of tests, and the results will be reviewed for testing already completed.

The PE/QAR is directly responsible for the work and will attend Preparatory Inspection meetings. Verify that all items reviewed are acceptable and construction on that particular definable feature of work can begin. The PE/QAR is to remember that the contractor is responsible for conducting the meeting and should restrain from conducting it. If the CQC system manager is incapable of properly conducting the meeting then it is time to re-evaluate the CQC organization. The CQC shall document the Preparatory Inspection on a separate form and submit with daily QC reports. A copy of all Preparatory Inspections shall be kept in a separate file by the contractor for ready reference and for
use during the Initial Inspection and Follow-Up Inspection phases. This should further be documented in RMS.

05-4.2 Initial Inspection

The initial inspection phase will be accomplished at the start of each definable feature of work and at any time new workmen or crews are assigned to the work. This is the most critical inspection as it sets the standard for all work. The contractor's QC system must transfer information on quality requirements specified in this contract to each workman before he starts. Each worker must demonstrate that he can provide the specified quality of work. It is also during this phase that control testing will be discussed and initial tests will be taken. The PE/QAR will be notified at least 24 hours in advance of each initial inspection phase. The contractor's CQC team, including all foremen and individuals directly responsible for the work, will participate in this phase. As a minimum, the following steps shall be followed:

- Review the minutes of the Preparatory Inspection.
- Identify full compliance with the contract.
- Check preliminary work and compare to sample panels to make sure it complies.
- Establish level of workmanship.
- Resolve all differences.
- Check safety.

No work will progress on a definable feature of work until this Initial Inspection is completed successfully. The results of this inspection can then be applied to all remaining work for this definable feature of work. The CQC shall document the Initial Inspection on an Initial Inspection Checklist Form and in RMS. The area observed during this phase should be clearly marked for future reference as an example of acceptable work.

05-4.3 Follow-up Inspection

The follow-up phase is performed continuously to verify that control procedures are providing an end product which complies with contract requirements. If follow-up inspections show the work to differ from that demonstrated to be acceptable in the initial inspection phase, a new initial inspection may be required. A new inspection may also be required should significant changes in the contractor’s staff occur. Both the QAR and the CQC will perform follow-up inspections daily. The QAR follow-up inspections will be for the purpose of assuring that the contractor’s CQC system is adequately controlling the quality.
05-4.4 Documentation of Inspections
CQC and QAR personnel will maintain a log of all preparatory, initial, and follow-up inspection for tracking purposes in RMS where applicable. All inspections will be documented on the QA/QC Daily Report. The Log of Inspections shall be reviewed at a minimum of once a month to assure that all inspections are documented. The review should be coordinated with the monthly payment progress review. Payment will not be made on work that has not been validated through the 3 phase inspection process.

05-5 QA DAILY REPORTS
QA reports are to document the functions, observation and activities performed by QA personnel and any pertinent communication with the Contractor, for that day. The QA report should not be considered complete prior to receipt and review of the CQC daily report. The Contractor will be required to submit daily reports of his QC activities, in accordance with the contract requirements. The CQC report should be promptly and carefully reviewed. Any deviations or omissions, when compared with Governments records, should be noted on the QA report.

QA reports are especially important in documenting the Government’s position concerning disputes which could result in claims or litigation. Therefore, any contentious items should be carefully documented, and any incorrect items (or those not explained well) in the CQC reports should be corrected by the QC staff and discussed by the QAR in the QA report. The QAR should realize that the contractor can receive copies of the QA reports during litigation and should be very careful not to put unprofessional language or unsubstantiated opinions in them.

05-6 INPUTTING QA DATA INTO RMS
05-6.1 Procedures
a). QA reports shall be electronically prepared and submitted in the RMS.

b). QA reports will be prepared for each contract and for each hired labor project on which a QA person is assigned. For hired labor projects, that do not require a full time on site QAR or daily visits of a QAR, a weekly summary report will be prepared and submitted on Wednesday of each week. QA reports are not required on relocation contracts.

c). QA reports shall be current with all daily QA observations and/or activities adequately reported. Contract specifications require the CQC report to be furnished the Government within 24 hours after the date covered by the report. Normally, upon receipt of the CQC report the QA report shall be completed and submitted. At no
time, on contracts with full time QA representation, shall QA reports be more than three (3) working days behind. On contracts that do not have full-time QA representation, QA reports shall be no more than five (5) working days behind, at any time.

d). QA report preparation and submission times shall be as stated in paragraph 1d, except for extended periods of no contract work due to weather conditions, high water events, excepted contract periods, etc. In those instances, as a minimum, one QA report will be prepared for every seven days of non-work and on the last day of a no work period. Most contract specifications, require as a minimum, one CQC report to be prepared and submitted for every seven (7) days of no work and on the last day of no work. In addition, Storm Water Pollution Prevention Plan (SWPPP) requires at least once every seven (7) calendar days a SWPPP inspection be conducted and a report be submitted to the Government. All calendar days will be accounted for throughout the life of the contract. The first QA report following a “no work” period will be for that day only.

(1) NOTE: the RMS numbers the day following the date of Notice to Proceed as No. 1 and each succeeding date is automatically numbered. As such the QA reports will not be consecutively numbered when there is an extended non-work period. The number for a date that an actual report is not prepared and submitted will be omitted. Therefore when a QA report is prepared and submitted for more then one date, the QA Narrative file (Progress of Work, Causes and Extent of Delay) must be selected to record the reporting period (dates), report numbers and the reasons or causes for the non-work. The QA report following a “no work” period will be for that day only.

e). QA reports and CQC reports will be retained by the Area/Resident Office. After contract completion and close out QA and CQC reports will be transferred by the Area/Resident Office to Records Holding Area as prescribed by District Regulations.

f). On occasions, QA reports may need to be typed or hand written. However, this is an exception that should rarely occur. When circumstances develop that require a typed or hand written QA report, ENG Form 2538-1-R or ENG Form 2538-2-R shall be obtained and completed.
05-6.2 Getting Started on the Documentation

a). The Government QA report will be prepared and submitted utilizing the QA modules of the RMS.
   1. To begin the QA report process, OPEN RMS with your personally created Oracle Password (UPASS/CEFMS/P2/SPS/RMS/Englink).
   2. Select Contract Office.
   3. Select Contract.
   5. Select QA/QC Daily Reports.

b). To create a QA report:
   1. Select “ADD” and a popup calendar will appear.
   2. Select appropriate date and press “OK” and the QA report window will appear.

05-6.3 Documenting Weather

To begin the QA report Select “Weather”:
   1. The Report Number, Contract Number, Project Name, Contractor Name, Date and Day are automatically reflected based upon the date and contract selected.
   2. Use the mouse to access the Weather drop down menu and select the appropriate description.
   3. Record the minimum and maximum temperatures for the shift worked and the amount, if any, of precipitation. If applicable, enter river stage in NGVD. This river stage should be taken at the same time each day. For days when personnel are not on the job site, temperatures, rainfall and river stages may be obtained from the nearest weather bureau service.
   4. Record the portion of the day suitable for operations occurring at the job site. The value entered is a percentage of the shift. The critical feature of work shall be noted in the QA Narrative file titled (Controlling Features of Work) in the event of concurrent operations. This information is very important in developing modifications and claims. If the spaces titled “Structural Excavation,” “Borrow Excavation,” “Embankment,” “Concrete,” or “Structure,” are not appropriate to indicate the actual work performed, then the QA Narrative file titled (Controlling Features of Work) shall be used to report/explain the controlling feature of work and the percentage of the shift suitable for the features.
   5. Record the Government and Contractor manpower.
   6. Record the number of shifts and interval of each shift.
   7. If something developed that might lead to a change order or finding of fact a check mark should be placed in the “YES” block. An explanation in the QA Narrative file titled (Remarks) shall report and fully explain such development. If “NO” is checked no explanation is required.
NOTE: The RMS uses information within the “Weather” file section to calculate any weather delay days due the contractor.

05-6.4 The QA Narrative
When completed with the weather, click on the QA Narrative. The QA Narrative provides QA Personnel a wide variety of topics in which to record the days’ activities.

1. Push “ADD.” To enter narratives. Select “Manually Add QA Narratives” or “Copy Narratives From Previous Report.” When you select “Manually Add QA Narratives” a “LOOKUP” provides several topics from which to choose. These topics are simply the headings that are printed on the report form for each narrative or group of narratives. The RMS can accept an unlimited number of narratives for a particular day. The narratives should contain the QAR’s observations, activities, factual information and comments applicable to the contract work. The narrative information is simple text and it may be spell checked and imported or exported to/from other Word Processing programs.

2. Place the cursor on the desired Narrative and push the OK button. Enter comments relative to the selected Narrative. A larger screen, spell check, cut and paste, etc. may be used by pushing the EDIT button.

3. Enter a check in the Unresolved Issue box if the item requires further action or confirmation.

4. Each narrative is linked to the QAR entering the comment. The QAR’s name will appear at the bottom of the screen. If necessary use the lookup table to make a different selection.

5. Enter the correct shift in the block at the right bottom of the screen.

6. Push the Close button on the narrative window when complete.

7. When the close button has been selected you return to the QA Narrative screen and may select the “ADD” button again, for entering additional QA Narratives. As many narratives can be entered as needed.

8. The QA Narrative file contains twenty-one (21) subject narrative titles. Each narrative title applicable to the days work must be selected and observations, activities, factual information and comments applicable to the contract work must be entered by the QAR.
05-6.5 Required and Recommended Use of QA Narrative Titles

i.- Contractor/Subcontractor & Area of Responsibilities:
Utilize this QA Narrative to list contractor and subcontractor(s) working onsite, and list areas of work performed by each for the date of the report. Should the Contractors QC report completely and accurately list all contractor(s) working on site and list areas of work performed by each this QA Narrative may state: “See Contractors QC report.”

ii.- Operating Plant and Equipment:
This QA Narrative shall be utilized to report Contractor on site equipment to include a description and operating hours. The Contractor’s RMS module has a paragraph “Equipment Hours” that requires the Contractor to list on site equipment by serial number, description, standby hours and operating hours. QAR’s shall review the Contractor’s paragraph “Equipment Hours” to verify accuracy and correctness. Should the CQC report be accurate and correct, the statement: “See CQC report” shall be provided in this QA Narrative. Should the QAR review determine that there are errors in the Contractors “Equipment Hours” paragraph, then each discrepancy must be reported and the correct information recorded in this QA Narrative.

iii.- Work Performed Today:
A concise statement of the work actually performed on the particular day to include who performed the work shall be provided in this QA Narrative. Should the CQC report provide an accurate and detailed statement of the work performed and who performed the work, the QAR may record the statement: “See CQC report.” If no work was performed this shall be reported and a statement with the reason or reasons for no work.

iv.- Result of Control Activities:
This QA Narrative shall be utilized to report the “results” of all CQC activities. The Contractor is required by most contract specifications to document results of all tests, both passing and failing. Test includes specified operation and acceptance tests. Results of control activities documentation shall address if the test passed or failed to meet contract requirements, verification of test equipment calibration, if testing procedures complied with contract requirements or certified standards, etc. If approved, actual test reports may be submitted later with a reference to the test number and date taken. Should the CQC report provide complete and accurate data for “results” of control activities; this QA Narrative may state: “See CQC report.” However, should the CQC report be incomplete and/or inaccurate the QAR must utilize this QA Narrative to provide additional details or record necessary corrections. If, for the date of the report, no control testing was performed, this QA Narrative need not be utilized.

v.- Test performed as required by Plans and/or specifications:
On days when the Contractor performs required contract testing this QA Narrative shall be utilized. Test performed with specification paragraph reference, date, location where test was taken, sequential control number identifying the test, name of personnel performing test, control phase (Preparatory, Initial, or Follow-up) and other pertinent test
information shall be documented. The CQC report should record the referenced data. Should the CQC report provide complete and accurate data for performed test; this QA Narrative may state: “See CQC report.” However, should the CQC report be incomplete and/or inaccurate the QAR must utilize this QA Narrative to provide additional details or record necessary corrections. If, for the date of the report, no control testing was performed, this QA Narrative need not be utilized. Care should be taken to be sure all failing tests have corresponding re-tests documented.

vi.- Material Received:
This QA Narrative shall be utilized on the days when contract materials arrive on the job site. Upon arrival to the site a physical examination of the material shall be conducted by the QC System Manager. As required by most contract specifications the QC System Manager shall document the material delivery to include quantity of materials received at the site with a statement as to the acceptability, storage, and reference to specifications/drawings requirements. On the days when contract materials arrive on the site the QAR shall review the CQC report. Should the CQC report be correct and accurate concerning the site delivered materials this QA Narrative may record the statement: “See CQC report.” Should the CQC report be incorrect or inaccurate concerning the site delivered materials, the QAR shall address the issues and provide appropriate comments and/or clarifications. There is no need to utilize this QA Narrative on days when contract materials are not received at the site.

vii.- Submittals:
In the event that the Contractor submits a contract Submittal to the QAR this QA Narrative shall be utilized to acknowledge receipt. The QAR shall record the Transmittal No, item No(s), item description(s) and his action (forward to another office/individual for review, will review, etc) the day the Submittal is received. There is no need to utilize this QA Narrative on days when Submittals are not received by the QAR.

viii.- Offsite Surveillance Activities:
This QA narrative shall be utilized whenever the QAR performs an off-site surveillance activity and/or evaluation. Observation, deficiencies, controversial matters, instructions, verbal statements, comments, etc. including actions taken shall be recorded for each off-site surveillance activity and/or evaluation. There is no need to utilize this QA Narrative on days when off-site surveillance activities and/or evaluations are not performed.

ix.- Job Safety:
At least one safety observation is required daily, stating exactly what was inspected and the results reported in this QA Narrative. This should be more than just a hard hat check.

x.- Remarks:
This QA Narrative shall be utilized when the block on the report has been checked “YES” for, “Has Anything Developed On The Work Which Might Lead To A Change Order Or Finding Of Fact?” When the block has been checked “YES” an explanation
with accurate and precise details needs to be recorded. Also, this QA Narrative shall be utilized when no other narrative is appropriate for reporting necessary information. Information should be contract relevant, factual and in detail. Opinions may be reported that are of a professional nature. There is no need to utilize this QA Narrative except when the referenced statement has been checked “YES” or when no other narrative is appropriate for the information to be reported.

xi.- Progress of Work, Causes and Extent of Delay:
If the Contractor has no lost time or delaying factors, (for the date of the report) there is no need to utilize this QA Narrative. If there are delays, give a brief statement as to what was delayed, extent or length of delay, and reason for delay. State plant and equipment involved and work in progress at time of delay, if not shown on the CQC report. Major plant and equipment, with hours worked, will be listed daily for the duration of the delay. Report equipment arriving and departing the site. If all the above information is listed correctly and in satisfactory detail on the CQC report, then the statement: “See CQC report” may be recorded in this QA narrative. ALSO, THIS QA NARRATIVE SHALL BE UTILIZED FOR REPORTING EXTENDED PERIODS OF NO WORK DUE TO WEATHER CONDITIONS, HIGH WATER EVENTS, EXCEPTION CONTRACT PERIODS, ETC.

d.- CQC Phases Attended and Instructions Given:
To be completed when QA and CQC Personnel make a joint phase evaluation. State the phase (Preparatory, Initial, Follow-up) observations and any instruction given. Every effort should be made to have joint evaluations. If no joint or phase evaluations were made for the date of the report then this QA Narrative need not be utilized.

xiii.- Comments Pertaining to CQC Activities:
The QAR shall utilize this QA Narrative to report observations of the CQC Activities and personnel performing their duties, other than performance of required contract testing. Observations should include verifications the Contractor is performing and complying with requirements in the approved CQC Plan and contract documents. Should observations of noncompliance be detected the QAR shall take immediate corrective action and shall report in detail the noncompliance to include the names of individuals involved, description of work, statements made, corrective action taken by the Contractor, if any, etc. Observed noncompliance’s not corrected on the date of the report shall be recorded in the QA Narrative file (Contract Deficiencies). Should the QAR’s daily observations indicate compliance with the requirements of the approved CQC Plan and the contract documents then these observations shall be reported providing details such as: phase of work, description of work, location of work and other pertinent information.

xiv.- Verbal Instructions Given To Contractor:
Record all instructions given to the Contractor. Include name(s) of individual receiving instructions, and any other relevant, factual information. Avoid opinions and
second-guessing. Utilize this QA Narrative only on dates when verbal instructions were given the Contractor.

xv.- Controversial Matters in Detail:
Any controversial matters, incorrect information or comments on the CQC report or controversial verbal discussions that the QAR disagrees, shall be clearly addressed in detail. This shall include the QAR’s account of the event, conversation, information, etc. The QAR shall also notify the CQC Officer of the disagreement and record such notification in the narrative. This information is important in processing modifications and claims. If, for the date of the report, there are no controversial matter, incorrect information or comments on the CQC report or controversial verbal discussions that the QAR disagrees, then this QA Narrative need not be utilized.

xvi.- Information, Instructions or Actions Not Covered in QCR:
State "CQC report No. ____ was received, reviewed, and accepted on ____." However, if there are incorrect statements on the CQC report, DO NOT record the referenced statement but identify and address each incorrect statement that appears on the report. Other observations concerning the CQC report which are not covered in other areas may be recorded here.

xvii.- Miscellaneous Remarks and Visitors to Project:
For the date of the report, utilize this QA Narrative to indicate official visitors to the project by name and office they represent. Include applicable remarks or discussion items pertinent to the work, resulting from their visit. There is no need to utilize this QA Narrative if no visitors were on site for the date of the report.

xviii.- Contract Deficiencies:
Utilize this QA Narrative to record contract deficiencies on the date they are observed. Each deficiency shall be identified and described in detail to include location, contractor/subcontractor name, comments and/or discussions that occurred etc. The “Unresolved Issue” box shall be checked for tracking deficiencies in the “QA Summary” file. When a recorded deficiency has been has been corrected (future date) this shall be noted in the QA Narrative for that date. Also on the date the deficiency was corrected enter the “QA Summary” file and go to the QA Narrative in which the deficiency was reported and remove the checkmark from the “Unresolved Issue” box. The QA Summary file column “Unresolved Issues” will now record a “NO.” If for the date of the report there are no contract deficiencies, then there is no need to utilize this QA Narrative.

xix.- Controlling Features of Work:
The critical feature of work and the percentage of the shift suitable for the feature shall be recorded in this QA Narrative file in the event concurrent operations are reported. Also, if the spaces (“Structural Excavation,” “Borrow Excavation,” “Embankment,” “Concrete,” or “Structure”) on the QA report under “Portion Of Scheduled Day Suitable For Operations,” are not appropriate to indicate the actual work performed, then this QA Narrative shall be used to report/explain the controlling feature of work and the
percentage of the shift suitable for the feature. Example, if “Paving” is the controlling feature of work it shall be reported in this QA Narrative with the percentage of the shift suitable for the feature.

**xx.- Preparatory or Initial Inspections Held:**
This QA Narrative shall be utilized to document the QAR’s participation in a Contractor conducted Preparatory or Initial Inspection. Statements, comments, corrective actions taken pertaining to QC activities, etc shall be provided by the QAR. Should the Contractor conduct a Preparatory or Initial Inspection that is not, or can not, be attended by the QAR, this shall be recorded on the report for the date of the inspection. Should the CQC report completely and accurately detail, all aspects, of the Contractor conducted Preparatory or Initial Inspection this QA Narrative may state: “See CQC report.” If for the date of the report there are no Contractor conducted Preparatory or Initial Inspections, then there is no need to utilize this QA Narrative.

**xxi.- What Equipment did you see on the job today:**
**RBP:** Periodically the QAR shall verify the Contractor’s inventory of on-site equipment and report the results in this QA Narrative.
05-6.6 Punch List Items

Punch List Items by QAR’s gives the Government a means to communicate to the Contractor comments resulting from an inspection, site visit, evaluation, test or various other reviews. This communication may be of a positive or negative nature. The comment can document a problem, deficiency or safety item. If the comment is issued as an action item, the comment is placed on a QC list to be corrected by the Contractor, report corrected by the Contractor, and then verified by the Government. For the Contractor, the list will be found in RMS-QC under “QA/QC Punch List,” on the CQC report. When a Punch List Item is issued to the Contractor, the Contractor has the action. Once the Contractor dates the item as being completed, the data will appear in the Government verification window. The Government can then track the item to satisfactory completion.

1. Select Punch List Items by QA.
2. Select “ADD” and the Punch List Item by QA screen will appear to enter a quality assurance comment.
3. Enter the “Location” to allow reports to print a punch list for later verification and inspection.
4. Indicate whether or not the comment is a “Safety Violation” by placing a check in the appropriate block.
5. Record punch list item on the screen under “Description of Punch List Item.”
6. Since payment should be for work/activities that are complete and satisfactory always link a punch list item to the specific pay activity. On the bottom left of the screen use the lookup screen to access the “Activity Number” and complete the link.
7. Each punch list item entered is linked to the QAR entering the item. The QAR’s name will appear at the bottom of the screen. If necessary use the lookup table to make a different selection.
8. Enter the correct shift in the block at the right bottom of the screen.
9. Close the Punch List window and proceed to the next item for the daily report.
10. After the Contractor has reported the Punch List item as being corrected, the QAR will return to the “Punch List Items by QA” file and select “Verify Punch Lists Items Reported Corrected” tab.
11. The QAR will review the corrected work and will either concur, or reissue the comment back to the Contractor. Placing a check in the QA Concur box indicates that the item was inspected by the Government and deemed acceptable and it will no longer be reported as an active or outstanding issue. Placing a check in the QA Reissue box indicates that the item was inspected by the Government and deemed less than acceptable and it will be returned to the Contractor for further action.

05-6.7 QA Tests

Not only are QC tests required, but Government personnel must also perform QA tests and record the results of such tests. ER 1180-1-6 specifies the percentage of QC tests the QA should perform. This file section affords The RMS the ability to track and record
this required data.

1. Select QA Tests.
2. Select “ADD” and the QA Test screen will appear to enter quality assurance testing requirements and results.
3. In block noted “Section” enter the section of specification requiring test.
4. In block noted “Paragraph” enter paragraph in the specification requiring test.
5. In block noted “Performed By” enter name of individual(s) or firm performing the test.
6. Record the full description of the test and any relevant comments on the test on the screen under “Description of QA Test.”
7. In the block “Activity Number” the pay activity number description will automatically appear.
8. In the block “Date Performed” use the drop down calendar and choose the correct date.
9. Select “Edit” on the present screen to enter additional quality assurance test.
   Enter as many test as were accomplished for the day’s report.
10. Push close button when complete.

**05-6.8 QA Final Follow-Ups**
The next report entry is for QA Final Follow-Ups. This is a file wherein the Government QAR may document the CQC, successes and failures. An effective and conscientious QC program will almost always result in a good quality project. The reverse situation is just as true. QA Final Follow-ups are ratings by the QAR when the Contractor reports a pay activity complete. These individual QC ratings (one for each activity) will assist in determining the Contractors’ overall QC performance evaluation at the end of the contract. These are ratings for QC efforts, not quality of the activity. These ratings become the backup for the Contractor’s final or interim performance evaluation. This is extremely important for substantiating an outstanding or unsatisfactory rating for the Contractor.

The RMS will ultimately provide a screen report that will group the completed activities by category and will display a table with a summary of how many activities in each category were rated: Outstanding, Above Average, Satisfactory, Unsatisfactory, and Not Applicable.

- As noted on the QA Report screen, at this time, NO ENTRIES ARE REQUIRED for this file.

**05-6.9 Verify QC Requirements**
The next report entry is verify QC Requirements. Contract documents may require the Contractor to conduct training for the Customer on systems or equipment, perform
various tests on equipment or systems, provide maintenance/repair information on equipment installed or account for property as part of the contract.

If you open this file and observe the message “There are no QC requirements requiring QA Verification,” either there are no QC requirements entered that need any verification or the Contractor has not reported they have been completed. If there are no QC requirements entered that need any verification then NO ENTRIES ARE REQUIRED for this file.

When the Contractor has reported items complete a screen will be available. The screen will indicate a “Verification Date,” “Requirement No,” description of the “QC Requirement,” “QA Concur” block and “QA Reissue” block.

The QAR shall place a check in the QA Concur or QA Reissue block indicating whether the item is completed satisfactorily, or Reissue the item back to the Contractor for further action.

The RMS titles this group of actions or contract requirements as “Verify QC Requirements.” The QC Requirements appear in the CQC report screens (RMS- Quality Control), until they are updated and reported complete. Once a QC Requirement is reported complete, it appears in the Governments QA report area to be verified. If the QAR determines the actions taken by the Contractor complies with the requirement and checks the “QA Concur” block the item is officially complete. If the QAR determines the actions taken by the Contractor do not comply with the requirement and checks the “QA Reissue” block in appears again in the Contractor’s list and the cycle repeats itself.

**05-6.10 Payroll Tracking in RMS**

Quality assurance verification of payroll requirements shall be tracked using RMS. The construction representative shall make an entry in his or her daily report under the ‘QA Activities’ narrative every time an inspection is made of the Contractor’s payroll records. In addition, payroll data shall be maintained in RMS in the ‘Administration’ portion of RMS. To accomplish this, follow these instructions:

1. Select the appropriate contract from the RMS ‘Home’ main menu.
2. Once in the designated contract, click on the ‘Administration’ button at the top.
3. From the Administration menu, click on ‘Contractor Payrolls’ button from the choices on the left side of the window.
4. From the ‘Contractor Payrolls’ window, enter the data in the fields as requested (i.e., Contractor/Subcontractor name, POC information, date started on the job, date payroll submitted, etc.)

The construction representative shall ensure the Contractor’s payroll information is maintained in RMS and is accurate and up to date throughout the performance of the contract.
05-6.11 Insurance Tracking in RMS

Quality assurance verification of insurance requirements shall be tracked using RMS. The construction representative shall make an entry in his or her daily report under the ‘QA Activities’ narrative every time an inspection is made of the Contractor’s insurance records. In addition, insurance data shall be entered in RMS under the ‘Administration’ button of the RMS Main Menu of the designated contract. To accomplish this, follow these instructions:

1. Select the appropriate contract from the RMS ‘Home’ main menu.
2. Once in the designated contract, click on the ‘Administration’ button at the top.
3. From the Administration menu, click on ‘Contractor Insurance’ button from the choices given on the left side of the window.
4. From the Contractor Insurance window, click on the ‘Add’ button located at the middle of the window.
5. Enter the data in the fields as requested (i.e., Contractor Name, Type Insurance, POC Information, Expiration Dates, etc.)

The construction representative shall ensure the Contractor’s insurance information is maintained in RMS and is accurate and up to date throughout the life of the contract.

05-6.12 Accident Reporting

The next report entry is Accident Reporting. Construction Accident Reporting typically begins with the Contractor. The Contractor will first enter the details of the accident in RMS-Quality Control. The Government can then make comments on the accident in the daily QA report. In addition, the Government can make comments on accidents that do not appear on the CQC Report. For example, if a Government Employee is injured the QA report might address the issue in some detail. In the event of an accident, there are two essential steps that should be followed in RMS, QA report. They are: (1) The Contractor reports the accident and records it in RMS-QC and (2) the Government uses the “QA, Accident Reporting” option to make any additional comments, add the official number of Lost days, if any, and the date the accident report was sent to the District Office.

NOTE: These RMS entries by the Contractor and the Government are not a substitute for the required DD Form 3394 that must be completed for all accidents and provided to the District Safety Office. Procedures for completing the Preliminary Accident Notification (PAN) in ENGLINK must also be followed.

1. Select “Accident Reporting.”
2. Select ‘ADD,’ to enter information on the accident reported by the Contractor or entered by the Government
3. “Accident Date,” block. Use the drop down calendar to enter accident date.
4. Under “QA Remarks On Accident,” enter additional comments to the Contractor’s description of the accident and make any recommended changes in the Contractor’s plan to avoid a similar occurrence in the future. “QA Remarks On Accident,” is also the location to report and describe an accident involving a Government employee.

5. Place a check in the block for “Reportable Accident.”

6. Enter the number of lost days, if any, into the “Lost Days” block.

7. Select from the lookup calendar provided the date the report was sent to the District Office. The date selected will then be recorded in the “Accident Report Sent to District” block.

The first page for the Quality Assurance, Accident Reporting, will show a summary listing of each accident to include “Accident Date,” “Accident” description, “Reportable Accident” yes/no, “Lost Days” and ”Report to District” date.
05-6.13 Finalizing the QA Report

a). The report should be printed and the project QAR’s name, typed or printed. The QAR shall sign and date the report. The date shall be the actual date signed.

b). Supervisor’s Initials. All QA reports will be initialed by the QAR’s supervisor subsequent to review of report. The supervisor shall record the date the report was initialed.

c). In addition to the QA Narrative entered by the QAR at the project site, supervisory engineers or QA personnel may add QA Narratives to report any significant action they have taken with respect to the job.

d). When there are no QA personnel on site on days that work is performed, the QA report shall be prepared as follows: Enter the QA Report file (Weather) and record Weather, Temperature, Precipitation, if any and River Stage. Close the file. Enter the QA Narrative file and record under the topic (Comments Pertaining to CQC Activities) the statement: “No QAR on site this date.” Close the file. QA report complete for that date.

e). All record copies of the QA report will contain the same information and have all applicable enclosures, for the day, as the Master QA report. The CQC report will be attached to or filed with QA reports IAW ER 415-1302, Inspection and Work Records. Other applicable enclosures to be attached shall include Test Results/Data, SWPPP Inspection Reports, etc.

f). Proper preparation of QA reports by all Quality Assurance Personnel and supervisory personnel is essential, and Area/Resident Engineers will consistently review project reports in light of available information to be sure the QA report is a complete and accurate record of events and not just a progress report.

05-7 CORRESPONDENCE AND INTERCHANGE WITH CONTRACTORS

05-7.1 Submittal Review Process
Refer to Chapter 4, paragraph 4-1.5 and Chapter 12, Submittal Management.

05-7.2 Schedule Updates for Pay Estimates/Stored Materials
The QA and contractor personnel should walk the project and agree on the updated percentages complete during the most recent period of work. The QA should keep a copy of the previous and agreed to percentages. When the current pay estimate arrives, the QA must compare the current and previous pay estimate percentages. It is useful to use a computer program i.e, Claims Digger, (RMS will compare the schedules for you if the
project is fully loaded in RMS, and notify you of any discrepancies) to compare changes from the previous month to the current month.

The QA should check to see that the current schedule reflects only agreed to percentages. A letter should be written to the contractor if the percentages requested do not match those agreed to in the field, and he should be requested to resubmit the pay estimate with the percentages correct. The QA should also check to see if critical dates have changed, activities have been added or deleted, or activity durations changed. Contractors occasionally adjust activities to show that they are on schedule, when they are in fact falling behind schedule.

Stored materials may be paid for if they are present on the jobsite and a paid invoice or cancelled check is provided documenting that the contractor has already paid for the materials. The QA should verify that all stored materials are actually onsite.

Materials delivered to the contractor at locations other than the site of work may be paid for if all the conditions of the General Provisions are fulfilled. Payment for materials delivered to locations other than the jobsite will be limited to: (1) materials required by the technical provisions; or (2) materials fabricated to the point where they are identifiable to an item of work required under this contract. Payment for these materials will only be made after receipt of paid or receipted invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item.

05-7.3 Contractor Correspondence/Letter File
Write letters on the Accident Prevention Plan and CQC Plan to accept the plans or to detail items which must be corrected before the plans can be accepted. Send letters to the contractor when deficiencies are not corrected in a timely manner. Often including pictures in the official correspondence can clarify the situation to the home office and help with problem resolution. Identify the deficiencies and request a plan addressing how those deficiencies will be corrected. Repeated safety violations should definitely trigger a formal letter, as should erosion control problems. Almost every formal correspondence initiated by the contractor should receive an official response. Concerns about the integrity of the QC staff merit an official letter. Any formal agreements made in the field should be put in writing and sent to the contractor so that they have a chance to respond if they do not agree with the Governments’ phrasing of the agreement. Meeting minutes should be sent as formal correspondence. Every month weather days should be handled by official correspondence. A letter file should be kept with sequentially numbered Government correspondence, and each letter that is sent in response to a contractor correspondence should have the date and subject of the contractor correspondence included in the letter. RMS should be utilized to track and coordinate contractor’s correspondence with the Government.
E-mails are not considered a formal response, and there are many issues that should not be handled in any manner other than official correspondence. Personnel without contractual authority frequently communicate directly with the contractor. In certain instances this is not a bad thing, i.e., scheduling a meeting, acknowledging receipt of a document, etc. But there are other times when this is inappropriate, such as pointing out construction deficiencies; perceived lack of manpower; personnel problems; or NAS problems. Personnel with “implied authority” such as a Project Engineer or QAR can sometimes inadvertently bind the Government. All communication with the contractor relating to contractual matters should be by signature of the ACO/COR whether it be an e-mail or a formal letter.

05-7.4 Request For Information (RFI's)
The QAR should keep a log of RFI’s and their responses with the RFI # and dates. All RFI’s should be handled in a timely manner. RMS should be used to the fullest extent to track/record RFI’s. If an RFI pertains to the plans or specifications a copy of the RFI and response should be attached to contract drawings being used to alert personnel that there is an issue. QA’s should ensure that As-builts reflect the changes made in the field as a result of RFI’s. Clear lines of responsibility should be set up to say who has the authority for an RFI response and approval.
05-8 REVIEW OF CONTRACT REQUIRED ITEMS

05-8.1 Leadership In Energy and Environmental Design (LEED) Information
Many projects require compliance with a LEED Silver rating. LEED points are established in the design phase. All points that are being sought should be incorporated into the plans and specifications. The Quality Assurance personnel need to be especially cognizant of several points, some of which require careful updating and verification as the work is proceeding. The PE/QAR will coordinate with the CQC for compliance and documentation of critical LEED points. Listed below are some examples of field activities which must be documented.

Water Use Reduction, Credits 3.1 and 3.2 – Water Use Reduction – Ensure that specified low flow fixtures are used, and that they are tamper resistant if specified to be so. Many lavatory and shower faucets simply have screens put in to lower the water flow. Users frequently remove these, so tamper proof fixtures are often specified.

Energy & Atmosphere, Credit 3 – Enhanced Commissioning- An independent, third party, commissioning authority must be subcontracted early, during the design phase and be involved though submittal review, commissioning, and User training. QA personnel should ensure this third party is involved early and gain a rapport with them.

Materials & Resources, Credits 2.1 and 2.2 – Construction Waste Management – The QA personnel should ensure that the contractor has a plan for how they are going to achieve the 50% or 75% (based on weight or volume, and only one must be chosen) of construction waste diversion before construction begins. Tree grubbing and existing building demolition are included in these totals and grinding trees into mulch and concrete slabs into gravel are very useful to achieve these points, but must be planned up front. All waste leaving the site should be weighed, and the contractor should use those weight tickets to determine whether the goals are being met. QA personnel should help ensure that this data is being captured.

Materials & Resources, Credits 3.1 and 3.2 – Materials Reuse – These credits require 5% or 10% (based on cost) of all non-mechanical, electrical, or plumbing materials be salvaged, refurbished or reused materials. The contractor must have a detailed plan of how this is going to be achieved. The QA personnel should ensure that the specified materials are being used and that the contractor is keeping up with the value of the materials used that fit is the reuse or non-reuse categories.

Materials & Resources, Credits 4.1 and 4.2 – Recycled Content - These credits require 10% or 20% (based on cost) of all non-mechanical, electrical, or plumbing materials be recycled. The contractor must have a detailed plan of how this is going to be achieved. The QA personnel should ensure that the specified materials are being used and that the
contractor is keeping up with the value of the materials used that fit is the recycled or non-recycled categories.

Materials & Resources, Credits 5.1 and 5.2 – Regional Materials - These credits require 10% or 20% (based on cost) of all non-mechanical, electrical, or plumbing materials be made within 500 miles of the project. The contractor must have a detailed plan of how this is going to be achieved. The QA personnel should ensure that the specified materials are being used and that the contractor is keeping up with the value of the materials used that fit is the Regional or non-Regional categories.

Material & Resources, Credit 7 - Certified Wood – The QA personnel should ensure that at least 50% of all wood be certified. This should be done by ensuring that wood delivered to the project has the markings and paperwork identifying it as certified.

Indoor Environmental Quality, Credits 4.1, 4.2, 4.3 and 4.4 - Low Emitting Materials – QA personnel should ensure that materials delivered to the site meet the specified standards. Paint systems must be compatible. It is quite difficult to do this, and no single paint manufacturer has all the paints needed for a large job.

05-8.2 QC Field Testing Log

The Specifications for CQC require the contractor to have, "Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test". They also require the contractor to have "Procedures for tracking control verification, and acceptance tests including documentation". "Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where the tests were taken, and the sequential control number identifying the test shall be given".

CQC Specification may or may not require the contractor to have maps and diagrams showing where each test is taken. A good CQC will ensure that maps and diagrams are made showing the different layers of fill and where each compaction test was taken, or what section of a concrete slab a specific compressive strength cylinder was taken from. The QA staff should encourage the contractor to graphically represent their testing, but must ensure they are keeping a log of all tests taken and a verbal description of the location where each individual test is taken. When failing concrete tests show up twenty eight days after placement, or cracked slabs due to insufficient compaction of earth beneath them occur eight months after they are placed, it is imperative that the proper test reports are available. The goal of the maps, diagrams, or location descriptions is so that a specific area of interest can be tied to a specific test.
05-8.3 Working As-Builts

The following is a chronology of activities which will be performed in the field:

At least two sets of working as-built drawings shall be maintained by the construction contractor on which all changes are noted during the construction phase. One set shall be available on the jobsite at all times. Marked up working as-built prints shall be neat, legible and accurate.

The contractor shall note all changes and deviations on each phase of construction promptly as the action occurs (but not later than on a weekly basis). The field office staff is responsible for checking the working as-built drawings maintained by the contractor (at least monthly) to ensure that the contractor is in fact recording as-built conditions. The working as-built drawings will be checked for the following:

- Actual location, size and type of existing and new utility lines, especially underground utilities.
- Any changes made within the building structure.
- Site work changes including the correct grade, elevations, cross-section, or alignment of roads, earthwork, structures or utilities as well as the topography, invert elevations, and grades of drainage installed or affected as part of the project construction.
- Cross out words or phrases such as optional requirement, equal, etc., and list the specific item or material provided.
- Show any unusual or uncharted obstructions encountered in the contract work area during construction.
- Correct dimensions and details should be transferred from shop drawings.
- Provide layout and changes to schematic drawings of electrical circuits and mechanical piping.
- Actual locations of anchors, construction and control joints, etc., in concrete.
- Any changes in location of equipment and architectural features that are an integral part of construction should become a part of the record drawings.
- The manufacturer, size and model numbers of equipment should be specified on the drawings as required by contract requirements. (i.e., Building Information Modeling (BIM))
- Additional sketches plus any sketches included in contract modifications as required providing an accurate account of all existing as-built conditions at the facility.
- Any additional changes or modifications arising from the final inspection.

Working as-built drawings and the final as-built drawings will be jointly reviewed for accuracy and completeness by the field office and contractor prior to the submission of each payment estimate. In the event of a failure to maintain the working and final as-built drawings the ACO will deduct from the monthly payment estimate an amount
representing the estimated cost of maintaining the as-built drawings. This deduction will continue until agreement is reached between the ACO and Contractor regarding the accuracy and completeness of the updated drawings. Non-compliance may result in an interim contractor rating highlighting substandard performance.

Upon completion of an individual phase of work (i.e., all underground utilities), the contractor shall prepare and complete that portion of the as-builts in the CADD file. The contractor will produce a set of blue lines on that work only and submit to the field office for review against the contractor’s on-site marked up as-builts. The requirement for submission of these drawings is outlined within contract documents. These files will be the media for the final submission of the as-builts.

The Contractor is responsible for maintaining one set of master prints on the job site, on which he keeps a careful and neat record of deviations made from the original contract drawings. The Contractor must note all changes and corrections on a weekly basis. The Quality Assurance personnel will verify this before processing partial pay requests.

The record drawings shall indicate all changes and modifications incorporated into the work as well as the following:

a. Actual location of all subsurface utility lines and their materials and sizes.
b. Any shop drawings which constitute part of the design.
c. The manufacturer and model number of all major items of equipment.
d. Delete all references to unawarded additives shown in the drawings.
e. An index of modifications included in the as-builts.

Upon completion of the contract, the record drawings will be certified as to their correctness by the Contractor and submitted to the Contracting Officer Representative for review not later than 10 days after acceptance of work. The contractor will provide a second set of as-builts after approval. The Contracting Officer Representative will distribute as-built CADD files to the user/sponsor as appropriate.

05-8.4 Progress Photos

As may be required, each field office will identify projects of command or of high-interest which will be photographed monthly. Field offices will photograph these selected projects from several different positions. These same positions will be photographed each month to adequately portray the construction progress. Only one copy of each view will be made and saved. Each photograph will be numbered. Digital photos will be saved on disk and labeled (a Microsoft Word file may be created to indicate how the digital photos are filed).

Field offices will maintain representative photographs of completed MCA construction projects valued over $1 million. These photographs will also be saved on disk and filed in the official contract files. The photos of completed MCA projects should be maintained for three years.
05-8.5 Davis Bacon Wage Rates / Payrolls and Labor Interviews
See Chapter 17, Labor Relations.

05-8.6 Partnering
Partnering is a process that attempts to build an effective team that will pursue a common goal. Partnering has two basic forms; Formal, and Informal.

a. Formal Partnering: Formal contracting is detailed in the contract specifications and normally involves a meeting of personnel who have a "stake" in the project. A facilitator is often used, and a formal signed Charter is produced. The Charter does not modify the contract, but serves as a statement and commitment to common goals and ideals. Formal Partnering is most effective when initiated prior to the start of work and follow up meetings are periodically conducted.

b. Informal Partnering: Informal Partnering is a positive attitude on the part of both Government and contractor personnel. Informal Partnering may occur when a changed condition arises and the Government and the contractor agree to jointly work to minimize the impact to the "project". A Partnering attitude is displayed by sitting down with the contractor to work out differences and establish ways to work together.

c. Partnering: Partnering is a way to reduce the confrontations on a job. However, for partnering to be effective there are some basics:

(1) Commitment: Commitment must be real and it must be to the partnership. Commitment is the foundation of an effective partnership. Without it nothing has changed in our way of conducting business. The commitment is not to the common goals or Charter, but to each other.

(2) Communication: Effective communication must be conducted effectively and openly. This is often difficult on the construction site. Communication may be enhanced by touring the job together early in the morning or late in the day, by weekly status meetings, or by coordination meetings. The more we share information, the better the partnership.

(3) Conflict Resolution: Partnerships that do not address conflict resolution often fail. Conflicts will arise and a manner or method to handle the conflict should be established. Conflict resolution should be timely. A small problem may lie around and fester until it becomes a major factor in the breakdown of commitment and communications.
05-8.7 Contract Files
The following instructions include all required files to be kept by the field office.

1. Contract File Checklist. This form lists all documents required to be maintained. This form should be placed in front of the first contract folder and serves as a quick reference. See exhibit 05-13.1, Contract Record Checklist. Additional items can be added to list as needed.

2. Documentation.

a). Pre-award correspondence. All correspondence prior to contract award, in date order, most recent on top. This is correspondence which contains the bid number rather than contract number.


c). Correspondence. Correspondence files will be broken down into five (5) types (separate folders). The five types being - District, Post (Installation), Contractor, AE, and Request for Clarification. A copy of all correspondence, with all backup correspondence (correspondence received in/response out); will be maintained in date order with most recent correspondence on top.

d). Contract funding.


g). Certificate of Insurance. A copy of the Prime Contractor’s Insurance Certificate and memorandum transferring the original certificate to District Contracting Office (CT-CF) or other appointed section.

h). Permits.

i). Bonds.

j). Pre-construction conference minutes. A copy of minutes.

k). Meeting Minutes. A copy of QA MMU and Coordination Minutes
l). Claims.

m). Safety Plan. A copy of APP and all correspondence regarding the plan, and general safety letters sent to the contractor (lessons learned, Safety Alert).

n). Standard Form 1413, Subcontractor data.


p). Warranty Files. Copies of correspondence concerning warranty work on the contract with a copy of the work order, if there is one.

q). Contract Close-out documents. DD Form 2626, Performance Evaluation; DD Form 2631, Performance Evaluation (AE); DD Form 1354, Transfer and Acceptance of Military Real Property; Real Property List; Equipment Testing Records; Shop Drawing Log; Submittals; O&M Manuals; Spare Parts & Tools; Keys; Warranty Letter; and DD 1348-1, Property Transfer to DRMO and others as applicable.

r). CQC Plan. A copy of Contractor’s QC plan and all correspondence associated with plan.

   (1) Testing File (QA). Copies of all testing performed for the Corps of Engineers.

   (2) Testing File (QC). Copies of all testing performed for the Contractor.

s). Modifications. Official Contract Record Checklist, Contract Modification/Delivery Order is used to make sure all documents listed on this checklist is placed in mod file. There are three (3) folders broken down by type:

   (1) Contract Modifications - Working. These are mods being worked. File in order by modification number (A, B, etc.) and all backup correspondence associated with mod.

   (2) Contract Modifications - Settled. After settled, send mod to the District. Keep a log on the inside of file folder. File a copy in order by PO#, i.e., P00001, P00002, etc. in this folder.

   (3) Contract Modifications - Canceled. File canceled mod by PO# once canceled modification funding document is received.
t). **Pay Estimates.** File by numerical order with latest estimate on top.

u). **Submittals.** File in date order.

v). **Daily Reports.** Copies of Contractor’s Daily QC reports with a copy of QA Reports (after supervisor has signed off on them). File in date order with most recent report in front.

w). **Value Engineering Proposal.** All information/correspondence, including all backup information, concerning a VECP prior to it being incorporated into a modification.

x). **Specification Sections.** File in numeric order.

y). **Drawings.** Keep an official set in a central location within the office.

z). **Contractor Payrolls.** ENG Form 3180-R, Contractor Payroll Record; DD Form 879, Statement and Acknowledgment (Statement of Compliance); and Standard Form 1445, Labor Standards Interview.

3. **FILE NUMBERS.** There are three (3) Army Records Information Management System (ARIMS) file numbers that may be used, depending on your office’s mission. They are listed below.

   a. **MILITARY MISSION.**

      (1) **415-15k Military construction contracts.**

         (a) **Description:** These files include records listed in the Army Standard Pricing System (ASPS) Nos. 2 and 3, such as pre-award data; contractual instruments; compensation and insurance information; contractor terminations; contract property account records; photographs, notices of award, and notices of assignment; notices to proceed, stop and start orders; related correspondence and all information determined by the contracting officer as essential for completion of the individual contract; tool and equipment files pertaining to the rental, inspection, and repair of equipment; materials inspection files accumulated in the inspection of material, equipment, and supplies purchased by the contractor for use under contract provisions; payroll files; and related information.

         (b) **Disposition:** Destroy 6 years and 3 months after final payment.

   b. **CIVIL MISSION.**

      (1) **1180-1-1q Civil Works construction and maintenance contracts.**
(a) Description: These contract files include contractual instrument files of contracts and related information pertaining to design, construction, and maintenance of Civil Works projects. Including pre-award data, daily log of construction, the advertising orders, estimates of cost, abstracts of bids, accepted and unsuccessful bids, notices to proceed, stop and start orders, notices of completion, progress photographs, related correspondence, and all other information determined by the contracting officer as essential for completion of the individual contract.

(b) Disposition: Destroy after 6 years and 3 months. Transfer after 3 years or on completion of GAO audit, whichever is first.

(2) 1180-1-1p Contractor’s payroll files.

(a) Description: Copies of payrolls submitted by construction contractors. They are used in determining compliance with labor laws and decisions.

(b) Disposition: Destroy 3 years after final payment of related contract.

4. **FILE LABELS.** Refer to AR 25-400-2, pgs 14 & 15, Table 7-1, Disposition Standards for different examples of labels depending on disposition of record listed in Appendix B of AR 25-400-2, pgs 26 and beyond. **The positions of the label should be placed in center label position on file folder.** The following are how labels should appear on file folders:

a. 415-15k Military construction contracts.

   (1) Active contract:
   415-15k Military construction contracts
   destroy after 6 years and 3 months

   (2) Inactive contract:
   415-15k Military construction contracts
   COFF 30 SEP __ TRF RHA 1 OCT __ DEST 1 JAN __

b. 1180-1-1q Civil Works construction and maintenance contracts.

   (1) Active contract:
   1180-1-1q Civil Works construction and maintenance contracts.
   destroy after 6 years and 3 months

   (2) Inactive contract:
   1180-1-1q Civil Works construction and maintenance contracts.
   COFF 30 SEP __ TRF RHA 1 OCT __ DEST 1 JAN __
05-9  GOVERNMENT FURNISHED EQUIPMENT

05-9.1 Property Administrator
In accordance with EFARS 45.7001-1, the property administrator shall be appointed by the contracting officer (KO).

Procedure

Approval by Chief of CD is required to deviate from this procedure.

05-10  DESIGN / BUILD CONTRACTS

Construction Contract Administration:

(1) General. Once the Contractors' design documents are approved, a construction NTP will be issued and construction administration should be conducted similar to a conventional project. Incremental NTP's may be issued for portions of approved designs if so approved at the pre-design conference. The Construction ACO will be designated at the commencement of the construction phase or at such time in the contract as incremental construction NTP's are anticipated. The preconstruction conference, contractors' network analysis, quality control/quality assurance plan, safety plan, progress payment procedures, and other steps should be conducted as usual.

(2) Shop Drawings and Submittals. Requirements for Shop Drawings will be similar to the requirements of a conventional design-bid-build project. Much of the information usually provided in the shop drawings can be included in the contractor's construction documents such as manufacturer and model designations. Laboratory test results, samples, certificates of compliance (COC's) and similar QC and sample submittals are handled in the usual manner.

(3) Quality Assurance. Quality assurance and contract enforcement are based on the contractor's final, approved construction documentation. The construction ACO must become familiar with local building codes, industry standards and specifications, and other non-USACE specifications included in the RFP and therefore reflected in the construction documents.

(4) Change Orders and Contract Modifications. The contractor is responsible for the accuracy and correctness of the design and construction documentation. Any errors or omissions in these documents, or improper materials or construction as a result, must be corrected at the contractor's expense. The contractor can propose changes to the proposal or construction documents for convenience or economy. The construction ACO can consider such modifications and, if appropriate, issue approval. However, since the original design documentation and submittals have already been found acceptable, the Government is under no obligation to offer reimbursement for these modifications. Unless there are errors or omissions in the RFP, the only contract modifications that would normally be required in a design-build project would be user-requested changes, changes
due to unanticipated site or subsurface conditions, or weather delays. These change orders and contract modifications should be processed as usual.

05-11 REPETITIVE DEFICIENCIES
A sample list of repetitive deficiencies is included in exhibit 5-13.2. This list is very useful for new QA representatives and interns.

05-12 OBTAINING REFERENCE MATERIALS

05-12.1 RMS and QCS Guidebooks
The RMS and QCS User Guides are available at


05-12.2 Whole Building Design Guide (WBDG) and IHS
Many industry standard specifications and standards are available free of charge through a contract Norfolk District has with IHS. Specs and standards available on-line include IBC, NFPA, ASHRAE, ASME, NEMA, ASTM, ANSI, BHMA, etc. In addition, the website has numerous manufacturers' catalogs and web addresses available for product research.

Access to specs, standards, and manufacturers' catalogs/websites is as follows:

a). Go to: http://www.wbdg.org

b). On the far right of the screen you will see many governmental agency symbols. Click on the second one down from the top, which is the Department of Defense.

c). Under the USACE symbol select "non-government standards-IHS".

d). Select "Continue to IHS Standards" in upper right of screen.

e). Select "Specs & Standards" or "Catalog Xpress" as desired.

f). Type in what you are searching for. For Specs & Standards, the input is a very small area in the top left of the screen.
After search value has been entered for "Specs & Standards" or "Catalog Xpress" a menu will appear indicating all applicable references under the search value. Most current specs and standards required are available for free viewing/download. Older versions are typically available only for purchase. Menus will indicate references as "view" or "buy". If the reference required is a "buy" item a credit card purchase may be made by the resident credit card holder with local approval.

Personnel who routinely use references available on the website above may set up a list of references and receive e-mail notification when changes/updates are made. A list may be set up as follows:

   a. Select “view lists” in the toolbar under the search engine in “Specs & Standards”
   b. Enter registration information for initial access.
   c. Select “create list” and name as desired.
   d. Add references by selecting “add to list” during normal searches.

It is recommended that the website above be added to favorites in Internet Explorer. The area IHS Customer Support Manager has indicated that there has been little access by Corps of Engineers personnel, an indicator that we are not taking advantage of the resources at hand. At present, IHS continues to work with Huntsville to consolidate all USACE/UFGS references/criteria in their system (several are already linked on the front page of the www.wbdg.org website). Operations will be ongoing to simplify the process of accessing reference material required to properly administer construction contracts.
05-13 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page:

a). Contract Record Checklist. (Fillable PDF)

b). Repetitive Deficiencies List
### 05-13.1 Contract Record Checklist

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October 2002
Previous Editions Are Obsolete
Sheet 1 of 2

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05-13.2 Repetitive Deficiency List

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CHAPTER 06    CONSTRUCTION COMPLETION AND CLOSEOUT

06-1    GENERAL

06-1.1 Purpose
This portion of the manual covers Construction Division’s (CD’s) policies and objectives’ regarding field construction offices responsibilities in order to close out the project.

06-1.2 References
a. ER 415-345-38, Construction: Transfer and Warranties
b. ECB 2007-18, Construction Warranty Management

06-1.3 Responsibilities
Authority and responsibility for implementing and maintaining the quality system within the field offices is delegated to the head of each field office.

06-1.4 Definitions
a. ACASS –
b. CCASS -
06-2  **CONTRACT CLOSE OUT**

Contract close out are those physical and administration functions required to satisfy the contract and program requirements. The field construction offices play a critical role in the real property transfer of the property from the COE to the using agency, i.e. DPW, BCE or other. The contract close out process requires continuous planning starting from the beginning of the contract. It is critical that the contract documentation is current at all times in order to expedite the final contract actions. Modifications, Submittals, Claims, payments should be processed timely to keep the contract record current.

The current USACE Metric for CONUS MILCON projects is to physically close out contracts within six (6) months of the Beneficial Occupancy Date (BOD). For OCONUS MILCON projects the close out is twelve (12) months. An Enterprise Business Process (EBP) for MILCON project closeout has been developed by USACE and is available for guidance and can be found at:

http://www.wbdg.org/ccb/

06-3  **REDZONE**

The Red Zone process was initially proposed by the Air Force as a means to expedite the close out of projects. It gets its name from a football term to describe the team effort to move the football the last 20 yards into the end zone. This is a good analogy for the final push to close out a contract. The objective is to be sure all parties adequately plan for the project turnover.

The Red Zone process formally begins at approximately 60-90 days from the scheduled BOD or at approximately 80% of the construction completion. It is an intensive management process to assure that a project is turned over to the USER in an efficient and orderly manner.

The REDZONE process is chaired by the RE/PM/AE and includes the critical stakeholders in the project. Typically, the DPW PM, BCE, USER, Fire Marshall, DOIM, contractor, real property manager and other critical members must be in the REDZONE process. The planning process sets up time tables of critical training, and coordinated work efforts to minimize the turnover process.

For example:

- If the Installation/Base is responsible for running communication cabling, then a date can be scheduled for the work to be accomplished.
- If the Installation/Base is responsible for the furniture delivery and installation a date can be established for the base to have furniture delivered and installed.

The following checklist is an example of critical milestones that must be taken into consideration. This list is not all inclusive and should be tailored to a specific installation.
### Action Completion Milestone Checklist

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<td>As built Drawings</td>
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<td>Provide Spare Parts if Req.</td>
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<td>Provide Warranty documents/MOU</td>
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The REDZONE process consists of weekly to bi-weekly meetings to assure the project is completed in a timely manner.

For additional information see the following website:

06-4 Prefinal and Final Inspections

Near the completion of, but prior to the final completion date of a construction project, the CQC staff shall conduct a comprehensive QC inspection of the project. The CQC will prepare a deficiency list of all items not completed or not meeting the plans and specification requirements. The preparation of this list and the correction of the deficiencies is the contractor's responsibility.

The contractor is required to maintain an effective work force until deficiencies have been corrected. The contractor is allowed to leave and return for seasonal work such as grassing and seasonal testing of systems.

After the contractor has prepared the list and made final corrections, a joint pre-final inspection is made by the CQC and QA personnel.

The final joint inspection is then scheduled and is attended by representatives duly authorized to act for the Contracting Officer, DPW or BCE, the contractor, and the using service. Representatives of the appropriate command should also be encouraged to participate.

06-5 Close-Out Documents

The basic regulation which prescribes USACE policy and procedures for transfer of completed construction projects is ER 415-345-38, Transfer and Warranties. The transfer of construction to the using service will be simultaneous with the acceptance of that construction from the contractor. The materials to be transferred to the using service are accumulated, organized, and ready to be transferred on the date of the final inspection.

06-5.1 DD1354 Transfer and Acceptance of Military Real Property

A DD Form 1354, must be used to transfer any facility to the using agency prior to either partial or complete occupancy. All facilities (including buildings, structures, utilities, distribution systems, and paved areas) whether new construction, rehabilitation, or remodeling, are to be listed on the DD Form 1354. This form is supplemented by DA Form 2877, Real Property Record on Army construction projects. The initial draft DD Form 1354 is prepared by the designer. Since final costs are not known at this time, the Contracting Officer will furnish final costs on a final DD Form 1354. (The 1354 shall be developed in RMS. See RMS Guide for process). There is also a reference at:

http://www.wbdg.org/ccb/DOD/UFC/ufc_1_300_08.pdf
06-5.2 Real Property List
The COR shall prepare a real property list for all installed equipment and/or equipment already in place. This list should include make, model, serial numbers, and manufacturer's name for all equipment. The contractor must furnish this information. This should be a simplified process if the material is gathered as the construction progresses.

06-5.3 Equipment Testing Record
All equipment tests required by the contract are made and recorded prior to the pre-final inspection. It is good practice to invite the local user to participate in the tests. In contracts where user training is specified, such training is to be satisfactorily completed prior to acceptance by the Government.

06-5.4 Shop Drawing Record
The shop drawings and other data are compiled so that the drawings for any desired item can be made readily available at the final inspection. After inspection, the material is transferred to the user with a receipt memorandum.

06-5.5 As-built Drawings
AE/RE and PE are responsible for ensuring that accurate master prints are being maintained on each contract under their administration. The Field shall review all redlines drawings during the Red-Zone process to assure their accuracy. On MILCON and CW projects the prime contractor shall be responsible for converting the final approved Red Line drawings into the final electronic drawings. Once the final drawings and CD’s are submitted they should be verified for accuracy and transmitted by formal memorandum to the installation DPW, BCE, or other users. A copy of the final electronic files shall be forwarded to the PM for archiving or future reference. The final transmittal shall be logged in RMS critical Milestones Tab.

Transfer of Documents - In order to comply with ER 415-345-38, the following documents must be transferred to the customer:

a. A complete set of marked up red-line drawings marked to show “As-Built” conditions will be transferred to the user at the time of turnover. (Field Office Action)

b. The final corrected drawings with ELECTRONIC MEDIA showing “As-Built” conditions will be transferred to the user as agreed to with the customer (proposed target should be 60 days from acceptance of the project).

NOTE: Final payment should not be made to the construction contractor until both copies of approved master prints have been received by the ACO.
06-5.6 Operating and Maintenance Instructions

Within 30 days of the final completion of work the Operation and Maintenance (O&M) manuals should be transferred to the installation. The manuals shall be furnished in accordance with the contract requirements at or before project occupancy.

PROCEDURE - O&M Manual Submittals

Field offices must emphasize the importance of O&M submittals at the earliest possible date and to further notify the contractor that two submittals (a draft edition of the manual and a final edition) may be required in order to obtain final approval. Field offices should ensure that construction schedules reflect activities associated with the development of O&M manuals. Insist on approved manuals as a prerequisite to the contractor providing O&M training for the customer. Receipt of manuals and User training is required prior to beneficial occupancy.

The contractor should be encouraged to submit final draft manuals at least 60 days prior to expected beneficial occupancy date. In all cases, the final draft of the manuals must be made at project transfer. The final edition of the manuals is to be delivered to the User no later than 30 days after the transfer of the completed project. The contractor should also be informed that funds will be withheld pending final approval of O&M manuals. Untimely submission of this material will be a factor in the contractor’s performance evaluation.

While most review levels of specification submittals for O&M manuals are CQC it is important that all such submittals are concurrently reviewed by the field office and the DPW/BCE or others. This will afford all an opportunity to review the material in final form and request any changes they deem necessary prior to final approval.

O&M Training

Training normally requires classroom discussion (i.e. review of O&M manuals, discussions of systems, etc.) combined with hands-on training at the new facility where systems are demonstrated. The contract specifications will typically state the length of training, areas to be covered and the number of manuals to be provided prior to the training session. The training schedule is developed by the field office and contractor for approval by the COR.

Commitment should be obtained by field offices from the DPW/BCE and others to dedicate full-time operating and maintenance personnel during the training activity. For complex portions of the facility or unique systems consider video taping all or part of the training program to assist work force development in the future. Video taping of the training may be required by the contract specifications if the need is identified in the planning stages.

Field offices should ensure that the contractor’s instructors are both knowledgeable and fully capable of communicating the subject matter. Field offices are encouraged to participate in the training to the fullest extent possible as part of their technical education and to help improve their monitoring of training on future contracts.
Basic O&M Manual Content - The following provides guidance on the content of O&M systems-oriented manuals:

a. Description of the System
This section should indicate, in general, the type of system installed; its overall capacity, performance capabilities and limitations; any special or unusual features; its relationship, if any, to other systems in the building or facility; its major subsystems and components; and the rationale for the various design decisions that were incorporated. The system description will include a detailed listing and description of each piece of system equipment. The description must include the following:

1. Name and Nomenclature/Date Installed
2. Manufacturer’s Name/Address
3. Supplier’s Name/Address/Phone Contact
4. Size/Capacity/Power Requirements
5. Description of components, i.e., motors, controls, drives, special items, etc.
6. Numerical tie-in to the equipment as shown on the “As-built” drawings

b. Functioning of the System
By means of schematic diagrams and text, a detailed description of the entire system and how it will operate is to be provided in this portion of the manual. The nature and purpose of each individual component and subsystem should be explained as well as their functioning collectively as an integrated system. The manufacturer, model number and capacity of each major component must be indicated. Special emphasis should be given to the nature and function of any automatic control systems incorporated in the design.

c. Operating Instructions
Provide, in detail, the sequence of steps that should be followed in start-up and shut-down of both the entire system and individual components in the system; the instruments that should be monitored while the system is in operation and the significance of various readings; adjustments that should be made to obtain optimum performance under various conditions; corrective action that should be taken when instrument readings or alarms indicate a malfunction; and an operator-oriented troubleshooting checklist which includes techniques that can be used to keep a system operating, at least partially, in spite of a malfunction, but without creating a hazard or damaging the system. Include any special safety considerations during operation. If applicable, address winter/summer change-over procedures.

d. Maintenance Instructions
Describe the nature and frequency of any routine or preventive maintenance that should be performed on components of the system. The procedure to be followed, along with a list of the required tools and materials to perform the task, should be fully described.
e. Repair Instructions
This section should provide a repair-oriented troubleshooting checklist and guide for diagnosing problems in the system as a whole and its components, subsystems and similar systems. These instructions should include a list of spare parts that might be required and how they can be obtained. The names and addresses of individuals or firms to contact for assistance in diagnosing problems or for the repair of various system components should also be provided.

06-5.7 Spare Parts and Tools
Where required by the contract, all necessary spare parts and tools, spare parts lists for the items of equipment and the source of suppliers and unit costs are obtained from the contractor for transfer to the user. An itemized list shall be developed as part of a DA Form 1149. Installation personnel shall sign for the property transfer. This is especially important for computers and other sensitive equipment, i.e. computer diagnostic computer turned over as part of HVAC controls.

06-5.8 Cores and Keys
All required cores and keys are normally sent directly to the user or field office. Keys are labeled and prepared for transfer to the user by letter with a complete listing of the keys. The Bit list for the keys is transferred to the user.

06-5.9 Warranties
The contract specifications are reviewed in order to compile a list of warranties or guarantees. The AE/RE assures that all warranties or guarantees are received from the contractor. This includes the names, addresses, and contact points for all parties responsible for implementing such warranties or guarantees. A list of expiration dates is retained, and copies are provided to the user.

06-6 WARRANTY PROCEDURES

Procedures for implementing warranty enforcement are outlined in ER 415-345-38. Each AE/RE will set up a written Memorandum of Understanding (MOU) with the DPW, BCE, or user. The MOU will cover procedures to be followed for transfer of completed facilities and responsibilities on warranty enforcement. A sample MOU is shown in paragraph 06-15.1.

At 4 month and 9 month periods after transfer, joint user and COR inspections will be held. Any defects will be identified and corrective actions started. The COR will advise the DPW/BCE or user in writing as to when these inspections should be scheduled. The inspections will be held even if the user does not wish to attend.
06-7 PERFORMANCE EVALUATIONS

06-7.1 CCASS Policy
The Administrative Contracting Officer (ACO) will prepare a final contractor performance evaluation using DD Form 2626 within 30 calendar days of acceptance date for all contracts under their administration. Interim evaluations may be prepared and submitted as dictated by contractor performance. Evaluations are to be prepared using the automated web-based system called Construction Contractor Administration Support System (CCASS) program. CCASS shall be developed in RMS and transferred into the Contractor Performance Assessment Reporting System (CPARS).


The AE/RE shall coordinate with the Construction Division CPARS manager to define the roles of the Reviewing Official (RO), the Accessing Official (AO) and Contractor POC/Focal Point. The role definition should be executed at the time of contract award. CPARS has an internal tracking system that will notify these key officials of milestone processing dates thru the e-mail system.

ER 415-1-17 specifies the required steps and procedures for contractor performance evaluations. All references to Standard Form (SF) 1420 in ER 415-1-17 are changed to DD Form 2626 in accordance with ECB 2005-15 Deployment of Modernized Architect-Engineer Contractor Administration Support System (ACASS) and Construction Contractor Appraisal Support System Construction Bulletin 94-17.

Contractor evaluations are normally prepared by the field office at the completion of the project. However, interim evaluations may be prepared on the construction contractor in order to document unsatisfactory performance and/or to encourage the contractor to improve his performance. An important factor for interim evaluations is timely notification to the contractor with documented facts.

These evaluations are an important part of the close-out process, and can impact a contractor's ability to obtain future work. The CCASS system has been automated and can be accessed thru the web at:

http://www.cpars.csd.disa.mil

06-7.2 CCASS Process
A District Focal Point is designated in CCASS that must register the Reviewing Official (AO), the Accessing Official (AO), Accessing Official Representative.(AOR) and the Contractor’s Representative (CR). The AO is normally the ACO and the RO is the Contracting Officer.

Once RMS exports a contractor’s appraisal to CCASS; the AO is notified by e-mail. The AO can then login into CCASS review and forward the appraisal to the Contractor. The contractor has
30 days to respond to the rating. If the contractor concurs the AO can forward the appraisal to the RO for final processing. If the AO reviews the contractor’s comments and agrees that the rating should be changed, the AO can revise the appraisal and forward it to the RO. The CCASS system is robust and has reporting functions to allow the AO to track all ratings and review listings of Coming Due, Over Due and Completed CCASS evaluations.

The Contractor is required to obtain access to CPARS through a registration process in order to participate in the review process. Registration is processed through the CPARS home page.

**06-7.3 CCASS Ratings**

Performance evaluations will be prepared for every construction contract with a value greater than $100K. This includes all completed contracts, contracts terminated for default and contracts terminated for the convenience of the Government. Performance evaluations will not be prepared for purchase orders.

The evaluations are a rating of the contractor’s performance in five different aspects of work (Quality Control, Effectiveness of Management, Timely Performance, Compliance with Labor Standards, and Compliance with Safety Standards). The evaluation acts as a reference for each contractor indicating his suitability for future work with the Government. The contractor's overall performance rating will fall into one of the following five categories:

- **Outstanding** - This rating is provided to a contractor whose performance has been exceptional. Administrative Contracting Officers are strongly urged to recommend this rating when warranted. The additional effort required to justify the rating may reap benefits on future contracts awarded to the contractor if he knows his efforts are recognized.

- **Above Average, Satisfactory, Marginal** - The greatest bulk of the performance ratings will fall in these categories. The contractor must meet most, if not all, contract requirements in these five major rating areas. The contractor need not necessarily be "Above Average, Satisfactory, or Marginal" in all five of the rating areas to obtain an overall "Above Average, Satisfactory, or Marginal" rating. He can be Unsatisfactory or Outstanding in as many as two of the five rating areas and still receive an overall Above Average, Satisfactory, or Marginal rating.

- **Unsatisfactory** - This rating is appropriate for contractors who cannot effectively manage/organize the construction process to ensure an acceptable quality of work and/or timely project completion. An unsatisfactory rating in any three or more of the five areas requires the issuance of an overall unsatisfactory rating. Unsatisfactory performance needs to be conveyed to both the contractor and the Contracting Officer prior to issuance of a rating (See Chapter 7, Performance Management). Prior to forwarding an Interim Unsatisfactory or Final Unsatisfactory Evaluation to the District Office, the Administrative Contracting Officer shall provide the Contractor with written notice of the intended Unsatisfactory Evaluation and allow the contractor sufficient time to respond. Based on an evaluation of the contractor response the ACO may either change his/her position on the evaluation or if still deemed appropriate prepare necessary documentation for issuance of the rating by the Contracting Officer.
A FINAL EVALUATION MUST BE ISSUED FOR ALL INTERIM EVALUATIONS ISSUED.

06-8 ACASS

06-8.1 ACASS Policy
The DD Form 2631 is the official form used to record the quality of work performed by design firms. Designs are generally done by commercial Architect-Engineer (A-E) firms; however, some designs come from using agencies or District “in-house” personnel. Engineering has the responsibility to complete ACASS on the DD Form 2631, however Construction Divisions have the responsibility for evaluating the construction portion of the evaluation, which is a part of the overall evaluation of the design firm. This evaluation will be performed by the AE/RE upon notification by Engineering within 30 days after acceptance of the project. Completion of the evaluation form is required for A-E designs.

06-8.2 ACASS Field Office Procedures
The following items of the DD Form 2631 will be completed by the Area/Resident Engineer:

a. Item 1 - enter the AE contract number. (The AE contract number may be found in the letter appointing the Area/Resident Engineer as the COR on the AE contract when applicable or by contacting the Project Manager.)

b. Item 2 - enter the construction contract number

c. Item 3a - check the “Final” block

d. Item 3b - check the "Construction" block

e. Item 3c - check if applicable

f. Items 4 & 5 - leave blank

g. Item 6 - enter the name and mailing address of the design firm

h. Item 7a - enter the project title and location of the work

i. Item 7b - enter additional information to describe the project if necessary

j. Items 8a, 8b leave blank
k. Item 8c – will normally be District Address

l. Item 8d - enter name address and phone number of the AE/RE Office

m. Section 9 - leave blank

n. Items 10a(1) and 10a(2) - leave blank

o. Item 10a(3) - enter original contract award amount

n. Item 10b - enter the date the construction work was accepted

o. Item 10b(1) - enter the total number of modifications issued as of the date of acceptance and their total dollar amount.

p. Item 10b(2) - enter the number and dollar value of the modifications listed in 10b(1) that are the result of the A-E’s design, drawings, and/or specifications (currently reason code 1).

q. Item 11 - mark none if applicable otherwise leave blank

r. Item 12 - check the appropriate block for an overall rating based on the evaluation of the performance rating for each of the performance elements covered by items 16 through 19. There is no fixed mathematical relationship between the number of performance elements rated outstanding, satisfactory, or unsatisfactory and the overall performance evaluation. However, the ratings in blocks 16 through 19 provide the basis for the overall rating.

s. Item 13 - self explanatory

t. Items 14 and 15 - The rating official is generally the AE/RE.

u. Items 16a and 16b - Complete only the "Construction" portion of Item 16a. This is a rating of the quality of each of the disciplines utilized in the design. If a discipline is not utilized on a specific project then type "not applicable" or "N/A" in section 16b adjacent to the corresponding discipline.

v. Items 17 & 18 - leave blank

w. Item 19 - An overall evaluation of the project design.

x. Item 20 - Comments regarding performance which the rater desires to become a matter of record.
Upon completion of the DD Form 2631, the form will be forwarded to the field offices designated Point-of-Contact.

06-9  PHYSICAL COMPLETION STATEMENT

As part of the final review process the AE/RE shall complete a physical completion statement. The statement certifies that all requirements of the contract have been accepted. Prior to signing the document the AE, RE and PE shall review completed contract records and be satisfied that the contract is complete. See paragraph 06-12.5.

06-10  ENVIRONMENTAL CLOSE OUT

Depending on Installation and State Requirements environmental issues must be closed out. The final close out must address all erosion control requirements specifically included in the contract drawings along with any local environmental requirements. A final inspection must be scheduled with the state or installation to close out the existing permits. The environmental close out should address the following items as applicable:

- Required records of inspections – these records must be maintained for a period of 2 years or turned over to the installation
- Site specific SWPPP Records
- Erosion Control Permit – Obtain release
- Water Quality Management Plan - Obtain Release
- Demolition and Asbestos Abatement Records Permit to address project specific requirements such as asbestos removal, lead abatement, etc. Closure report on hand and has been submitted.
- Water and Sewer Permit construction certifications – RE must submit final as-built on water and sewer to certify installation (must be signed by Professional Engineer)
- Clean Air Permits – Obtain release from installation on Title 5 Permit (if boilers larger than 250 MBH or generators over 250 KVA)
- Wetland Permits – If required – Records of final closeout
- Remediation Closure reports for Fuel tanks – If applicable
- Other Environmental Closure reports

It is imperative that any ENVIRONMENTAL CONCERNS be resolved prior to final close out. SEE CHAPTER 9 ENVIRONMENTAL FOR DETAILS
06-11 RELEASE OF CLAIMS

The final closeout requires the contractor to furnish a Release of Claims on the contract. See 06-12.3 for a sample of the Release of Claims format. See the SAD CA manual for processing of final pay estimate. Reference the following web-link:


06-12 FINAL CLOSEOUT MEMO

The final close out check list and memorandum is shown in 06-12.2 This checklist should accompany the documents indicated as part of the final close out process.
06-13 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page:

a. Office QA Plan Template (RMS Macro – template pending)
b. Controlled Document Log sheet (RMS Macro)
c. MOU Template (RMS Macro – template pending)
06-13.1 Sample Installation MOU

DIRECTORATE OF PUBLIC WORKS / BASE CIVIL ENGINEER  
& U.S. ARMY CORPS OF ENGINEERS – AT FORT _____ / _______ AFB

TRANSFER AND WARRANTIES OF COMPLETED CONSTRUCTION

SUBJECT: MOU for Warranty Procedures at XXXXXXXXXXX

1. Purpose. The purpose of this memorandum is to outline established policies for transfer of completed facilities, to describe working relationships in carrying out warranty enforcement and to ensure a timely response to warranty related problems following construction of facilities.

2. Reference. ER 415-345-38, Transfer and Warranties; ER 5-1-11 Program and Project Management.

3. Policy. The transfer of construction from the USACE Savannah District (SAS) to the Directorate of Public Works (DPW) / Base Civil Engineer (BCE) will be simultaneous with the acceptance of construction from the contractor unless otherwise specifically stated. Only facilities which have been completed according to contract requirements, or substantially completed with minor deficiencies not interfering with the intended use of the facility (as coordinated with DPW/BCE, will be accepted from the contractor and transferred to the DPW/BCE.

4. Procedure. The following is an outline of key procedures by project phase which should be followed to insure good management of transfer/warranty issues:

a. Project Design Phase: The project manager and the designer will explain the transfer/warranty options available to the customer early in the design process, in order that those special requirements can be incorporated into the contract documents. The SAS Project Manager will have overall responsibility to ensure transfer and warranties are addressed in the project management plan, and if a separate MOU is required, it will become a part of the plan. Some items may require additional funding by the customer, and early discussion will allow for proper programming of monies. The most common options include commissioning of HVAC and other complex systems, O&M of the facility by the contractor, extended warranty, and Corps warranty management services.

b. Construction Phase: The DPW/BCE will be:

   (1) Invited to attend and participate in the Preconstruction Conference held by the SAS Area/ Resident Office prior to beginning construction.
   (2) Invited to participate in the Partnering process.
(3) Invited to visit the construction site(s) at any time with an escort from the SAS Area/Resident Office.

(4) Notified of the schedule of customer training required to be presented by the contractor.

(5) Invited upon substantial completion of the facility, to a Pre-Final Inspection where a deficiency list for the facility will be prepared. The DPW/BCE will be notified of the scheduled inspection in order to plan attendance. The SAS Project Engineer/Quality Assurance Representative responsible for the project will monitor correction of noted deficiencies and annotate the resulting deficiency list as to the date each item is corrected.

(6) Responsible for inviting the end user to the Final Joint Inspection.

(7) Invited to participate in any commissioning of building systems, which are included in the project, to include testing and balancing, and performance verification tests.

c. Project Turnover: Draft DD 1354 will be coordinated with the DPW/BCE prior to the Final Inspection and a final document will be presented to the DPW/BCE representative at the Final Joint Inspection. At the Final Joint Inspection of the facility (or at a later time as noted below), the following documents will be provided to the DPW/BCE:

(1) Physically Complete DD form 1354, Transfer and Acceptance of Military Real Property, with annotated list of remaining deficiencies listed on the back of the DD form 1354. A copy will be signed by the DPW/BCE representative present at the Joint Final Inspection to complete project acceptance. The costs indicated on the transfer DD form 1354 will be the cost to-date for construction, design, S&A, and other non-construction costs as provided by SAS Project Manager.

(2) Equipment In-Place List. The make and model number of each piece of major equipment, with spare parts lists and manufacturer’s catalogs for equipment. A draft document will be provided at the time of acceptance, with the final version provided no later than 30 days after acceptance.

(3) All specified keys, handles and tools required for operation of building equipment. All keys will be tagged for each lock clearly showing lock schedule data, building number or location. (as provided directly from the lock supplier to DPW/ BCE)

(4) All warranty documents as required by the contract, including special warranties which may extend beyond one-year after acceptance.

(5) Final as-built contract specifications, including all modifications, will be furnished within 30 days of acceptance.

(6) O&M Manuals will be furnished within 30 days of acceptance.

(7) A copy of the final approved shop drawings/submittals will be furnished within 30 days of acceptance.

(8) As-built record construction drawings (in CADD format-as applicable) will be furnished as specified in the contract.

(9) Status report on items, which the customer determines should have been included in the contract, will be furnished within 30 days of acceptance.
Upon correction of all deficiencies, the SAS Area/Resident Office will notify the DPW/BCE that all deficiencies listed on the back of the DD form 1354 have been corrected and that action will be taken to financially close out the project. Upon final financial close out of the project by the SAS, a ‘Financially Complete’ DD Form 1354 will be provided to DPW/BCE by the SAS Area/Resident Office within 30 days after the financial data is provided to field office. Financially completed costs, including design and all other non-construction costs, will be allocated to all Category-Coded items as requested by the DPW/BCE.

(d) During Warranty Period: The warranty period on the constructed facility begins on the acceptance date and extends for one year. At the beginning of the warranty period the contractor will be advised of the warranty procedures and will be requested to furnish the names and phone numbers of their warranty point of contact for each type of work.

(1) When the facility user discovers what he/she thinks is a warranty problem, it is reported to the appropriate DPW/BCE personnel. The DPW/BCE will make the primary determination as to whether the defect results from a warranty problem, user abuse, improper operation or maintenance, or from a design or construction deficiency. If the defect is determined by DPW/BCE to be the responsibility of the construction contractor, the DPW/BCE will make initial contact with the contractor, vendor or manufacturer to obtain correction. In the case of a critical item affecting habitability of living space or operations, this contact should be expedited. In the case of non-critical defects, a list should be maintained and presented at the four and nine month warranty inspections. If the effort by the DPW/BCE to solve the problem is unsuccessful, the SAS Area/Resident Office should be contacted for action. Some caution should be used in requesting warranty defect correction by the construction contractor. If the problem is not an actual warranty item, and the contractor responds and corrects the problem, it could be viewed as an obligation of the Government. If there are questions as to the validity of a warranty complaint, the SAS Area/Resident Office should be consulted. The contractor’s Performance Bond remains in effect through the one-year warranty period, and if the contractor is not responsive, the surety may be used as a means to have the warranty deficiencies corrected.

(2) The SAS Area/Resident Office will designate a Warranty Liaison. The Warranty Liaison’s basic duty will be to coordinate and expedite correction of any problems that may occur after acceptance of the facility.

(3) All necessary actions shall by taken by the SAS Project Manager to recover the cost of defects from the contractor or design firm when the contractor or design firm are held responsible. Appropriate available project funds will be used to correct defects if the construction contractor is not responsive to requests for defective work. Additional funds will be requested from HQUSACE or reimbursable funds will be requested from the customer, through the DPW/BCE, depending on the nature of the defect, and the funding appropriation.
(4) Monthly meetings will be held between the SAS Area/Resident Office, SAS Project Manager and the DPW/BCE to exchange information concerning completed facilities, in order to highlight recurring maintenance problems, user complaints and design correction, as well as maintenance or functional data, which may indicate a design or construction deficiency.

(5) Joint warranty inspections: Four months and nine months after acceptance, warranty inspections will be scheduled by the SAS Area/Resident Office and conducted with SAS Project Manager, DPW/BCE representatives, the user, and contractor personnel attending. The DPW/BCE will provide a list of work orders on the facility to help identify defects. A list of deficiencies existing at the time will be compiled and furnished to the contractor for correction.

5. Disposition: This memorandum of Understanding will be reviewed and updated as required, especially upon the change of either of the signatories

__________________________________________________________________________

(Name)                                  (Name)
(Position)                              (Position)
DPW/BCE                                 USACE District Office

(Date)                                  (Date)
**Sample Closeout Memo**

CESXX-CD-XX (415-15k)
Date

MEMORANDUM FOR CESXX-XX-XX (XXXXX)

SUBJECT: Completion Memo - Contract No. DACXXX- or W912XX, Description, Ft. Lost in the Woods, North America

1. I certify that all of the administration office actions required have been fully and satisfactorily accomplished. This includes final settlement in the case of a price revision contract. The following represents the status of subject contract upon physical completion of the work.

   A. Contract is physically complete and final payment estimate is enclosed.

   B. Notice to Proceed was acknowledged on:

   C. Contractor started work on:

   D. Contract completion Date(s):

<table>
<thead>
<tr>
<th>Phase of Work</th>
<th>Date Tested or Accepted</th>
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<tbody>
<tr>
<td>Grassing</td>
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<tr>
<td>Testing of Cooling System(s)</td>
<td></td>
</tr>
<tr>
<td>Testing of Heating System(s)</td>
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</tbody>
</table>

   E. Final Inspection Date(s):

   F. Complete this section for Military and OMA Funded Contracts
      1. Transfer of Facilities (DD 1354) furnished User on
      2. User accepted DD 1354 without deficiencies on
      3. If deficiencies existed, User agreed to unconditional acceptance on

   G. Status of “as-builts” and shop drawings, specifications, and guarantees and warranties:
      1. Marked up prints reflecting “as-builts” conditions furnished User on
      2. Record Shop Drawings furnished User on
      3. Specifications with all modifications furnished User as issued
4. All guarantees and warranties required by specifications furnished User as issued.

H. All work performed under this contract meet requirements of the plans and specifications.

I. Liquidated damages assessed? No. From ___ to ___ calendar days at $___/day.

J. All contractor and subcontractor payrolls have been received.

K. Government Furnished Property (GFP)
   - [ ] No GFP for this contract
   - [ ] All GFP listed in specification paragraph section has been installed and none remains in the hands of the contractor.
   - [ ] All GFP listed in specification paragraph section has NOT been installed.

L. Scrap
   - [x] No usable scrap remains in the hands of the contractor
   - [ ] The contractor retains the following scrap materials:

M. Contractor has [ ] or has not signed the final pay estimate, claims release, and certificate of payment.

N. Variations in Estimated Quantities (VEQ)
   - [x] This contract contains no VEQ clause
   - [ ] This contract contains a VEQ clause, but final quantities did not over/under run.
   - [ ] This contract contains a VEQ clause, and final quantities did over/under run. The following modification were issued to resolve these variation:

O. North Carolina Sales and Use Tax data:

2. Status of Evaluations:

<table>
<thead>
<tr>
<th></th>
<th>Date Submitted to CD-TE or CCASS/ACASS</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Contractor</td>
<td></td>
<td></td>
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<tr>
<td>Architect Engineer</td>
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3. The following items will be held in the field office until transfer to Record Holding Area in the District (IM-PR) via SF135 and SF135a. These records will be sent once final payment has been made to the contractor, the contract/project CWE(s) have been financially complete and financially complete DD1354 has been issued to the user, if applicable:

   a. Contractor Payroll Records
   b. Labor Standards Interviews
   c. Quality Control and Assurance Reports
For contracts awarded after 30 June 1998, the following records will be transferred:
   a. Contract Modification Records
   b. Correspondence Records

Encls: Who Did It, P. E.
       Ft. Lost in the Woods Area Engineer
06-13.3 Sample Release of Claims

CESXX-XX-XX XXX
March 20XX

MEMORANDUM FOR: XX-XX

SUBJECT: Release of Claims - To be Submitted with Final Payment Estimate

CONTRACT NO.: «Contract»

CONTRACTOR: «Contractor»


FOR THE CONSTRUCTION OF: «Description»

LOCATION: Ft. Lost in the Woods, North America

DATE AWARDED: «Award_Date»

The undersigned contractor, under above numbered contract, between the United States of America and said contractor, in accordance with paragraph (f) of the "Payments under Fixed-Price Construction Contracts" clause of said contract and upon acceptance of the final payment hereunder, hereby releases the United States, its officers, agents, and employees from any and all claims arising under or by virtue of said contract of any modification or change thereof except with respect to those claims, if any, listed below: (Itemize claims and amounts.)

DATE: _______________   ___________________________________

COMPANY

NAME (SIGNATURE)

TITLE

CESXX Form XXX
06-13.4 Sample Physical Completion Statement
06-13.5  As-Built Flow diagram

Under Revision
## QUALITY OF A/E SERVICES BY DISCIPLINE

<table>
<thead>
<tr>
<th>DISCIPLINES (If applicable)</th>
<th>DESIGN SERVICES</th>
<th>CONSTRUCTION</th>
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<tr>
<td></td>
<td>SATISFACTORY</td>
<td>INSUFFICIENT</td>
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<tr>
<td></td>
<td>SATISFACTORY</td>
<td>INSUFFICIENT</td>
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<table>
<thead>
<tr>
<th>DISCIPLINE NAME</th>
<th>ADDRESS OF KEY CONSULTANT(S)</th>
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### DESIGN PHASE OR ENGINEERING SERVICES:

#### Quality of A/E Services Evaluated

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<tr>
<th>A/E SERVICES</th>
<th>SATISFACTORY</th>
<th>INSUFFICIENT</th>
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#### THOROUGHNESS OF SITE INVESTIGATION

<table>
<thead>
<tr>
<th>QUALITY CONTROL, PROCEDURES AND EXECUTION</th>
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| PLANS/SPCS ACCURATE AND COORDINATED      |
|プランス/スペックが正確かつ統合されている |

| PLANS CLEAR AND DETAILED SUFFICIENTLY   |
|プランスは明確で十分詳細である |

| MANAGEMENT AND ADHERENCE TO SCHEDULES  |
|管理とスケジュールの従順 |

| MEETING COST LIMITATIONS                |
|コスト制限を満たす |

| SUITABILITY OF DESIGN OR STUDY RESULTS |
|設計または研究結果の適合度 |

| SOLUTION ENVIRONMENTALLY SUITABLE       |
|解決は環境的に適している |

| COOPERATION AND RESPONSIVENESS          |
|協力と責任 |

| QUALITY OF BRIEFING AND PRESENTATIONS   |
|説明とプレゼンテーションの品質 |

#### HOW MANY 100% FINAL SUBMITTALS WERE RECEIVED BECAUSE OF POOR A/E PERFORMANCE

<table>
<thead>
<tr>
<th>18. HOW MANY 100% FINAL SUBMITTALS WERE RECEIVED BECAUSE OF POOR A/E PERFORMANCE?</th>
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#### CONSTRUCTION PHASE:

#### Quality of A/E Services Evaluated

<table>
<thead>
<tr>
<th>ATTRIBUTES</th>
<th>SATISFACTORY</th>
<th>INSUFFICIENT</th>
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</table>

| PLANS CLEAR AND DETAILED SUFFICIENTLY |
|プランスは明確で十分詳細である |

| DRAWINGS REFLECT TRUE CONDITIONS       |
|レイアウトは正しい状況を反映 |

| PLANS/SPCS ACCURATE AND COORDINATED    |
|プランス/スペックが正確かつ統合されている |

| DESIGN CONSTRUCTIBILITY                |
|設計の構造性 |

| COOPERATIVENESS AND RESPONSIVENESS     |
|協力と責任 |

| TIMELINESS AND QUALITY OF PROCESSING SUBMITTALS |
|進行中の出荷の遅れ |

| PRODUCT AND EQUIPMENT SELECTIONS READILY AVAILABLE |
|製品および機器の選択がすぐに利用できる |

| TIMELINESS OF ANSWERS TO DESIGN QUESTIONS |
|設計に対する回答の速さ |

| FIELD CONSULTATION AND INVESTIGATIONS   |
|フィールドの相談と調査 |

| QUALITY OF CONSTRUCTION SUPPORT SERVICES |
|建設支援サービスの品質 |

#### REMARKS (Attach additional sheets or documentation if necessary)

<table>
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<th>REMARKS (付録が必要な場合、追加のシートまたはドキュメントを添付)</th>
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### DD Form 2631, Nov 92 (REVISED) [21-41] Form PM

| DD Form 2631, Nov 92 (REVISED) [21-41] Form PM |
CHAPTER 07 PERFORMANCE MANAGEMENT

07-1 GENERAL

07-1.1 Purpose

07-1.2 References

07-1.3 Responsibilities

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CHAPTER 07   PERFORMANCE MANAGEMENT

07-1   GENERAL

07-1.1 Purpose
This chapter prescribes the procedures relating to failure to perform in accordance with the terms of the contract or unsatisfactory performance. Contractor’s performance is critical for the success of a construction project. The plans and specifications establish the requirements to be met by the contractor in the performance of the contract (Schedule, Quality, Management, Safety, Labor, As Built and Warranties). The Administrative Contracting Officer (ACO) is responsible to monitor the contractor’s performance and notify the contractor of deficiencies observed and direct appropriate action to affect correction. There are several options open to the Government under the General Provisions of the contract when a contractor fails to perform satisfactory work. Strong and accurate documentation is necessary to support these actions. In any case, unsatisfactory performance must not be allowed to drag on. The longer a deficient performance is allowed to proceed, the more difficult it will be to support more severe measures such as termination. This specific chapter outlines actions needed when a contractor’s performance in unsatisfactory. Awareness should be heightened when the contractor is behind schedule.

07-1.2 References

b. FAR 52.246-21, Warranty of Construction Clause

07-1.3 Responsibilities
Authority and responsibility for performance management resides within the field office and is delegated to the Administrative Contracting Officer and Contracting Officer Representatives.

07-1.4 Definitions
a. None.
07-2 PERFORMANCE ISSUES

Performance issues can be classified on the following categories: schedule, quality control, management, labor and safety. Deficiencies in any of these key elements normally manifest themselves in the contract schedule. Key performance deficiencies related to labor and safety issues, may not result in scheduling issues.

The objective of the Government is to correct the systemic program through working with the contractor to correct the root cause of the problem and should not be punitive in nature. Actions should give the contractor every opportunity to correct the deficiency without direct intervention by the Government. However, if the problem leading to the lack of progress persists, the Government must take a more aggressive approach to resolving the problem.

One key issue is the failure to react to the lack of progress in a timely manner. There is a tendency to be overly optimistic that the lack of progress will be corrected by the contractor rescheduling the job with unrealistic durations and resources. This is commonly known as “crashing the schedule”. In the short term it may appear the contractor is on schedule but at the end the contractor will not meet the performance duration. The logic of the NAS must not be changed to include unrealistic durations or sequences of work in an effort to hide slow progress.

It is imperative for the project engineer to monitor the schedule monthly to assure that the contractor is not changing the logic of the schedule to hide a progress problem. No revisions to the approved schedule are allowed unless they are approved by the AE/RE.

07-3 IDENTIFYING THE PROBLEM

When performance issues are discovered either through the analysis of schedule updates or field observations; it is imperative that the RE/PE/QAR meets with the contractor to identify the root cause of the problem. The Government must determine if the Government has in anyway delayed the contractor, i.e. pending modification, design error, delay in submittal review, user delays, adverse weather, etc. The contractor cannot be punished for a progress failure on the Government’s part or issues/factors beyond the contractor’s control. If the delay or lack of progress is not related to the Government actions then the contractor’s performance must be closely analyzed. Initially the NAS schedule must be analyzed to assure that there is not a logic issue or false constraint causing the perception of a delay.

If it is indeed a failure of progress is due to the contractor; then it is imperative that the issue be documented. Minutes of the initial meeting should be developed as part of the documentation process. The initial effort must be towards identifying the problem and having the contractor correct the management issues internally.
It is imperative that the field office staff remain professional at all times during the performance evaluation process. Personal feelings have no place in the evaluation process. If the RE/PE/QAR does not remain professional, the emotions of the situation will affect the overall objective of improving the contractor’s performance.

07-3.1 Schedule
Failure to maintain the progress as scheduled is defined as schedule slippage greater than 5% or more than 30 days behind schedule.

07-3.2 Management
Contractor management concerns are typically identified by:

- Failure of the onsite management staff to adequately manage the project
- On site staff is not cooperative with the Government personnel
- Submittals not being prepared or submitted in a timely manner
- Failure to submit progress schedule
- Failure to comply with drawings and specifications
- Unqualified supervisory or CQC personnel, etc

07-3.3 Quality Control
Defective or deficient work is a direct result of inadequate quality control. The following are key indicators:

- Failure to implement and document the 3-phase inspection process
- Poor workmanship
- Lack of testing and/or not providing required documentation
- Untimely and/or incomplete/non-conforming submittals
- Failure to adequately inspect and/or report quality control activities
- Failure to maintain as-built drawings

07-3.4 Labor Requirement
Failure to comply with Labor provisions of contract may be manifested in the following:

- Failure to submit required payroll records, including subcontractors
- Improper payment and/or classification of workers
- Hiring of illegal workers
- Failure to comply with Davis-Bacon Act
07-3.5 Safety Issues
Failure to maintain an effective safety program may be manifested by:

- Repetitive safety infractions
- Reckless behavior or disregard of safety and health requirements
- High number of safety deficiencies
- High frequency of accidents

07-4 RECOVERY PLAN

Once a performance problem has been identified, the Government should send a letter to the contractor outlining the performance problem. The letter should request the contractor to formally respond to the identified issues with a corrective action plan within an established suspense date. The RE/PE/QAR must closely monitor the contractor’s plan to assure the appropriate recovery actions are executed. The goal must be working with the contractor to help them correct their performance issue. If the corrective action plan is effective then the issue is resolved. It must be noted that a corrective action plan is much more effective in the early stages of a contract rather than later in a contract. It is imperative that a lack of progress be identified as early as possible.

07-5 REMEDIAL ACTIONS IF PROGRESS DOES NOT IMPROVE

If after 30 days substantial improvement is not made on the project then an Intensive Management Plan must be implemented to improve the contractor’s performance. The plan shall include as a minimum:

- Weekly performance reviews – documented with minutes
- Establishment of milestones/objectives for improvement
- Weekly schedule reviews for critical activities
- Other management objectives

If satisfactory progress is not made during the initial recovery period, the contractor will be notified in writing of the lack of improvement with specific details on the deficient areas. The letter will state that if improvement is not made in the next 30 days then the Government may issue an interim unsatisfactory performance rating in CCASS. A copy of this letter should be furnished to the bonding company. The PDT and Contracting Officer should be made aware of a contractor’s substandard performance early in the process.
07-5.1 Continued Schedule Issues
When the actual progress versus schedule is greater than 10% for a period of 30 days or more, the ACO will initiate the following actions:

Request a meeting with Contractor’s upper management to discuss the contractor plan and corrective actions to recover the schedule. Minutes of the meeting will be prepared and forwarded to all participants. The contractor will be advised that performance must improve within 30 days or within a reasonable period. During this period, the ACO/COR will closely monitor problem areas. Retainage should be deducted in accordance with the provision of the payment clause (See CA manual). If the performance date extends beyond the current contract completion date, liquidated or actual damages should be withheld in accordance with the terms of the contract. When the contractor is entitled to additional excusable time, liquidated damages are not withheld. Another letter to the contractor should be written with a copy furnished to the bonding company.

07-5.2 Management Issues
The contract clauses require the contractor to have adequate and competent personnel to properly plan, schedule, resource, organize and manage the work. If poor management persists, the following actions should be considered:

Remove project superintendent, CQC staff, or other personnel: The Contracting Officer may require the contractor to make changes to the project management staff plan at any time during construction or have unqualified or ineffective personnel removed when necessary to obtain the quality construction required by the contract. If contractor personnel are deemed to be incompetent, careless, or otherwise objectionable, the Contracting Officer can require the removal of such personnel from the project. Such action must be supported by facts which show continued incompetence, carelessness, neglect, or other behavior detrimental to contract performance and to Government’s best interest. Incompetence on the part of the contractor’s staff should be brought to the contractor’s attention. If no immediate corrective action is taken by the contractor, he can be directed to remove an employee. If adequate action is not implemented the ACO may require the contractor to attend another coordination meeting to reach a mutual understanding of contract requirements.

07-5.3 Quality Issues
Defective or deficient work as a result of inadequate quality control should be identified and corrected in a timely manner. Upon detection of a deficiency, the contractor is first informed verbally and, where necessary, the verbal notification is immediately confirmed in writing. Additionally, the PE/QAR makes a descriptive entry on the daily QA report and the project engineer insists that a like entry be made by the contractor on the daily CQC report and deficiency tracking log. The ACO is promptly informed of any refusals by the contractor to correct a deficiency. A complete record is kept of facts relating to the deficiencies and efforts to correct them.
Once identified, require the contractor to remove and replace deficient materials and/or workmanship. This is the most important tool for CQC enforcement. It is vital to quality control and provides an incentive for effective CQC. If there is any doubt whether the work or service complies with the contract, the Government makes the final determination.

Payment should not be made for defective or deficient quality and additional funds may be retained for failing to adequately meet the contract quality requirement (See CA manual). The AE/RE may exercise the right to withhold monies for defective workmanship and failure to correct deficiencies. Enough funds should be withheld to cover all possible corrective work. However, funds withheld will not exceed the value of the disputed items. If the contractor refuses to replace defective material or to perform an acceptable service the Government may employ another contractor to make the correction or to provide the service. This option should be invoked carefully because if the contractor is proven to be correct the expense for tearing out and replacing will have to be borne by the Government.

Another Government option is halting the work until deficiencies are corrected. Directives to stop should not be designated as “Stop Work Orders”, but should site the deficiency and direct that no further work be done that will affect the deficiency correction, ie do not allow construction upon defective work. Make sure that this action is in the best interest of the Government and that no Government action contributed to the deficiency. If the contractor refuses to stop and correct the deficiency immediately, a letter from the COR is appropriate, directing the contractor to cease that particular operation. Often the contractor will stall as long as possible in these situations, postponing the correction in the hope of being allowed less stringent standards to keep the project on schedule. This stalling by the contractor must not be tolerated.

07-5.4 Management

When dealing with management issues, the Contracting Officer may implement the following actions:

- Require the contractor to assume personal supervision. If the contractor does not provide an adequate superintendent, a provision within the contract allows the Contracting Officer to require a principal of the contractor’s firm to assume personal supervision of the work. Management issues should be documented by official correspondence.

- Make changes to the management organization. The ACO may require the contractor to make changes to the management organization at any time during construction or have unqualified or ineffective personnel removed when necessary to obtain the quality construction required by the contract.

Poor administration and management of the contract could be basis to issue an Interim Unsatisfactory Performance rating (See CA Manual)

07-6
07-5.5 Labor Issues

The primary enforcement responsibility rests with the Department of Labor for determination that the prescribed wages have been met. Construction contracts require weekly payroll submission that must be checked to assure compliance with labor standards provisions. Basic guidelines for all Corps employees tasked with the administration and enforcement of statutory and contractual labor standards on construction contracts will be found in ER 1180-1-8. (http://www.usace.army.mil/usace-docs/eng-reggs/er1180-1-8/toc.htm) The ACO staff shall perform all required checking of the contractor's field operations, including the checking of payrolls and reporting any irregularities discovered which require further investigation or action at higher level.

The ACO shall, immediately upon the detection of any violation, notify the District Labor Advisor who will make such additional investigation necessary to determine the appropriate course of action to be taken by the Contracting Officer. All correspondence with contractors regarding Contract Work Hours and Safety Act violations, assessing of liquidated damages, and restitution payments resulting from violations will be initiated by the District Labor Advisor for the signature of the Contracting Officer. The Contracting Officer's notification to the contractor includes an assessment of liquidated damages and the contractor shall be advised that he may request relief from such assessment. If the contractor does not appeal the proposed assessment within 60 days of such notification, the liquidated damages are assessed automatically.

The ACO possesses and may exercise the right to withhold monies for wage rate violations in accordance with the labor provisions of the contract (Davis-Bacon Act) When payroll copies are delinquent, monetary amounts sufficient to cover labor performed during the time involved shall be withheld from partial payments estimates until the delinquent payroll copies have been received and determined to be in compliance. The ACO, after consultation with then District Labor Advisor, may withhold funds as necessary to pay laborers and mechanics the full amount of wages required by the contract and to satisfy liability for liquidated damages under Contract Work Hours and Safety Act-Overtime Compensation Clause.

07-5.6 Safety Issues

Repetitive safety deficiencies, reckless behavior or disregard of safety and health requirements will not be tolerated and will not exist in Corps projects. High number of safety deficiencies, loss time accidents and high frequency of accidents are indicators of chronic safety issues.

All deficiencies of the contract health and safety requirements will be brought to the attention of the contractor for prompt correction and documented on the safety deficiency tracking system and Quality assurance report. If there are deficiencies of a repetitive nature, the ACO representative will remind the contractor in writing of the contractual obligations to immediately correct unsafe and unhealthful conditions and maintain the workplace in a safe and healthful manner.
The ACO may exercise his authority to order a Safety Stand Down and request the contractor to revisit the Accident Prevention Plan to implement corrective actions to correct unsafe, unhealthful conditions and maintain the workplace in a safe, healthful manner.

If contractor supervisory-level employees allow willful violations of EM 385-1-1; the ACO may request the contractor to remove the employee from the project.

07-6 **WITHOLDING FUNDS FOR LACK OF PERFORMANCE**

In accordance with the FAR clauses of the contract the ACO possesses and may exercise the right to withhold monies for failure to correct unsatisfactory performance. Up to 10% retainage can be withheld any time for lack of performance by the contractors. The withholding is general withheld due to a lack of progress related to scheduling; however, it can apply to other key factors such as management, quality, safety or specific contract requirements. Any time funds are withheld the contractor shall be notified of the amount and purpose of withholding.

07-7 **INTERIM UNSATISFACTORY PERFORMANCE EVALUATION**

If after the 2\textsuperscript{nd} notice of unsatisfactory performance, the contractor’s performance has not improved the contractor will be sent a third letter stating the lack of improvement. This letter will state the Government’s intent to issue an interim unsatisfactory performance rating in CCASS if the contractor fails to correct the substandard performance within 30 days. In this letter the contractor will be afforded the opportunity to discuss the rating with the Contracting Officer prior to issuance.

The draft of interim unsatisfactory rating shall be entered into RMS at this time. This draft rating along with the supporting documentation shall be forwarded to the PM and Contracting Officer for comments. If there has not been satisfactory progress during this time, the Interim Unsatisfactory Performance rating shall be posted in CCASS.
07-8 **FINAL UNSATISFACTORY RATING**

After an interim unsatisfactory rating is issued the Intensive Management Plan must remain in effect. Every 30 days the contractor’s performance should be evaluated. If deficiencies are corrected, a new interim evaluating stating that the contractor had recovered from previous performance can be entered into CCASS. If improvement is not made, the documentation shall be utilized to substantiate a final unsatisfactory performance rating in CCASS. (See CA manual)

07-9 **TERMINATION FOR DEFAULT**

This action is taken only after all other measures have failed and it is in the best interests of the Government. It is the most severe action to take against the contractor. This can have a far-reaching impact on the contractor. If termination is proven unjustified, it could cause the Government significant liability. Therefore, strong and accurate documentation is necessary to support the action. In any case, unsatisfactory performance must not be allowed to continue. The longer deficient performance is allowed to proceed, the more difficult it will be to support termination. In most cases termination for default is not in the best interest for the Government. (See CA manual)

07-10 **OTHER REMEDIES**

07-10.1 **Untimely Punch List Correction**

If the contractor is not responsive or is performing marginally during the punch list period, a revised DD Form 2626 may be initiated and submitted for entry into the CCASS. The revised evaluation will reflect appropriate changes to Part III of the form, dealing with the section Evaluation of Performance Elements. Specifically, the rating for Part 15: Quality Control, Item k, identification/correction of deficient work in a timely manner; Part 16; Effectiveness of Management, Item g, Warranty Response; and Part 17: Timely Performance, Item g, Warranty Response. When the overall performance rating is revised to Marginal or Unsatisfactory, then Part 20: Remarks must be completed to explain the specific warranty problems which have caused the revision. This section is specifically important, since the change in rating must be communicated to the contractor, and serves to explain the rationale for the lesser rating.

If the contractor fails to perform the punch list items the AE/RE will notify the surety that furnished the required performance bond for the construction contract, or other optional bonding instruments. The AE/RE will pursue corrections with the surety as well as the contractor.

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If all these actions fail, the AE/RE may perform the repairs by other means, i.e., process a unilateral credit modification or issuance of a task order under a separate contract.

07-10.2 Untimely Final As-built Drawings
Retain sufficient funds for the completion of as-builts drawings.

RBP: Insure the contractor identifies in the NAS a payment activity in an amount sufficient to cover their preparation.

A revised CCASS rating may be issued for lack of Quality Control and Timely Performance related to substandard as-builts.

A unilateral credit modification may be issued to have the as-builts prepared by others.

07-10.3 Non-responsive Warranty Service
Warranty provisions are described in the “Warranty of Construction” clause of the contract. For military and civil works, the initial contact for warranty work is done by the DPW/BCE or others directly with the contractor, vendor, or manufacturer to obtain correction of warranty defects. Upon notification by the DPW/BCE or others that warranty assistance is required; the AE/RE assumes primary responsibility with the enforcement action.

If the contractor is not responsive or is performing marginally during the warranty period, a revised DD Form 2626 will be initiated and submitted for entry into the Construction Contractors Appraisal Support System (CCASS).

If the contractor responsible for the warranty or latent defect refuses to perform or is no longer in business, the AE/RE will notify the surety that furnished the required performance bond for the construction contract, or other optional bonding instruments. The AE/RE will pursue warranty corrections with the surety as well as the contractor until all warranty defects have been corrected.

If all above fails the AE/RE may perform the warranty repairs by other means if contract funds are available.
07-11 ANNEXES, EXHIBITS, AND TEMPLATES

Not Applicable.
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## CHAPTER 08 SAFETY

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CHAPTER 08   SAFETY

08-1   GENERAL

08-1.1 Purpose
Managing the safety program is vital to the Corps’ reputation and future. This chapter provides the general policy and guidance for establishing safety management procedures in the execution of construction contracts. It defines the related responsibilities and roles of both the contractor and the government in the management of safety during the construction of facilities.

08-1.2 References
   a. EM 385-1-1, Safety – Safety and Health Requirements

08-1.3 Responsibilities
Authority and responsibility for safety is the overall responsible of the head of each field office. Each and every employee is fully responsible for personal safety and assuring the safety of others. Specific authorities and responsibilities to stop work due to life safety issues should be designated in writing.

08-1.4 Definitions
   a. None.
08-2  INTRODUCTION

An acceptable safety standard is guided by a well planned and conscientiously applied program for policing hazardous conditions and controlling personal acts which might result in accidents. The AE/RE must takes an aggressive, sincere interest in the safety program, making it clear to field office personnel and representatives of Contractor that the accident prevention clause of the specifications carries the same weight and is given the same strict attention as all of the other provisions of the contract. Safety is a "critical" job requirement for all Government Employees having safety responsibilities.

Contractors are obligated by the terms of their contract to protect the lives and health of persons exposed to their operations and to safeguard property and equipment from accidental loss or damage. All work will be performed in accordance with the safety and health provisions of the contract, EM 385-1-1 (US Army Corps of Engineers Safety and Health Requirements Manual), and federal, state, and local codes and standards.

In addition to being a contract requirement, a well planned and conscientiously applied accident prevention program is essential to the efficiency, quality, and scheduling of work and the minimization of costs. To ensure that the accident prevention program meets these intents, the Area/E/Resident Engineer and his staff must take a sincere, aggressive interest in obtaining the maximum effectiveness and benefit from the contractor and the contractor's accident prevention plan. Paramount to achieving this is the AE/RE involvement and confidence in, visible support for, and enforcement of the contractor's accident prevention plan. The methods a contractor uses in satisfying safety requirements are immaterial as long as the requirements are met. The contractor shall have the option of selecting any technique or method as long as the AE/RE is assured that it will produce the desired results and is allowed per the terms and conditions of the contract. Effective application of the Corps' construction safety and health program requires follow-up by Corps supervisors and Quality Assurance Representatives’ to ensure that the contractor is fulfilling the contractual obligations in accordance with the contractor's accident prevention plan and any agreements reached at the preconstruction conference and/or mutual understanding meeting.

08-3  SAD CONSTRUCTION SAFETY SUCCESS

In order to promote a safe construction environment, South Atlantic Division has established a safety program that recognizes and awards Government and Contractor personnel for their contributions in reducing and/or eliminating accidents. For a full description of the program and Safety Program for each District use the following link:

08-4 **ACCIDENT PREVENTION PLAN (APP)**

Prior to starting work, the Contractor must submit an acceptable Accident Prevention Plan. The plan is usually submitted prior to the Pre-Construction Conference and within 20 calendar days after Contract Award as required by specification paragraph PLANS.

A format for the Accident Prevention Plan can be found in EM 385-1-1, Appendix A ([http://www.usace.army.mil/publications/eng-manuals/em385-1-1/a-a.pdf](http://www.usace.army.mil/publications/eng-manuals/em385-1-1/a-a.pdf)). The Contractor's plan will be job specific and will include work to be performed by the contractor and subcontractors, and measures to be taken by the contractor to control hazards associated with materials, services, or equipment provided by suppliers. Consideration will also be made to cover the prevention of alcohol/drug abuse on the job. The plan should address, as a minimum, the following:

- Signature sheet
- Background information
- Statement of Safety and Health Policy
- Responsibilities and lines of authorities
- Subcontractors and suppliers
- Training
- Safety and Health Inspections
- Safety and Health expectations, incentive programs, and compliance
- Accident reporting
- Medical Support
- Personal Protective Equipment
- Plans (Programs, Procedures) required by the Safety Manual
  - Layout plans
  - Emergency response plans
  - Procedures and tests
  - Spill plans
  - Firefighting plan
  - Posting of emergency telephone numbers
  - Wild Land fire prevention plan
  - Man overboard/abandon ship
  - Hazard communication program
  - Respiratory protection plan
  - Health hazard control program
  - Lead abatement plan
  - Asbestos abatement plan
  - Abrasive blasting
  - Confined space
  - Hazardous energy control plan
- Critical lift procedures
- Contingency plan for severe weather
- Access and haul road plan
- Demolition plan (engineering and asbestos surveys)
- Emergency rescue (tunneling)
• Underground construction fire prevention and protection plan
• Compressed air plan
• Formwork and shoring erection and removal plans
• Jacking plan (lift) slab plans
• Safety and health plan and SSHP (for HTRQ work, and SSHP must be submitted and shall contain all information required by the APP – two documents are not required.
• Blasting plan
• Diving plan
• Plan for prevention of alcohol and drug abuse
• Fall protection plan
• Steel erection plan
• Night operations lighting plan
• Site sanitation plan
• Fire Prevention Plan
• Contractor information
• Site-Specific Hazards and Controls

A sample minimum APP outline is located at the end of Chapter 8.

08-4.1 Accident Prevention Plan Submission and Approval

The contractor must submit an acceptable APP before beginning work. The plan will be reviewed by the field office within 10 days of receipt and comments to the plan will be entered into RMS. The plan is forwarded to the District Safety Office for review and/or comment. Revisions to the plan may be necessary during the course of the contract, as this is an active document.

Any asbestos abatement plans, site safety and health plans for hazardous and toxic waste (HTW), lead abatement, or plans for other environmentally related issues, will also be reviewed by the District Environmental Section and Safety. This will be discussed in a later paragraph.

08-5 BULLETIN BOARDS

The contractor shall erect and maintain a safety and health bulletin board in an area commonly accessed by workers. The bulletin board shall be maintained, current, in clear view of on-site workers, protected against the elements and unauthorized removal. It shall contain at a minimum the following safety and health information:
• Map denoting the route to the nearest emergency care facility
• Emergency phone numbers
• Copy of the most up-to-date APP shall be mounted on or adjacent to the bulletin board or state the location, which will be accessible on the site by all workers.
• Occupational Safety and Health Administration (OSHA) Form 300A shall be posted in accordance with OSHA requirements and mounted on or adjacent to the bulletin board or state the location, with will be accessible on the site by all workers.
• Copy of Safety and Occupational Health deficiency tracking log shall be mounted on or adjacent to the bulletin board or state the location where it will be accessible by all workers on request.
• Safety and Health promotional posters
• Date of last lost workday injury
• OSHA Safety and Health Poster

08-6 SAFETY INDOCTRINATION

Worksites with non-English speaking workers shall have a person(s), fluent in the language(s) spoken and English, on site when work is being performed, to translate as needed. As part of the contractor's accepted Accident Prevention Plan and EM 385-1-1, each of the contractor's employees shall receive an initial safety indoctrination based on the safety program required by the contract. The contractor must maintain a record of employees who have received this indoctrination by date, name and content. Suggested topics to be covered shall include but not be limited to the requirements found in EM 385-1-1 paragraph 01.B.03 be found in EM 385-1-1, paragraph. 01.B.03:

• Requirements and responsibilities for accident prevention and maintaining safe and healthful work environments;
• General safety and health policies and procedures and pertinent provisions of this manual;
• Employee and supervisor responsibilities for reporting all accidents;
• Provisions for medical facilities and emergency response and procedures for obtaining medical treatment or emergency assistance;
• Procedures for reporting and correcting unsafe conditions or practices;
• Job hazards and the means to control/eliminate those hazards, including applicable position and/or activity hazard analyses; and
• Specific training as required by this manual.
08-7 ACTIVITY HAZARD ANALYSIS (AHA)

The AHA is a systematic, dynamic, documented analysis of proposed job activities for the purpose of identifying potential hazards and developing procedures which will be used to control or remove those hazards. Activity hazard analyses, carefully planned, thorough, and enforced, are the primary tool for achieving a safe and healthful project.

08-7.1 AHA Development

An Activity Hazard Analysis (AHA) will be developed by the contractor for each construction activity and operation occurring in each major phase of work in accordance with EM 385-1-1 paragraph 01.A.13 of EM 385-1-.1. Do not allow the use of "canned" AHA’s, but require the contractor to develop ones which will be job specific to address those hazards expected in the activity, and which will address the following major points:

- Activity being performed
- Sequence of work
- Hazards to be controlled and the procedure implemented to control them.
- Potential Safety/Health Hazards
- Recommended Controls
- Equipment to be used
- Inspection Requirements
- Training Requirements
- Signature of Competent/Qualified person

08-7.2 AHA Discussions

The AHA will be discussed by the contractor and QA personnel at the preparatory phase and work will not proceed on that phase until the AHA has been accepted by the Government. A copy of each AHA should be kept with the minutes of the preparatory phase or QA report.

A sample AHA format is provided at the end of this chapter.
08-8 ACCIDENT REPORTING

Employees are responsible for reporting all injuries or occupationally related illnesses as soon as possible to their employer or immediate supervisor. Employers and immediate supervisors are responsible for reporting all injuries to the field office within twenty four (24) hours.

The following reporting procedures apply to all Contractor activities performed within the South Atlantic Division. The Contractor shall prepare and submit an ENG Form 3394, USACE Accident Investigation Report, within five (5) working days for any accident which results in the following:

- Lost work day
- Restricted work
- Transfer to another job
- Loss of consciousness
- Medical treatment beyond first aid
- A significant injury/illness diagnosed by a physician or other licensed health care professional
- Property damage of $2,000 or more
- Any of the conditions described in paragraph 15.3.2 the paragraph below.

08-8.1 Significant Damage or Fatalities

An accident that appears to have any of the consequences listed below shall be immediately reported to the field office. The Contractor shall prepare and submit an ENG Form 3394, USACE Accident Investigation Report, within 24-hours for any accident listed under this paragraph. In addition, immediate notification to the Government representative and securing of the affected area must be done if any of the following occurs:

- Fatality
- Permanent totally disabling injury
- Permanent partial disabling injury
- Three or more persons being hospitalized
- Property damage of $200,000 or more
- Any incident which would result in adverse publicity to the Government
08-8.2 Automated Reporting
The appropriate Project Engineer/Quality Assurance Representative at the field office shall
immediately create a Preliminary Accident Notification (PAN) upon receiving notification from
the Contractor that a recordable accident (those listed in para 13.5.1 and 13.5.2) has occurred.
An individual at the Area/Resident Office authorized to create PAN’s shall access ENGLink and
input the PAN as soon as possible. PAN’s are generated in ENGLink, therefore the Contractor
does not have access and will not be able to create and/or submit a PAN to the Government.

The Area/Resident Engineer shall immediately electronically report to the District Commander
all serious accidents/incidents:

- Those that result in a fatality,
- The hospitalization of three or more persons,
- The loss of a facility by fire,
- The sinking of a government or contractor floating plant,
- Property damage greater than $200,000,
- Or, the hospitalization of one person if the potential exists for that person to die, lose
  sight in any eye, or have a body part amputated.

08-9 SAFETY MEETINGS
Safety meetings shall be conducted to review past activities, plan for new or changed operations,
review pertinent aspects of appropriate AHA’s (by trade), establish safe working procedures for
anticipated hazards, and provide pertinent safety and health training and motivation. A copy of
minutes of these meetings shall be submitted to the field office. The minutes will include date,
time, attendance, subject(s) discussed and who conducted the meeting. The contractor will
inform the field office of all scheduled safety meetings in advance and invite them to attend.

08-9.1 Frequency
The contractor shall conduct safety meetings for all supervisors at least once a month. In
addition at least one safety meeting shall be conducted weekly by field supervisors or foremen
for all workers. This is commonly known as the "Weekly Tool Box Safety Meeting."

08-9.2 Inspections
The APP and/or the USACE Project Safety and Health Plan shall provide for frequent safety
inspections, conducted by competent persons, of the work sites, material, and equipment to
ensure compliance with the plan and this manual. In addition to the above, a Contractor QC as
part of their QC responsibilities shall conduct and document daily safety and occupational health
inspections in their daily QC logs.
08-9.3 Temporary Electrical Inspections
Inspections will be performed on a routine basis for temporary electrical work on site. As a minimum, the following items will be inspected:

- Wire size, type, and condition
- Systems and devices (polarity, continuity of ground, resistance to ground)
- Maximum 25 OHMS resistance of ground rods measured and recorded.
- Check GFI for 15/20 amp 120 Volt circuits.
- Plugs and receptacles (type, NEMA rating)
- Circuit breakers and disconnects (size, type, weatherproof)
- Extension Cords (type, UL listed, insulation condition, splices, location)
- Open wiring on insulators, nonmetallic sheathed cable, outside clearance (600 volts or less), Festoon lighting.

08-9.4 Equipment Inspections
Before any machinery or equipment is placed in use, it shall be inspected and tested in accordance with the manufacturer’s recommendations and requirements of EM 385-1-1 and shall be certified in writing by a competent person to meet said requirements. A copy of the inspection shall be maintained at the site by the contractor and another copy will be kept in the official file, either with the QA/QC reports, or separately. All equipment should be checked daily before use to ensure safe operating condition.

08-10 SAFETY DEFICIENCY TRACKING

The Contractor shall establish a safety and occupational health deficiency tracking system that lists and monitors the status of safety and health deficiencies in chronological order. The list will be maintained in RMS, be updated daily, and will provide the following information:

- Date deficiency identified
- Description of deficiency
- Name of person responsible for correcting deficiency
- Projected resolution date
- Date actually resolved
08-11 ENVIRONMENTAL SAFETY

08-11.1 Hazardous, Toxic and Radioactive Waste (HTRW) Sites
Hazardous waste sites pose a multitude of health and safety concerns, any one of which could result in serious injury or death. Sites that are classified as HTRW sites include Underground Storage Tank (UST) removals, sites with known or unknown chemical or petroleum product contamination, sites prone to explosion or fire, etc. Contractor personnel working on HTRW sites as well as all QAR personnel entering the site must have an initial 40 hour training class, 24 hours of supervised on the job training, and an annual 8 hour refresher course. This training is required by 29 CFR 1910.120 (Code of Federal Regulations – Hazardous Waste Operations and Emergency Response) BEFORE the employee is allowed to enter an HTRW site. Copies of the training certificates shall be maintained in the field office and be available for review.

08-11.2 Asbestos Abatement
QAR’s inspecting asbestos abatement projects are required to have successfully completed an initial 40 hour training course which has been approved by EPA to meet AHERA accreditation requirements. Annual 8 hour refresher courses are also required. If two years elapse without taking the refresher, the 40 hour class must be repeated.

08-11.3 Lead Based Paint Abatement
The OSHA regulations specifically designed for lead hazards are General Industry Standard 29 CFR 1910.1025 and Construction Standard 29 CFR 1926.62. Any activity that will impact lead-based paint or other lead-containing materials shall require a written lead compliance plan to protect workers from lead hazards. A part of this plan shall address lead waste management to ensure that the waste is properly classified, controlled, and disposed of in accordance with the above regulations and applicable USEPA, state and local hazardous waste regulations. When QA personnel encounter potential problems involving lead, they should obtain assistance from their construction technical manager and the District SOH Office.” See EM 385-1-1 paragraph 06.B.05-1.
08-12 SAFETY GOALS

The safety goal of construction QA is to assure that the Contractor achieves zero accidents and delivers a safe product that complies with contract plans and specifications. This goal is achieved when the Contractor maintains a safe work environment and enforces safe work practices. This requires that every person at the project site be trained to recognize and control the hazards associated with their work activities.

08-12.1 Accident Frequency

For FY08, USACE has a contractor employee lost-time accident frequency rate target of 0.54 accidents or less per 100 employees. By keeping every project as safe as possible and thereby achieving zero accidents at the vast majority of their projects, QA personnel can assure that their Area/Resident Office, district, and South Atlantic Division achieve the above frequency rate.

08-12.2 Accident Severity

A severity rate is a measure of the seriousness caused by accidents that have occurred over a specific period of time. For USACE, it is a measure of the number of lost days incurred due to accidents per 100 employees per year. Although the USACE does not have a target severity rate, it is critical that the number of lost days for each accident be minimized to contain worker compensation costs and maximize productivity and employee morale. The best way to accomplish this is to prevent all accidents and place particular emphasis on preventing serious accidents. The secondary means of reducing severity rates, which is still important, is by providing injured employees excellent medical care and returning them to their normal work or restricted duty ASAP.
08-13 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page.
## ACTIVITY HAZARD ANALYSIS

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<th>Contract No.</th>
<th>Project:</th>
<th>Location:</th>
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<tr>
<th>Date:</th>
<th>Activity:</th>
<th>Estimated Start Date:</th>
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### PRINCIPAL STEPS

Identify the principal steps involved and the sequence of work activities.

### POTENTIAL SAFETY/HEALTH HAZARDS

Analyze each principal step for potential hazards.

### RECOMMENDED CONTROLS

Develop specific controls to eliminate or reduce each hazard to an acceptable level of risk.

### EQUIPMENT TO BE USED

List equipment to be used in the work activity.

### INSPECTION REQUIREMENTS

List inspection requirements for the work activity.

### TRAINING REQUIREMENTS

List training requirements. Include hazard communication.

Prepared by: Contractor's competent/qualified person(s) (Signature & Date)

This AHA has been reviewed by the designated SAS COR and is acceptable for use on this project. This acceptance is predicated on satisfactory implementation in the field by the contractor and will be rescinded if the contractor fails to enforce the controls identified in this document and/or the requirements identified in EM365-1-1. This AHA will be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).

Name, COR (Signature & Date)
08-13.2 Minimum Basic APP Outline

PRIME CONTRACTOR INFORMATION.

<table>
<thead>
<tr>
<th>Project name:</th>
<th>Contractor:</th>
<th>Contract no.:</th>
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APPROVAL SIGNATURES.

a. Plan preparer (Safety manager, site safety and health officer (SSHO), or quality control representative will fill this role).

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<th>Name:</th>
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b. Plan approval (Company owner will fill this role).

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<th>Name:</th>
<th>Title:</th>
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c. Plan concurrence (Safety manager, SSHO, project manager, or supervisor will fill this role).

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<th>Name:</th>
<th>Title:</th>
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<th>Date:</th>
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</table>
1. INTRODUCTION.

Instructions. The prime contractor will type-in the information called for or put a checkmark in the appropriate box or boxes. A checkmark will signify a) Prime’s selection from a list of items, b) Prime agrees with the corresponding information, c) Prime agrees to follow the requirement(s) listed herein and those contained in EM 385-1-1 dated 3 November 2003, and d) Prime agrees to develop a written plan based on the requirements listed herein when required by this accident prevention plan.

2. BACKGROUND INFORMATION.

a. Project description and location. Prime contractor will provide a brief description of the project to include its location.

<table>
<thead>
<tr>
<th>Project description and location</th>
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<tr>
<td>Prime contractor will provide a brief description of the project to include its location.</td>
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b. A map of the project site area will be provided.

c. Prime contractor accident experience. Prime contractor will provide accident experience information, if available, on how many accidents the prime has experienced in the last two years and what type of accidents have occurred.

<table>
<thead>
<tr>
<th>Prime contractor accident experience</th>
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<tr>
<td>Prime contractor will provide accident experience information, if available, on how many accidents the prime has experienced in the last two years and what type of accidents have occurred.</td>
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d. Phases of work. (Examples: Grading, excavation, formwork & shoring, steel erection, etc).

<table>
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<tr>
<th>Phases of work</th>
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<tr>
<td>Prime contractor will provide accident experience information, if available, on how many accidents the prime has experienced in the last two years and what type of accidents have occurred.</td>
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3. STATEMENT OF SAFETY AND HEALTH POLICY. Prime contractor will provide a safe and healthful project site which is free from recognized and anticipated hazards that could cause injury or death. The prime contractor and his subcontractor(s) and supplier(s), and visitor(s), will comply with the policies set forth in EM 385-1-1 ‘Safety and Health Requirements Manual’ dated 3 November 2003.
4. RESPONSIBILITIES AND LINES OF AUTHORITY.

a. □ Resumes. Prime contractor will provide resumes for safety and industrial hygiene personnel if the contract requires these positions. Competent person qualifications for the site safety and health officer (SSHO) will also be provided.

b. □ Accountability for personnel responsible for safety.

Company owner will:
- Accept responsibility and accountability for the safety program.
- Provide leadership and guidance to supervisory personnel for the acceptance, maintenance, and enforcement of the safety program.
- Provide the necessary resources to maintain a safe and healthful project site.
- Conduct or attend monthly supervisory safety meetings.

Company owner name/phone no.

Project manager (superintendent) will:
- Implement the safety and health program at the project site.
- Conduct periodic project site inspections to verify accident prevention plan (APP) and EM 385-1-1 compliance.
- Review and act upon site safety and health inspection reports.
- Prepare man-hour reports, if applicable.
- Have authority to make spot corrections or stop work for safety purposes.
- Conduct or attend monthly supervisory safety meetings.
- Generate and/or sign ENG Form 3394 when required.

Project manager name/phone no.

Safety manager will:
- Accept administrative and oversight responsibility for the project site safety program.
- Provide technical guidance and support to the project manager, SSHO, supervisors, and foremen on safety and health issues.
- Conduct periodic worksite visits to verify APP and EM 385-1-1 compliance.
- Report observations and findings to the company owner.
- Purchase personal protective equipment (PPE) and safety supplies as necessary.
- Have authority to make spot corrections or stop work for safety purposes.
- Conduct or attend monthly supervisory safety meetings.
- Generate and/or sign ENG Form 3394 when required.

Safety manager name/phone no.
Site safety and health officer will:

- Be on site when work is performed.
- Conduct frequent worksite inspections to verify APP and EM 385-1-1 compliance.
- Conduct or supervise on-site safety training.
- Investigate accidents and incidents as necessary.
- Purchase PPE and safety supplies as necessary.
- Have authority to make spot corrections or stop work for safety purposes.
- Conduct weekly employee safety meetings and attend monthly supervisory safety meetings.
- Generate and/or sign ENG Form 3394 when required.

Site safety and health officer name/phone no.

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Supervisors (foremen) will:

- Cover appropriate activity hazard analysis before work begins.
- Conduct periodic project site inspections to verify APP and EM 385-1-1 compliance.
- Assist SSHO with accident and incident investigations.
- Have authority to make spot corrections or stop work for safety purposes.
- Conduct daily safety meetings with specific work crews.
- Conduct weekly employee safety meetings and attend monthly supervisory safety meetings.
- Generate and/or sign ENG Form 3394.

Workers will:

- Wear required PPE for each task.
- Inspect electrical cords daily before use.
- Inspect in-use hand and power tools daily before work begins.
- Inspect in-use machinery and mechanized equipment daily before work begins.
- Maintain good housekeeping at the worksite.
- Report accidents and incidents immediately to supervisor.
- Have authority to make spot corrections or stop work for safety purposes.
- Attend employee safety meetings.

c. Lines of authority. Prime contractor lines of authority will be as follows: Company owner, project manager, safety manager, SSHO, supervisors, and workers.

5. SUBCONTRACTORS AND SUPPLIERS.

a. Check the box if there aren’t any subcontractors or suppliers working the site.

b. Identification of subcontractors and suppliers. Prime contractor will list subcontractors and suppliers, if known, and their phone numbers.

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Site safety and health officer will:
• Be on site when work is performed.
• Conduct frequent worksite inspections to verify APP and EM 385-1-1 compliance.
• Conduct or supervise on-site safety training.
• Investigate accidents and incidents as necessary.
• Purchase PPE and safety supplies as necessary.
• Have authority to make spot corrections or stop work for safety purposes.
• Conduct weekly employee safety meetings and attend monthly supervisory safety meetings.
• Generate and/or sign ENG Form 3394 when required.

Site safety and health officer name/phone no.

Supervisors (foremen) will:
• Cover appropriate activity hazard analysis before work begins.
• Conduct periodic project site inspections to verify APP and EM 385-1-1 compliance.
• Assist SSHO with accident and incident investigations.
• Have authority to make spot corrections or stop work for safety purposes.
• Conduct daily safety meetings with specific work crews.
• Conduct weekly employee safety meetings and attend monthly supervisory safety meetings.
• Generate and/or sign ENG Form 3394.

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• Maintain good housekeeping at the worksite.
• Report accidents and incidents immediately to supervisor.
• Have authority to make spot corrections or stop work for safety purposes.
• Attend employee safety meetings.

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c. **Means for controlling subcontractors and suppliers.** Prime contractor will meet with subcontractors and suppliers before work begins, and periodically thereafter, to coordinate activities and schedules, and to resolve any safety issues that may arise.

d. **Subcontractor and supplier safety responsibilities.** Subcontractors and suppliers will adhere to the requirements of the prime contractor’s APP. *(Note: Prime contractor will have subcontractors and suppliers sign the accident prevention plan signifying their understanding of, and compliance with, its provisions – See Appendix A on page 19.)*

6. **TRAINING.**

a. **Safety indoctrination subjects.**

- Personal protective equipment requirements for project site.
- Review of accident prevention plan and activity hazard analyses.
- Weekly (employees) and monthly (supervisors) safety meetings.
- Location of portable fire extinguishers.
- Location of first-aid kits.
- Identification of first-aid/CPR qualified personnel (if applicable).
- Location of emergency phone numbers.
- Location of the nearest on-site/off-site medical facility.
- Emergency plans for fires/spills (if applicable).
- Accident notification and reporting procedures.
- Current project site safety issues.

**Other safety indoctrination subjects.**

b. **Training or certifications applicable to the project.** *(Note: If the activity selected is in bold the prime contractor will provide employee names working the job along with their years of ‘on-the-job’ experience. If workers have attended a specific training class or hold a certification in the job the prime will also annotate this information – See Appendix B on pages 20 and 21.)*

- Abrasive blasting.
- Blasting.
- Compressed gas cylinders.
- Concrete/masonry.
- Confined space.
- Cranes/derricks.
- Crane hand signals.
- Electrical.
- Fall protection.
- First-aid/CPR.
- Formwork/shoring.
- Hand/power tools.
- Hazard communication.
- Hazardous waste.
- Lockout/tagout.
- Machinery/mechanized equipment.
Elevating work platforms.          Motor/all-terrain vehicles.
Excavation.                         Portable fire extinguishers.
Explosive-actuated tools.           Powered industrial trucks.
Pressurized equipment/systems.      Scaffold systems.
Respiratory protection.             Steel erection.
Rigging.                            Vehicle-mounted elevating platforms.
Rotating work platform.             Wearing/maintaining PPE.
Safe lifting techniques.             Welding/cutting.

Other training and certifications.

c. Weekly employee safety meetings.

Project manager, safety manager, site safety and health officer, or supervisor will conduct employee safety meetings.

Prime contractor and subcontractor workers will attend employee safety meetings.

Day and time of employee safety meetings is listed below:

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Meetings will be documented with facilitator/attendee names, date, and subjects discussed.

d. Monthly supervisory safety meetings.

Company owner, safety manager; or project manager will conduct supervisory safety meetings.

Prime contractor and subcontractor supervisors will attend supervisory safety meetings.

Day and time of supervisory safety meeting is listed below:

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Meetings will be documented with facilitator/attendee names, date, and subjects discussed.
7. **SAFETY AND HEALTH INSPECTIONS.**

a. □ Project site safety inspections.

- Company safety manager (periodically).
- Project manager (periodically).
- Supervisors and foremen (periodically).
- Site safety and health officer (SSHO) (frequently).
- Quality control representative (daily).
- Employees will conduct project site inspections of electrical cords, in-use hand and power tools, and in-use machinery/mechanized equipment (daily).

b. □ Inspector qualifications. Prime contractor will provide inspector qualifications for safety manager, SSHO, and quality control representative.

c. □ Deficiency log. A deficiency log will be generated after inspections using the criteria listed below. Follow-up inspections will be performed to ensure identified deficiencies have been corrected.

- Date deficiency identified.
- Description of deficiency.
- Name of person responsible for correcting deficiency.
- Projected resolution date.
- Date actually resolved.

d. **External inspections.** Are external inspections or certifications required? □ Yes □ No

If yes please explain.

8. **SAFETY AND HEALTH EXPECTATIONS AND COMPLIANCE.**

a. □ Company goal. Prime contractor will provide a safe and healthful worksite that is free from recognized or anticipated hazards that could cause serious injury or death. We will strive for a zero accident rate and demand zero tolerance for unsafe acts, the workers who perpetrate them, and persons in positions of leadership who condone such actions.

b. □ Incentive program. Prime contractor will provide their incentive program, if any.
c. □ Check the box if prime contractor will provide his own non-compliance program. If not, prime will put a check mark in paragraph’s d and e.

d. □ Worker non-compliance with safety requirements. The commission of unsafe acts will not be tolerated at the project site. In the event this type behavior occurs the following disciplinary actions will be taken:

- **First offense.** The offending party will be verbally warned and asked to correct the unsafe act (mentoring will take place if necessary - action will be noted in the daily report).
- **Second offense.** The offending party will be issued a written reprimand (action will be noted in the daily report).
- **Third offense.** The offending party will be removed from the worksite (action will be noted in the daily report).

e. □ Supervisor non-compliance with safety requirements. The condoning of unsafe acts at the worksite will not be tolerated. In the event this type behavior occurs the prime contractor will ensure disciplinary actions commensurate with the violation are taken.

9. **ACCIDENT REPORTING.**

a. □ Exposure data. Man-hours worked will be reported to the Resident Office by the 25th of every month.

b. □ Accident notification. Prime contractor will report accidents and incidents as soon as they happen to the contracting officer’s representative (COR). The COR, in turn, will notify the Resident Office according to the notification information below. For accidents and incidents that require immediate notification the prime contractor will seal-off the site and await for the SAS board of investigation team.

**Immediate notification (telephonically).**

- Fatality.
- Permanent total disability.
- Permanent partial disability.
- Three or more persons admitted to a hospital.
- Property damage of $200,000 damage or more.

**24-hour notification (telephonically and/or email).**

- Lost time (Note: Lost time is defined as any loss of time away from work beyond the day or shift on which it occurred).
- Property damage not less than $2,000 but no greater than $200,000.
- Treatment of medical injuries not resulting in lost time.

c. □ Accident recording. Prime contractor will coordinate with the COR on forwarding the appropriate documents to the SAS Safety Office.
Reportable accident and incident requirements. All accidents and incidents to include occupational injuries and illnesses that result in medical treatment with no lost time, and property damage of less than $2,000, will be documented in an email and sent to the Resident Office within 24 hours.

Recordable accident and incident requirements. All accidents and incidents to include occupational injuries and illnesses that result in lost time (measured in days) or property damage of $2,000 or more will be documented on ENG Form 3394 ‘U.S. Army Corps of Engineers Accident Investigation Report’ dated March 1999 and submitted to the Resident Office within 48 hours and to the SAS Safety Office within five (5) days of the occurrence.

10. MEDICAL SUPPORT.

a. General requirements.

☐ An effective means of communication (hard-wired, cellular, or two-way radio and tested in the area of use for functionality) with emergency response source access will be provided along with transportation for injured workers.

☐ Telephone numbers of medical facilities, physicians, and ambulances will be conspicuously posted (at a minimum these numbers will be posted near project-office telephones).

☐ A map showing the best route to the nearest medical facility will be conspicuously posted.

b. Type of medical support.

☐ Less than 100 persons employed on any one shift. On sites with less than 100 workers, and where neither a first-aid station nor infirmary is available, prime contractor will provided a first-aid kit for every 25 persons. These kits will have latex gloves and a CPR shield.

Location of first-aid kits.

☐ Trained first-aid/CPR employees. Prime contractor will have at least two employees on each shift trained to administer first-aid/CPR when a medical facility or physician is not accessible within five minutes of an injury to a group of two or more employees.

☐ More than 99 but less than 300 persons employed on any one shift. On sites with more than 99 but less than 300 workers the prime contractor will establish and equip, as directed by a licensed physician, a first-aid station. Identification signs and directional markers will be used to denote the station’s location. Emergency lighting will be provided and a first-aid attendant will be on duty at all hours when work is in progress.

☐ 300 or more persons employed on any one shift. On sites with 300 or more workers the prime contractor will establish and equip, as directed by a licensed physician, an infirmary. Identification signs and directional markers will be used to denote the infirmary’s location and emergency lighting will be provided.
Infirmaries will provide reasonably quiet conditions with some privacy, lighting, climate control, adequate toilet facilities, hot and cold water, drainage, and electrical outlets. Walls and ceilings will be finished with two coats of white paint, windows and doors screened, and the floors made of impervious construction.

A properly-equipped emergency vehicle, helicopter, or mobile first-aid unit will be provided during work hours (the emergency vehicle will not be used for any other purpose). A registered nurse, licensed physician’s assistant, certified emergency medical technician, or a licensed practical nurse (approval by a licensed physician) will be assigned on a full-time basis to each work site.

11. PERSONAL PROTECTIVE EQUIPMENT (PPE).

a. General Requirements.

☐ Prime contractor will conduct hazard assessments to find out the type(s) of PPE required.

☐ Prime contractor will ensure workers know how to put on, adjust, wear, remove, and use PPE. PPE will be inspected before each use, maintained in a serviceable and sanitary condition, and stored so the integrity of the equipment is protected. This training will be documented with the name of the facilitator/attendees, date, and subjects taught.

☐ Damaged and defective equipment will not be used but rather marked ‘out-of-service’ and removed from the project site.

b. PPE used on the project site.

☐ Minimum required clothing.
☐ Hard hat.
☐ Safety glasses/goggles.
☐ Face shield.
☐ Ear plugs/muffs.
☐ Work gloves.
☐ Welding gloves.
☐ Steel-toed/hard-soled shoes.
☐ Welding helmet.
☐ Welding goggles.
☐ Welding hand-held shields.
☐ Full-body harness w/lanyard(s).
☐ Body-belt (positioning device).
☐ Dust mask.
☐ Half-face/full-face respirator.
☐ Personal floatation device.
☐ Life ring.
☐ Reflective vest.

Other PPE used on the project site.

12. PLANS (PROGRAMS AND PROCEDURES) REQUIRED BY EM 385-1-1.

☐ Temporary facilities/layout plan (Section 4 on page 35). Written plan required.

☐ NA.
• Trailers and other temporary structures used as field offices, personnel housing, or storage areas will be anchored with rods and cables or by steel straps attached to ground anchors.
• Temporary facility spacing requirements will be in accordance with (IAW) paragraph 09.A.19.
• Temporary power distribution requirements will be IAW paragraph 11.D.01.
• Temporary project fencing will be provided on projects located in areas used by the public.
• Signs warning of construction hazards will be posted on fencing every 300’.
• Temporary structures with an electrical capability will be grounded.
• Temporary work camps will be adequately drained (graded and ditched) and rendered free from depressions where water may settle.
• The area surrounding the structures will be free of debris, garbage, and rubbish.
• Temporary sleeping quarters will be heated, ventilated, lighted, and maintained in a clean and safe condition.

☐ Emergency response plans for fires/spills (Section 1, paragraph 01.E.01 (a) on page 17). Written plan required.

☐ NA.

• Discuss escape procedures and routes.
• Designate critical project site operations and discuss how the operations will be protected.
• Discuss employee accountability procedures following an evacuation.
• Discuss employee roles in emergencies to include responsibilities and equipment used.
• Discuss the location of emergency contact information to include reporting procedures.

☐ Hazard communication plan (Section 1, paragraph 01.B.06 (a-c) on page 12). Written plan required.

☐ NA.

• A current inventory of project site hazardous chemicals will be prepared.
• Material safety data sheets for hazardous substances will be kept at the project site.
• Containers will be labeled with the type of hazardous substance they contain.
• Workers will be notified about new substances that are brought onto the worksite to include the hazards associated with them.

☐ Respiratory protection plan (Section 5, paragraph 05.E.01 on page 54). Written plan required.

☐ NA.

• Discuss the use of dust masks to protect workers from large particulate matter.
• Discuss the use of half-faced respirators to protect workers from small particulate matter to include fumes, mists, and aerosols.
• Discuss sealing a half-face respirator properly.
• Discuss cleaning a half-faced respirator properly
• Discuss inspecting and storing a half-face respirator properly.
Health hazard and control plan (Section 6 on page 87). An activity hazard analysis will be completed for each applicable area.

NA.

- Discuss hazardous substances.
- Discuss hot substances (heating devices and melting kettles).
- Discuss harmful plants, animals, and insects.
- Discuss ionizing radiation.
- Discuss the use of lasers.
- Discuss ventilation and exhaust systems.

Abrasive blasting plan (Refer to Item 11. ‘Abrasive Blasting’ in Appendix C of EM 385-1-1 dated 3 November 2003). Written plan required.

NA.

Confined space plan (Section 6, paragraph 06.1 on page 113).
Written plan required.

NA.

- Discuss responsibilities of attendants, entrants, and entry supervisors.
- Train workers how testing and monitoring equipment is used.
- Discuss the type of ventilating equipment needed to obtain acceptable entry conditions.
- Discuss the type of communication equipment to be used.
- Discuss the PPE to be used when engineering and/or administrative controls fail to protect workers adequately.
- Discuss the lighting equipment to be used.
- Discuss the equipment to be used for entrant ingress and egress.
- Discuss rescue procedures to include required equipment and emergency phone numbers.

Hazardous energy control plan (Section 12 on page 249).
Written plan required.

NA.

- Discuss why the lockout/tagout procedure is being used.
- Communicate and coordinate the lockout/tagout procedure with the workers being affected by the procedure and the government’s designated authority.
- Discuss the procedural steps in place for shutting down, isolating, blocking, and securing systems to control the release of hazardous energy to include the person(s) responsible for performing this task.
- Discuss the procedural steps in place for placing, removing, and transferring lockout/tagout devices to include the person(s) responsible for performing this task.
- Discuss the procedural steps in place for placing and removing locks and/or tags to include the person(s) responsible for performing this task.
- Discuss the procedures for testing the effectiveness of isolating hazardous energy to include lockout/tagout.
• Discuss emergency scenarios that could arise during the lockout/tagout procedure to include the actions to be taken for safely responding to an emergency.

• Discuss the procedure for transferring removal authority from one person to another.

☐ Critical lift plan (Section 16, paragraph 16.C.18 on page 315).
Written plan required.

☐ NA.

• Designate a crane operator, lift supervisor, and rigger (and state their qualifications).
• Describe ground conditions and outrigger and crawler track requirements.
• Discuss crane position, height of the lift, load radius, and boom angle and length for the entire range of the lift.
• Discuss the size and weight of the load to include any crane and rigging components that add to the weight.
• Discuss the rigging plan to include lift points, hardware requirements, and procedures.
• Discuss coordination of the lift and how individual players will communicate with each other.
• Discuss tandem and tailing-crane lift procedures, if applicable.
• Describe environmental conditions which, when in effect, will stop the lift.

☐ Access and haul roads plan (Section 8, paragraph 08.D.01 on page 147).
Written plan required.

☐ NA.

• Discuss equipment to be used on the road, traffic density, and the hours of operation.
• Discuss road layout and widths, horizontal and vertical curve data, and sight distances.
• Discuss sign and signalperson requirements, road markings, and traffic-control devices.
• Discuss how drainage will be controlled.
• Outline contact between vehicles and the public to include implementing safety controls at each one of these places.
• Discuss the maintenance needed to keep the roads hard, smooth, and as dust-free as possible.

☐ Demolition plan (Section 23 on page 477).
Written plan required.

☐ NA.

• A demolition plan based on engineering, lead, and asbestos surveys will be prepared.
• Utilities and other service lines will be shut-off, capped, or otherwise controlled outside the building line.
• Service lines will be temporarily relocated and protected if utilities are maintained.
• If hazardous building materials and chemicals, flammable materials, explosives, gases, or other dangerous substances have been used in building construction, pipes, tanks, or other equipment on the property they will be controlled or eliminated before demolition begins.
• Glass fragmentation will be controlled.
• Mechanical equipment will not be used on floors or other working surfaces unless the floors and surfaces are of sufficient strength to support the loads.
• Chute openings will be protected by a guardrail 42” in height. When debris is dropped through floor openings without chutes, the openings and the area onto which the material is dropped will be enclosed with barricades not less than 42” in height and not less than 6’ back from the protected edge of the opening above. Signs warning of the fall-material hazard will be posted at each side of the debris opening at each floor.

• No wall section more than 6’ in height will stand without lateral bracing unless the wall was designed and constructed to stand without this support and its condition is determined safe enough to be self-supporting.

• Workers will not be allowed in the area directly underneath floor arches when they’re being removed. The area will be barricaded to prevent access and signed to warn of the hazard.

• Steel construction will be dismantled column-by-column and tier-by-tier (columns may be in two-story lengths).

Compressed air plan (Section 20 on page 393).
No written plan required.

NA.

Compressors and related equipment will be located so safe access is provided to all parts of the equipment for operation, maintenance, and repairs.

• Air hose, pipes, valves, filters, and other fittings will be pressure-rated by the manufacturer and not exceeded. Defective hose will be removed from service.

• Hose will not be laid over walkways, steps, ladders, and scaffolds to create a tripping hazard.

• Compressed air will not be used to blow dirt from the hands, face, or clothing.

• A speed governor independent of the unloaders will be installed on air compressors except those driven electrical induction or electrical synchronized motors.

• Piping will be equipped with traps or other means for removing liquid from the lines.

• Air receivers will be installed so that all drains, hand holes, and manholes are accessible.

Formwork/shoring (Section 27, paragraph 27.B on page 539).
Written plan required.

NA.

• Formwork, shoring, and bracing will be erected and maintained to safety support all vertical and lateral loads that might be applied until such loads can be supported by the structure.

• Sills will be sound, rigid, and capable of carrying the maximum intended load.

• Base plates, shore heads, extension devices, or adjustment screws will be in firm contact with the sill and form material and, as applicable, will be snug against the posts.

• Diagonal bracing will be provided in vertical and horizontal planes to provide stiffness and to prevent buckling of the individual members.

• Forms and shores (except those on slab or grade and slip forms) will not be removed until the concrete has gained sufficient strength to support its weight and all superimposed loads.

Jacking plan (lift) slab plan (Section 27, paragraph 27.D on page 545).
Written plan required.

NA.
• Manufacturer’s rated capacity will be legibly marked on all jacks and not exceeded.
• Jacks will be designed and installed so they won’t continue to lift when overloaded.
• Jacks will have a positive stop to prevent over-travel.
• Base of the jack will be blocked or cribbed. If there’s a possibility of slippage a wood block will be placed between the jack’s metal cap and the load.
• Maximum number of manually-controlled jacks on one slab will be limited to 14.
• During lifting all point of the slab support will be kept within ½” of that needed to maintain the slab in a level position.
• No one will be permitted under the slab during jacking operations.

☐ Personal fall protection systems (Section 21, paragraph 21.C on page 415). No written plan required.

☐ NA.

• Workers will be protected by guardrail, personal fall protection, safety nets, catch platforms, or temporary floors in the following situations: Worker can fall 6’ or more; on access ways or work platforms over water, machinery, or dangerous operations; on runways where workers can fall 4’ or more; and on all exposed sides of stairways and ladder-floor openings.
• Top rails, mid rails, and toe boards will be able to withstand outward and downward forces of 200, 150, and 50 lbs., respectively.
• Wire rope can be used as a top or mid rail under the following conditions: When the posts are spaced no farther than 8”; deflection of the rope under 200 lbs. of force is less than 3”; and the rope if flagged for visibility. Synthetic and natural-fiber rope will not be used.
• Paneling and screening will be in place from the mid rail to the toe board when material is piled higher than the toe board.
• Personal fall protection will consist of a full-body harness (not chest-wait units or body belts), lifeline, and anchorage point.
• Two lanyards will be used when vertical movement is required and when a horizontal lifeline is inappropriate.
• Anchorages capable of supporting 5,000 lbs. per worker will be independent of anchorages used to support or suspend platforms. Lifelines will not be attached to guardrails or hoists but rather to the structure.
• Floor holes will be covered completely and securely. If the cover to an open hole is missing the hole will be barricaded with a guardrail. Workers laboring by wall openings 6’ or more above a lower level will be protected by a guardrail or personal fall protection.
• Roofer’s will be protected by the following forms of fall protection: Guardrails; personal fall protection; a warning line 6’ from the roof’s edge, or a safety-monitoring system.
• Excavations will be guarded when they are 6’ or more in depth and not readily seen because of plant growth or other visual barriers.

☐ Steel erection plan (Section 27, paragraph 27.E on page 546). Written plan required.

☐ NA.

☐ Night operations lighting plan (Refer to Section 7, Table 7-1 ‘Minimum Lighting Requirements’. No written plan required.

☐ NA.
☐ Site sanitation plan (Section 2 on page 19).
   No written plan required.

☐ NA.

- An adequate supply of drinking water (cool water during hot weather) will be provided.
- Portable drinking-water dispensers will have a tap – water will not be dipped. Dispensers will be clearly marked as “Drinking Water” and will be capable of being closed. Use of a common cup will be prohibited unless sanitized between uses.
- When sanitary sewers are not available porta-johns will be provided.
- Washing facilities will have running water, soap, and an individual means of drying (hand sanitizer will be used when running water is not practical).
- No food or beverage will be stored or consumed in a toilet room or in any area that is exposed to a toxic material.
- An adequate number of waste receptacles will be provided. Receptacles will have covers that fit tightly, be emptied at least daily, and be maintained in a sanitary condition.

☐ Fire prevention plan (Section 9, paragraph 09.A on page 163).
   Written plan required.

☐ NA.

- Discuss the major worksite fire hazards to include potential ignition sources.
- Describe the types of fire-suppression systems to be used (portable fire extinguishers, ect.).
- Discuss employee responsibilities for maintaining the fire-prevention equipment and systems.
- Discuss employee responsibilities for controlling fuel-source hazards.
- Discuss housekeeping procedures to include the removal of waste materials.

13. CONTRACTOR INFORMATION.

☐ Excavations (Section 25 on page 489).
   No written plan required.

☐ NA.

- Workers will not labor in excavations in which there is accumulated water or where water is accumulating until the water hazard is controlled.
- Excavations less than 5’ in depth will not require support systems if they are determined safe by a competent person.
- Shoring will be used for unstable soil or depths greater than 5’ unless benching, lay-back, or another acceptable plan can be implemented.
- In excavations less than 20’ in depth the maximum slope will be 34 degrees measured from horizontal (1 1/2’ horizontal to 1’ vertical).
- Excavations will not go below adjacent structures unless they are underpinned or determined safe by a registered professional engineer.
- Excavated material will be placed a minimum of 2’ from the excavation’s edge.
- Stairs, ramps, or ladders will be provided to workers who are required to enter excavations greater than 4’ in depth. This equipment will be located so no more than 25’ of lateral travel is required to escape the excavation.
• Ladders will extend 3’ past the excavation’s edge.
• Personal access ramps will be 4’ wide with guardrails while equipment ramps will be 12’ wide with curbs of 8” X 8” timbers or equivalent.
• Protection for excavations exposed to the public will meet guardrail requirements while protection against vehicles will be able to withstand the impact forces with traffic.
• Excavations 6’ or more in depth, or where workers are routinely exposed to a hazard (impalement or hazardous material), will have a barricade no closer to the edge than 6’ with a warning (tape, flags, act.) located 3-4’ above the ground.
• Excavations less than 6’ in depth will have a barricade no closer than 6”/no farther than 6”.

☐ Scaffolds (Section 22, paragraph 22.B on page 430).
  No written plan required.

☐ NA.
  • Scaffolds will be level and plumb and erected with base plates upon mudsills or other adequate foundation. Rolling scaffolds will have wheels locked and/or outriggers secured in place.
  • Work near overhead power lines will not commence until a survey is made to ascertain a safe clearance distance from the lines. Scaffolds will not be erected or used near power lines until the lines are insulated, de-energized, or rendered safe.
  • Scaffolds and their components will be capable of supporting four times the maximum anticipated load. If a scaffold’s height is more than four times the minimum base dimension (to include the width added by outriggers) it will be secured to the wall or structure.
  • Guardrails will be installed on open sides and ends.
  • Platforms will be a minimum of 18” in width and extend over their end supports by at least 6” but no more than 12” unless cleated or restrained by hooks or equivalent means. Platforms will overlap over supports by a minimum of 12” unless nailed together or restrained from movement.
  • Platform area will be fully-planked with no greater than 1” gaps between adjacent platforms, and platforms and uprights.
  • Scaffold access will be from ladders (bottom rung no greater than 24” in height), stair towers, ramps, and walkways but not from cross-braces.
  • If a worker can fall 6’ or more to a lower level they will be protected by a guardrail or a full-body harness with lifeline and anchorage point.

☐ Machinery/mechanized equipment (Section 16 on page 291).
  No written plan required.

☐ NA.
  • Before machinery and mechanized equipment is placed into service it will be inspected and certified as safe by a competent person.
  • Front-end loaders, bulldozers, backhoes, cranes, and similar equipment will have at least one dry chemical or CO2 portable fire extinguisher on-board with a minimum rating of 5-B:C.
  • Self-propelled construction equipment will have a reverse signal alarm.
  • Belts, gears, chains, shafts, pulleys, drums, and other rotating and moving equipment parts will be guarded when exposed to contact by persons or when they otherwise create a hazard.
  • Crane will operate at least 10’ away from overhead power lines.
• An operating manual, log book, load chart, and document detailing operating limits in windy or cold weather conditions will be in the cab when the crane is operating.
• Crane will be within one degree of level and outriggers fully-extended when in use. Wheels will be off the ground at every setting.
• Crane outrigger floats will be securely attached. Float blocking will be of sufficient size and stability to support the total area. Blocking will not be performed under the outrigger beams.
• Crane’s rear swing radius will be barricaded.
• Riding on or standing under loads is prohibited.

☐ Electrical (Section 11 on page 209).
No written plan required.

☐ NA.

• Work activity adjacent to energized overhead power lines will not be initiated until a survey has been made to ascertain the safe clearance distance from the lines.
• Whenever possible, all circuits and equipment will be de-energized before work is started and personnel protected by lockout/tagout and clearance procedures, and grounding.
• Live parts of wiring or equipment will be guarded.
• Transformer banks and high-voltage equipment will be protected against unauthorized access and those entrances not under constant observation will be kept locked. Metallic enclosures will be grounded and signs warning of high voltage and prohibiting unauthorized entrance posted.
• Flexible cords will be inspected by the user daily. Cord sets used on construction sites or in damp locations will contain an equipment ground wire and have a plug attached.
• Flexible cords will be protected from damage caused by vehicles, foot traffic, sharp corners, and pinching. Cords passing through holes will be protected by suitable means.
• Flexible cords will only be used in continuous lengths. Cords No. 12 or larger may be used with a splice if the splice is made by a qualified electrician, the insulation is equal to the cord being spliced, and the wire connections are soldered. No wire nuts will be used.
• Flexible cords and cables will not be secured by staples or hung from nails or bare wire.
• Enclosures containing over-current protective devices will be provided with lockable, close-fitting doors. Circuit-breakers, switches, fuse panels, and motor controllers located out-of-doors or in wet locations will be contained in weatherproof enclosures or cabinets. When receptacles are used in wet locations they will be contained in a weatherproof enclosure the integrity of which is not affected when a plug is inserted.
• All electrical circuits will be grounded.
• Portable and semi-portable electrical tools and equipment will be grounded by a multi-conductor cord having a polarized plug with a grounding conductor. Double-insulated tools do not have to be grounded.
• Grounding rods with pipe electrodes will be used in 8’ lengths and driven to full depth.
• Temporary lights will not be suspended by their electric wire unless designed for suspension.
• Bulbs attached to temporary lighting strings and extension cords will be protected by guards. Empty light sockets (broken bulbs, etc.) will be immediately filled.

14. SITE-SPECIFIC HAZARDS AND CONTROLS. An activity hazard analysis will be prepared detailing hazards and controls for each project site activity (See pages 22 and 23).
## APPENDIX A
### SUBCONTRACTOR AND SUPPLIER ACCEPTANCE OF ACCIDENT PREVENTION PLAN

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### APPENDIX B
### SPECIFIC WORKER TRAINING

**Abrasive blasting.**

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**Blasting.**

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**Confined space.**

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**Cranes/derricks.**

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**Electrical.**

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Explosive-actuated tools.

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First-aid/CPR.

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Lockout/tagout.

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Machinery/mechanized equipment.

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CHAPTER 09   ENVIRONMENTAL CONCERNS

09-1   GENERAL

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

09-1.1 Purpose
USACE construction contracts require contractors to minimize environmental pollution and damage that may occur as a result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of the contract. The contract documents also require contractors to comply with all applicable environmental Federal, State, and local laws and regulations and assigns total responsibility to contractors for any delays resulting from failure to comply with environmental laws and regulations. Field Personnel must be cognizant of the environmental regulations to assure compliance during the final execution of the project.

09-1.2 References
   a. CFR Title 40, Protection of Environment

09-1.3 Responsibilities
Responsibility for environmental compliance resides within all team members with the AE/RE ultimately responsible for overall adherence.

09-1.4 Definitions
   a. None.
09-2 **ENVIRONMENTAL CONSIDERATIONS**

Key environmental requirements must be taken during the master planning process if all environmental issues are not resolved during the planning process the project will fail during execution. The original site location of the project must take into consideration the NEPA requirements. This work is normally the responsibility of the installation with support from the COE. COE can support the installation upon request. On Civil Works Projects the COE may be responsible for all NEPA documentation.

09-2.1 **Key Environmental Acts**

**NEPA** - The National Environmental Policy Act (NEPA) requires Federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, Federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS). EPA reviews and comments on EISs prepared by other Federal agencies, maintain a national filing system for all EISs, and assure that its own actions comply with NEPA. The field office must be aware of the NEPA documentation during the execution phase of the project. There may be specific limitations that must be complied with. For additional information concerning NEPA see [http://www.epa.gov/compliance/resources/policies/index.html](http://www.epa.gov/compliance/resources/policies/index.html).

**Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S.C. 6901)** - The RCRA is a Federal law of the United States contained in 42 U.S.C. §§6901-6992k. The Environmental Protection Agency (EPA) states that RCRA's goals are:

- to protect the public from harm caused by waste disposal
- to encourage reuse, reduction, and recycling
- to clean up spilled or improperly stored wastes

EPA waste management regulations are codified at 40 C.F.R. pts. 239-282. Regulations regarding management of hazardous waste begins at 40 C.F.R. pt. 260. As noted below, most states have enacted laws and promulgated regulations that are at least as stringent as the Federal regulations. Furthermore, the statute authorizes states to carry out many of the functions of RCRA through their own agencies, if such programs have been approved by the EPA.

Clean Water Act (CWA) (33 U.S.C. 1251) - The CWA is the primary Federal law in the United States governing water pollution. Commonly abbreviated as the CWA, the act established the symbolic goals of eliminating releases to water of high amounts of toxic substances, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983.

The principal body of law currently in effect is based on the Federal Water Pollution Control Amendments of 1972, which significantly expanded and strengthened earlier legislation. Major amendments were enacted in the CWA of 1977 enacted by the 95th United States Congress and the Water Quality Act of 1987 enacted by the 100th United States Congress.

The CWA policies are essential to any projects that discharge water from the construction site. For additional information see [http://en.wikipedia.org/wiki/Clean_Water_Act](http://en.wikipedia.org/wiki/Clean_Water_Act).

Clean Air Act (CAA) - The CAA, like other laws enacted by Congress, was incorporated into the United States Code. The House of Representatives maintains a current version of the U.S. Code, which includes amendments of the CCA enacted since 1990. To see the current provisions of the CAA, you should refer to Title 42, Chapter 85 of the U.S. Code. Section numbers are different; for example, section 101 in the CAA is equivalent to section 7401 in the U.S. Code. CAA is applicable to any project that discharges particles unto the air. For additional information see [http://www.epa.gov/air/caa/](http://www.epa.gov/air/caa/).

Oil Pollution Act (OPA) (Title 33 U.S.C. 2701) - The Oil Pollution Act (OPA) was signed into law in August 1990, largely in response to rising public concern following the Exxon Valdez incident. The OPA improved the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the money and resources necessary, to respond to oil spills. The OPA also created the national Oil Spill Liability Trust Fund, which is available to provide up to one billion dollars per spill incident. [http://www.epa.gov/emergencies/content/lawsregs/opaover.htm#overview](http://www.epa.gov/emergencies/content/lawsregs/opaover.htm#overview)

Federal Facility Compliance Act (42 U.S.C. 962) - The Federal Facility Compliance Act of 1992 amends the Resource Conservation and Recovery Act (RCRA) which was a set of amendments to the Solid Waste Disposal Act (SWDA), 42 U.S.C. § 6901-6992(k). It establishes that Federal facilities do not have sovereign immunity from state enforcement of state environmental laws. The result is that all Federal agencies, having jurisdiction over a solid waste facility or disposal site, or engaged in the management of solid or hazardous waste are subject to all applicable Federal, state, and local laws, regulations, and ordinances addressing solid and hazardous waste. Thus, they are obligated to pay fines and penalties assessed by states. In addition, Federal facilities now must reimburse the EPA for yearly inspections, and states may assess service charges for permitting and inspections of Federal facilities. For additional information see: [http://www.ntc.blm.gov/learningplace/res_FFCA.html](http://www.ntc.blm.gov/learningplace/res_FFCA.html)
Pollution Prevention Act (Title 42 United States Code (U.S.C.) 13101) - The Pollution Prevention Act of 1990, Congress established a national policy that:

- pollution should be prevented or reduced at the source whenever feasible
- pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible
- pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible
- disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner

Pollution prevention means "source reduction," as defined under the Pollution Prevention Act, and other practices that reduce or eliminate the creation of pollutants. For additional details see http://www.epa.gov/p2/.

09-2.2 RFP Development
During the development of the RFP, the PDT must assure that all environmental regulations are taken into consideration. Environmental issues not adequately covered in the design process must be addressed prior to the advertisement of the project. The environmental issues must be addressed and solved prior to the start of work. See environmental check list provided in Chapter 2 and 3 of this manual.

09-2.3 Contract Award Documents
In the Transition documents after award all applicable documents must be provided to the AE/RE to assure environmental compliance. See Chapter 2 and 3 for transition checklist.

09-3 KEY CONSTRUCTION CONSIDERATIONS
During quality assurance review and oversight, considerations should be given to those issues which may have a major and adverse affect on the environment and safety of construction personnel. Attention and preparation for adequate response must be given to any issue which may create a hazard to any of the environmental entities. Construction related issues should address:

09-3.1 Asbestos Containing Materials (ACM) -
Asbestos – Asbestos is the name given to several naturally occurring, fibrous silicate minerals and was commonly used years ago as an acoustic insulator, thermal insulation, fire proofing and in other building materials. It is made up of microscopic bundles of fibers that may become airborne when asbestos-containing material is damaged or disturbed. When inhaled into the lungs these fibers can cause significant health problems such as asbestosis, lung cancer, and mesothelioma and are defined as the asbestiform varieties of Chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite/grunerite); anthophyllite; tremolite; and actinolite.
Some materials are cement pipes, laboratory hoods/table tops, elevator brake shoes, cement wallboard, lab gloves, HVAC duct insulation, cement siding, fire blankets, boiler insulation, vinyl floor covering, elevator equipment panels, ductwork, flexible fabric connections, asphalt floor tile, fire curtains, breaching insulation, vinyl sheet flooring, caulking/putties, cooling towers, flooring backing , adhesives, pipe insulation (corrugated air-cell, block, etc.), construction mastics (floor tile, carpet, ceiling tile, etc.), wallboard, heating and electrical ducts, acoustical plaster, joint compounds, vinyl wall coverings, decorative plaster spackling compounds, high temperature gaskets, textured paints/coatings, roofing shingles, roofing felt, ceiling tiles, lay-in panels, base flashing, thermal paper products, spray-applied insulation, fire doors ,electrical cloth, blown-in insulation, electrical panel partitions, fireproofing materials, taping compounds (thermal), packing materials (for wall/floor penetrations), electric wiring insulation, and chalkboards. The list of materials can be huge and special attention should be given to control and disposal when these items are present within the proposed construction area.

Vermiculite is a natural, non toxic mineral which expands with the application of heat. Asbestos contamination of vermiculite and vermiculite products is considered to be of national concern. The use of these vermiculite products require determination of asbestos-free contamination prior to use in construction.

09-3.2 Lead
Lead is a highly toxic metal which may cause a range of health effects. Research suggests the primary sources of lead exposure are deteriorating lead-base paint, lead contaminated dust, and lead contaminated residential soils. Construction materials, such as paint, are to be examined and certified as being lead free. Surveys for lead containing materials should be made of existing structures prior to demolition/rehabilitation efforts and proper certification and disposal efforts conducted.

09-3.3 Mold
Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints. Attention should be given to the potential for mold occurring within a proposed structure in the latter and finished stages of its construction. Although there is no practical way to eliminate all mold and mold spores in the indoor environment, the way to control indoor mold growth is to control moisture. This can be done by preventing a potential water problem or leak to prevent mold growth. Reducing the indoor humidity (to 30-60% ), where possible, will help to decrease mold growth and can be accomplished by providing venting for bathrooms, dryers, and other moisture-generating sources to the outside; using air conditioners and de-humidifiers; increasing ventilation; ensuring positive pressurization of buildings; and using exhaust fans whenever cooking, laundry, and dishwashing areas are contemplated. Ensure damp or wet building materials and furnishings are cleaned and dried within 24-48 hours to prevent mold growth. Clean mold off hard surfaces with water and detergent, and dry completely. Absorbent materials such as ceiling tiles, which are moldy, may need to be replaced. Prevent possible condensation problems by reducing the potential for condensation on cold surfaces (i.e., windows, piping, exterior walls, roof, or floors) by adding insulation. Ensure that in areas where there is a perpetual moisture problem, that the designer
has not chosen to install carpeting (i.e., by drinking fountains, by classroom sinks, or on concrete floors with leaks or frequent condensation).

09-3.4 Underground Storage Tanks (UST)
In 1988, EPA issued UST regulations divided into three sections: technical requirements, financial responsibility requirements, and state program approval objectives. EPA regulations require all tanks installed after December 1998 have spill, overfill, and corrosion protection. EPA regulations do not cover farm/residential tanks of 1100 gallons or less capacity holding motor fuel used for noncommercial purposes, tanks storing heating oil used on the premises where it is stored, tanks on or above the floor of underground areas (such as basements or tunnels), septic tanks and systems for collecting storm water and wastewater, flow-through process tanks, and emergency spill and overfill tanks. USTs must have leak detection which can detect a leak from any portion of the tank or its piping that routinely contains petroleum, the leak detection is installed, calibrated, operated, and maintained in accordance with the manufacturer’s instructions, and leak detection meets the performance requirements described in the Federal regulations (40 CFR Part 280, Sections 280.43 and 280.44)

09-3.5 Polychlorinated biphenyls (PCB’s)
Polychlorinated biphenyls (PCB’s) - Fluorescent ballasts manufactured prior to 1979 may contain high percentages of PCB’s. It is always best to check for current Federal, state, and local government requirements and local facilities for proper recycling and proper disposal instructions. Ballasts manufactured after 1979 should not contain PCB’s, and are normally labeled “No PCB’s”. If the ballast is unlabeled, it should be assumed that it does contain PCB’s.

09-3.6 Oil Water Separators (OWS)
OWS’s are typically installed in industrial and maintenance areas and receive oily wastewater generated during processes such as aircraft and vehicle maintenance and washing. The effluent from oil/water separators is typically discharged to either a sanitary sewer system or a storm sewer. Discharges of domestic and industrial wastewater are regulated under the CWA. Properly designed, installed, and operated; oil/water separators provide a treatment system for handling oily wastewater that prevents the entry of unacceptable levels of contamination to a storm sewer or sanitary sewer system. However, oil/water separators are generally not designed to separate solids or high concentrations of oil from water, such as might occur, for example, when a large quantity of oil or sludge is spilled or poured into a wash bay drain. Thus, it is important for all personnel who discharge wastewater into an oil/water separator to understand how they function, including their limitations, in order to prevent them from becoming sources of environmental pollution.

09-3.7 Storm Water Management
Storm Drains – Polluted storm water runoff from construction sites often flows to storm drainage systems and ultimately is discharged into local rivers and streams. The runoff from construction sites can contribute more sediment to streams than can be deposited naturally during several decades. Runoff that contains nutrients such as nitrogen and phosphorous, are of specific concern and can cause significant water quality issues. Other pollutants such as solid and sanitary
wastes, pesticides, oil and grease, concrete truck washout, construction chemicals, construction debris, and metals may be discharged and cause an impact on receiving waters. Effective construction site planning and pollution prevention can dramatically reduce pollutant loading to stream ecosystems and other environmentally sensitive areas.

**Many States require a Level I or II certificate for anyone involved with land disturbance.** The bill defines land-disturbing activities as any activity which may result in soil erosion and the movement of sediments into state water or onto lands within the state. The law affects landscape contractors, parks and recreation workers, landscape designers, machine operators, construction contractors, homebuilders and utility contractors. Farming and minor landscape repairs and maintenance work are exempt. To become certified, you must attend one of three courses designed especially for regulatory inspectors and erosion-control design professionals.

**09-3.8 Mercury**

Mercury is toxic to the human and animals. Mercury can cause a range of physical symptoms including inability to coordinate body movement and impairment of hearing, speech, vision, skin rashes, and kidney damage. Some sources of mercury are fluorescent lamps and ballasts and fossil fuel combustion.

**09-3.9 Boilers and Diesel Generators**

Boilers and or Generators over a certain size are subject to permit requirements under the CAA. The AE/RE and PE must be cognizant of the permit requirements. If an individual boiler is over 400 MBTUH or 350 KVA the permitting requirements must be verified prior to ordering the equipment.

**09-4 CONTRACT SPECIFIC REQUIREMENTS**

Prior to commence any construction activity or delivery of materials to the site, the Contractor is required to submit an Environmental Protection Plan (EPP) for review and acceptance by the Contracting Officer, with the purpose of requiring the contractor present a comprehensive overview of known or potential environmental issues which the contractor must address during construction. The plan must address all issues of concern as defined by the specifications and must identify the person(s) within the Contractor’s organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

**State and Local Requirements** - State and local regulatory agencies may require compliance with standards that may be more stringent than Federal requirements. It is important for each installation to contact their state and local regulatory agencies for information on regulations and standards applicable to oil/water separators.
09-5 **CONTRACTOR RESPONSIBILITIES**

In addition to being a contract requirement, a well planned and conscientiously applied Environmental Protection program is essential to the quality and efficiency of the work and minimization of costs.

The contractor’s responsibility is not limited to the preparation of an Environmental Protection Plan document but also to provide the necessary qualified personnel for environmental protection, provide all required drawings showing locations of borrow areas, temporary excavations, embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, stockpiles of excess materials and methods of runoff control and containment.

09-5.1 **EPP Requirements**

As part of the EPP, the contractor is responsible for the preparation and submission of plans such as an erosion and sediment control plan, a traffic control plan, a work area plan, a spill control plan, a non hazardous solid waste disposal plan, a recycling and solid waste minimization plan, an air pollution control plan, a contaminant prevention plan, a waste water management plan, a historical, archeological, cultural resources and wetland plan, a pesticide treatment plan and any other plan that may be required by the contract documents. Sometimes these plans are required prior to the award of a contract depending on State requirements.

As part of the contractor’s accepted EPP, each of the contractor’s employees shall receive an initial environmental training based on the environmental program required by the contract.

09-6 **QUALITY ASSURANCE RESPONSIBILITIES**

To ensure that the intent of the Environmental Protection program is met, the AE/RE and his/her staff must familiarize with all environmental requirements of the contract. They must take an aggressive, sincere interest in the environmental program, making it clear to field office personnel and representatives of the contractor that the environmental clauses of the specifications carries the same weight and given the same attention as all other provisions of the contract.

The contractor must submit an acceptable EPP before beginning work. The plan will be reviewed by the field office and the environmental section of the District. Within 10 days of receipt of comments to the plan they will be entered into RMS. Revisions to the plan may be necessary during the course of the contract, as this is an active document.

Quality Assurance personnel assigned to construction projects shall perform detailed reviews of the environmental requirements during the BCOE review process and become very familiar with the permit conditions and requirements.

It is also very important and beneficial for the AE/RE and his/her staff to contact that state and local environmental officials and establish a good working relationship from the award of the
contract. State and local environmental officials shall be notified on relevant environmental issues.

09-7 NOTICE OF VIOLATIONS (NOVS)

It is the responsibility of the AE/RE to notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor’s EPP. The AE/RE has the option of issuing an order stopping all or part of the work until satisfactory corrective action is taken by the contractor. Again, field personnel need to become very familiar with applicable Federal, State and local environmental laws and regulations in order to be able to properly determine possible noncompliance issues. In cases where field personnel are not completely familiar with the applicable laws or regulations, they should immediately consult with the Environmental section of the District.

09-8 OTHER ENVIRONMENTAL ISSUES

As part of the preparation of the environmental requirements of the contract documents, the environmental section must prepare an environmental matrix which will describe all environmental actions required after award of the contract and assign responsibilities and due dates for all required environmental actions. The matrix must contain the Permit/Authorization No., issuance and expiration date, Permit Reference, Specification Section reference, deadline, responsible entity, require dates. This information is separated in Pre-Construction, During Construction, and Post-Construction environmental requirements. This matrix is a very useful tool that will allow field personnel to keep close track of all environmental compliance schedules. An example environmental compliance matrix is shown in Exhibit 9-9.1

09-9 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page.
09-9.1 Environmental Compliance Matrix

TO BE ADDED.
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CHAPTER 10  PERIODIC PROGRESS UPDATES

10-1 PERIODIC PROJECT UPDATES

10-1.1 Purpose
The purpose of this chapter is to outline requirements for periodic project updates. These requirements cover required verifications from the QA/QC perspective and go beyond just a review of the progress payment. The administrative portion of periodic progress updates is covered in the CA Manual. The CA Manual also provides a CD Checklist for Progress/Final Payments in Chapter 4.

Periodic project updates shall include a review of the progress, the quality of work, stored materials, as-built drawings, weather data, status of payrolls and insurance, LEED, environmental compliance, status of submittals, progress photos and any other contract requirements that require periodic review prior to the end of the contract.

RBP – When using the standard checklist, Project Engineers must identify project specific items not covered and add them to the checklist.

10-1.2 Applicability
This procedure applies to all Area/Resident Engineer Offices and sub-offices within Construction Division.

10-1.3 References
a.  UFGS 01320A / UFGS 013201.0010 - Project Schedule
b.  UFGS 01330 / UFGS 013300 – Submittal Procedures
c.  UFGS 013329 – LEED™ Documentation
d.  UFGS 01312A / UFGS 014502.0010 – Quality Control System (QCS)
e.  UFGS 01451A / UFGS 014504.0010 – Construction Quality Control
f.  UFGS 01780 / UFGS 017802.0010 – Closeout Submittals
10-1.4 Responsibilities
Area/Resident Engineers (AE/RE) are responsible for the overall approval of periodic progress updates. Project Engineers, Office Engineers, or other designated individuals are responsible for ensuring that the update is proper, accurate, and reflects all contract performance areas and not just the ones outlined in this chapter.

10-1.5 Definitions
Leadership in Energy and Environmental Design (LEED). LEED is a rating system to define and measure “green” buildings. LEED is a measurement system designed for rating new and existing commercial, institutional and residential buildings. It is based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts. The rating system evaluates environmental performance from a whole building perspective over a building’s life cycle, providing a definitive standard for what constitutes a “green building”. LEED is the US Green Building Council’s (USGBC) primary vehicle for promoting sustainable design and construction. It is a leading-edge system for designing, constructing, operating, and certifying the world’s “greenest” buildings. 69 points possible: Silver (33-38 points); Gold (39-51 points); Platinum (52+ points).

10-2 THE PERIODIC PROGRESS MEETING (SCHEDULES & PAYMENTS)
Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed upon at the preconstruction conference. The cutoff date for progress payments should also be agreed upon at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer, or the Contracting Officer’s Representative, will approve activity progress, proposed revisions, stored materials, and adjustments as appropriate.

Based on the agreements reached during the meeting, a complete update of the project schedule containing all approved progress, revisions, and adjustments shall be submitted not later than 4 working days (verify spec requirement) after the monthly progress meeting. The narrative must be reviewed for accuracy and the submission verified to conform to the reached agreements.

10-2.1 Progress Meeting (Schedule) Contents
Updated information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during the progress meeting: Start and Finish Dates, Time Completion, Cost Completion, Logic Changes, and Other Changes. Other changes includes (1) delays beyond the Contractor’s control (such as strikes and unusually severe weather), (2) delays encountered due to submittals, Government Activities,
deliveries or work stoppages which make re-planning the work necessary, and (3) changes required to correct a schedule which do not represent the actual or planned prosecution and progress of the work. For detailed review procedures see Chapter 05-7.2.

10-3 ADDITIONAL ITEMS REQUIRING PERIODIC REVIEW

Prior to approval of the pay request, all contract periodic verifications must be completed (examples might include the LEED notebook, As-builts, Environmental Data, etc…). The periodic progress meeting is an excellent time to cover these requirements, but these items can be verified at any time during the progress period. RBP – Any verification performed during the progress period must be annotated on the QA report.

10-3.1 CQC System / QCS

The contractor is required to keep the QCS database updated each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. The Government will not process progress payments until an acceptable QCS export file is received. The Government Representative must verify that QCS is being properly updated and maintained. The Contractor Action Item Report in RMS is a great tool for managing data quality. This report should be reviewed during each periodic update (prior to each payment) to ensure that QCS is being maintained and that missing or past due items are addressed in a timely manner. Do not wait until the end of the contract to manage these items!

The Contractor Action Item Report can be accessed under each contract IN RMS via the REPORTS → QA/QC → CONTRACTOR ACTION ITEMS links. The report should be run through the actual data date (or cutoff date) of the update to determine actions that need to be taken on or before that date. This report includes such information as:

a. Missing QC Reports
b. Missing Payroll Submissions from subcontractors
c. Insurance Documentation that is no longer current
d. Missing SF1413 Statement & Acknowledgement from subcontractors
e. Initial Inspections to be scheduled
f. Activities with early/late scheduled start/finish dates between the report date and the data date
g. Past due responses to correspondence
h. Activities that are not assigned to a contractor/subcontractor
i. Activities that are not assigned to a feature of work
j. Outstanding QC Punchlist Items
k. Outstanding QA Punchlist Items
l. Submittals that need to be resubmitted
m. QC Tests
10-3.2 CQC Reports
Are CQC reports being submitted in hard copy in accordance with the contract requirements? Daily reports should be submitted by the next business day. Timeliness must be proactively addressed.

10-3.3 As-built Drawings
The working as-built marked prints (red lines) and final as-built drawings will be jointly reviewed for accuracy and completeness by the QA (or Project Engineer) and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified in the contract, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. **RBP**– Withholding up to 10% of the monthly payment may be justified.

10-3.4 LEED Documentation Notebook
On LEED projects, the contractor must prepare a comprehensive notebook documenting compliance for each LEED credit. The LEED documentation notebook shall contain up to date information through the previous periodic update’s work, and at least one set shall be available on the jobsite at all times. Some contracts may require the notebook to be maintained and available for reference electronically.

The website for LEED templates and documentation is [http://www.usgbc.org](http://www.usgbc.org).

If the contractor fails to maintain the LEED Documentation Notebook, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the notebook. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of the notebook.

10-3.5 Progress Photos
Where required by contract, are progress photos current for all months?
**RBP** – Require the contractor to submit the progress photos with the pay request.

10-3.6 Safety/Environmental Compliance
Monthly status review of safety and environmental concerns should be conducted as part of the progress review. See Chapters 8 and 9.
10-3.7 Submittals
The status of missing or late submittals shall be reviewed prior to making payment. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

10-3.8 Stored Materials
Where payment for stored materials is authorized by contract, the stored materials must be verified and matched with paid invoices. Previously paid stored materials must be backed out as the material is incorporated into the construction. Agreements on stored materials must be made prior to submission of the pay request so that the government will have time to perform the necessary verifications.

10-3.9 Weather Data
Verify that adverse weather data has been submitted and agreed upon through the previous progress period. Check the contract unusually severe weather clause for specific requirements. See the CA Manual for information on processing weather modifications.

10-4 ANNEXES, EXHIBITS, AND TEMPLATES
Not Applicable.
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SAD QA FG – Chapter Version Control

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CHAPTER 11   STATUS UPDATES AND BRIEFINGS / AUTOMATION

11-1   STATUS UPDATES AND BRIEFINGS / AUTOMATION

11-1.1 Purpose
The purpose of this chapter is to outline:

- Use of RMS for providing status updates/briefings.
- Provide guidance on the conduct of briefings for high visibility projects.
- Standardizes the layout and development of project briefing boards.
- Detailed requirements for RMS milestones related to QA activities. These milestones will be used as part of management’s oversight of field office performance.

11-1.2 Applicability
This procedure applies to all AE/RE (AE/RE) Offices and sub-offices within Construction Division.

11-1.3 References
   a. FAR 52.211-10, Commencement, Prosecution, and Completion of Work (Apr 1984)
   b. UFGS 01320A / UFGS 013201.0010 - Project Schedule
   c. UFGS 01330 / UFGS 013300 - Submittal Procedures
   d. UFGS 01451A / UFGS 014504.0010 – Contractor Quality Control
   e. UFGS 01780 / UFGS 017802.0010 – Closeout Submittals

11-1.4 Responsibilities
AE/RE’s are responsible for overall preparation of updates and briefings. Typically, Project Engineers prepare the updates and briefings/briefing boards with input from QAR’s, Safety, and office engineering staff.

Project Engineers are also responsible for maintaining data quality and milestones in RMS. Responsibilities covering RMS data quality should be detailed in the office QA plan and supplemental plans as appropriate.
11-1.5 Definitions

a. **Line Item Reviews (LIR’s)** – joint review meetings with the customer to review all projects under design, under construction, and in the closeout or warranty phase.

b. **Project Review Boards (PRB’s)** – District internal review meetings on the status of critical or key on-going projects, projects under design, and the status of program execution.

c. **Field Office Quality Assistance (FOQA) Visits** – Visits by the regional QA team to verify field office QA and contractor QC performance on ongoing contracts.

d. **Construction Completion** – Date that the COE accepts the work (i.e. Substantially Complete… LD’s would not longer apply. Warranty starts the next day.

e. **Physical Completion** – Date all work is completed. All deficiencies / punch list items are completed. Nothing is left outstanding.

f. **Fiscal Completion** – Date funding removed from CIP Accounts and any remaining funds returned to customer. (Date on the Final Cost Date from RM)

g. **Transfer Document Date** – RMS User Guide defines it as the “Transfer Memo or Final 1354 Date which includes All/Final Cost from RM.”
11-2 USE OF RMS REPORTS AND KEEPING DATA CURRENT

11-2.1 Line Item Reviews (LIR’s)

The requirements for LIRs vary from customer to customer as to what format they expect. It is to our advantage to utilize RMS data to the greatest extent possible. **RBP** – Use of the RMS Construction Status Report is recommended for covering the status of both future projects and the status of active contracts. By using the Customer or USACE comment fields, the report can be setup as the meeting outline covering information from the last LIR update and new information. In addition, the report can be exported to a PDF file and shared electronically with team members and archived for future reference. Example LIR update sheet is found under part 11-6.3 of this chapter.

11-2.2 Project Review Boards (PRBs)

RMS project data is used by PM when preparing for project review boards (PRBs). RMS data must be kept current, reviewed, and verified to assure that the correct information is presented at the PRB. Field Offices will coordinate with their Project Manager to make sure all issues are correctly presented.

11-2.3 Field Office Quality Assistance (FOQA) Visits

Visits by the regional QA team will consist of reviews of the onsite construction, safety, QA/QC documentation, contract administration, field office documentation (files and processes), and review of RMS data. The RMS data may be reviewed as part of a pre-audit prior to the actual visit. The requirements of this manual and the Contract Admin manual will be the basis for the administrative review.

The reports will evaluate both Construction Quality (findings on the construction site) and Construction Management (findings on how we are implementing required processes, procedures, and recommended best practices). Details on reporting, requesting inspection assistance, available services, and available tools will be covered under the regional QA procedures.

A summary of requirements/recommendations found in this manual and QA audit points will be provided as an Appendix to this manual.
11-3 COMMAND MANAGEMENT REVIEW (CMR) INDICATORS

Quality RMS data is critical to reporting our organization’s success in our rating metrics. It is imperative that team members understand how we are rated, on what we are rated, and what role milestones and status codes play in these calculations. For an overview of the CMR indicators, refer to Chapter 1 of this manual.

RBP – Some status codes prevent projects with extenuating circumstances (like the Design Construct Commission, DCCx, pilot projects with 5 years of warranty included) from being included in the CMR’s. The PDT needs to assure that these projects are properly coded.

11-3.1 Beneficial Occupancy Date (BOD)

BOD date must be reviewed and tracked against actual construction progress. When changes in the BOD date are necessary, the change and reasons must be coordinated with PM and the customer. See Chapter 3 for additional information on BOD calculation and procedures.

11-3.2 RMS QA Related Milestones

This procedure provides guidance on setting dates for typical construction projects with durations of one year or more. Projects of shorter duration, 5 year commissioning periods (DCCx), task orders, purchase orders, etc… will require significant thought and professional judgment to properly set the milestones.

Project Engineers shall load all milestone “scheduled” dates NLT 14 days after award. Dates shall be based on established policy and the guidance outlined in the CA Manual and adjusted to fit the actual project. A comparison of the scheduled dates to the actual dates may be used as a performance indicator.

RBP – AE/RE’s are encouraged to identify performance goals for the office. These goals should be identified in performance standards, QA plans, performance plans, work instructions, or a field office implementation plan. Here are a few examples:

- All O&M Manuals provided to User prior to User Training. Allow time for them to review the manuals prior to the training. All manuals turned over before Construction Completion.
- Redlined As-built drawings submitted to the government at time of acceptance or prior.
- Where required, Real Property Cards and Installed Equipment list provided to User at the same time BOD 1354 is provided.
- Contractor Evaluation, and AE Evaluation when applicable, completed in RMS and loaded in CCASS/ACASS system within 28 days of Construction Completion. This allows 2 days to get approval of the Reviewing Official and 30 days for the contractor review period to complete the entire process within 60 days of Construction Completion.
- Shop Drawings to User within 30 days.
o Final As-built Drawings to User within 60 days.
o Physical Completion within 60 days.
o No missed warranty inspections.
o Projects completely closed out and fiscally complete within 12 months of acceptance (CONUS).

Prior to award the milestone dates are controlled by P2. RMS will download the Mandatory System Milestone dates from P2 prior to award. Past experience indicates that the majority of these milestone dates require adjustment after award.

**RBP** – Use of calculated dates (or contractor schedule dates) versus manually scheduled dates assists with keeping data current and with tracking.

Project Engineers, or appointed individuals, are responsible for setting the Initial Scheduled Milestone Dates no later than 14 calendar days after award. Project Engineers will schedule the milestones based upon the contract type, duration, and requirements specified within the contract specifications.

The following QA related milestones will be added to RMS as local milestones if not include at a higher level. These milestones are required and will be reviewed as part of the FOQA visits.

a. **Preconstruction Conference**

b. **Meeting of Mutual Understanding** – the date that the meeting of mutual understanding was held for both safety and quality control.

c. **APP Accepted**

d. **CQC Plan Accepted** – the scheduled date should take into consideration the submittal requirements in the CQC spec (# days after NTP) and the allowed review time.

e. **Initial Project Schedule Approved** – the date the baseline schedule for the project was approved. This is not the preliminary schedule date.

f. **Pre-Final Inspection**

g. **O&M Manuals to User** – date last manual is turned over to the customer.

h. **O&M Schools Held** – date last training is held.

i. **Final Inspection**

j. **As-built Redlines Submitted**

k. **Real Property Card to User**

l. **Installed Equipment List to User**
m. Final As-built Drawings to User
n. 4 – month Warranty Inspection
o. 9 – month Warranty Inspection
p. Warranty Expiration Date

Project Engineers should review milestone dates on assigned project each month to assure that scheduled dates are still appropriate and that actual dates are current. Due to the variability in how projects are turned over, it is extremely important to review the BOD, warranty, and closeout dates and how they are calculated once Construction Completion is reached. In the event that a project slips significantly behind schedule (unlikely to recover), the Construction Completion date will be revised to reflect the expected late completion indicated by the contractor’s schedule.

**RBP** – Periodically print the “milestone closeout check list report” to review outstanding milestones and warranty inspection dates. The Project or Office Engineer will provide oversight and follow-up on all post construction dates during the close-out stage. Project close-out must be performed in a timely manner. Just because construction is complete, it does not mean we can forget about the project.

The Project Engineer will assure that an After Action Review (AAR) is prepared on any project that fails to meet the CMR indicators related to turnover and closeout. Likewise, any lessons learned or process improvements should be documented and forwarded to the AE/RE. Local lessons learned will be incorporated into the appropriate processes, plans, etc… as part of the continuous improvement cycle. AE/RE will forward applicable lessons learned to the District office as part of the lessons learned and construction bulletin process.

### 11-4 PROJECT STATUS UPDATES / ONSITE PROJECT BRIEFINGS

Project Status Updates generally consist of an office overview and an onsite briefing. The onsite briefings will consist of a project overview (briefing board presentation) and a site tour. AE/RE will determine information to be provided at the office overview versus the onsite briefing and ensure that presentations are not redundant and lost in facts, figures, or statistics.

#### 11-4.1 Itinerary Development and Briefing Preparation

If no specific projects are identified for the visit, the itinerary shall be determined by the AE/RE and coordinated accordingly prior to the actual site visit rather than asking visitors what they would like to
see. Coordination with PM is required if PM is preparing a fact book on projects. The individual performing the briefing should also be identified as part of the itinerary.

Professionalism and standardization are extremely important in providing an effective briefing. The office overview may be briefed by the RE at the office prior to the site visit or briefed en route. If an office briefing is provided, slideshow presentations and handouts may be appropriate. If the office overview is going to be briefed en route, a fact sheet with take away points is recommended.

Onsite briefings require advance planning and consideration of the contractor’s planned work activities. Briefing locations should be established prior to the visit in a safe location with appropriate noise levels conducive to a briefing. Dry runs should be performed to verify safe travel through the project sites and ease of access. Briefing board presentations must be presented off an easel/stand versus someone holding the board or balancing it on a vehicle. Pointers shall be used for important briefings. Laser pointers should be avoided if the briefing is to be conducted in direct sunlight.

AE/REs must handle introduction, ensure that the briefer is well prepared, and should direct the flow of the briefings and tours to keep the visit on schedule.

11-4.2 Office Overview Presentation

Depending on the nature of the visit, the type of visitor, time allowed for the visit, type of projects being visited, and coverage of topics at the onsite portion of the briefing, an office overview may or may not be required. Try to avoid redundant information being presented at the office overview and the onsite briefing. Typical Office Related Topics to be covered include:

- **Safety** - safety first! – Both contractor and government safety records should be addressed. Provide an overview on safety performance for the fiscal year including the number of lost time accidents and the office’s frequency rate. Include programs and things being implemented to improve safety. Discussion of OSHA visits and citations if appropriate. **RBP** – Provide overview of the field office’s frequency rate for current FY and prior years to show exceptional safety performance or improvement.

- **Environmental** – Discussion of any environmental problems or Notice of Violations (NOVs) received.

- **Placement** - Originally estimated placement for the fiscal year and any slippage's or acceleration of placement should be covered including a discussion of the reasons for the variance. Approximate placement as of the briefing date should be given (scheduled versus actual).

- **Staffing** – Discussion of overall office staffing such as number of team members, number of project teams, and any personnel “shortages” or “surpluses.” A handout of a current organization chart, complete with names and grades of individuals assigned, is probably the quickest way to handle this item if not provided in a pre-visit fact book.
e. **Overview of Construction Quality** – Comment on the overall quality of construction being provided to the customer. How well is the office meeting the customer’s expectations?

f. **Schedule / Timeliness / Time Growth / BOD Growth** – Overview of timeliness and schedule performance. How is the office performing in regards to the CMR indicators? What types of problems, category of modifications, are driving time growth? Know the percentages.

g. **Cost Growth / Funding Issues** – Overview of funding problems and cost growth performance for the office. How is the office performing in regards to the CMR indicators? What types of problems, categories of modifications, are driving the cost growth? Know the percentages.

### 11-4.3 Onsite Presentation

During the actual project site visit, the AE/RE or the Project Engineer will assume control of the briefing. The individual giving the briefing will not only cover the project details, but they will also lead the entire walk-through, directing the visitor’s attention to key details of the project and the construction underway, and answering any questions that might arise. The briefer must lead the tour as a tour guide…. not acting like they are on the tour. The keys to a successful briefing are professionalism, knowledge of the project, controlling the flow of the visit, and accuracy of data presented (including the negative aspects of what is happening on the project, such as quality concerns, design issues, timeliness, safety, etc…).

Briefings should be concise and well organized. Only the facts should be presented, with a minimum of editorializing, and excuse-making for items which obviously need improvement. Do not make excuses for the contractor or our staff, just present the facts. As a minimum, coverage of the following items should be accomplished at each briefing:

a. **Safety** (Always cover safety first!) - Both contractor and government safety records should be addressed. Plans for improving poor safety records should be discussed. Safety concerns that have been a challenge (type of hazard, subcontractor, etc…) should be addressed. In addition cover the information on the Safety Briefing Sheet (See part 11-6.2 of this chapter). Note that the frequency rate goals must be updated for each FY. Goal for FY 08 is as follows:

   - **Green**: \( FR \leq 0.35 \)
   - **Amber**: \( 0.35 < FR < 0.56 \)
   - **Red**: \( FR \geq 0.56 \)
b. **Environmental** – Identify any environmental problems encountered on the project. Any proactive steps implemented to prevent NOVs should be addressed. NOVs should be shown on the Project Data Sheet.

c. **Sustainability** – Sustainable Standard for the project, LEED, and the rating goal must be identified. Briefing should address points obtained from design, and possibly from construction, that have been obtained to date. Briefer must be able to identify where the majority of the points are to be obtained. An example would be using crushed and graded concrete from demo work as the base course for the parking lots. Sustainability Goal should be shown on the Project Data Sheet.

d. **Quality of Construction** - Any problems with CQC/QA process should be discussed along with impacts and corrective actions taken.

e. **Schedule / Timeliness** - Discussion should include a statement of whether the contractor is ahead or behind the contractually approved schedule and by approximately how many days. If behind, the visitor should be briefed on what steps have been taken to get the contractor back on schedule, i.e., meeting with top management, meeting with bonding company, interim unsatisfactory performance appraisals, etc.

f. **Time Growth / BOD Growth** - The original contract completion date, current completion date and AE/RE's best estimate of when the project will actually be accepted should be covered. Promised "B.O.D." to the user should also be addressed. Time growth should also be expressed as a percentage to allow comparison with the CMR goal.

g. **Cost Growth / Funding Status** - The original contract amount, current contract amount and AE/RE's best estimate of final project cost should be given. Discussion should include status of contingency funds, and funds to cover user changes and claims with merit. Cost growth should be expressed as a percentage to allow comparison with the CMR goal.

h. **Modifications** - Status of modifications should be discussed. Indicators such as average age of change orders, how many changes over 90 days old, etc., should be included in the briefing.

i. **Claims** - Status of claims should be discussed. Indicators such as numbers of claims, dollar amounts, estimates of when Contracting Officer’s Decision (C.O.D.’s) will be issued, and who presently has the action on the claim should be covered.
11-5 STANDARDIZED PROJECT BRIEFING BOARDS

A briefing board with building floor plan(s) and/or site to be viewed should be provided for projects of significant scope. Information should include items such as building square footage, NTP date, scheduled vs. actual construction progress, current contract costs, etc. If a project orientation hasn't already been accomplished in the office, it should be covered in the field prior to the walk through. A brief site orientation should normally be made in any event. Project Engineers should tailor their briefings/tours to accommodate the type of visitor. Greater emphasis should be placed on the overall quality of construction rather than explaining the functional use of the facility. Briefings should be upbeat, positive and concise.

All briefing boards developed after issuance of this manual, must conform to the required standard formatting defined in this section.

11-5.1 Briefing Board Layout

Briefing board should be developed using standard size foam board, such as 30” x 40” white foam board, in a landscaped orientation. The use of CADD or PowerPoint to develop the briefing boards is encouraged.

RBP - For high visibility jobs, briefing boards can be developed electronically and printed in color, mounted, and laminated by a local print shop. Also, sheet protectors mounted on the board for the Project and Safety Briefing Sheets make it easy to update the briefing boards. As a cost savings measure, clear contact paper can be used to cover the boards and protect the drawings.
a. **Fonts** – Only use one style font for all of the text on the briefing board. Standard font is Times New Roman.

b. **Project Title** – located at the top center of the board with USACE and Customer’s Logos. Example layout uses 72pt text.

c. **USACE Logo** - Only use approved logos. Logos can be downloaded from the USACE Digital Visual Library (http://images.usace.army.mil/main.html). Offices within South Atlantic Division can download their logo from the Division Map at http://images.usace.army.mil/gsad_map.html. Use the red castle when briefing boards are in color. Example layout uses a graphic height of 3 inches.

d. **Customer Logo** – Sized to balance with the USACE logo. Set height to match USACE logo.

e. **Project Data Sheet** – the project data sheet is an 8.5” x 11” sheet of paper in the portrait orientation. The first page of the “Contract Status Sheet – Contract Level” report in RMS will be used. Use the status section to include key information for the briefings, such as the PA amount, the original BOD, the LEED goal, and the # of
modifications to date. Approximately the first six lines of the “RMS Contract Issues – Customer” remarks field show up on page 1 of the report. **RBP** – Offices should standardize the first few remark lines for all projects in the office.

f. **Safety Briefing Sheet** – the safety briefing sheet is an 8.5” x 11” sheet of paper in the portrait orientation. See exhibit 11-6.2 for a sample that shows the data required for the safety briefing. The template file can be downloaded from the website.

g. **Project Rendering** – used if available.

h. **Building Plans and Elevations** – these views need to represent the major buildings involved in the project. Views must be sized so that they are legible. Text and dimension lines should be cleaned up to make the drawings more legible.

i. **Site Plan** – used to orient individuals to where they are located in relation to the facility.

j. **Key Facts** – Text should be sized so as not to detract from the briefing board. Example layout used a text size of 24 pt.

### 11-6 EXHIBITS AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.

In addition, electronic templates related to this chapter can be accessed via hyperlinks posted on the website index page

a. Safety Briefing Template (MS PowerPoint)
b. Briefing Board Template (MS PowerPoint)
   o Delete Placeholders and add images. Quality is not as good as briefing boards developed using CADD.
11-6.1 Briefing Board Layout Example
11-6.2 Safety Briefing Sheet Example

**Barracks Upgrade Project**

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Status of 5/12/2006
USACE issues - ON SCHEDULE
Sheetrock installation continuing throughout Bldg 2/1A, 1/1A, LTW and CHW lines being caped in the mechanical rooms. Installation of SSMF takes place at Bldg 1/1B, 2/1A and 2/2B. Installation of distribution scheme takes place inside the CEP. Boilers have been installed. Brickwork continuing on Bldg 2/1A and Bldg 1/1B. Interior electrical and plumbing rough-in continuing throughout Bldg 2/1A and 2/2B. Installation of cable work taking place at Bldg 1/1B and Bldg 2/1A. Painting continues at Bldg 1/1B and 2/1A. High voltage cable being installed in underground conduit along Duncan Drive. Placement of curb and gutter begins at north parking lot. Furniture has been ordered and tentative date for phase 1 turnover is late October.

ISSUES & ACTION ITEMS FROM LAST DPW/COE UPDATE:
1. COE - Status of traffic control at Bldg Mitchell and Duncan.
2. ROE - Reschedule lift to LTU to discuss phased turnover.

ISSUES & ACTION ITEMS SINCE LAST DPW/COE UPDATE:
N/A

| 04-C-0046   | Physical Fitness Center           | MILCON     | 03 Oct 06    | 01 Jul 11                        | 0.3%          | $15,097,000.00                | $15,074,225.00| -0.2%    | 69%     | 63%     |

Status of 5/16/2006
USACE issues - BEHIND SCHEDULE
The contractor is significantly behind schedule and is working from a recovery schedule. Contractor is currently working on the critical milestone of the project, which was scheduled to complete in 31 Mar 06. Contractor received interim unsatisfactory performance evaluation.

ISSUES & ACTION ITEMS FROM LAST DPW/COE UPDATE: N/A

RANGE: Active Contracts
CHAPTER 12 SUBMITTAL MANAGEMENT

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12-1.2 Applicability
12-1.3 References
12-1.4 Responsibilities
12-1.5 Definitions

12-2 THE SUBMITTAL PROCESS
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12-2.2 ENG Form 4025
12-2.3 Review of Test Reports

12-3 SUBMITTALS ON DESIGN BID BUILD PROJECTS
12-3.1 Government Approved (GA) Submittals
12-3.2 For Information Only (FIO) Submittals
12-3.3 Variations

12-4 SUBMITTALS ON DESIGN BUILD (D/B) PROJECTS
12-4.1 Design Build Contractor Responsibility
12-4.2 Design Build Government Responsibility
12-4.3 Variations

12-5 SUBMITTALS REGISTERS

12-6 TRANSMITTAL FORM, ENG FORM 4025

12-7 SUBMITTAL PROCEDURE

12-8 ANNEXES, EXHIBITS, AND TEMPLATES

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CHAPTER 12 SUBMITTAL MANAGEMENT

12-1 SUBMITTAL MANAGEMENT OVERVIEW

12-1.1 Purpose
Submittals are essential to ensure that the Contractor has properly interpreted the contract requirements and chosen materials and equipment that will meet the Government’s requirements. Submittals also regulate the timely flow of materials to be incorporated into work. They are necessary to demonstrate that the proposed materials, etc., are in compliance with the contract. All required submittals must be provided by the contractor in time to allow for the review, approval, procurement, delivery, and performance of the preparatory phase of the Three Phases of Control. Submittals are indispensable in assuring and controlling construction quality and must be given the attention required to ensure they are reviewed, processed and returned in a timely manner. This chapter provides an overview of the submittal management process.

12-1.2 Applicability
This procedure applies to all AE/RE Offices and sub-offices within Construction Division.

12-1.3 References
a. UFGS 01330 / UFGS 013300 – Submittal Procedures
b. UFGS 01451A / UFGS 014502.0010 – Construction Quality Control

12-1.4 Responsibilities
Authority and responsibility for implementing and maintaining the quality system within the field offices is delegated to the head of each field office. Project Engineers, Office Engineers, QAR’s or other designated individuals are responsible for maintaining an effective submittal management program.

12-1.5 Definitions
Not Applicable
12-2 THE SUBMITTAL PROCESS

12-2.1 Submittal Registers
The Government will provide the initial submittal register, ENG Form 4288, in electronic format on Design Bid Build projects. The Contractor will review this register and add additional submittals resulting from a review of the contract documents and coordinate the register with the project schedule. On Design Build projects, the contractor will be responsible for developing the submittal register. The government will review this submittal register and approve it as part of the design review process. Thereafter, the contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor and the Government shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update shall be produced using QCS. The submittal register should be reviewed by both parties at least monthly to insure that it is kept current. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals. Submittal descriptions and procedures are outlined in UFGS 01330.

12-2.2 ENG Form 4025
Contractors will transmit submittals to the Government on ENG Form 4025, Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance. As part of the Contractor's CQC program, all submittals are the responsibility of the contractor. The approval of the Contracting Officer (GA/D or GA/F) shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

12-2.3 Review of Test Reports
Test reports shall be 100% reviewed by the QA staff in the early stages of each definable feature of work to ensure that the testing is being done properly, and reporting is satisfactory to document compliance. Once positive results are achieved the 100% oversight requirement can be reduced, however this oversight should never approach 0%. A tracking system must be employed to assure that testing is performed both at the required frequency and to assure that the testing is random and complete enough to be representative of the project work. On Civil Works projects the 100% oversight requirement for testing review may be maintained throughout the duration of the contract.
12-3  SUBMITTALS ON DESIGN BID BUILD PROJECTS

Submittals are classified as either Government Approved (GA/D or GA/F level) or For Information Only (FIO). Government approved submittals can be either GA/D - reviewed by the designer, or GA/F - reviewed by the field office. All submittals not requiring Government approval will be for information only (FIO).

12-3.1 Government Approved (GA) Submittals

The Design Team will designate "G" for submittal items requiring Government approval. "G" designation is limited to critical materials, extensions of design, variations, equipment whose compatibility with entire system must be checked, and other items as designated by Design Team and Designer of Record. The Government or Government AE will review these submittals and give the applicable codes of A, B, C, D, E, or G. These codes have the following meanings, which can be found on the back of the ENG 4025:

A-Approved as submitted  
B-Approved, except as noted on drawings  
C-Approved, except as noted on drawings. Refer to attached sheet resubmission required.  
D-Will be returned by separate correspondence  
E-Disapproved (See Attached)  
G-Other (Specify)

As also noted in item 10 of the ENG 4025 Instructions, approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications. Government approval is not a complete check, but indicates only general method of construction, materials, detailing and other information are satisfactory.

RBP – CD must review the submittal register to ensure that the designer has not marked inappropriate submittals as GA. GA submittals must be primarily limited to critical submittals and extension of design.

12-3.2 For Information Only (FIO) Submittals

All submittals not designated "G" are for information only, to be reviewed, coded and approved by Contractor. FIO submittal items are provided to Government to document materials, etc., comply with contract. A minimum of 10% of FIO submittal items shall be reviewed by the Government. Applicable QA codes are F, and FX, with the following meanings as indicated on the back of ENG 4025:

F-Receipt Acknowledged  
FX-Receipt acknowledged, does not comply as noted with contract requirements.

It should be noted that since submittal review is a Contractor Quality Control responsibility, the quality of FIO submittals will give the Government insight into how the Contractor’s Quality
Control System is working. It is a good idea to review the first FIO submittals sent to the Government to ensure the CQC system is functioning in accordance with the Three Phase Inspection requirements.

### 12-3.3 Variations

Variations from contract requirements shall be marked for government approval. A detailed description of the proposed variation and the reason shall be included in the narrative of the submittal. Appropriate materials data sheets should be provided for the review. Failure to mark the ENG Form 4025 as a variance does not relieve the contractor from complying with the contract requirements (even if accepted by the government).

### 12-4 SUBMITTALS ON DESIGN BUILD (D/B) PROJECTS

D/B is a two party contract of Owner & D/B Contractor or Designer/Constructor Joint Venture. D/B contracts are written with SOW performance standards in place of a detailed design. Prior to the start of work, D/B Contractor shall submit a design and construction schedule in accordance with the terms in Contract Clause "FAR 52.236-15, Schedules for Construction Contracts" and as described in the contract. Design and Construction of major Features of work are typically concurrent (aka fast tracking). "Notice to Proceed" is used for Design and Construction. Design Phase submittals are similar to A/E Contract deliverables (i.e. Drawings with simple specs for subcontractor quotes.) D/B Construction Phase submittal items are primarily construction details and QC documentation along with O&M requirements. D/B Design Phase submittals may also be classified as “designer of record approval” or “Government reviewed extension of design.”

### 12-4.1 Design Build Contractor Responsibility

a. **Design Submittals.** For each major feature of work the D/B Contractor is to provide overall Design submittal items usually schematic drawings and short form specifications for Government review.

b. **Construction Submittals.** For each major feature of work D/B Contractor is to provide detailed construction drawings, specifications of product and material used, planned means and method work plans and documentation of selected product and materials incorporated into the construction.

### 12-4.2 Design Build Government Responsibility

a. **Design Submittals.** Government design personnel shall review for conformance to required SOW criteria and performance standard. Government construction personnel shall review for constructability and operability.
b. Construction Submittals. Government design personnel shall review D/B extensions of design and that critical materials meet applicable SOW criteria.

Government Construction QA personnel shall review SD 01 Preconstruction Submittal items like Accident Prevention Program or Work Plans for conformance to contract requirements. Construction QA personnel shall review construction phase technical submittal items (Div 01 - 49) for conformance to approved detailed construction drawings and specifications.

12-4.3 Variations

Any changes to the RFP requirements, contractor’s technical proposal, betterments, or accepted design submittals are considered variations and shall be submitted for government review and acceptance. A detailed description of the proposed variation and the reason shall be included in the narrative of the submittal. Appropriate materials data sheets should be provided for the review. Failure to mark the ENG Form 4025 as a variance does not relieve the contractor from complying with the contract requirements (even if accepted by the government). Any variation resulting in a contract cost savings may be subject to a contract credit modification.

12-5 SUBMITTALS Registers

The Submittal register using QCS/RMS is a shared electronic database constantly updated by both Government and Contractor. The Government will provide the initial RMS export file to populate the QCS submittal register in electronic format. Columns "c" through "f" will be completed by the Government. The contractor will complete columns "a", "b", and "g" through "r" for approval within 30 days after Notice to Proceed. As stated earlier, these dates must be coordinated with the project schedule to insure timely flow of materials and information. The items on the submittal register for “Contractor Action” and “Government Action” will be filled in as they occur and are required to be kept current by the Contractor Quality Control. Field personnel should remind the Contractor of his responsibility to verify the submittal register provided for completeness and accuracy.

12-6 TRANSMITTAL FORM, ENG FORM 4025

The contractor shall use QCS to generate an “ENG Form 4025 – Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer’s Certificates of Compliance” to transmit submittal items to the Government. This form shall be properly completed using QCS software to fill out all the heading blank spaces and identify each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph or sheet number of the contract drawings pertinent to the data submitted for each item.
12-7 SUBMITTAL PROCEDURE

Field Project personnel responsible for submittals will ensure the submittals are receipt acknowledged in RMS so they are tracked properly. The submittals designated as FIO (For Information Only) will be reviewed or receipt acknowledged as Government time and resources permit. A minimum of 10% of FIO submittals are required to be reviewed by Government personnel.

**RBP** – QA personnel should review a sufficient number of submittals to establish a confidence level in the CQC program. 10% review is often insufficient to assure quality. Many offices require at least a 100% cursory review. This helps provide the QA with background information that is relied on during preps, initials, review of stored materials, etc…

Submittals designated as Government Approved will be checked either by onsite Government personnel or by the Designer of Record as determined in the planning stage. Certain Government approved submittals may also be coordinated with the local customer such as colors, environmental reviews, or fire alarms. The field personnel responsible for submittals need to have a clear understanding of local procedures for these special reviews and disseminate the appropriate information to interested parties. A review of the Transition Documents provided by the Project Manager for the project will include a list of submittals that the Designer of Record has been contracted to review. Those submittals will be transmitted to the Architect/Engineer of Record using Form ENG 4026. It is important to note that these submittals will nearly always be reviewed offsite, and will need to be transmitted by some form of mail service both ways. This shortens actual review time, so it is critical to send these submittals out as quickly as possible. When these submittals are received with the designer’s comments, they will be logged into RMS accordingly and returned to the Contractor. It is a good idea to provide a cursory review of these submittals to ensure a clear understanding of the comments made by the Designer of Record. Those Government Approved submittals not being reviewed at the District or Designer of Record will be reviewed in the field. In most cases, the contract documents provide for a Government review period of 30 calendar days. Each contract must be checked and the review period adhered to in order to avoid costly delays to the contract on the part of the Government. On projects designed by in-house government personnel, field project personnel responsible for submittals will notify and send submittals directly to Engineering Division (EN) or Technical Services (TS). EN or TS Branch will coordinate directly with the field personnel any information/coordination that may be required during the submittal review process and will ensure the particular submittal is reviewed in a timely manner by the responsible office within EN or TS. Once the review is completed, and the submittal review is logged, EN or TS will send submittal back to the field office.

12-8 ANNEXES, EXHIBITS, AND TEMPLATES

Not applicable to this chapter.
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CHAPTER 13  TRAINING

13-1  TRAINING OVERVIEW

13-1.1 Purpose
To provide standard procedures and information for determining and identifying appropriate training needs, for developing Individual Development Plans (IDP) and for developing Annual Training Plans. This systemic approach links the training requirements to the Mission Essential Task List (METL) thereby insuring that the training is related to the mission and insuring that CD employees are properly trained to perform the task and duties that are critical to the successful completion of the CD mission.

13-1.2 Applicability
This procedure applies to all AE/RE Offices and sub-offices within Construction Division.

13-1.3 References
a. CEHNDP-350-1-1 known as “The Purple Book”
b. DA Pamphlet 351-4 U.S. Army Formal Schools Catalog
c. ER 350-7-1 Professional Development of Construction Personnel
d. ER 350-1-420 - Five Year Individual Development Plan and Developmental Assignments
f. Acquisition: Defense Acquisition University (DAU) http://training.dau.mil

13-1.4 Responsibilities
Construction Division Chief Responsibilities – The CD Chief is responsible for oversight of the Construction Division Training Program. The CD Chief should designate one or more Construction Division Training Officers and a Construction Division Training Coordinator at District or Area Office Level.

The CD Chief should provide yearly guidance to the CD Training Officer/s and CD Supervisors concerning budgeting of training funds, limits on number of courses, etc.
Construction Division Training Officer Responsibility - CD Training Officers are responsible to the Division Chief for oversight of their portions of the CD Training Program. CD Training Officers are responsible for insuring that the Annual Training Plan is in accordance with applicable regulations, guidance issued by the District Engineer and the CD Chief, and that the overall cost of training is within budget.

Training Coordinator Responsibility - The Training Coordinator (located in CD or CPAC) is responsible for the day-to-day duties and tasks needed to administer the training program. The Training Coordinator is CDs point of contact with CPAC on all training matters.

The Training Officer receives the suggested annual training plans from the Branch Chiefs and Area Engineers. They consolidate them into the Annual Training Plan for approval. Once approved the Plan is forwarded to the Training Coordinator who enters them into the Automated Training Management Program (ATMP). A copy of the approved Annual Training Plan will be provided to the Branch Chiefs, Area Engineers and Resident Engineers.

The Training Coordinator coordinates with the CPAC to register team members in the approved PROSPECT courses. Once confirmation of registration is received the Training Coordinator distributes the approved course list.

Attendance instructions are forwarded via e-mail to applicable team members.

The Training Coordinator works with the Branch Chiefs, Area Engineers and Resident Engineers in the event a team member can not attend a scheduled class to find an appropriate substitute.

The Training Officer/s maintains the files for their Training Program and Annual Training Plan.

Supervisor Responsibilities - Supervisors are responsible for insuring that team members under their supervision are appropriately trained for the tasks they perform. This training is accomplished through a combination of on-the-job training, mentoring and formal classroom training. It is the supervisor’s responsibility to identify, on the IDP, the training needed by team members that can not be provided through on-the-job training. The supervisor is also responsible for identifying and nominating appropriate team members for special career developmental assignments, technical, acquisition and leadership training.

The Supervisor should periodically, but not less than once per year, evaluate the individual training requirements of each subordinate team member using the Construction Division Mission Essential Task List (CD-METL) and update the individual IDP. This evaluation must include a review of future projects to determine training requirements that will be needed for their execution. It is recommended that this evaluation be performed in February so the updated IDPs can be discussed and adjusted as necessary with each team member during the March mid term performance evaluation review. This timing will result in having a recently updated IDP to use when preparing the Annual Training Plan in April. See Exhibit 13-5.1 for a complete description of the CD-METL and Exhibit 13-5.2 for information on IDPs.
Supervisors are responsible for developing a suggested Annual Training Plan that identifies the formal classroom training to be attended by each subordinate team member during the next FY. In addition to having the formal classroom training linked to the CD-METL and included on the IDP the supervisor must also consider guidance from the CD Chief, training funds available in the budget, and how the mission will be accomplished while team members are away being trained. The suggested Annual Training Plan is to be submitted to the CD Training Coordinator for approval by the Division Chief.

See Exhibit 13-5.3 for guidance and limitations on training and the format to be used in submitting the suggested annual training plan.

Supervisors are responsible for notifying the CD Training Coordinator in the event a team member cannot attend school. A written explanation is required. Notification should be made at least four weeks prior to the start of the class so that a substitute CD team member can be identified to attend. Note that once registered for a PROSPECT course the District must still pay the tuition even if a District employee does not attend. It is therefore imperative that the supervisor insure that the team member attends the class or that an appropriate substitute attends.

Supervisors are responsible for assuring that a SF 182 is approved and confirmation from the school has been received before approving travel orders.

Team Member Responsibility - Notify their Supervisor as soon a possible if a conflict or problem arises that will prevent them from attending a scheduled class.

Complete a SF 182 (if not done by Field Office Assistant) in CEFMS approximately 60 days before actual training date.

Complete application/registration for approved non-Prospect courses. These are usually courses for which registration is done on-line such as ATTRS.

Obtain school confirmation before arranging for travel orders.

Obtain travel orders to assure timely receipt of ticket.

Arrange for hotel/motel accommodations.

Attend and participate in all course sessions.

Complete of SF 182 after attendance at training course.

13-1.5 Definitions
a. ATMP – Automated Training Management Program
b. ATRRS – Army Training Requirements and Resources System
c. DAU – Defense Acquisition University
d. **DAWIA** – Defense Acquisition Workforce Improvement Act  
e. **METL** – Mission Essential Task List  
f. **IDP** – Individual Development Plan  
g. **CPAC** – Civilian Personnel Assistance Center

### 13-2 PROCEDURES

#### 13-2.1 Requesting Attendance of Courses/Schools

During March/April of each year the CD Branch Chiefs, AE/RE’s will prepare a suggested annual training plan for team members within their respective offices and forward to the CD Training Coordinator. This training plan is for the following fiscal year which runs from 1 October to 30 September. The annual training plan will include all PROSPECT (Proponent Sponsored Engineer Corps Training), non-PROSPECT, and other training courses and will list the cost of each. CD Branch Chiefs, AE/RE’s must insure that suggested courses are linked to the CD-METL and shown on the respective team members IDP. The cost of training must be checked to insure it is within budget unless approval has been received from the CD Training Officer to exceed the budget. See Exhibit 13-5.1 for a complete description of the CD-METL, Exhibit 13-5.2 for information on IDPs and Exhibit 13-5.3 for guidance and limitations on training and the format to be used in submitting the suggested annual training plan.

After review and approval by the CD Chief, the CD Training Coordinator will consolidate the training plans into the CD Annual Training plan for data input into the ATMP. A copy of the CD Annual Training Plan will be provided to the Branch Chiefs, AE/RE’s.

#### 13-2.2 Registering for Courses

**PROSPECT**: The CD Training Coordinator will work with CPAC to get team members registered in the Prospect Courses included in the approved plan. Once confirmation of registration for Prospect Courses has been received, the Training Coordinator will notify the Branch Chiefs, AE/RE’s with a list of the courses that have been successfully scheduled.

**NON_PROSPECT**: For approved non-Prospect courses the supervisor and individual team member are responsible for registering and scheduling the course with the applicable course provider.

#### 13-2.3 Course Confirmation

**PROSPECT Schools**: Students enrolled in PROSPECT schools normally receive a package approximately 30 days before the actual start date. This package contains information concerning motel/hotel reservations, travel instructions between airport and lodging, classroom location, and a class roster. If team members have not received this package within this time
frame, they should contact the CD Training Coordinator for school confirmation. Attendees must provide a copy of the approved SF 182 on the first day of class.

Other Government Schools: Students enrolled in other government sponsored schools should receive a letter of acceptance from the school approximately 10 days before the start date. If they have not received this letter of acceptance within that time frame, they should try to contact the applicable course vendor or contact the CD-Training Coordinator for assistance. Other government schools normally direct all correspondence to the team member; CPAC rarely is informed of school cancellation or postponement.

Local Training (District or Field Offices): Periodically, local training will be held at the field offices or around the District area for both district members and the field office. A CD Training Officer will approve the content/need for the training. Typically CD will notify the nominees both in the field and in the district 4-6 weeks in advance of the training. If team members scheduled to attend local schools have not received notification as mentioned above, contact CD for further information.

13-2.4 Payment for Courses

Supervisors are responsible for working with an IMPACT card holder to insure that PR&Cs are prepared and approved prior to the Team Member attending the course. The card holder should contact the course provider to work out the payment details.

The USACE Learning Center requires payment for Prospect courses to be made several months in advance of the course. Once confirmation has been received that the course has been scheduled for a team member the card holder should initiate payment.

In the event that a course provider does not accept payment by credit card the supervisor should contact the CD Training Coordinator for advice on other methods of payment.

13-3 TRAINING SOURCES

13-3.1 PROSPECT Courses:

The availability of both the traditional and exportable PROSPECT courses is listed in “The Purple Book” titled, HNDP-350-1-1 which is available on-line from the USACE Learning Center. Go to http://pdsc.usace.army.mil/ and click on ‘view the catalog’.

13-3.2 Exportable PROSPECT Materials:

Training materials for some of the exportable courses have already been obtained and are available from Construction Division. Prior to registering with PROSPECT for an exportable course check with Construction Division to see if they already have the materials available.
13-3.3 Special Training:
Training required by OSHA for team members that will be involved with HTRW, Asbestos and Lead projects is usually obtained through one of the State Universities. Some states require training in environmental compliance such as Qualified Inspector for storm water and erosion control. Contact local universities and/or approved training providers for information on available courses.

13-3.4 Leadership Training
Information on Leadership Training can be found from many sources such as:
https://ekopowered.usace.army.mil/cp18/
http://www.amsa.belvoir.army.mil/ces/

Registration for these courses is available at https://www.atrrs.army.mil/channels/chrtas/.

13-3.5 Supervisory Training:
Action Officer Development Course (AODC), Supervisory Development Course (SDC), and Management Development Course (MDC). Information for these on line courses is available at http://cpol.army.mil/library/train/ces/index.html

13-3.6 Army Civilian Training Education and Development System (ACTEDS)
There are applicable courses available through ACTEDS. The course catalog can be accessed by going to http://cpol.army.mil/library/train/

13-3.7 Contracting Officer’s Representative (COR):  
Before a team member can be appointed as a Contracting Officer’s Representative (COR) they must complete the training listed below. Supervisors should include these courses in the IDP for engineers working at a construction field office and work the courses in along with other technical training identified through the METL process.

After completion of the training the team member should complete the QUALIFICATIONS STATEMENT FOR CONTRACTING OFFICERS REPRESENTATIVE (COR) shown at Exhibit 13-5.4 and submit to the District Contracting Office for review and approval. Once approval has been received the employee can then be delegated COR authority by the Contracting Officer for specific contracts on an as needed basis as determined by the Area/Resident Engineer.
Courses required for COR appointment - Corps of Engineers requirements from ER 350-7-1:
- Contracting Overview (Prospect)
- CLC 106: COR with a Mission Focus (DAU)
- Construction Contract Administration (Prospect)
- Negotiation Construction Contract Modifications (Prospect)
- Network Analysis (Prospect)
- District Contracting Officer Representative Course (Local)

13-3.8 Administrative Contracting Officer (ACO):
In accordance with the Defense Acquisition Workforce Improvement Act (DAWIA) team members are required to have successfully completed the respective DAWIA courses before being appointed as an ACO. These requirements often change and the DAU Catalog should be reviewed periodically for updated requirements. Potential ACO’s should have an Acquisition Career Record Brief (ACRB) and IDP established in Career Acquisition Personnel and Position Management Information System (CAPPMIS) accessed through the internet Career Acquisition Management Portal (CAMP) at [https://rda.altes.army.mil/camp/](https://rda.altes.army.mil/camp/).

Normally, only the AE/RE will need to have an ACO warrant and therefore ACO training should be limited to those team members that show self initiative and leadership potential to become a Resident Engineer. Project engineers should be considered the primary feeder group with consideration given to interns early in their professional development. Those personnel in the feeder group must be coded as members of the acquisition workforce in order to enter an ACRB and IDP.

13-3.9 Long Term Training (LTT):
HQUSACE and HQDA both fund long term training programs. Annually (usually in the fall) CPAC will distribute packages to each division in the District. Supervisors should further disseminate the application packages to eligible employees and the Districts recommend selections through Division to HQUSACE based on merit principles.

13-3.10 Non-Government Training:
Courses provided by non-government vendors can be authorized provided that they are directly applicable to the team member’s current job duties and they are orientated toward improvement of the team member’s performance. All non-government training must be approved prior to the start of class. Regulations specifically state that all non-government training requests submitted after the start of class must be disapproved.
13-4 RECORDS

Records will consist of completed SF 182’s. Training records are held by the employee and also in the employee’s office. A record of training is also entered into the Defense Civilian Personnel Data Systems through CEFMS. Unofficial records (exportable training) will be centrally filed at the respective field office.

13-5 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.
13-5.1 Construction Division Mission Essential Task List (METL)

A METL is the Army's way to examine a unit's overall job, honing in on the tasks that a unit absolutely must perform to be effective. Once those are identified, then the level of readiness for each task can be assessed - Trained (T), Untrained (U), or Partially trained (P). All training planned and conducted will be logically cross-walked to one of the District's Mission Essential Task. Each Division or office with distinct branches will develop their own set of METL tasks that logically support one or more District METL tasks. Branch Chiefs will then develop a Collective Task List that supports those METL tasks developed by the Division or Office Chief. Each Office without branches will develop a Collective Task List that directly supports the District's METL.

Managers will use the Collective Task List to identify those Individual Tasks each team member must accomplish to support a specified Collective Task. These tasks will be unique to the individuals' position and reflect the job description of that team member. Each manager will assess the proficiency of his or her team members with respect to each individual task. The team member will be rated as either a "T" for Trained, "P" for Partially Trained, or "U" for Untrained. The manager will use every means possible to quantify their assessment in order to replicate the assessment with other team members. Each Task will also be assessed in terms of its overall value for mission success. All individual tasks will therefore be assigned a rating, determined by the manager, as "C" Critical, "I" Important, or "B" Beneficial. Once identified, prioritized and documented, leaders must make legitimate efforts to resource these IDP needs.

The Automated Training Management Program (ATMP) is the primary automation tool for managing the training requirements. The ATMP provides a link between mission essential tasks from the organization level down to the employee level. Once tasks have been identified, they are assessed and collated by managers (through the ATMP) to provide the Commander with an accurate representation of the readiness of the District with respect to its assigned mission. METL is the tool to determine the training needs of individual team members.

The following tasks have been identified as the mission essential tasks for Construction Division.

- Process Contactors' Pay Request
- Analyze Contractors' Progress
- Issue Modifications & Analyze Claims
- Perform Quality Assurance Inspections and Monitor Safety Compliance
- Monitor/Perform Technical Evaluations
- Prepare Office Budget
- Prepare/Perform Office Administration Requirements
- Build Future Leaders While Managing Supervising Personnel
- Interact With Customers

An Individual Team Member Task List prepared by the supervisor consists of tasks that are performed by each individual team member in support of the CD-METL. Each task will then be identified as Critical (C), Important (I) or Beneficial (B). These tasks will then be put into a matrix with the CD-METL listed horizontally and the individual tasks listed vertically (see
Once the matrix is developed the CD mission essential task or tasks for which each individual task supports will be identified by placing an X in the intersecting box. Note that if there is more than one team member that performs the same set of tasks they are all included on the same matrix.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Description</th>
<th>C</th>
<th>P</th>
<th>P</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>P</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Execute QA Plans</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>2</td>
<td>Manage QA Testing</td>
<td>X</td>
<td>X</td>
<td></td>
<td>I</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Interpret Contract Documents</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Manage Submittal Process</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Perform Technical Reviews</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>P</td>
<td>U</td>
<td>P</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Prepare Modifications</td>
<td>X</td>
<td>X</td>
<td></td>
<td>I</td>
<td>P</td>
<td>P</td>
<td>U</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Enforce Contract Requirements</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>C</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Monitor Construction Progress</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>C</td>
<td>T</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>9</td>
<td>Ensure Safe Construction Practices</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>C</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

Assessing the proficiency of team members: Once the matrix is developed the supervisor then needs to assess (for each individual task) whether the team member is Trained (T), Partially Trained (P) or Untrained (U) to perform the task and record it on the matrix. The supervisor will need to use their own judgment in making this determination. To assist in making this determination training matrixes have been developed for each typical CD job position which lists the typical training needed to perform each task (see example below). It is generally assumed that after a team member has received the training listed as priority I in the table that they are trained.

The training matrixes should be used along with the Supervisor’s own judgment to help determine future training requirements and can also be used to record training that has already been completed.
<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Description</th>
<th>Priority I Courses</th>
<th>Priority II Courses</th>
<th>Completed</th>
<th>Priority III Courses</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Execute QA Plans</td>
<td>Const Qual Manage</td>
<td>Pavement Construction       QV</td>
<td>Dec 2004</td>
<td>HVAC SYS VAV QV</td>
<td>Dec 2004</td>
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<tr>
<td></td>
<td></td>
<td>General Construction QV</td>
<td>Architectural Hardware QV</td>
<td></td>
<td>Mech Sys Commission</td>
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<tr>
<td></td>
<td></td>
<td>BEnergy Training</td>
<td>Roofing Technology</td>
<td></td>
<td>Flexible Faring QV</td>
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<tr>
<td></td>
<td></td>
<td>Mechanical QV</td>
<td>Welding QV</td>
<td></td>
<td>HVAC CTRL SYS QV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical QV</td>
<td>Str Steel Fastener</td>
<td></td>
<td>National Elec Code</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete QV</td>
<td>Concrete II QV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Earthwork QV</td>
<td>Fire Protection</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Masonry QV</td>
<td>Paint QV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ITMWM Training</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Manage QA Testing</td>
<td>On-The-Job-Training</td>
<td>CCR Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Interpret Contract Documents</td>
<td>On-The-Job-Training</td>
<td>CCR Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Manage Submittal Process</td>
<td>Const Qual Manage</td>
<td>CCR Course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Perform Technical Reviews</td>
<td>Training for Task 1</td>
<td>Training for Task 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Prepare Modifications</td>
<td>On-The-Job-Training</td>
<td>EST Const Mode</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Enforce Contract Requirements</td>
<td>Training for Task 4</td>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Monitor Construction Programs</td>
<td>On-The-Job-Training</td>
<td>Network Analysis Scheduling</td>
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<td></td>
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</tr>
<tr>
<td>9</td>
<td>Ensure Safe Construction Practices</td>
<td>On-The-Job-Training</td>
<td>Construction Safety</td>
<td></td>
<td>Crane Safety</td>
<td></td>
</tr>
</tbody>
</table>
13-5.2 Individual Training Plans (IDP)

Personal career development is an important consideration for all team members. Local emphasis on career development will not only aid employees in receiving education, training, and development, it will also help to insure that team members are properly trained for their current job position and that qualified team members will be available for future upper level job positions. The team member must first develop a clear sense of vision regarding his or her long-term career goals coupled with the requirements of their current job position and an understanding of the limitations placed on training paid for by the government. After career goals are determined, the primary responsibility for career counseling rests with the supervisor or manager of the team member. Together they can work to turn the plan into reality through the use of all available resources.

Most career programs emphasize a combination of basic skills, automation skills, technical subject matter skills, and even team-building or leadership skills. Each team member should determine the difference between the skills needed to achieve his or her goal with the skills already possessed. The gap between the two is the career development need. Career development needs may be met through on-the-job training (OJT), performing special projects or details, PROSPECT training, other governmental training, available commercial training/education, or even through volunteer work. All of these training options should be reviewed and considered when writing a formal individual development plan (IDP).

The supervisor and employee jointly develop the IDP using ENG 5055R. Both short-term and long-term objectives are addressed along with required training, recommended training and developmental assignments required and/or recommended. The supervisor reviews employee skills and capabilities annually in relation to the Mission Essential Task List (METL) and the career developmental needs of the employee and updates the IDP accordingly. The IDP is then discussed with the employee and changes made as appropriate. Formal class room training should be linked to the METL Individual Task in which the training supports. Training completed during the previous year should also be recorded on the IDP.

The IDP is signed by the employee and the supervisor and then sent to the Training Office for coordinating entry into the Automated Training Management Program (ATMP). It must be understood that an approved IDP does not mean that the employee will receive the training included, however, the supervisor should endeavor to make the plan a reality if budget and other constraints allow.

IDPs should be reviewed, discussed, and modified as needed, but not less than once a year. The ideal time to review and modify the IDP is during the mid-year and/or annual performance review so a recently updated IDP will be available for use in preparing the annual training plan in April.
13-5.3 Annual Training Plan

Construction Division develops its annual training plan for the upcoming fiscal year during the March/April time frame of the current fiscal year. Supervisors are to prepare a Proposed Annual Training Plan which includes all team members in their area of responsibility and provide it to the CD Training Officer. Courses included in the plan must be listed on the team members IDP and linked to an individual METL task. This information is input into Automated Training Management Program (ATMP) and consolidated into an annual CD Training Plan.

Use of 40 hours as a target for training each team member each year for overall budget purposes is standard. As good stewards of the tax payer’s money, supervisors should select course sessions nearest to the place of employment, considering workload, schedule, price and quality of training. The proposed training plan must include the cost of the training and should be within the funds budgeted for training unless approval has been received to exceed the budget. See sample Training Plan below.

**PROPOSED TRAINING PLAN FY07**

As of May 2006

<table>
<thead>
<tr>
<th>NAME</th>
<th>TRAINING CLASS</th>
<th>METLS TASK</th>
<th>Course #</th>
<th>Control #</th>
<th>TUITION</th>
<th>Travel</th>
<th>Per Diem</th>
<th>LOCATION</th>
<th>DATES</th>
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</thead>
<tbody>
<tr>
<td>Employee 1</td>
<td>NEG CONST CONT MODS</td>
<td>Prepare IGE &amp; Negotiate Mods</td>
<td>41NCC01A</td>
<td>368-1</td>
<td>$1,060.00</td>
<td>$500.00</td>
<td>$700.00</td>
<td>Huntsville, AL</td>
<td>4-8 Dec 2006</td>
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<td>Project Scheduling (NAS)</td>
<td>Prepare IGE &amp; Negotiate Mods</td>
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<td>60-2</td>
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<td>14-18 May 2007</td>
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<td>EST FOR CONST MODS</td>
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<td>$980.00</td>
<td>Dallas, TX</td>
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<td>CON 120</td>
<td>Perform COR Dutes</td>
<td>SAU Course</td>
<td>Cost Paid by DA</td>
<td>TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Employee 3</td>
<td>HVAC CONTROL SYSTEMS DESIGN</td>
<td>Contract Surveil for QA/QC</td>
<td>35HVC01A</td>
<td>340-1</td>
<td>$1,430.00</td>
<td>$1,030.00</td>
<td>$750.00</td>
<td>Champaign, IL</td>
<td>7-11 May 2007</td>
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<td>CON 120</td>
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<td>SAU Course</td>
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<td>TBD</td>
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<tr>
<td>Employee 4</td>
<td>CONFLICT MGMT &amp; DISPUTE RESOLUTION</td>
<td>Obtain knowledge &amp; skills needed</td>
<td>65NBG01A</td>
<td>306-1</td>
<td>$1,540.00</td>
<td>$500.00</td>
<td>$940.00</td>
<td>Jacksonville, FL</td>
<td>16-20 April 2007</td>
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<tr>
<td>Employee 5</td>
<td>EARTHWORK CONTRACTORS</td>
<td>Execute QA Plans</td>
<td>35EW101A</td>
<td>40-1</td>
<td>$1,740.00</td>
<td>$800.00</td>
<td>$570.00</td>
<td>Vicksburg, MS</td>
<td>29 Jan-2 Feb 2007</td>
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<td>Employee 6</td>
<td>FIRE PROTECTION ENGINEERS</td>
<td>Obtain skill necessary to enter</td>
<td>55FPE01A</td>
<td>6-2</td>
<td>$1,710.00</td>
<td>$500.00</td>
<td>$700.00</td>
<td>Huntsville, AL</td>
<td>25-27 July 2007</td>
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<td>Employee 7</td>
<td>Const Contract Admin</td>
<td>- Prepare Mods</td>
<td>41CCA01A</td>
<td>366-3</td>
<td>$1,330.00</td>
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<td>$750.00</td>
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<td>$500.00</td>
<td>$940.00</td>
<td>Orlando, FL</td>
<td>30 Apr-4 May 2007</td>
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<td>Employee 11</td>
<td>ELECTRICAL QM</td>
<td>Perform Quality Assurance</td>
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<td>42-1</td>
<td>$1,080.00</td>
<td>$500.00</td>
<td>$975.00</td>
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<td>25-29 Jun 2007</td>
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<td>Employee 12</td>
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<td>Perform Record Management</td>
<td>Non-Government Vendor</td>
<td>$200</td>
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<tr>
<td>Employee 13</td>
<td>MS Power Point</td>
<td>Mail &amp; Correspondence Support</td>
<td>Non-Government Vendor</td>
<td>$200</td>
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<td></td>
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</tbody>
</table>

Total $19,680.00 $8,130.00 $11,325.00

Grand Total $39,135.00

13-13
13-5.4 COR Qualification Statement

QUALIFICATIONS STATEMENT
FOR
CONTRACTING OFFICERS REPRESENTATIVE (COR)

1. NAME OF DESIGNEE: ________________________________________________

2. RANK OR GRADE, TITLE & POSITION ________________________________

THE FOLLOWING SUPPLEMENTAL INFORMATION IS FURNISHED (ATTACH ADDITIONAL SHEETS IF NECESSARY):

   a. BRIEF DESCRIPTION OF CURRENT DUTIES: __________________________

   b. CIVIL SCHOOLS: (COLLEGE, ETC.) _________________________________

   c. MILITARY SCHOOLS: (LIST ANY PROSPECT COURSES IN CONTRACT ADMINISTRATION, ARMY OR LOCAL COURSES RELATED:)

   d. PREVIOUS PERTINENT EXPERIENCE: (INCLUDE COMMENTS ON KNOWLEDGE/EXPERIENCE IN CONNECTION WITH SMALL & DISADVANTAGED BUSINESS UTILIZATION (SADBU) PROGRAM)

   e. TYPE & DURATION OF PREVIOUS KEY POSITIONS:

   f. COMMENT ON EVIDENCE OF BUSINESS ACUMEN, PERSONALITY TRAITS, ETHICS, ETC:

Recommended for Appointment:

Date ___________________________ Supervisor

Date ___________________________ Chief, Contracting Division

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CHAPTER 14  TESTING

14-1  TESTING OVERVIEW

14-1.1 Purpose
This prescribes responsibilities and procedures for materials testing performed by and for U.S. Army Corps of Engineers District Offices. Methods and procedures are established for the Contractor Quality Control (QC) and the Government Quality Assurance (QA) testing used in the construction of buildings and other facilities and will be prescribed in the contract documents for the respective projects.

Methods and procedures are further prescribed for the QC and QA testing of materials used in all fills (except large dam embankments and cofferdams), backfills, embankments, subgrades, sub-bases, and base courses, unless otherwise noted.

14-1.2 Applicability
Applicable to all USACE commands having responsibilities for the planning, design, construction, and operation of Civil Works, Military, and Support-for-Others programs.

14-1.3 References

a. ER 1110-1-8100 Laboratory Investigations and Testing
b. ER 1110-1-261 QA of Laboratory Testing Procedures
c. ASTM E329 Agencies Engaged in Construction Inspection and/or Testing
d. ASTM C1077 Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
e. ASTM C 1093 Practice for Accreditation of Testing Agencies for Unit Masonry
f. ASTM D 3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
g. ASTM D 3740 Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
h. EM 1110-2-1906 (1986 Change 2) Laboratory Soils Testing
i. EM 1110-2-2000 Standard Practice for Concrete for Civil Works Structures
j. NRMCA CPMB 100 Concrete Plant Standards


14-1.4 Responsibilities
N/A

14-1.5 Definitions
a. Validation - A process to verify that the laboratory is qualified to perform required tests for a project. Validation of a laboratory may consist of either inspection or audit as defined below.

b. Inspection - On-site examination of a laboratory in accordance with the requirements established within ASTM E329 and other related methods and procedures.

c. Audit - Examination of inspection reports and other documentation to verify the qualification of a laboratory.
14-2 VERIFICATION OF TESTING LABORATORIES

14-2.1 Verification
QC and QA testing is typically conducted by separate commercial laboratories. To ensure compliance with Engineer Regulations 1110-1-8100 (Laboratory Investigations and Testing) and ER 1110-1-261 (QA of Laboratory Testing Procedures), all contracted laboratories will have an initial inspection, performed by a recognized national authority, conducted prior to contract award or prior to the initiation of testing. Inspections for all commercial labs are acceptable from AASHTO Materials Reference Laboratories (AMRL) and Cement and Concrete Reference Laboratories (CCRL), or directly from Engineer Research and Development Center's Materials Testing Center (MTC). Upon completion of inspections by one of the approved authorities, final Validation of the laboratories shall be conducted by the MTC. Validation can be processed by the MTC through audit of inspection and QA records from AMRL, and/or CCRL. Upon completion, Validation periods last for two (2) or three (3) years. The AMRL or CCRL inspection teams do not inspect for all procedures conducted by a given laboratory. Some procedures required by Corps of Engineers specifications may not be covered under a laboratories inspection and Validation. The procedures needed for Corps work, as identified in the contract specifications can be checked against the Validated Laboratories listing found at:


Inspection information and a request form for laboratory inspections can be found at the following:


Requests for inspection or for verification of procedures not identified under a particular Validation can be sent to:

Director of MTC, Engineering Research and Development Center
3909 Halls Ferry Road, Vicksburg, MS 39180-6199

14-2.2 Laboratory Facilities
Under the Validation program, laboratory facilities and personnel are required to be in accordance with ASTM E 329 Agencies Engaged in Construction Inspection and/or Testing, ASTM D 3740 (soils), ASTM C 1077 (aggregates & concrete), ASTM C 1093 (masonry) and ASTM D 3666 (asphalt) as applicable. The Government reserves the right to make inspections and to validate the Contractor's designated laboratory facilities, including test equipment and procedures. This is to ensure that all equipment is in proper working order, as well as correctly calibrated, and that specified test procedures are being performed by qualified personnel. The Government may also reserve the right to conduct additional QA testing, using either its own equipment and facilities or the Contractor's. This additional QA testing shall be performed for all projects, as the COR deems necessary, to assure the Contractor's compliance with the contract documents.
14-2.3 On-Site Laboratory
The Corps of Engineers requires that temporary (project, satellite or mobile) laboratories be Validated. Nearly all such validations will require an inspection. When a contractor establishes a QC laboratory at a project site, it must be verified to meet Validation requirements. Project laboratories shall be verified to meet facility, personnel, supervision and training, and equipment requirements as identified by ASTM standards. This shall be verified by qualified USACE personnel approved by the Materials Testing Center. Depending upon the magnitude of testing and the level of criticality for a project, some of the detailed quality requirements may be waived by a qualified and approved Materials Testing personnel as appointed by the MTC.

14-3 QC TESTING REQUIREMENT

14-3.1 Requirement
The QC program is based, in part, on specific tests required for several items of work involved. The location and frequency of tests required depend on the manner in which the work is being performed and the uniformity and quality of the tests obtained. A minimum testing program for quality control testing is outlined in paragraphs 14-6.6, 14-7.2, and 14-8.4. Additional testing may be required by the contract specifications. Tests indicating noncompliance with the contract documents shall be reported immediately to the CO or the COR. CQC representative will recommend steps to be taken to alleviate areas of noncompliant conditions. The ACO or his representative reserves the right to designate the location and type of additional sampling and testing (to be performed at the Contractor's expense) to verify compliance if quality is inconsistent or questionable. References to standard test methods and testing procedures for sampling and testing of the material are given within this chapter, unless otherwise specified, and additional types of tests may be required by other areas of the contract documents. Periodic QA tests shall be made to assure the Contractor's compliance with contract requirements and specifications.

14-3.2 Frequency
Frequency of QC testing is established within the contract specifications. When the established frequency of testing is not adhered to, then follow-up verification testing should be conducted in order to determine acceptability of materials within a given project. QA representatives shall verify compliance to QC testing frequency and shall identify areas of non-compliance immediately to the QC manager.

14-3.3 Tracking
The QC manager shall provide test results for compliance within 24 hours of completion of the test. Some specifications require charting of various testing data, with control parameters for corrective action. This type of control charting is critical for production placement and to ensure that corrective actions are taken while minimizing the magnitude of rework to meet compliance.
14-4 QA TESTING REQUIREMENT

14-4.1 Requirement

QA testing shall be employed to confirm the QC testing procedures are performed correctly and have a secondary goal of material acceptability. QA testing is to be used as a regular tool in assuring contract compliance. QA personnel are responsible for the implementation of a positive and active QA testing program for contracts assigned. The field office QA plan should state the office policy on QA testing as well as provide a schedule of QA tests to be performed on each contract and describe the facilities that will be utilized. The QA testing program shall utilize an approved (Validated) commercial testing lab, or expertise in the field office that can consist of a step by step check of the contractor's work. QA testing must be done according to the testing procedure specified in the contract and QA testing must be done so that valid comparisons can be done between the QA testing and QC testing. The QA personnel will also assure that all labs contracted by the Contractor are inspected in accordance with the above procedures. At the beginning of each contract, the QA representative will prepare a schedule of QA tests to be performed. This schedule should be maintained in the specific contract QA plan.

RBP: Utilize RMS to the maximum extent possible for Scheduling and Tracking QA/QC tests

14-4.2 Frequency & Tracking

For all projects, the recommended minimum testing frequency will be at least two tests done concurrently with the first two QC tests and thereafter at a rate of one test for every 20 made by the Contractor. A sufficient number of tests, but not less than 5 percent of the frequency of the CQC tests, should be scheduled to verify CQC test procedures and results. Testing duplicate samples is part of, not in addition to, the requirement to perform QA test at a minimum frequency of 5 percent of the CQC tests. QA testing and inspection should be conducted at unannounced intervals and should verify the following:

(1) Accuracy and calibration of equipment,
(2) Correct application of specified test standards, and
(3) Verify the coverage and accuracy of required CQC tests by observing approximately 10 percent of the CQC tests.

14-4.3 Destruction

Required in accordance with the contract specifications and drawings

14-4.4 Non-Destructive Testing

Nondestructive testing (NDT) has been defined as comprising those test methods used to examine an object, material or system without impairing its future usefulness. NDT is used to investigate the material integrity of the test object and is concerned in a practical way with the performance of the test piece.
CLASSIFICATION OF NDT METHODS

Nondestructive testing is a branch of the materials sciences that is concerned with all aspects of the uniformity, quality and serviceability of materials and structures. The science of nondestructive testing incorporates all the technology for detection and measurement of significant properties, including discontinuities. Table 1 provides information about nondestructive testing methods arranged to show their purposes and similarities. The term method as used here refers to the body of specialized procedures, techniques and instruments associated with each nondestructive testing approach. There are usually many techniques or procedures associated with each method. The National Materials Advisory Board (NMAB) Ad Hoc Committee on Nondestructive Evaluation adopted a system that classified methods into six major categories: visual, penetrating radiation, magnetic-electrical, mechanical vibration, thermal and chemical-electrochemical.

<table>
<thead>
<tr>
<th>Basic Categories</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical and optical</td>
<td>color, cracks, dimensions, film thickness, gauging, reflectivity, strain distribution and magnitude, surface finish, surface flaws, through-cracks</td>
</tr>
<tr>
<td>Penetrating radiation</td>
<td>cracks, density and chemistry variations, elemental distribution, foreign objects, inclusions, microporosity, misalignment, missing parts, segregation, service degradation, shrinkage, thickness, voids</td>
</tr>
<tr>
<td>Electromagnetic and electronic</td>
<td>alloy content, anisotropy, cavities, cold work, local strain, hardness, composition, contamination, corrosion, cracks, crack depth, crystal structure, electrical and thermal conductivities, flakes, heat treatment, hot tears, inclusions, ion concentrations, laps, lattice strain, layer thickness, moisture content, polarization, seams, segregation, shrinkage, state of cure, tensile strength, thickness, disbonds</td>
</tr>
<tr>
<td>Sonic and ultrasonic</td>
<td>crack initiation and propagation, cracks, voids, damping factor, degree of cure, degree of impregnation, degree of sintering, delaminations, density, dimensions, elastic moduli, grain size, inclusions, mechanical degradation, misalignment, porosity, radiation degradation, structure of composites, surface stress, tensile, shear and compressive strength, disbonds, wear</td>
</tr>
</tbody>
</table>
Thermal and infrared bonding, composition, emissivity, heat contours, plating thickness, porosity, reflectivity, stress, thermal conductivity, thickness, voids

Chemical and analytical alloy identification, composition, cracks, elemental analysis and distribution, grain size, inclusions, macrostructure, porosity, segregation, surface anomalies

VISUAL OBSERVATION

Visual testing would seem to many people to be so simple that there would not be any "basics" to consider. Visual testing is extremely important and often is the only form of NDT used on some specimens. In some areas, such as aircraft NDT, it can account for over 70% of the testing done, so it really has to be done right. In any case, visual testing should be the first form of testing done and may be all that is required if unacceptable discontinuities are found. Performing visual testing of a specimen may make other NDT easier or better than if it is not done. Since specifications required radiography for proof of unacceptable discontinuities, the visual testing can pinpoint the places for radiography to be done in order to obtain the necessary radiographs.

The main point of visual testing is that the inspector must be able to see the surface being tested. The specimen must also be clean. The instrument being used for testing is the human eye and it needs to be tested and corrected if necessary. In some cases, both vision acuity and color vision need to be checked.

The inspector may need some physical or mechanical aids to determine if the specimen is correct. Tape measures or rules, calipers, microthickness gages, squares or angle measurement devices, levels and plumb lines, thread gages and a variety of weld gages may be needed to help the inspector determine the "fitness for use" of a specimen. Without some of these simple mechanical aids, the test might be incomplete or incorrect.

Optical aids that may be required include such items as mirrors, magnifying lenses, rigid and flexible borescopes, image enhancement technologies, video devices and machine vision instruments.

GROUND PENETRATING RADAR

An NDT technology that is beginning to receive increased attention is ground penetrating radar. Useful for imaging structures and anomalies under concrete and soil, ground penetrating radar is a valuable tool for a number of infrastructure applications:

- pavement layer thickness determination
- subsurface moisture detection
- subsurface void detection
• the detection of concrete pavement deterioration
• discontinuity detection

Ground penetrating radar uses echo-sounding principles. The radar system produces a short duration pulse of radio wave energy that is transmitted into the concrete, base, subbase and/or soil. Changes in material composition (which can change the electrical character) cause some of the energy to be reflected back. The reflected signals are detected and amplified at the receiving antenna and stored on a data logger. Objects (reinforcement bars and conduits) and subsurface voids embedded in the concrete can be detected because these objects will have markedly different electrical properties than the host concrete. Data, carefully acquired over a grid area, are processed to produce depth slice maps of the subsurface. The resulting images are similar to X-ray images, but with lower resolution.

**INFRARED THERMAL IMAGING**

Technology in thermal imaging as well as other methods in our industry continues to expand. Test personnel have more detailed data available allowing extremely accurate condition determinations not possible a few years ago.

For the working thermographer, high resolution allows a camera to work at a much greater distance from a target without a loss of temperature measurement accuracy. Resolution is very important in infrared imaging. With infrared cameras, resolution affects temperature measurement accuracy, not just image quality. With more background averaged into temperature readings, the readings are inherently less accurate. Likewise, the low resolution thermal image looks as though it's made of tiny little squares, no matter what the viewing size.

Another fine point in detector design is fill factor - the space between pixels on the detector that has to be interpolated when the image is formed electronically. The newest detectors have reduced this spacing by 25%, giving them the highest fill factor and best imaging capability in the industry. All of these factors result in the latest generation of infrared cameras being both more affordable and more powerful for use in NDT.

**PULSE VELOCITY**

There is unanimous agreement among engineers that the presently available test methods for nondestructive determination of concrete strength are, without exception, inadequate. It has been demonstrated repeatedly that the standard ultrasonic method using longitudinal (or L) waves for testing concrete (*ASTM C 597*) can estimate the concrete strength only with ± 20 percent accuracy under laboratory conditions (Malhotra, 1980; Popovics, 1998). In the field the potential error is even greater.

Although potential inaccuracies exist, longitudinal ultrasonic waves are an attractive tool for investigating concrete. Such waves have the highest velocity so it is simple to separate them from the other wave modes. The equipment is portable, usable in the field for *in situ* testing, is truly nondestructive and has been successful for testing materials other than concrete. In addition, none of the available nondestructive methods for testing concrete strength is better.
There are intrinsic and practical factors that may interfere with the determination of concrete strength by ultrasonic means. These factors are:

- the complexity of the internal structure of concrete
- that factors that affect the strength may affect the pulse velocity differently, especially since the strength of a typical structural concrete is controlled by the strength of the cement paste, whereas the pulse velocity is controlled by the properties of the aggregate
- the insensitivity of the longitudinal pulse velocity to small but important changes in the internal structure of concrete
- the lack of a theoretically justifiable relationship between strength and wave velocity

Therefore, concrete strength cannot be calculated with acceptable accuracy from the longitudinal pulse velocity $v_L$ alone - supplementary tests are needed. Supplementary test(s) should also measure material characteristics of the concrete.

**14-4.5 Witness QC Testing**

The number of QC tests observed should correspond to the confidence level in the contractor's CQC system and to the consistency in QA versus QC test results. Testing reports should be reviewed by government engineering, laboratory, and/or QA personnel assigned to the work depending upon the type of test.

**14-5 PORTLAND CEMENT (PCC)**

**14-5.1 Fundamentals**

Cement and concrete are not interchangeable terms; cement is only one of the basic materials that go into concrete. The list of possible concrete materials is virtually endless and, combined in all possible proportions; they form an almost endless list of different types of concrete. Basically, concrete is made up of two parts, aggregates and paste. The paste, plus fine aggregate, is called mortar. Paste is made up of hydraulic cement and water. Most hydraulic cement is Portland cement. The paste binds the aggregates into a rock-like mass as it hardens. This is the result of a chemical reaction, called “hydration”, between the cement and the water. Paste makes up from 25 to 40 percent of the total volume of the concrete (absolute volume of cement is from 7 to 15 percent, water from 14 to 21 percent). Aggregates are usually sand, gravel, or crushed stone, and usually make up 60 to 75 percent of the volume of concrete. Aggregates serve as inexpensive filler and impart certain positive benefits to the concrete.
14-5.2 Materials

a. Aggregates are divided into two broad groups:

- **Fine aggregates** consist of natural or manufactured sand, with particle sizes ranging up to ¼ inch.

- **Coarse aggregates** are generally those with particle sizes larger than ¼ inch. Very large aggregates, from 3 to 6 inches in diameter, may be used in mass concrete; they are sometimes referred to as “cobble”.

b. Invariably, air is also present in concrete. It may be simply entrapped during mixing and placing or purposely introduced (entrained) in the mixture:

- **Entrapped air** is present in relatively large bubbles or voids; it is undesirable in all cases and can contribute up to 3 percent of the concrete volumes.

- **Entrained air**, when provided, is present throughout the mixture in billions of microscopic bubbles. It is deliberately introduced to impart specific properties to the concrete. Entrained air may contribute up to 8 percent of the volume.

c. Other materials commonly present in the basic concrete mixture are admixtures of many types. These admixtures impart specific properties desired in the concrete.

d. Properties of Freshly Mixed and Hardened Concrete. Concrete in its final state is called hardened concrete. After mixing, but before hardening, it is called “freshly mixed” concrete. There are four desirable properties of freshly mixed concrete:

- **Workability** refers to the ease or difficulty with which freshly mixed concrete can be mixed, placed in forms, consolidated (compacted), and finished. Workability is largely controlled by the amounts of and proportion of fine to coarse aggregate used with a given quantity of paste. It is also affected by the amount of entrained air.

- **Uniformity** implies that all concrete mixed with the same proportions of the basic materials should be the same. Concrete is mixed in batches, so each batch must be uniform within itself, and uniformity must extend from batch to batch. Uniformity includes no segregation, or no separation, of the materials throughout all concreting operations, so that the hardened concrete is also uniform. QA personnel must ensure prevention of segregation and ensure uniformity of freshly mixed and hardened concrete.

- **Plasticity** determines the ease of molding or shaping of freshly mixed concrete within the forms. Without plasticity, freshly mixed concrete is difficult to mold; with good plasticity, it is easily molded.

- **Cohesiveness** is the property that holds freshly mixed concrete together. Cohesiveness is closely related to plasticity. It keeps the aggregates encased within the paste and held in place during transporting and placing. Freshly mixed concrete with cohesiveness does not crumble, but flows sluggishly without segregation.
e. Hardened concrete has two desirable properties:

- **Strength** is the ability to resist a force or load. The factor that most influences strength in hardened concrete is the ratio of water to cement in the initial mixing of concrete. This ratio of water to cement is referred to as the water-cement (W/C) ratio.

- **Durability** is the ability of hardened concrete to resist the effects of weather, abrasion, pollution, chemicals in the soil, and other things. Durability is affected by climate and exposure. It is also affected by the W/C ratio and air entrainment.

f. Advantages and Limitations of Concrete. The advantages of concrete make it one of the most economical, versatile, and widely used of all construction materials. Before hardening, concrete can be readily handled and placed in forms and cast in virtually any desired shape. Quality concreting results in structures that are long lasting, pleasing in appearance and need little maintenance. Concrete does have limitations, though many of these can be minimized during the design phase. There are two principal limitations of concrete:

Concrete has low tensile strength, but also has a very high compressive strength. This low tensile strength is the major reason for use of reinforcement in concrete. Concrete tends to shrink during hardening and, after hardening, to contract and expand with changes in temperature or moisture. This limitation can be provided for in design, placement and curing.

g. QA personnel must ensure that the right mixture is being delivered and properly placed, consolidated, finished, and cured.

14-5.3 Materials Verification

Submittals of materials shall be verified to be current and compliant with the specified contract requirements. It is critical to identify throughout the duration of the project, that materials listed within individual submittals are the same materials identified within the Mixture Design. It is very common for contractors to submit mixture designs that reflect a change in materials, which at times can be non-compliant with the specifications. This is most typically due to changes in sources of materials at the batching plants and/or from their changing suppliers.

14-5.4 Admixtures

Except where authorized by the specifications, admixtures other than an air-entraining agent is not to be used in any concrete without prior approval of the Contracting Officer. The admixture type proposed for use will be thoroughly investigated in laboratory tests of concrete made with the cement and aggregate proposed for use on the project. Minimum test requirements will include the effect of the admixture on strength of concrete at an age of 28 days and may include strength test of up to 90 days, as well as on such other properties as may be necessary to demonstrate that there will be no adverse effect on the concrete. Continued use of any approved admixture other than entrained air will be based on satisfactory control of the concrete under all conditions in the field.
a. Water-reducing admixtures are used to reduce the amount of mixing water needed for concrete of a given consistency. A water reduction of at least 5 percent is required to meet the specifications set for these admixtures in ASTM C 494. Using a water-reducing admixture also reduces the water-cement ratio and, other things held equal, increases the strength of concrete.

b. Retarding admixtures, when used, retard, or slow, the hydration reaction. This gives more time to place, consolidate, and finish concrete before its initial set. Typically, these admixtures are used during hot weather, which tends to speed the setting of concrete. Accelerating admixtures have the opposite effect – they speed setting and strength development of concrete.

c. Water reducing, high range, and retarding admixtures are newer types, commonly called “Superplasticizers”. These admixtures are organic chemicals that can be used purely as water reducers or used to give additional workability without changing the water-cement ratio. They make concrete easier to place and finish, and provide a more workable mixture without lowered strength. They may reduce time and labor, resulting in lower-cost concrete. Some of the most widely used of the “superplasticizers” may interfere with air entrainment. Only those with a proven performance record should be used where air entrainment is desired; and then only in strict accordance with the manufacturer’s or Corps’ guidelines. Their plasticizing effect may last only 30 to 60 minutes, after which the concrete will revert to more normal conditions. Because of this limited time, these admixtures may need to be added at the placement site, unless the concrete plant is only a few minutes away.

14-5.5 Mixture Design Submittals

For projects involving 1,200 cubic yards or more of concrete, a job mix design shall be made for each class of concrete, unless otherwise specified. For projects involving less than 1,200 cubic yards, an established plant mix design may be used, for each class of concrete, provided it meets all specified requirements. Certain features which involve small quantities of concrete (10 cubic yards or less) may be excluded from the testing requirements shown in Table 14-1, provided the material delivered is from a plant consistently producing concrete which conforms to the requirements of the contract documents. The Contracting Officer's representative reserves the right to request supporting test data reports in evidence of plant and materials conformance with the aforementioned documents. Some typical excepted project features are nonstructural concrete curbs and gutters, sidewalks, duct backfill, thrust and anchor blocks, pole anchorage, lean concrete backfills, and manhole works. Project features such as isolated, continuous, and strip footings for the wall and columns, piles and pile caps, exterior vehicular slabs, interior on-grade floor slabs, and similar structurally related building features are not to be considered excluded items regardless of the quantities of concrete required.

Mixture design submittals should be thoroughly reviewed for compliance with the following:

a. Cement provided with certificate including test results for verification to parameters specified in ASTM C 150.

b. Flyash or Pozzolan provided with certificate including test results for verification to parameters specified in ASTM C 618.
c. Mixing water shall be sampled to determine if water from sources other than a municipal water supply is suitable for mixing, and should be tested in accordance with CRD-C 400 Requirements for Water for Use in Mixing or Curing Concrete. If contamination by silt or a deleterious material exists, samples should be taken when contamination is the greatest.

d. Coarse and Fine Aggregates provided with quality and durability test results for verification to parameters specified in the contract and within ASTM C 33 Specification for Concrete Aggregates.

e. Admixtures provided with certificate including test results for verification to parameters specified in ASTM’s C 260 and C 494. Air entraining admixtures shall consistently cause the concrete to have an air content in the specified ranges under field conditions. The admixture may be used only when approved by the Contracting Officer, such approval being contingent upon particular mixture control as described in the CQC Plan.

f. The mixture design submittal shall not exceed the specified maximum permissible water/cement ratio. The water/cementitious materials ratio is calculated by the weight equivalency method.

g. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by the manufacturer's test reports indicating compliance with applicable specified requirements.

h. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios, which will produce a range of strength encompassing those required for the work.

i. Trial mixtures shall be proportioned for maximum permitted slump and air content with due consideration to the approved conveying and placement method. The temperature of concrete in each trial batch shall be reported.

j. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M. They shall be tested at 7 days and at the design age specified and in accordance with ASTM C 39/C 39M. From these test results, a curve will be plotted showing the relationship between water-cement ratio and strength.
14-5.6 Minimum Test Requirements

A minimum number of production and control tests are listed below. The frequency of testing may be increased or decreased as directed by the contract specifications or the Contracting Officer to maintain adequate control of the concrete mix, plant productions, and placement operations.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REQUIREMENT</th>
</tr>
</thead>
</table>
| 1. Concrete Mix Design | 1. Mix design for each class of concrete shall include all of the following data:  
   (a) Weights, specific gravity, and volumes of all materials.  
   (b) Water-cement ratio by weight.  
   (c) 7 and 28-day compressive strengths.  
   (d) Air Content.  
   (e) Slump.  
   (f) Unit weight (also 28-day air-dry unit weight for lightweight concrete).  
   (g) For class P concrete, flexural beam strength tests for 7, 28, and 90 days, as specified.  
   (h) Certified test reports of aggregate compliance with ASTM C33 (ASTM C330 for lightweight aggregate) or other specified standards.  
   (i) Certification of admixture compliance with the requirements as stated in the contract documents.  
   (j) Certified test reports for cement and pozzolan, accompanied by Mill Test Reports from a plant with a record of high quality production for the past 3 years. |
| 2. Slump, Entrained Air, Unit Weight (Lightweight Concrete Only), Temperature of Mix | 2. Three per day per 8-hr shift as minimum and whenever there is a change in consistency of concrete. Samples shall be taken at the point of discharge as stated by ASTM C172, unless otherwise specified. Samples shall be taken at the beginning, midpoint, and end of each daily placement of each concrete used. |
| 3. Test Cylinders | 3. One set of three cylinders shall be made for each increment or fraction of 150 c.y. placed during each 8-hour shift. For lightweight concrete, a minimum of one set of four cylinders shall be taken. One cylinder shall be used to determine 28-day air-dry unit weight. If the consistency of the concrete (as measured by the slump test) exceeds the |
maximum slump obtained in the design mix or by the contract requirements, then one additional set of represent any deficient concrete already delivered to the forms. Any remaining concrete at the site exceeding the slump stated above shall be removed from the site at no additional cost to the Government. All subsequent batches shall be tested for slump until the necessary adjustments have been made to ensure that concrete delivered to the forms does not exceed the maximum slump.

<table>
<thead>
<tr>
<th>4. Test Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td>For flexural concrete, one set of four beams shall be made for each increment or fraction of 300 cu. yd. placed during each 8-hour shift. Additional sets may be required when concrete slump or mix proportions are adjusted. Additional sets will be required when the concrete slump is excessive as stated in Item 3 above, or when mix proportions are adjusted.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Plant and Mixing Equipment Compliance Tests And Materials Tests at Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor compliance with ASTM C94 &quot;Standard Specifications for Ready Mix Concrete&quot;, with documentation, reports, or certification of compliance upon request by the Contracting Officer.</td>
</tr>
</tbody>
</table>

Note: Where pumping is approved samples for slump test shall be obtained prior to entering the pump

**14-5.7 Mixing Plant Certifications**

Requirements for batching plants, mixers, conveying, and placing equipment is generally identified in the plans and specifications. Available options in batching equipment include automatic, semiautomatic, partially automatic, manual, and volumetric batching (ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete, ASTM C94 Ready-Mixed Concrete, and ASTM C685 Concrete Made by Volumetric Batching and Continuous Mixing). The batching system shall be equipped with an accurate recorder or recorders that meet the requirements of NRMCA CPMB 100 Concrete Plant Standards. The equipment for batching by mass shall conform to the applicable requirements of NIST Handbook 44 Specifications, Tolerances, and other Technical Requirements for Weighing and Measuring Devices, except that the accuracy shall be plus or minus 0.2 percent of scale capacity. An offsite plant should be considered when the maximum size aggregate is 37.5 mm (1-½ in.) or less, commercial concrete plants exist in the project area, the plants are close enough that the interval between concrete batching and final placement will be 1-½ hr or less, and the required placement rate can be maintained.
14-5.8 Field Technician Certification

Supervising field technicians shall possess a minimum of 3 years relevant experience and current technician certification. The certification requirement is satisfied by being certified as:

(1) an ACI Concrete Field Testing Technician-Grade 1, or
(2) a NICET Construction Materials Testing-Concrete at Level 1 Engineering Technician or higher, or (3) by an equivalent certification program.

Field technicians shall meet the certification requirements above, but are allowed to have less than 3 years of experience.

14-5.9 Methods of Curing

Several different methods of curing are suitable, and the Contractor is given the option of selecting a preferred method in accordance with ACI requirements, unless otherwise specified. However, any curing method that has proved unsatisfactory in a particular geographic area will not be permitted for projects in that area. All materials and equipment necessary for curing and protecting the concrete must be available on the job before concrete placement is started, and no delays in starting the curing will be tolerated. Curing procedures will include provisions for attaining proper moisture and temperature conditions in the concrete. Experience has indicated that evaporation shrinkage cracking can be controlled by moist curing of the concrete under wet covers for a minimum of 24 hours after placement. To prevent excessive heat loss and promote hydration, it is important that the covers extend over the forms as well as the concrete surface. Fog spraying equipment should direct a very fine mist of water onto the concrete surface until curing under wet covers can be started. During cold weather, other approved methods of curing providing adequate protection against rapid heat loss from the concrete shall be used during the early hardening period. Precautions shall also be taken at the end of the curing period to avoid rapid cooling of the concrete and the resulting development of undesired stresses.

14-5.10 Procedures for Sampling and Testing

a. Testing and reporting shall be performed in accordance with the American Society for Testing and Materials (ASTM) Standards as follows: Sampling Fresh Concrete, ASTM C 172; Slump of Portland Cement Concrete, ASTM C 143; Air Content of Freshly-Mixed Concrete by Pressure Method, ASTM C 231 (for lightweight concrete use volumetric method, ASTM C 173); and Unit Weight, Yield, and Air Content (Gravimetric) of Concrete, ASTM C 138, with the exception that a 0.25 cubic-foot container, such as the lower part of an air meter, may be used in place of the 0.50 cubic-foot capacity specified for concrete with coarse aggregates up to 1-1/2 inch maximum size.

b. The minimum number of cylinder specimens shall be three per set (one for 7-day and two for 28-day compressive strength tests). For lightweight concrete, one additional cylinder specimen shall be taken to test for 28-day air-dry unit weight. Additional specimen shall be made if required to establish strengths for form stripping or other purposes. Concrete samples shall be secured in conformance with Standard Method of Sampling Fresh Concrete, ASTM C 172, and test specimens fabricated and cured in accordance with Standard Method of Making and Curing Concrete Compression Test Specimens in the Field, ASTM C 31. Cylinders shall be tested in...

c. Use of plastic molds, in lieu of other approved molds, will be based upon the following: (1) Prior approval as to type, dimensions, and other properties shall be required. (2) Plastic molds will not be reused.

d. Field adjustment of approved water-cement ratios. (1) Addition of water to the plastic concrete at the job site will not be permitted, except when directed by the CQC representative with the approval of the Contracting Officer's representative. (2) Adjustment of the concrete mix at the job site will be cause for rejection in the absence of compliance with the above provision. (3) Adjustments, if required, will be made by the supplier at the point of mixing and the water-cement ratio of the concrete delivered to the project shall not exceed that ratio which has been previously submitted and approved.

e. Unless otherwise specified, the minimum number of beams shall be four per set and shall be tested for flexural strength in pairs at 7 and 28 days. Additional beams shall be made, if required, to establish strengths after changes in mix proportions are made. Concrete samples shall be secured in conformance with Standard Method of Sampling Fresh Concrete, ASTM C 172 and test specimens shall be fabricated and cured in accordance with Standard Method for Making and Curing Concrete Test Specimens in the Field, ASTM C 31. Beams shall be tested in accordance with Standard Method of Test for Flexural Strength of Concrete, ASTM C 78.

f. The coarse and fine aggregates shall be tested weekly at the plant for gradation and the amount of surface moisture of the fine and coarse aggregate shall be determined prior to batching. Additional gradation and moisture testing may be required by the Contracting Officer at no additional cost to the Government, if it is evident that there is excessive variation in the consistency of the concrete delivered to the project site. The procedure outlined in Standard Method of Testing for Sieve or Screen Analysis of Fine and Coarse Aggregates, ASTM C 136, and Standard Method of Test for Materials Finer Than No. 200 Sieve in Mineral Aggregates by Washing, ASTM C 117 shall be followed for gradation test. Moisture tests are to be performed in accordance with the Standard Method of Test for Total Moisture Content of Aggregate, ASTM C 566. Other methods such as the use of a graduated volumetric flask may be used, provided accurate moisture contents based on saturated-surface-dry conditions are obtained.

g. Evaluation of the Contractor's mixers and concrete handling equipment shall be made periodically throughout the construction period to ensure that no concrete of marginal quality due to segregation is being placed in any structure. The compliance tests which provides the test data for this evaluation is described in the specification for Ready Mixed Concrete, ASTM C 94.

h. In addition to the minimum testing program above, for large projects only (greater than 1200 c-y.), samples consisting of 15 pounds of fine aggregate, 25 pounds of 3/4" to No. 4 coarse aggregate, and 35 pounds of 1-1/2" to 3/4" coarse aggregate used in concrete mix shall be delivered only upon request to the District approved Laboratory. These samples shall be taken under the direction of the CQC representative and shall be shipped prepaid in suitable containers.
by the Contractor at the Contractor's expense. Testing of these samples will be performed by the Government at no cost to the Contractor.

**Addition of water on the job:** The maximum specified or approved water/cement ratio should never be exceeded. If all the water allowed by the specification or approved mixture proportions has not been added at the start of mixing, it may be permissible, depending upon project specifications, to add the remaining allowable water at the point of delivery. Once part of a batch has been unloaded, however, it becomes impractical to determine what water/cement ratio is produced by additional water. The production of concrete of excessive slump or adding water in excess of the proportioned water/cement ratio to compensate for slump loss resulting from delays in delivery or placement should be prohibited. Persistent requests for the addition of water should be investigated.

**14-5.11 Field Curing and Transporting Concrete Specimens**

a. Field curing concrete specimens has resulted in many deficiencies on projects. Concrete specimens should be shaded or insulated to ensure that initial field curing is maintained within the required 60 to 80°F (16 to 27°C) up to 48 hours. In hot weather placements, a shaded area allowing for air flow typically provides an acceptable initial protection for concrete cylinder specimens. ASTM C31 paragraph 10.1.3 further requires after 48 hours of initial field curing, that specimens shall be removed from their molds and placed into water storage tanks in water saturated with calcium hydroxide and maintained at 73 ± 3°F (23 ± 2°C). This may be impractical for remote projects, but deviations from this requirement should be recorded on field and testing reports, including recording temperature extremes from maximum-minimum thermometers.

b. Care should be conducted in protecting the specimens as close to the specified requirements as possible. Transporting specimen requirements identify that concrete cylinders or beams shall be protected from surface drying and be cushioned during transportation in order to prevent damage from jarring. As noted in ASTM C31 paragraph 11.1, specimens shall not be transported until at least 8 hours after final set. Insulation material may be required during cold weather. Wet sawdust or wet sand generally provides a suitable material for cushioning and moisture protection. Transportation time shall not exceed 4 hours.

**14-5.12 Reports and Recordkeeping**

a. Concrete Testing Report (EMU Form C172-1). This form is used for documenting fresh concrete properties as received and placed, including field conditions, supplied concrete mixture data, sampling and testing results. This form should be used when submitting compressive and flexural test results. It shall be completed showing the required information including the batch weights of cement, water, and the fine and coarse aggregate as corrected for surface moisture and the mix design weights per cubic yards in addition to other pertinent tests noted in Table 14-1. The result of each strength test shall be submitted for each age interval.

b. Checklist for Field Concrete Sampling & Testing (EMU Form C172-2). This form can be used for QA or QC documentation of a testing technician in the performance of concrete field testing.

c. Concrete Mix Design Data (DD Form 1220). This form can be used for documenting more detailed analysis of a concrete mixture design including material properties and blending.
d. Aggregate Sieve Analysis (EMU Form C136-1) and Aggregate Grading (WES Form 886). The results shall be computed and plotted on the appropriate form.

14-6 EARTHWORK

14-6.1 Fundamentals
The fundamentals of earthwork involve application of the specifications for a contract. Several of the Specification Sections in a project’s contract documents describe procedures to fill, excavate, backfill, or place soil on the project site. These Sections include but are not limited to 02210--Grading, 02221--Excavation, Filling, and Backfilling for Buildings, 02222--Excavation Trenching, and Backfilling for Utilities Systems, and 02225--Earthwork for Roadways, Railroads, and Airfields. In order to apply specification requirements for earthwork on a project, the following should be conducted:

a. Identify the soil types available.

b. Determine their characteristics related to compaction:
   (1) Material suitable, marginal, or not suitable,
   (2) Standard or Modified Compaction Efforts,
   (3) Maximum Dry Density & Optimum Moisture Content, Specific Gravity, etc.

c. Identify the equipment required for compacting the selected materials to the required effort.

d. Conduct a field test section and determine roller pattern.

e. Conduct testing per contract requirements for compliance verification.
### 14-6.2 Earthwork Testing

Testing and reporting shall be performed in accordance with the American Society of Testing and Materials (ASTM) Standards as indicated below or as shown in below (latest editions at time of contract award, unless otherwise indicated):

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>Procedure/Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Sampling.</td>
<td>ASTM D75</td>
<td>Sampling Aggregates</td>
</tr>
<tr>
<td>b. Sample Preparation.</td>
<td>ASTM D2217</td>
<td>Wet preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants (Method B)</td>
</tr>
<tr>
<td></td>
<td>(2) ASTM C136</td>
<td>(2) Sieve or Screen Analysis of Fine and Coarse Aggregates.</td>
</tr>
<tr>
<td>d. Sieve Analysis.</td>
<td>ASTM D422</td>
<td>Particle-Size Analysis of Soils. (Used with or without hydrometer analysis where specified)</td>
</tr>
<tr>
<td>e. Unit Weight.</td>
<td>ASTM C29</td>
<td>Unit Weight and Voids in Aggregates.</td>
</tr>
<tr>
<td>g. Specific Gravity.</td>
<td>ASTM D854</td>
<td>Specific Gravity of Soils.</td>
</tr>
<tr>
<td>i. Moisture Content.</td>
<td>ASTM D2216</td>
<td>Laboratory Determination of Moisture Content of Soil (oven drying).</td>
</tr>
<tr>
<td>j. Moisture-Density Relationship.</td>
<td>(1) ASTM D698</td>
<td>(1 &amp; 2) Moisture-Density Relations of Soil and Soils Aggregate Mixture using 5.5-lb Rammer and 12-inch Drop (Standard Effort D698) or 10-lb Rammer and 18-inch Drop (Modified Effort D1557).</td>
</tr>
<tr>
<td></td>
<td>(2) ASTM D1557</td>
<td>(3) Moisture-Density Relations of Soil (using a 12-inch diameter mold).</td>
</tr>
<tr>
<td></td>
<td>(3) EM 1110-2-1906, Appendix VI A</td>
<td>(4) Maximum Index Density of Soils Using a Vibratory Table.</td>
</tr>
<tr>
<td></td>
<td>(4) ASTM D4253(^1)</td>
<td></td>
</tr>
<tr>
<td>k. Field Wet Density.</td>
<td>(1) ASTM D1556(^2)</td>
<td>(1) Density of Soil in Place by the Sand-Cone Method (recognized standard).</td>
</tr>
<tr>
<td></td>
<td>(2) ASTM D2922(^3)</td>
<td>(2) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).</td>
</tr>
<tr>
<td></td>
<td>(3) ASTM D2937</td>
<td>(3) Density of Fined Grained Soil by Drive Cylinder Method</td>
</tr>
<tr>
<td>l. Field Moisture Content.</td>
<td>(1) ASTM D3017(^3)</td>
<td>(1) Moisture Content of Soil &amp; Soil-Aggregate in place by Nuclear Methods.</td>
</tr>
<tr>
<td></td>
<td>(2) ASTM D4959</td>
<td>(2) Moisture Content of Soil by Direct Heat (hot-plate) Method.</td>
</tr>
</tbody>
</table>
(3) ASTM D4643  
(3) Moisture Content of Soil by Microwave Method.

m. Durability Test.  
ASTM C131  
Resistance to Abrasion of Small-Size Coarse Aggregate by Use of the Los Angeles Machine.

n. Soil Classification  
ASTM D2487  
Unified Soil Classification System requires ASTM D422 and D4318 test results for classifying soils.

Note1: Vibratory table shall be used for cohesionless materials for which a well-defined moisture-density relationship cannot be obtained using ASTM’s D698 or D1557.

Note2: The field density test shall be performed in accordance with the Standard Method of Test for Density of Soil in Place by the Sand-Cone Method, ASTM D1556, except that in each test the weight of the disturbed sample representing the full depth of layer shall be not less than 10 pounds for fine-grained or sandy materials and 12 pounds for gravelly materials using a scale for weighing of sufficient capacity sensitive to 0.01 pounds. All field density samples shall be oven-dried in accordance with ASTM D2216.

Note3: The use of Nuclear Methods for determining field densities and moisture contents should be limited to drainage materials and base course materials as outlined by Table 14-3. Where nuclear methods are allowed for Fill or Backfill operations, correlations shall be conducted with ASTM’s D1556 and D2216 for each classification of soil encountered.
<table>
<thead>
<tr>
<th>TYPE OF TEST</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. BACKFILL AND EMBANKMENT</strong></td>
<td></td>
</tr>
<tr>
<td>1. Field Density with Moisture Content.</td>
<td>1. Two per lift for each increment or fraction of 2000 sq.yd. placed during each 8-hour shift.</td>
</tr>
<tr>
<td>2. Gradation with Atterberg Limits</td>
<td>2. One per 5 field (from Compacted Material)</td>
</tr>
<tr>
<td>3. Moisture-Density Relationships with Gradation, Atterberg Limits, Specific Gravity, and Classification (from Bulk Sample).</td>
<td>3. One per 5 field densities (with not less than one per type of material) for the first 25 field density tests. Thereafter, one additional test for each change in material.</td>
</tr>
<tr>
<td><strong>B. SUBGRADE AND SUBBASE TEST FREQUENCY</strong></td>
<td></td>
</tr>
<tr>
<td>1. Field Density w/Moisture Content</td>
<td>1. Two per lift for each increment or fraction of 1000 sq.yd. placed during each 8-hour shift.</td>
</tr>
<tr>
<td>2. Gradation w/Atterberg Limits (from Compacted Material)†</td>
<td>2. One (1) per five (5) field densities.</td>
</tr>
<tr>
<td>3. Moisture-Density Relationship w/Gradation, Atterberg Limits, Specific Gravity and Classification (from Bulk Sample)</td>
<td>3. One per 5 field densities (with not less than one per type of material) for the first 25 field density tests. Thereafter, one additional test for each change in material.</td>
</tr>
<tr>
<td><strong>C. BASE COURSE AND DRAINAGE MATERIAL TEST FREQUENCY</strong></td>
<td></td>
</tr>
<tr>
<td>1a. Wet Density: Two per lift for each increment or fraction of 1000 sq.yd. placed during each 8-hour shift. First 5 tests during initial construction of each base course or drainage material shall be determined by ASTM D1556 and by ASTM D2992 for correlation of sand cone and nuclear methods. Thereafter, every 10th nuclear test method shall be verified by sand cone method. If verification testing does not show adequate correlation as determined by the Contracting Officer, all tests shall be performed in accordance with ASTM D1556. However, the Contractor may, at his option, perform all field density tests in accordance with ASTM D1556.</td>
<td></td>
</tr>
<tr>
<td>1b. Moisture Content: Two per lift for each increment or fraction of 1000 sq.yd. placed during each 8-hour shift. First 10 tests during initial construction of each base course or drainage material shall be determined by ASTM D2216 and by ASTM D4959, or D3017 for correlation of oven versus direct heat or nuclear methods. Thereafter, every 10th direct heat or nuclear test method (rapid determination) shall be verified by oven method. If verification testing does not show adequate correlation as determined by the Contracting Officer, all tests shall be performed in accordance with ASTM D2216. However, the</td>
<td></td>
</tr>
<tr>
<td>Table 14-6.3</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Contractor may, at his option, perform all field density tests in accordance with ASTM D2216.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2. Gradation and Atterberg Limits (From Compacted Material)</strong>*</td>
<td><strong>2. One (1) per five (5) field density tests.</strong></td>
</tr>
<tr>
<td><strong>3. Moisture-Density Relationship w/Gradation, Atterberg Limits, Specific Gravity, and Classification (from Bulk Sample).</strong></td>
<td><strong>3. One (1) per five (5) field density tests (with not less than one per type of material) for the first 25 field density tests. Thereafter, one additional test for each change in material.</strong></td>
</tr>
<tr>
<td><strong>4. Crushed Faces, L-A. Abrasion, and Smoothness</strong></td>
<td><strong>4. Frequency to be in accordance with contract specifications.</strong></td>
</tr>
<tr>
<td><strong>D. BACKFILL FOR CULVERT TRENCHES, WALLS, CULVERTS, BUILDING PERIMETERS TEST FREQUENCY</strong></td>
<td><strong>TRENCHES, WALLS, CULVERTS, BUILDING PERIMETERS TEST FREQUENCY</strong></td>
</tr>
</tbody>
</table>
| **1. Field Density w/Moisture** | **1a. Culverts and Utility Trenches:** One per lift for each increment or fraction of 500 lineal feet of backfill.  
**1b. Walls and Building Perimeters:** One per lift for each increment or fraction of 200 lineal feet of backfill. |
| **2. Lab Moisture-Density Relations w/Atterberg Limits, Gradation, Specific Gravity, and Classification (from bulk sample).** | **2. One per 5 field density tests (with not less than one per type of material) for the first 25 field density tests. Thereafter, one additional test each time there is a change in material.** |

**Note:** Compacted material sample taken adjacent to field density test site.

**Note:** For subbase and base courses, measure thickness of lift concurrently with field density test and record on test form. In addition to the minimum testing program listed above, representative samples of subgrade, subbase, base, and all other construction materials (including on-site materials) shall be collected (prior to compaction) by the Contractor and submitted to the Government for testing. Samples shall be taken under the direction of the CQC representative. Bag samples for this purpose shall be shipped within 24 hours by the Contractor at the Contractor's expense to the District approve QA Laboratory. Weight of these samples shall be a minimum of 100 pounds for material containing less than 10% plus No. 4 material, 150 pounds for material containing more than 10% plus No. 4 material, or 750 pounds for material containing more than 30% plus 3/4-inch material.

### 14-6.3 Suitable & Unsuitable Soils

Contract specifications will identify suitable and unsuitable soils by establishing classification, grain-size, and/or Atterberg limits parameters. When a soil classification is identified as suitable or unsuitable, then verification of this is specified by ASTM D2487 requirements. Visual classification of soil by ASTM D2488 method is not acceptable when verifying acceptance or non-acceptance of soils for earthwork construction. ASTM D2487 shall be enforced for acceptance purposes, which includes requiring ASTM D422 Particle-Size Analysis of Soils and ASTM D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils to be performed in order to properly classify soils. Visual classification (identification) of soils requires an experienced and specialized technician or engineer to properly classify materials. Significant errors from visually classifying soils are a common problem and should be avoided.
14-6.4 Subgrade/Subbase/Base Materials

If required by contract, representative samples of subgrade, subbase, base, and all other earthwork materials shall be sampled by the Contractor (prior to compaction) for the first two (2) and every 10th field density tests and submitted to the Government for testing. Samples shall be taken under direction of the CQC representative. Bag samples for this purpose shall be shipped within 24 hours by the Contractor at the Contractor's expense to the District approved QA Laboratory. Weight of these samples shall be minimum 100 pounds for material containing less than 10% plus No. 4 material, 150 pounds for material containing more than 10% plus No. 4 material, or 750 pounds for material containing more than 30% plus 3/4 inch material.

14-6.5 Moisture Control

The recognized industry standard for moisture content control is the oven dried determination by ASTM D2216 Laboratory Determination of Moisture Content of Soil. Some contracts allow for “rapid” moisture determinations by methods such as ASTM D3017 Water Content of Soil & Rock In-place by Nuclear Method, ASTM D4959 Moisture Content of Soil by Direct Heat (hot-plate) Method, and ASTM D4643 Moisture Content of Soil by Microwave Method. Problems identified within ASTM D3017 concerning moisture content determinations are as follow:

1. Comparisons with recognized Industry standard moisture content determination had not been properly conducted as identified in ASTM D3017 paragraph A1.4.4.
2. Further notes in paragraph 4.2 identify that the nuclear readings are heavily influenced by water content of the material closest to the surface (upper 2-3 inches) and do not reflect the complete lift thickness.
3. Furthermore, as noted in paragraph A1.3, calibration by the manufacturer is not applicable to all materials and should be verified by methods in paragraph A1.4.
4. Correlations developed between ASTM’s D3017 and D2216 have also been found to be incomparable among different nuclear gauges, as well as with differing soils. When “rapid” methods are to be utilized, initial correlations shall be conducted prior to production commencement, and re-verified periodically through construction placements. When soil classifications change, new correlations shall be conducted.

14-6.6 General Density Control

The recognized standard for density control is the sand-cone density determination by ASTM D1556 Density of Soil In Place by the Sand-Cone Method. Other “rapid” determination methods have been utilized in the field such as ASTM D2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) and ASTM D2937 Density of Fined Grained Soil by Drive Cylinder Method. Nuclear wet density correlations generally identify small corrections and the data is typically more consistent than that found with moisture correlations noted above. When “rapid” density determination methods are to be utilized, initial correlations shall be conducted prior to production commencement, and re-verified periodically through construction placements. When soil classifications change, new correlations shall be conducted.
14-6.7 Compaction Control
For fine grained (clayey and silty) soils and for sands with appreciable fines such that normal shaped compaction curves are obtained, results of all compaction tests shall be plotted on a common plot as a family of curves. For each field density test performed, a one-point compaction test, with additional points as needed, shall be performed on the same material on which the field density test was conducted. The one-point compaction test shall be performed on the dry side of the optimum moisture content. For comparison of field density data to the proper laboratory compaction test results, the procedures for the one-point and/or two-point compaction control methods as described in paragraph Compaction Procedure, shall be used. Compaction curves plotted on the family of curves shall be of such a scale that the optimum moisture content can be interpreted to the nearest 0.1 percent and the maximum dry density can be interpreted to the nearest 0.1 pcf (or 2 kg/m³). When a one-point test plots outside the range of the family of curves, an additional five-point compaction test shall be performed.

14-6.8 Compaction Procedure
The following paragraphs describe methods of relating field density data to desired or specified values. Compaction control of soils requires comparison of fill water content and/or dry density values obtained in field density tests with optimum water content and/or maximum dry density. At a minimum, control shall be in accordance with the One-Point Compaction Method. Where conditions require, the Two-Point compaction Method shall be used.

a. One-Point Compaction Method: The material from the field density test is allowed to dry to a water content on the dry side of estimated optimum, and then compacted using the same equipment and procedures used in the five-point compaction test. Thorough mixing is required to obtain uniform drying; otherwise, results obtained may be erroneous. The water content and dry density of the compacted sample are determined and then used to estimate its optimum water content and maximum dry density as illustrated in Figure 14-1 below. In Figure 14-1, the line of optimums is well defined and the compaction curves are approximately parallel to each other, consequently, the one-point compaction method could be used with a relatively high degree of confidence. However, in Figure 14-2 at the end of this section, the curves are not parallel to each other and in several instances will cross if extended on the dry side. Consequently, the correct curve cannot be determined from the one-point method; therefore, the two-point compaction method should be used. The one-point method should be used only when the data define a relatively good line of optimums.
Figure 14-1. Illustration of one-point compaction method.

ONE POINT PROCEDURE:

1. Point A is the result of a one-point compaction test on material from field density test. This point must be on the dry side of optimum water content.
2. Point O is the estimated optimum water content and maximum dry density of the fill material based on a projection of point A approximately parallel to the adjacent compaction curves.
3. Point A must plot within 3 percent of the line of optimums.

b. Two-Point Compaction Method: In the two-point test, one sample of material from the location of the field density test is compacted at the fill water content if thought to be at or on the dry side of optimum water content (otherwise, reduced by drying to this condition) using the same equipment and procedures used in the five-point compaction test. A second sample of material is allowed to dry back about 2 to 3 percentage points dry of the water content of the first sample and then compacted in the same manner. At least one point shall fall within 3 percent of the line of optimums. After compaction, the water contents and dry densities for the two samples are determined. The results are used to identify the appropriate compaction curve for the material.
being tested as shown in Figure 14-2 at the end of this section. The data shown in Figure 14-2 warrant the use of the two-point compaction test because the five-point compaction curves are not parallel. Using point A only, as in the one-point test method, would result in appreciable error as the shape of the curve would not be defined. The estimated compaction curve can be more accurately defined by two compaction points.

Figure 14-2. Illustration of two-point compaction method.

TWO POINT PROCEDURE:

1. Points A and B are results of a two-point compaction test on material from field density test. Points A and B must be on the dry side of optimum water content.
2. The estimated compaction curve based on Points A and B establishes Point “O” on the locus, which is the estimated maximum dry density and optimum water content of the fill material.
3. One point must plot within 3 percent of the line of optiums.
14-6.9 Reports and Recordkeeping

Proper recordkeeping of the soil test data is imperative to insure that proper test procedures are being followed. Because of this, the Savannah District has developed some standard forms to show specific step by step procedures which determine the soil density, soil moisture content, and %Compaction. Examples of test worksheets and reports are provided in the Exhibits section of this chapter along with a brief explanation of how specific spaces on some of the forms are to be filled in and what data should be found. Forms such as CESAS Form 865-1, CESAS Form 865-2, and CESAS Form 1177, show a summary of all soil density tests, performed during a week. Also included is a fully developed “Family of Curves” with the one-point compaction test results plotted and labeled. Following the completed examples of CESAS Form’s 865-1, 865-2, and 1177 with testing data, is a checklist of relevant items which should be evaluated when reviewing soil compaction data sheets submitted by the contractor or independent soil testing firms.

Other testing forms for moisture content (EMU Forms D2216-1, D4643-1, D4959-1), Atterberg limits (ENG Form 3838), sieve analysis (EMU Form’s D422-1a), grain-size (ENG Form 2087), compaction (EMU Form D698/D1557-1), and drive cylinder density (EMU Form D2937-1) are also provided within the Exhibits section. Additional exhibits include example worksheets and reports with data included.

14-7 BITUMINOUS MATERIAL AND BITUMINOUS-AGGREGATE MIXTURES

14-7.1 Scope

This section prescribes methods and procedures for the CQC testing of bituminous mixtures used for the construction of streets, roads, parking area pavements, and unless otherwise specified, for the construction of airfield and heliport pavements.

14-7.2 Tests

Testing and reporting shall be performed in accordance with American Society for Testing Materials (ASTM) Standards as listed in Table 14-4.

<table>
<thead>
<tr>
<th>Table 14-4. Reference Test Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REFERENCE</strong></td>
</tr>
<tr>
<td>ASTM D 1559, or D 6926, &amp; D6927</td>
</tr>
<tr>
<td>Standard Test Method</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>ASTM D 1188</td>
</tr>
<tr>
<td>ASTM D 2172 or D 6307</td>
</tr>
<tr>
<td>ASTM D 2041</td>
</tr>
<tr>
<td>ASTM C 88</td>
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<tr>
<td>ASTM D 75</td>
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<tr>
<td>ASTM D 140</td>
</tr>
<tr>
<td>ASTM D 946</td>
</tr>
</tbody>
</table>

14-7.3 Mix Design Submittals

Certain features on projects which involve comparatively small quantities of bituminous mixture (less than 6 tons) may be excluded from testing requirements listed hereinafter, provided the material is delivered from a plant with a history of consistently producing bituminous mixtures which conform to contract requirements. The COR reserves the right to request certified test data to ensure that materials produced from the plant will conform to the contract requirements. On projects requiring more than 6 tons the Contractor shall submit the minimum items in Table 14-5, Item A.1. at least 30 days prior to bituminous material placement.
### 14-7.4 Minimum Test Requirements

For placement, the minimum number of each type of production test and each type of control test are listed below. These frequencies of testing may be increased by the CO to maintain adequate control of the bituminous mix, plant production, and placement operations.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. SUBMITTALS AND TEST SAMPLE SUBMITTALS</strong></td>
<td></td>
</tr>
<tr>
<td>1. Mix Design.(^1) (prior to placement)</td>
<td>1. Test results and material sources 30 days (minimum) in advance of paving. These data shall be presented with respect to asphalt cement content in tabulated form, as well as in graphical form, and shall include curves for unit weight, percent voids of total mix, percent voids filled, and stability; the optimum oil content shall be indicated, unless otherwise specified.</td>
</tr>
<tr>
<td>2. Hot Mix Sample (during placement)</td>
<td>2. Two 70-pound (minimum) samples shall be obtained from the belt or transport truck. One shall be obtained at the beginning of each 8-hour shift and one at mid-shift. Each 70-pound sample shall be split in half. The two half-samples (from beginning and mid-shift) shall be labeled packed separately and then submitted for QA testing to the District approved Laboratory within 24 hours of sampling. Retain remaining two half-samples for QC testing.</td>
</tr>
<tr>
<td>3. Aggregate Sample.(^2) (during placement)</td>
<td>Two 50-pound (minimum) samples shall be obtained from the hot bins. One shall be collected at the beginning of each 8-hour shift and one at mid-shift. Each 50-pound sample shall be split in half. The two half-samples (from the beginning and mid-shift) shall be packed separately and submitted to the District approved QA Laboratory within 24 hours of obtaining. Retain remaining two half-samples for QC testing.</td>
</tr>
<tr>
<td>4. Bituminous Material Sample (during placement)</td>
<td>4. Obtain one quart of bituminous material and refinery certification of compliance and submit to the District approved QA Laboratory with first hot mix sample. Repeat anytime bituminous material source changes.</td>
</tr>
<tr>
<td>5. Core Specimens (4&quot; diameter min.) (after each day's placement)</td>
<td>5. Obtain 1 set of 5 cores per each hot mix sample obtained (if possible, 2 cores from centerline of joints). Number cores and note locations obtained on as-built drawings. From each set, 2 cores shall be submitted to the District approved QA Laboratory, (Preferably 1 core from joint). Retain remaining cores for QC testing.</td>
</tr>
</tbody>
</table>
## B. QUALITY CONTROL TESTING

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None.</td>
<td>2. On each of the split samples of aggregates retained by the Contractor, a sieve analysis and specific gravity test shall be performed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3. On each of the split samples retained by the Contractor, the Contractor shall determine the bitumen content and perform a complete Marshall Method test, (including stability, flow, unit weight, percent voids of total mix and percent voids filled with bitumen). On every 10th sample the Contractor shall perform a retained-stability test.</td>
<td>4. For each core specimen retained by the Contractor the relative compaction and bitumen content shall be determined. The thickness of the cores shall be measured and recorded.</td>
<td>5. Shall be performed by the Contractor as required by the contract documents.</td>
</tr>
</tbody>
</table>

Note\(^1\): The theoretical maximum specific gravity of paving mixtures shall be determined in accordance with ASTM D 2041 (standard procedure). When determining Marshall properties on hot mix samples, measure the maximum specific gravity in triplicate and average. When determining Marshall properties for mix design purposes, measure the maximum specific gravity in triplicate for each design curve point and average. To determine the maximum specific gravity in triplicate on the projected optimum and calculate the specific gravity of the remaining points in accordance with the Asphalt Institute Manual MS-2, Chapter VI paragraph 6.07 (May 1984, or most recent edition).

Note\(^2\): For batch plants not utilizing hot bins, individual bin samples shall be obtained from the cold feed bins. If it is determined by the Contracting Officer's representative that representative samples cannot be readily obtained from the individual cold feed bins, representative samples shall be obtained from the combined cold feed conveyor.

### 14-7.5 Sample Transmittal

Samples of asphalt, aggregates, cores, and hot mixes (noted in Table 14-5) shall be delivered to the District approved QA Laboratory. These samples shall be taken under the direction of the CQC representative and shall be shipped prepaid in suitable containers by the Contractor at the Contractor's expense. Testing of these samples in the District approved QA Laboratory will be performed by the Government at no cost to the Contractor.
14-7.6 Compilation of Test Data for Submittal of Test Results

a. Sieve Analysis, (EMU Form C136-1). The grading data from the hot bin samples shall be recorded on this form.

b. Aggregate Grading Chart, (WES Form 886). The aggregate grading of hot bin samples and the extraction tests and specific limits shall be recorded on this form.

c. Specific Gravity of Bituminous Mix Components, (DD Form 1216). This form is used to record test data for determination of specific gravity for the various individual material constituents in a bituminous mixture.

d. Bituminous Mix Design - Aggregate Blending, (DD Form 1217). This form is to be used for computations for combined gradings of aggregate for bituminous mix design.

e. Marshall Method - Computation of Properties of Asphalt Mixture, (DD Form 1218). This form is used in recording Marshall test data and for recording field density data.

14-8 OPERATIONAL TESTING

Reference Contract specification requirements and Industry codes and standards

Waterline
Fire sprinklers
Fire Alarm
Mechanical T&B/Commissioning: HVAC Flow Hood test equipment, Bearings
Electrical: High Pot, Grounding, Comm. Cables, Electrical Panels
Commissioning
Elevator

14-9 MISCELLANEOUS TESTING & INSPECTION

Structural Steel
Structural Steel Welding
Standing Seam Roofing
Asbestos & Hazardous Materials Abatement
Masonry: Filled Cells, Reinforced, Rebar Detection, Infrared Detection
Fire Stopping
Steam Lines
Ground Penetrating Radar
14-10  SHOP INSPECTIONS

14-10.1  Off site surveillance/testing:
Where required under a contract, site visits for inspection and/or testing may be specified for
verification of compliance for some materials, components, or systems assembled elsewhere
prior to delivery to a project.  This may be particularly true for very large critical components
that should be verified for contract compliance before being released from an assembly yard for
delivery to a project. The COR shall have access for such inspection and testing verification
where required.

14-11  DEFICIENCY TRACKING

a.  Both the QC and QA organizations are responsible for identification of deficiencies. However, identification is only the first step in the process. The deficiencies must be tracked
until they are corrected.

b.  Deficiencies should be recorded on either the QC or the QA report, depending on who
observed the deficiency. The QA personnel are responsible for insuring that all known
deficiencies are recorded on the reports. A cumulative log of deficiencies for each contract will
be developed and maintained within the office computer system. The list will contain as a
minimum, a description of the deficiency, corrective action to be taken, and the date of
 correction.

c.  The deficiency list should be discussed by both the QC and the QA personnel on a weekly
basis and initialed upon correction of the deficiency. Major deficiencies in materials,
workmanship, working conditions, or construction methods which will not be corrected
immediately, generally justifies a letter to the contractor from the Resident Engineer.

14-12  ANNEXES, EXHIBITS, AND TEMPLATES

14-12.1  EMU Form C172-1 “Concrete Testing Report”:
This form is used for documenting fresh concrete properties as received including field sampling
and testing results. The form further includes other follow-up field laboratory testing results
such as strength. Concrete batch tickets can be reviewed further documented on this form, in
relation to field testing with targeted materials weights versus actual as-batched data. Field
conditions, adjustments or additions of water in the field can be documented on this form.
14-12.2 **EMU Form C172-2 “Checklist for Field Concrete Sampling & Testing”:**
This form can be used for QA or QC documentation of a testing technician in the performance of concrete field testing. Specific common deficiencies are noted on this form and can be used to verify compliance with the ASTM standards.

14-12.3 **Concrete Mix Design Data (DD Form 1220):**
This form is used for documenting more detailed analysis of a concrete mixture design including material properties and blending.

14-12.4 **CESAS Form 865-1 “Compaction Determination Sand Cone Method and One Point Compaction Test”:** This form is the worksheet needed when performing the sand cone density test. This form is required by the specifications to be completed and submitted to the COR within 24 hours of completion of each test. The Date, Project Name, and Contract Number are required information on each and every data sheet submitted.

14-12.5 **CESAS 865-2 “ONE OR TWO POINT COMPACTION TEST”**
This form is the reverse side of CESAS 865-1 (Sand Cone Density Data Sheet) and is used to record the calculations and measurements in the determination of the Moisture Content and Dry Density from the One-Point Compaction Test. Because the results of this test are used to determine the soils Maximum Dry Density and ultimately the %Compaction, it is imperative that this test be performed correctly, particularly if performed in the field. One procedural item of note is that when the one-point test is performed in the field the mold must be placed on a 200 lb. cube or cylinder of concrete (per ASTM D698 and D1557). If the mold is placed directly on the ground (very common incorrect procedure), the resulting density will be lowered which will lower the derived maximum dry density and erroneously inflate the %Compaction.

14-12.6 **CESAS FORM 1177 “SUMMARY OF FIELD DENSITY TESTS”:**
This form is a summation of the field density tests performed to date. Per the specifications, this form should be submitted to the COR on a weekly basis with the results of the density tests performed that week. The completion of the form is somewhat self explanatory and the data is merely taken from previous individual test data sheets (CESAS Form 865-1 and CESAS Form 865-2). The primary purpose of this sheet is to show the results of the testing procedures in a way that they can be compared and subtle deviations of the compactive effort or density testing procedures can be identified. A few items which should be evaluated on each sheet as they are submitted are as follows:

The numbers shown in the column under the heading “One-Point Comp. Test With Family of Curves” are numbers that were derived from plotting the one-point test on the family-of-curves and interpolating the intersection with the line of optimums. Each one of the numbers shown in this column should be unique. The continual use of one maximum dry density number and
optimum moisture indicates that the testing lab is not following the testing procedures as outlined in the specifications.

The numbers shown in the variation from optimum column ideally should be very close. In large fill projects where the material is coming from a borrow pit or moved around on site, the moisture contents will remain somewhat stable. When the numbers shown in this column begin to deviate substantially from Plus to Minus optimum, is an indication that the contractor is having to add water to the soil or dry it before soil compaction and that achieving the specified %compaction could be more difficult.

The numbers shown in the “Specified Compaction” column will usually be 90% for cohesive soils and 95% for cohesionless soils. This is a somewhat general statement and depends on which section of the specifications is being used, but in most cases these will be the %compaction requirements.

The last column shows any comments about the test results. Usually the technician will indicate in this column if a density test failed to meet the specified compaction requirements. With every failed test there should be a corresponding Retest. This summary makes it much easier to determine if a retest was performed and if it was done at the proper location and depth. Other comments which might appear in this column would be comments indicating the observations made by the technician during testing such as: “Pumping Soil”, or “Excessive Gravel in Test Location”, or “Equipment Operating During Test”, or “Soil Too Wet”, etc.

14-12.7 FAMILY OF CURVES:

Prior to the placement or compaction of soil operations the contractor’s testing lab will obtain several samples of the soil anticipated to be encountered on the jobsite and take them to the testing lab. Each sample will be processed through a sieve and dried. The samples will then be separated into at least five portions and mixed with varying amounts of water. Each soil portion of the original sample will be compacted in a mold and the corresponding density and moisture content will be plotted on the graph. The plotted results of the five portions should form a parabolic-bell shaped curve when the dots are connected. The peak of the curve determines the maximum density and optimum moisture content of that particular soil. After the Compaction Tests are performed on the other soil samples and the results plotted a line can be drawn which connects the maximum densities of each curve. This line is referred to as the “Line of Optimums” and is used to determine the maximum density and optimum moisture content of the soil tested in the field using the sand cone density test. As the project progresses additional 5-point compaction tests may be added to the family of curves depending on the variability of the soils encountered in the field. Occasionally the results of the one-point compaction test will plot significantly lower or higher than the maximum and minimum curves shown on the “family of curves”. This indicates that the soil tested in the field has changed or is different than the soil tested to obtain the “family of curves” and an additional five point compaction test should be performed and added to the “family of curves”.

14-35
14-12.8 **EMU Form’s D2216-1 “Oven Drying Moisture Determination”,** D4959-1 “Direct Heat/Hot Plate Moisture Determination”, D4643-1 “Microwave Moisture Determination”: These forms are used for documenting industry standard (Oven) and rapid moisture content determination methods.

14-12.9 **ENG Form 3838 “Liquid and Plastic Limit Tests”:**
This form is used for documenting laboratory testing for determination of liquid limit, plastic limit, and plasticity index. Per ASTM D4318, at least three liquid limit and two plastic limit determinations shall be conducted. A minimum of 6 grams of dry soil shall be representative of each plastic limit sample.

14-12.10 **EMU Form’s D422-1a and C136-1 “Sieve Analysis”:**
These forms are used for documenting particle size determination or sieve analysis testing for soils or aggregates. Weights of particles for individual sieve sizes can be recorded as individual weights or as cumulative weights on these forms. When cumulative weights are recorded, the percent retained and percent finer can disregard the previous percentages on the next larger sieve.

14-12.11 **ENG Form 2087 “Gradation Curves & Classification Results”:**
This form can be used to plot the grain-size curves, sample identification, moisture content, Atterberg limits, and classification results.

14-12.12 **EMU Form D698/D1557-1 “Compaction Test Worksheet”:**
This form can be used for documenting laboratory testing results for standard or modified compaction efforts.

14-12.13 **EMU Form D2937-1 “Drive-Cylinder Density Worksheet”:**
This form can be used for documenting field testing for density determination by the Drive Cylinder method.
<table>
<thead>
<tr>
<th>US Army Corps of Engineers</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Testing Report</td>
<td>Contract No.</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td><strong>Type of Project</strong></td>
</tr>
<tr>
<td><strong>Location in Structure</strong></td>
<td><strong>Class Concrete</strong></td>
</tr>
<tr>
<td><strong>Concrete Producer &amp; Location</strong></td>
<td><strong>Type Mix</strong></td>
</tr>
<tr>
<td><strong>Mixtute Number</strong></td>
<td><strong>Method of Curing</strong></td>
</tr>
<tr>
<td><strong>Type of Specimens</strong></td>
<td></td>
</tr>
<tr>
<td>CYLINDERS □</td>
<td>BEAMS □</td>
</tr>
<tr>
<td><strong>Truck No.</strong></td>
<td><strong>Load Ticket No.</strong></td>
</tr>
<tr>
<td><strong>Weather</strong></td>
<td><strong>Air Temp.</strong></td>
</tr>
<tr>
<td><strong>Other conditions</strong></td>
<td><strong>QC Contact</strong></td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td>BATCHING target / actual</td>
</tr>
<tr>
<td>Cement (lbs)</td>
<td></td>
</tr>
<tr>
<td>Flyash (lbs)</td>
<td></td>
</tr>
<tr>
<td>Fine Agg. (lbs)</td>
<td></td>
</tr>
<tr>
<td>Coarse Agg. (lbs)</td>
<td></td>
</tr>
<tr>
<td>Coarse Agg. (lbs)</td>
<td></td>
</tr>
<tr>
<td>Water (gal)</td>
<td></td>
</tr>
<tr>
<td>Field Specimen Number</td>
<td>C143 Slump (in)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**
Testing Performed in general accordance with ASTM’s: C172 ☐, C1064 ☐, C143 ☐, C138 ☐, C173 ☐, C231 ☐, C31 ☐, C39 ☐, C78 ☐.

**Sampled By**
**Tested By**
**Checked By**
**Average**
**Age (days)**
**Strength (psi)**

EMU Form C172-1
Jan 07

**Admixture (oz)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>± 3</th>
<th></th>
<th>Dosage (oz/cw t)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Admixture (oz)</td>
<td></td>
<td>± 3</td>
<td></td>
<td>Dosage (oz/cw t)</td>
<td></td>
</tr>
</tbody>
</table>
## Checklist for Field Concrete Sampling & Testing

<table>
<thead>
<tr>
<th>ASTM C172 Sampling</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moistened &amp; Clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampled from middle 1/3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection of testing Area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C173 Air Content Volumetric</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampen all equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill in two equal lifts by volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 strokes per lift (evenly distributed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After rodding tap sides 10-15 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strike-off with strike-off bar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C1064 Temperature</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermometer 30-120°F, 1°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-50°C, 0.5°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide 3&quot; cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Press concrete around probe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read to nearest 1°F,0.5°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C143 Slump</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampen cone and base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cone held firmly to base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 equal layer by volume (2-5/8&quot;, 6-1/8&quot;, 12&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 blow per lift (evenly distributed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strokes just penetrate underlying layer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strike-off with rod</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift cone 3-7 seconds (do not twist or turn)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure slump nearest ¼ inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform test in 2.5 min.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C231 Air Content Pressure</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampen all equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill in three equal lifts by volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 blows per lift (evenly distributed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After rodding tap sides 10-15 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strike-off with bar or plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wipe rim clean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill with water through petcock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(rock gently)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump to initial pressure mark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close petcocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Release air &amp; tap air meter bowl sharply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read to nearest 0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjust for Aggregate Correction Factor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C138 Unit Weight</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level &amp; Zero scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Record bucket Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dampen all Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weigh container</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill in 3 equal lifts by vol.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 blows per lift (evenly distributed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blows penetrate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASTM C31 Test Cylinders</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not dampen molds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label molds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill in three equal lifts by volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Underlying layer about 1&quot;</td>
<td>25 blows per lift (evenly distributed)</td>
<td></td>
</tr>
<tr>
<td>After rodding tap sides</td>
<td>Blows penetrate underlying layer 1&quot;</td>
<td></td>
</tr>
<tr>
<td>10-15 times</td>
<td>After rodding tap sides with open hand (or mallet for rigid molds)</td>
<td></td>
</tr>
<tr>
<td>Strike-off with flat plate</td>
<td>Strike-off and finish</td>
<td></td>
</tr>
<tr>
<td>(2/3 withdraw, final 1/3)</td>
<td>Cap and store in initial field curing 60-80°F (16-27°C) for a period up to 48 hours</td>
<td></td>
</tr>
<tr>
<td>Clean all excess concrete</td>
<td>Final curing 73 ± 3°F (23 ± 2°C)</td>
<td></td>
</tr>
<tr>
<td>Weigh container</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculate unit weight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EMU Form C172-2
Jan 07
### CONCRETE MIXTURE DESIGN DATA

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>SERIAL NUMBER</th>
<th>SIZE RANGE</th>
<th>BULK SP. GR.</th>
<th>ABSORPTION %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENT FINE AGGREGATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MIXTURE DATA

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>Mixture By Weight</th>
<th>Net Weights 1 Bag Batch (lb.)</th>
<th>Solid Volume 1 Bag Batch (cu. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIALS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEMENT FINE AGGREGATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (B)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COARSE AGGREGATE (D)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### REMARKS

1. Calculated on the basis of: 
2. In the entire batch as mixed.
3. In that portion of the concrete containing aggregate smaller than the 1½ inch sieve.

**DD FORM 1220, AUG 57**
REPORT OF CONCRETE MIXTURE PROPORTIONS

PROJECT: FT. STEWART, Ga., Tactical Equipment Shop

DISTRIBUT: MOBILE

CONTRACT NO: DACA21-94-C-0087

REQUISITION NO: CD-95-543

WORK ORDER NO: 7447

DATE RECEIVED: 25 OCTOBER 1994

DATE REPORTED: 7447

MIXTURE NO: 41B

PORTLAND CEM: BLUE CIRCLE CEMENT CO., Ravena, Lab No. 115/4569

POZZOLAN: BLUE CIRCLE CEMENT CO., Atlantic, Lab No. 115/4570

AIR ENT. ADMIX: HUNTS PROCESS CO., "AIR-IN", Lab No. 115/4567

CHEMICAL ADMIX: HUNTS PROCESS CO., "HPS-R", Lab No. 115/4568

FINE AGGREGATE: Natural Sand, ATLAS, Lab No. 115/4572

COARSE AGG. (A): No. 3 Crushed Stone, MARTIN-MARIETTA, Augusta Ga., Lab No. 115/4578

COARSE AGG. (B): No. 57 Crushed Stone, MARTIN-MARIETTA, Augusta Ga., Lab No. 115/4575

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>LAB NO.</th>
<th>TYPE</th>
<th>PERCENT BLEND</th>
<th>BULK SP. GR. (SSD)</th>
<th>ABSORPTION %</th>
<th>SOLID VOLUME (cu.ft.)</th>
<th>SSD BATCH Wts. (lbs)</th>
<th>SSD BATCH e.y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland Cement</td>
<td>115/4569</td>
<td>Type I</td>
<td>50^2</td>
<td>3.15</td>
<td>1.355</td>
<td>266</td>
<td>3.499</td>
<td>218</td>
</tr>
<tr>
<td>Pozzolan</td>
<td>115/4570</td>
<td>New Cem</td>
<td>50^3</td>
<td>2.94</td>
<td>1.355</td>
<td>249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine Aggregate</td>
<td>115/4572</td>
<td>Nat. Sand</td>
<td>37</td>
<td>2.64</td>
<td>0.2</td>
<td>7.213</td>
<td>1188</td>
<td></td>
</tr>
<tr>
<td>Coarse Agg. (A)</td>
<td>115/4578</td>
<td>No. 3</td>
<td>40</td>
<td>2.62</td>
<td>0.7</td>
<td>4.924</td>
<td>805</td>
<td></td>
</tr>
<tr>
<td>Coarse Agg. (B)</td>
<td>115/4575</td>
<td>No. 57</td>
<td>60</td>
<td>2.63</td>
<td>0.7</td>
<td>7.358</td>
<td>1208</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
<td></td>
<td>3.499</td>
<td></td>
<td>1296</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Totals: 27,000 3934

Water/Cement ratio^1 0.41  Air Entraining Admixture (oz/yd)^3 2.7

Slump (in)^2 1.25  Water Reducing Admixture (oz/yd)^4 20.2

Air Content (%)^5 4.5  Theoretical Unit Weight (lb/cu.ft.) 153.1

Air Content (%)^6 4.7  Actual Unit Weight (lb/cu.ft.) 145.7

7 Day Flexural Strength (psi) 525  Theoretical Cement Factor (lb/cu.yd.) 541

28 Day Flexural Strength (psi) 800  Actual Cement Factor (lb/cu.yd.) 515

Note: ^1 Computed by weight based on the equivalent weight of portland cement having the same solid volume as the cement-newcem blend used in the mixture.

^2 Computed by volume.

^3 In that portion of the concrete containing aggregate smaller than the 1-1/2-in. sieve.

^4 In the entire batch as mixed.

^5 Calculated on the basis of 1.02 oz. per CWT of cementitious materials. Adjust as required for air content.

^6 Water Reducing Admixture added at a rate of 7.60 oz. per CWT of cementitious materials.

REMARKS: This is a laboratory basic mix design for 750 psi paving concrete. Final minor adjustments may be found necessary under field prototype conditions. Adjustments should be made as required by contract specifications. All aggregate weights are saturated surface-dry and corrections for free moisture should be made as required.
### Sieve Analysis - ASTM C136

<table>
<thead>
<tr>
<th>Sieve Openings</th>
<th>Weight Retained (Grams)</th>
<th>Percent Retained</th>
<th>Percent Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve Size or Number</td>
<td>Millimeters</td>
<td>Partial¹</td>
<td>Total²</td>
</tr>
<tr>
<td>(3 inch)</td>
<td>76.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2½ inch)</td>
<td>64.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 inch)</td>
<td>50.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1½ inch)</td>
<td>38.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 inch)</td>
<td>25.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3/4 inch)</td>
<td>19.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(½ inch)</td>
<td>12.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3/8 inch)</td>
<td>9.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pan</td>
<td></td>
<td>8</td>
<td>2.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>0.149</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
<td>0.074</td>
</tr>
<tr>
<td>Pan</td>
<td></td>
<td>Total Weight in Grams of Fine Portion</td>
<td></td>
</tr>
</tbody>
</table>

Note¹: Partial Percent Retained = 100 x (weight in grams retained on a sieve)/(wt in grams of sample used for a given series of sieves)

Note²: Total Percent Retained = 100 x (weight in grams retained on a sieve)/(total wt in grams of oven dried sample)

For an individual sieve, the Percent Finer by Weight = Percent Finer than next larger sieve - Percent Retained on individual sieve.

**Remarks**

**Techician** | **Computed By** | **Checked By**
---|---|---
EMU Form C136-1 | Jan 07

---

**SAD QUALITY ASSURANCE FIELD GUIDE - Hard copies are uncontrolled**  
**SASCD-T is the proponent for this manual**
### COMPACTATION DETERMINATION

#### SAND CONE METHOD and ONE POINT COMPACTION TEST

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>CONTRACT NO.</th>
<th>DATE</th>
</tr>
</thead>
</table>

#### Test No.
- **Area** (subgrade, site fill, backfill, etc.)
- **Station**
- **Offset**
- **Elevation**

#### Materials
- **(A) Initial Weight of Jar and Sand**
- **(B) Weight of Jar and Sand Retained**
- **(C) Weight of Sand Used** (A – B)
- **(D) Weight of Sand in Cone & Plate**
- **(E) Sand Used in the Hole** (C – D)
- **(F) Bulk Weight of Sand per cu.ft.**
- **(G) Volume of Hole** (E / F)
- **(H) Wet Weight of Soil & Rock + Cont.**
  - **(I) Weight of Container**
  - **(J) Wet Weight of Soil & Rock** (H – I)
  - **(K) Weight of Rock > No. 4 sieve size**
  - **(L) Wet Weight of Soil** (J – K)
  - **(M) Volume of Rock\(^1\) = \(\frac{(K)}{\text{Spg} \times 62.4}\)**
  - **(N) Adjusted Volume of Hole\(^1\)** (G – M)
  - **(O) Wet Wt. of Soil per cu.ft.** (L / N)

#### MOISTURE DETERMINATION

<table>
<thead>
<tr>
<th>RAPID</th>
<th>OVEN</th>
<th>RAPID</th>
<th>OVEN</th>
</tr>
</thead>
</table>

- **(P) Wet Weight of Soil Sample**
- **(Q) Dry Weight of Soil Sample**
- **(R) Weight of Water** (P – Q)
- **(S) Moisture Content** (R / Q)
- **(T) Dry Wt. lbs./cu.ft. = \(\frac{(O)}{(S)} + 1.0\)**
- **(U) Optimum Moisture Content**
  - **ASTM D698 □ or ASTM D1557 □**
- **(V) Maximum Dry Density**
  - **ASTM D698 □ or ASTM D1557 □**
- **% Compaction = 100 x \(\frac{(T)}{(V)}\)**
- **Difference from Optimum** (S – U) +/-

**Note\(^2\)**: Corrected for plus No. 4 size fraction.

**TESTED BY**

CESAS Form 865-1

Jan 07
ONE or TWO POINT COMPACTION TEST

**Compaction Test:** ASTM D698 □ D1557 □  
**Blows per Layer:** 25 □ 56 □  
**Layers:** 3 □ 5 □  
**with Rammer:** 5.5 lb □ 10 lb □  
**Height Drop:** 12 inch □ 18 inch □  
**and Diameter of Mold:** 4 inch □ 6 inch □.

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Weight of Wet Soil + Mold, lbs.</th>
<th>Weight of Mold, lbs.</th>
<th>Weight of Wet Soil, lbs. (1 – 2)</th>
<th>Wet Unit Weight, lbs./cu.ft. = (3) / Volume of Mold</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MOISTURE DETERMINATION**¹

| (5) Wet Weight of Moisture Sample | | | | |
| (6) Dry Weight of Moisture Sample | | | | |
| (7) Weight of Water (5 – 6) | | | | |
| (8) Moisture Content (7 / 6) | | | | |
| (9) Dry Unit Weight, lbs./cu.ft. = (4) / (8) + 1.00 | | | | |

**Instruction:** Plot Items (8) and (9) on an appropriate family of 5 point compaction curves to determine the optimum moisture content and maximum dry density. Enter these values on SAS Form 865-1.

**Note**¹: Any rapid method of moisture determination may be used such as ASTM D4959 “direct heat” or ASTM D4643 “microwave” method, provided the results are compatible with the oven method (ASTM D2216). Preliminary results may be determined for moisture contents obtained by the Rapid Method; however, final results must be obtained using moisture contents determined from the oven method for acceptance. In the event of a conflict, the results using the oven method take precedence.

**CESAS Form 865-2**

Jan 07
### SUMMARY OF FIELD DENSITY TESTS

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Date Made</th>
<th>Type Test</th>
<th>Location of Test</th>
<th>Excavation or Borrow Source</th>
<th>Soil Class</th>
<th>Field Data</th>
<th>Laboratory Test Data</th>
<th>Field and Lab Correlation</th>
<th>Comments on Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>One Point Test with Family of Curves</td>
<td>One Point Comp. Dry (4&quot; Mold)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Specified Compaction</td>
<td>Specified Compaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Var. from Opt. (+/-)</td>
<td>Percent Compaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Sand-Cone density (SC) ASTM D1556, oven Moisture Content (MC) ASTM D2216, Direct heat Moisture (DM) ASTM D4959, Microwave Moisture (MM) ASTM D4643, Nuclear Density (ND) ASTM D2922, Nuclear Moisture (NM) ASTM D3017, Drive Cylinder density (DC) ASTM D2937. Note 2: Soil Classification by ASTM D2487. When classification is visually determined by ASTM D2488, identify the classification symbol with "(E)" for Estimated. Note 3: This method is used for control of sandy/cohesionless materials exhibiting flat or reversed shape compaction curves. Note 4: Enter Difference from Optimum Moisture to the Field Moisture.

CESAS Form 1177                         Jan 07
**Moisture Determination**  
**ASTM D2216 - Oven Drying @ 110 ± 5°C (230 ± 9°F)**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>A</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
<th>B</th>
<th>Final</th>
<th>Dry Weight + Tare (gms)</th>
<th>D=(A-B)</th>
<th>Weight of Water (gms)</th>
<th>C</th>
<th>Tare Weight (gms)</th>
<th>E=(B-C)</th>
<th>Dry Weight Soil (gms)</th>
<th>100x(D/E)</th>
<th>Moisture Content %</th>
</tr>
</thead>
</table>

**Sample No.**

<table>
<thead>
<tr>
<th>A</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
<th>B</th>
<th>Final</th>
<th>Dry Weight + Tare (gms)</th>
<th>D=(A-B)</th>
<th>Weight of Water (gms)</th>
<th>C</th>
<th>Tare Weight (gms)</th>
<th>E=(B-C)</th>
<th>Dry Weight Soil (gms)</th>
<th>100x(D/E)</th>
<th>Moisture Content %</th>
</tr>
</thead>
</table>

**Sample No.**

<table>
<thead>
<tr>
<th>A</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
<th>B</th>
<th>Final</th>
<th>Dry Weight + Tare (gms)</th>
<th>D=(A-B)</th>
<th>Weight of Water (gms)</th>
<th>C</th>
<th>Tare Weight (gms)</th>
<th>E=(B-C)</th>
<th>Dry Weight Soil (gms)</th>
<th>100x(D/E)</th>
<th>Moisture Content %</th>
</tr>
</thead>
</table>

**Sample No.**

<table>
<thead>
<tr>
<th>A</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
<th>B</th>
<th>Final</th>
<th>Dry Weight + Tare (gms)</th>
<th>D=(A-B)</th>
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<th>C</th>
<th>Tare Weight (gms)</th>
<th>E=(B-C)</th>
<th>Dry Weight Soil (gms)</th>
<th>100x(D/E)</th>
<th>Moisture Content %</th>
</tr>
</thead>
</table>

**Test Method:** ( ) Method A  ( ) Method B  
**Moisture Content %**

**Minimum Particle Size:**

<table>
<thead>
<tr>
<th>Particle Size (μm)</th>
<th>Minimum Mass (g)</th>
<th>Maximum Mass (g)</th>
<th>Maximum Error (g)</th>
<th>Maximum Mass (g)</th>
<th>Standard Deviation (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro (μm)</td>
<td>50</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Milli (μm)</td>
<td>500</td>
<td>2.5</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Nano (μm)</td>
<td>500</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**Remarks:**

**EMU Form D2216-1**  
Jan 07
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
<th>Final</th>
<th>Dry Weight + Tare (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D=(A-B)</td>
<td></td>
<td>Weight of Water (gms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Tare Weight (gms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E=(B-C)</td>
<td></td>
<td>Dry Weight Soil (gms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100x(D/E)</td>
<td></td>
<td>Moisture Content %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Sample No.

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<th>Sample No.</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
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<tbody>
<tr>
<td>A</td>
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<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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</tbody>
</table>

---

Sample No.

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<thead>
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<th>Sample No.</th>
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<th>Wet Weight + Tare (gms)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
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<td>D=(A-B)</td>
<td></td>
<td>Weight of Water (gms)</td>
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<tr>
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<td>Dry Weight Soil (gms)</td>
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<td></td>
</tr>
</tbody>
</table>

---

Sample No.

<table>
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<th>Sample No.</th>
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<th>Wet Weight + Tare (gms)</th>
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</tr>
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<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>E=(B-C)</td>
<td></td>
<td>Dry Weight Soil (gms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100x(D/E)</td>
<td></td>
<td>Moisture Content %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Type Direct Heat Used:
Scale or Balance Used:
Technician(s):
Remarks:

EMU Form D4959-1
Jan 07
# Moisture Content Determination

**ASTM D4643 - Microwave**

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Initial</th>
<th>Wet Weight + Tare (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>After 3 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>plus 1 min.</td>
<td>Weight + Tare (gms)</td>
</tr>
<tr>
<td></td>
<td>Final</td>
<td>Dry Weight + Tare (gms)</td>
</tr>
</tbody>
</table>

**Incremental Measurements**

<table>
<thead>
<tr>
<th></th>
<th>Weight of Water (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D=(A-B)</td>
<td></td>
</tr>
</tbody>
</table>

**C**

<table>
<thead>
<tr>
<th>Tare Weight (gms)</th>
</tr>
</thead>
</table>

**E=(B-C)**

<table>
<thead>
<tr>
<th>Dry Weight Soil (gms)</th>
</tr>
</thead>
</table>

100x(D/E) | Moisture Content %

---

**Microwave Oven Used:**

**Scale or Balance Used:**

**Technician(s):**

**Remarks:**

---

**Test Specimen Masses**

<table>
<thead>
<tr>
<th>Test Specimen Masses</th>
<th>Test Mass (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Evap. 10% Sample</td>
<td>100 to 200</td>
</tr>
<tr>
<td>No. 10</td>
<td>300 to 500</td>
</tr>
<tr>
<td>No. 4</td>
<td>500 to 1000</td>
</tr>
</tbody>
</table>

---

**EMU Form D4643-1**

**Aug-06**

---

**14-50**
# LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1805.

<table>
<thead>
<tr>
<th>LIQUID LIMIT</th>
<th>RUN NO.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>RUN NO.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TARE NO.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TARE PLUS WET SOIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TARE PLUS DRY SOIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TARE</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRY SOIL</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>WATER CONTENT, %</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
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<td>NUMBER OF BLOWS</td>
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</table>

<table>
<thead>
<tr>
<th>WATER CONTENT, w, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLASTIC LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN NO.</td>
</tr>
<tr>
<td>TARE NO.</td>
</tr>
<tr>
<td>TARE PLUS WET SOIL</td>
</tr>
<tr>
<td>TARE PLUS DRY SOIL</td>
</tr>
<tr>
<td>WATER</td>
</tr>
<tr>
<td>TARE</td>
</tr>
<tr>
<td>DRY SOIL</td>
</tr>
<tr>
<td>WATER CONTENT, %</td>
</tr>
<tr>
<td>PLASTIC LIMIT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NATURAL WATER CONTENT</th>
</tr>
</thead>
</table>

REMARKS

TECHNICIAN: ___________________  COMPUTED BY: ___________________  CHECKED BY: ___________________

---

(continued on next page)
<table>
<thead>
<tr>
<th>Sieve Openings</th>
<th>Weight Retained (Grams)</th>
<th>Percent Retained</th>
<th>Percent Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 inch)</td>
<td>76.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2½ inch)</td>
<td>64.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1½ inch)</td>
<td>38.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 inch)</td>
<td>25.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(¼ inch)</td>
<td>19.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(½ inch)</td>
<td>12.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(⅜ inch)</td>
<td>9.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>0.50</td>
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<td>40</td>
<td>0.42</td>
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</tr>
<tr>
<td>45</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>0.25</td>
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</tr>
<tr>
<td>100</td>
<td>0.149</td>
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</tr>
<tr>
<td>120</td>
<td>0.125</td>
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</tr>
<tr>
<td>170</td>
<td>0.088</td>
<td></td>
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</tr>
<tr>
<td>200</td>
<td>0.074</td>
<td></td>
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</tr>
<tr>
<td>230</td>
<td>0.0625</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** Partial Percent Retained = 100 x (weight in grams retained on a sieve)/(wt in grams of sample used for a given series of sieves)

**Note 2:** Total Percent Retained = 100 x (weight in grams retained on a sieve)/(total wt in grams of oven dried sample)

For an individual sieve, the Percent Finer by Weight = Percent Finer than next larger sieve - Percent Retained on individual sieve.

**Remarks**

**Technician** | **Computed By** | **Checked By**

EMU Form D422-1a
Jan 07
SAD QUALITY ASSURANCE FIELD GUIDE - Hard copies are uncontrolled
SASCD-T is the proponent for this manual

---

**U.S. STANDARD SIEVE OPENING IN INCHES**

|        | 6 | 4 | 3 | 2 | 1 1/2 | 1 1/4 | 3/8 | 3 | 4 | 6 | 8 | 10 | 14 | 16 | 20 | 30 | 40 | 50 | 70 | 100 | 140 | 200 |
|--------|---|---|---|---|-------|-------|-----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|-----|

---

**U.S. STANDARD SIEVE NUMBERS**

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1 1/2</th>
<th>1 1/4</th>
<th>3/8</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>14</th>
<th>16</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>70</th>
<th>100</th>
<th>140</th>
<th>200</th>
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</table>

---

**HYDROMETER**

---

**GRAIN SIZE IN MILLIMETERS**

<table>
<thead>
<tr>
<th>COBBLES</th>
<th>COARSE</th>
<th>FINE</th>
<th>MEDIUM</th>
<th>COARSE</th>
<th>FINE</th>
<th>SILT OR CLAY</th>
</tr>
</thead>
</table>

---

**PERCENT FINER BY WEIGHT**

---

**PERCENT COARSER BY WEIGHT**

---

**Sample No.**

---

**Depth (%)**

---

**Classification**

---

**Nat w%**

---

**LL**

---

**PL**

---

**Pi**

---

**Project**

---

**Lab No.**

---

**Boring No.**

---

**Date**

---

**GRADATION CURVES**
U.S. Army Corps of Engineers  
Savannah District  
Environmental & Materials Unit  
Marietta, Georgia

Compaction Test Work Sheet – ASTM D 698, D 1557

<table>
<thead>
<tr>
<th>Mol d No.</th>
<th>(A) Wet Wt. Sample + Mold (lbs)</th>
<th>(B) Mold Weight (lbs)</th>
<th>(C) Wet Wt. Sample (lbs)</th>
<th>(D) Wet Wt. + Tare</th>
<th>(E) Dry Wt. + Tare</th>
<th>(F) Tare Weight</th>
<th>(I) Weight Water (G) = (D-E)</th>
<th>(J) Percent Moisture (H) = 100x(G/H)</th>
<th>(K) Dry Wt. Sample (lbs)</th>
<th>(L) Volume of Mold (cu.ft.)</th>
<th>(M) Dry Density (lbs/cu.ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Standard ☐  Modified ☐  4 inch Mold ☐  6 inch Mold ☐  Mold Volume or Factor

Remarks:

EMU Form D698/D1557-1  
Jan 07
Drive-Cylinder Density Work Sheet - ASTM D 2937

<table>
<thead>
<tr>
<th>Cylinder No. &amp; Size</th>
<th>Wet Wt. Sample + Cylinder (gms)</th>
<th>Tare Weight (E)</th>
<th>Wet Wt. Sample (gms) (A-B)</th>
<th>Tare Weight (F)</th>
<th>Weight Water ( G = (D - E) )</th>
<th>Weight Dry Soil ( H = (E - F) )</th>
<th>Percent Moisture ( \frac{100x(G/H)}{} )</th>
<th>Dry Wt. Sample (lbs) ( \frac{(C)/453.6}{[1+(G/H)]} )</th>
<th>Volume of Cylinder (cu.ft.)</th>
<th>Dry Density (lbs/cu.ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(I)</td>
<td>(J)</td>
<td>(K)</td>
<td>(J/K)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cylinder No.</th>
<th>Location &amp; Depth of Test Site</th>
<th>Soil Description &amp; Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

EMU Form D2937-1
Jan 07
<table>
<thead>
<tr>
<th>PROJECT</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIG FILL PROJECT</td>
<td>10/15/96</td>
</tr>
<tr>
<td>CONTRACT NO.</td>
<td>95-C-0001</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Test No.</th>
<th>341</th>
<th>342</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area i.e., Subgrade, site fill, backfill</td>
<td>SITE FILL</td>
<td>STORM DRAIN BACKFILL</td>
</tr>
<tr>
<td>Station</td>
<td>16' WEST OF NW CORNER OF BLDG 461</td>
<td>36' WEST OF MANHOLE #</td>
</tr>
<tr>
<td>Offset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation</td>
<td>8.5' BELOW FINISHED SMTOP</td>
<td>2.5' ABOVE PIPE</td>
</tr>
<tr>
<td>(A) Initial Wt. Jar &amp; Sand</td>
<td>14.16</td>
<td>13.74</td>
</tr>
<tr>
<td>(B) Wt. Jar &amp; Sand Retained</td>
<td>6.04</td>
<td>4.87</td>
</tr>
<tr>
<td>(C) Wt. Sand Used (A-B)</td>
<td>8.12</td>
<td>8.87</td>
</tr>
<tr>
<td>(D) Wt. Sand in Cone &amp; Plate</td>
<td>2.41</td>
<td>2.41</td>
</tr>
<tr>
<td>(E) Sand Used in Hole (C-D)</td>
<td>5.71</td>
<td>6.26</td>
</tr>
<tr>
<td>(F) Wt. Sand Per Cu. Ft.</td>
<td>92.1</td>
<td>92.1</td>
</tr>
<tr>
<td>(G) Vol. Hole (ExP)</td>
<td>0.0621</td>
<td>0.0683</td>
</tr>
<tr>
<td>(H) Wet Wt. Rock &amp; Soil</td>
<td>8.04</td>
<td>9.176</td>
</tr>
<tr>
<td>(I) Wt. Container</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>(J) Wet Wt. Soil &amp; Rock (H - I)</td>
<td>8.03</td>
<td>9.166</td>
</tr>
<tr>
<td>(K) Wt. Rock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(L) Wet Wt. Soil (J - K)</td>
<td>8.03</td>
<td>9.166</td>
</tr>
<tr>
<td>(M) Volume Rock (Sp. Gr. X 62.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N) Adjusted Volume of Hole (G-M)*</td>
<td>0.0621</td>
<td>0.0683</td>
</tr>
<tr>
<td>(O) Wet Wt. Soil/Cu. Ft. (L + N)</td>
<td>129.3</td>
<td>134.2</td>
</tr>
</tbody>
</table>

**MOISTURE DETERMINATION (See Note)**

<table>
<thead>
<tr>
<th>RAPID</th>
<th>OVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPID</td>
<td>OVEN</td>
</tr>
</tbody>
</table>

| (P) Wet Wt. Moist. Sample | 700.9 | 700.9 |
| (Q) Dry Wt. Moist. Sample | 167.6 | 177.2 |
| (R) Wt. Water (P-O) | 32.4 | 22.8 |
| (S) % Moisture (ExQ) | 0.193 | 0.129 |
| (T) Dry Wt. Lbs. Cu. Ft. (8 + 1) | 108.4 | 118.9 |
| (U) Optimum Moisture | 17.7 | 10.5% |
| (V) Maximum Density | 111.8 | 121.6 |
| % Compaction (T+V) | 97.0% | 97.8% |

**Difference from Optimum + or -**

| Tested by | 1.6 | 2.4 |

SAS Form 863, 4 Aug 78

14-56
### ONE OR TWO POINT COMPACTATION TEST

**MODIFIED Compaction Test**

Blows per each of 5 layers with 10 lb. rammer 18 inch drop 4 inch dia. mold

<table>
<thead>
<tr>
<th>Test No.</th>
<th>341 &quot;A&quot;</th>
<th>341 &quot;B&quot;</th>
<th>342</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Weight of Wet Soil + Mold</td>
<td>7.52</td>
<td>7.77</td>
<td>7.96</td>
</tr>
<tr>
<td>2. Weight of Mold</td>
<td>3.51</td>
<td>3.51</td>
<td>3.51</td>
</tr>
<tr>
<td>3. Weight of Wet Soil (1-2)</td>
<td>4.01</td>
<td>4.26</td>
<td>4.45</td>
</tr>
<tr>
<td>4. lb./cu. ft. ((\frac{\text{Wt. Wet Soil}}{\text{Vol. of Soil Sample}}))</td>
<td>120.3</td>
<td>127.7</td>
<td>133.4</td>
</tr>
</tbody>
</table>

#### MOISTURE DETERMINATION (SEE NOTE)

<table>
<thead>
<tr>
<th></th>
<th>RAPID</th>
<th>OVEN</th>
<th>RAPID</th>
<th>OVEN</th>
<th>RAPID</th>
<th>OVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Wet Weight Moisture Sample</td>
<td>200.0</td>
<td>200.0</td>
<td>200.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Dry Weight Moisture Sample</td>
<td>178.3</td>
<td>178.0</td>
<td>181.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Weight Water (5-6)</td>
<td>21.7</td>
<td>27.0</td>
<td>18.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. % Moisture ((\frac{4}{7 + 6}))</td>
<td>0.122</td>
<td>0.156</td>
<td>0.101</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Dry Unit Weight ((\frac{8 + 106}{4}))</td>
<td>107.2</td>
<td>110.5</td>
<td>121.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plot Items 8 and 9 on appropriate family of 5 point compaction curves to determine optimum moisture content and maximum density. Enter these values on the front form.

**NOTE:** Any rapid method of moisture determination may be used provided the results are compatible with the oven method. Preliminary results may be determined for moisture contents obtained by the Rapid Method; however, final results must be obtained using moisture contents determined from the oven method. In the event of a conflict, the results using the oven method take precedence.

*SAS Form 865-2*
### Compaction Determination

<table>
<thead>
<tr>
<th>Project</th>
<th>Contract No.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Fill Project</td>
<td>95-C-0001</td>
<td>10/15/96</td>
</tr>
</tbody>
</table>

#### Table of Measurements

<table>
<thead>
<tr>
<th>Column</th>
<th>Test No.</th>
<th>Subgrade, site fill, backfill</th>
<th>Station</th>
<th>Offset</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>site fill</td>
<td>50' from left corner of Bldg #221</td>
<td>Site fill</td>
<td>NEAR NEW MANHOLE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Initial Wt. Jar &amp; Sand</td>
<td>15.23</td>
<td>14.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Wt. Jar &amp; Sand Retained</td>
<td>9.93</td>
<td>7.34</td>
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<tr>
<td>C</td>
<td>Wt. Sand Used (A-B)</td>
<td>5.30</td>
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<tr>
<td>D</td>
<td>Wt. Sand in Cone &amp; Plate</td>
<td>2.41</td>
<td>2.41</td>
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<td>E</td>
<td>Sand Used in Hole (C-D)</td>
<td>2.89</td>
<td>5.17</td>
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<tr>
<td>F</td>
<td>Wt. Sand Per Cu. Ft.</td>
<td>92.1</td>
<td>90.1</td>
<td></td>
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</tr>
<tr>
<td>G</td>
<td>Vol. Hole (P+F)</td>
<td>0.0314</td>
<td>0.0573</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Wet Wt. Rock &amp; Soil</td>
<td>3.721</td>
<td>7.107</td>
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<td></td>
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<tr>
<td>I</td>
<td>Wt. Container</td>
<td>0.01</td>
<td>0.01</td>
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</tr>
<tr>
<td>J</td>
<td>Wet Wt. Soil &amp; Rock (H-L)</td>
<td>3.711</td>
<td>7.097</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Wt. Rock</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Wet Wt. Soil (J-K)</td>
<td>3.711</td>
<td>7.097</td>
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<td></td>
</tr>
<tr>
<td>M</td>
<td>Volume Rock (Sp. Gr. X 62.4)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>N</td>
<td>Adjusted Volume of Hole (G-M)</td>
<td>0.0314</td>
<td>0.0573</td>
<td></td>
<td></td>
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<tr>
<td>O</td>
<td>Wet Wt. Soil/Cu. Ft. (L+N)</td>
<td>118.2</td>
<td>123.8</td>
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</table>

#### Moisture Determination

<table>
<thead>
<tr>
<th>Column</th>
<th>Rapid</th>
<th>Oven</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>700.9</td>
<td>200.9</td>
</tr>
<tr>
<td>Q</td>
<td>160.5</td>
<td>158.2</td>
</tr>
<tr>
<td>R</td>
<td>39.5</td>
<td>41.8</td>
</tr>
<tr>
<td>S</td>
<td>0.246</td>
<td>0.264</td>
</tr>
<tr>
<td>T</td>
<td>94.86</td>
<td>98.0</td>
</tr>
<tr>
<td>U</td>
<td>20.5</td>
<td>20.1</td>
</tr>
<tr>
<td>V</td>
<td>107.4</td>
<td>108.0</td>
</tr>
<tr>
<td>W</td>
<td>88.3%</td>
<td>90.1%</td>
</tr>
<tr>
<td>X</td>
<td>+4.1%</td>
<td>+6.3%</td>
</tr>
</tbody>
</table>

*SAS Form 865, 4 Aug 78*
## ONE OR TWO POINT COMPACTION TEST

**MODIFIED**

Compaction Test: 25 Blows per each of 5 layers with 10 lb. rammer 18 inch drop 4 inch dia. mold

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Weight of Wet Soil + Mold</th>
<th>Weight of Mold</th>
<th>Weight of Wet Soil (1-2)</th>
<th>lb./cu. ft.</th>
<th>Wet Unit Weight (WT. Wet Soil / Vol. of Soil Sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>343</td>
<td>7.69</td>
<td>7.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3.51</td>
<td></td>
<td>4.18</td>
<td>125.5</td>
<td></td>
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<tr>
<td>3</td>
<td>3.51</td>
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<td>4.39</td>
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</tr>
<tr>
<td>4</td>
<td>125.5</td>
<td></td>
<td>131.7</td>
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<td></td>
</tr>
</tbody>
</table>

### MOISTURE DETERMINATION (SEE NOTE)

<table>
<thead>
<tr>
<th>Moisture Type</th>
<th>Rapid</th>
<th>Oven</th>
<th>Rapid</th>
<th>Oven</th>
<th>Rapid</th>
<th>Oven</th>
<th>Rapid</th>
<th>Oven</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Wet Weight Moisture Sample</td>
<td>200.0 g</td>
<td></td>
<td>200.0 g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Dry Weight Moisture Sample</td>
<td>168.8</td>
<td></td>
<td>163.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Weight Water (5-6)</td>
<td>31.2</td>
<td></td>
<td>36.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. % Moisture (7 + 6)</td>
<td>0.185</td>
<td></td>
<td>0.225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Dry Unit Weight (B / 100)</td>
<td>105.9</td>
<td></td>
<td>107.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Plot Items 8 and 9 on appropriate family of 5 point compaction curves to determine optimum moisture content and maximum density. Enter these values on the front form.

**NOTE:** Any rapid method of moisture determination may be used provided the results are compatible with the oven method. Preliminary results may be determined for moisture contents obtained by the Rapid Method; however, final results must be obtained using moisture contents determined from the oven method. In the event of a conflict, the results using the oven method take precedence.

*SAS Form 865-2*
## SUMMARY OF FIELD DENSITY TESTS

<table>
<thead>
<tr>
<th>TEST NO.</th>
<th>DATE MADE</th>
<th>T. TYPE</th>
<th>LOCATION OF TEST</th>
<th>EXCAVATION OR BORROW SOURCE</th>
<th>SOIL CLASS</th>
<th>FIELD IN-PLACE DATA</th>
<th>LABORATORY TEST DATA</th>
<th>FIELD AND LAB CORRELATION</th>
<th>COMMENTS ON TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>341</td>
<td>10/12</td>
<td>SV</td>
<td>16 WEST OF NW CORNER OF BLDG #461</td>
<td>BORROW OFF-SITE</td>
<td>CL</td>
<td>108.4</td>
<td>19.3</td>
<td>111.8</td>
<td>17.7</td>
</tr>
<tr>
<td>342</td>
<td>10/15</td>
<td>SV</td>
<td>36' WEST OF MANHOLE #4</td>
<td>EXCAVATION</td>
<td>SM</td>
<td>118.9</td>
<td>12.9</td>
<td>121.6</td>
<td>10.5</td>
</tr>
<tr>
<td>343</td>
<td>10/15</td>
<td>SV</td>
<td>50' FROM LEFT CORNER OF BLDG #221</td>
<td>BORROW OFF-SITE</td>
<td>CL</td>
<td>94.9</td>
<td>24.6</td>
<td>107.4</td>
<td>20.5</td>
</tr>
<tr>
<td>344</td>
<td>10/15</td>
<td>SV</td>
<td>NEAR NEW MANHOLE</td>
<td>BORROW OFF-SITE</td>
<td>CL</td>
<td>98.0</td>
<td>26.4</td>
<td>108.0</td>
<td>20.1</td>
</tr>
<tr>
<td>345</td>
<td>10/17</td>
<td>SV</td>
<td>32' NORTH OF SOUTHERN CORNER OF BLDG #444</td>
<td>(E)</td>
<td>ML</td>
<td>108.3</td>
<td>15.2</td>
<td>111.4</td>
<td>17.8</td>
</tr>
<tr>
<td>346</td>
<td>10/18</td>
<td>SV</td>
<td>105' NORTH OF SOUTH CORNER OF BLDG #444</td>
<td>(E)</td>
<td>ML</td>
<td>105.1</td>
<td>13.1</td>
<td>112.3</td>
<td>17.1</td>
</tr>
<tr>
<td>347</td>
<td>10/18</td>
<td>SV</td>
<td>B' WEST OF 10' CORNER OF BLDG. #461</td>
<td>(E)</td>
<td>CL</td>
<td>102.3</td>
<td>16.4</td>
<td>108.2</td>
<td>20.9</td>
</tr>
<tr>
<td>348</td>
<td>10/19</td>
<td>SV</td>
<td>52' SOUTH OF NE CORNER OF BLDG. #444</td>
<td>(E)</td>
<td>ML</td>
<td>104.6</td>
<td>20.4</td>
<td>112.0</td>
<td>17.0</td>
</tr>
<tr>
<td>349</td>
<td>10/19</td>
<td>SV</td>
<td>BLDG #422 AL. TO SOUTHWALL - WEST SIDE</td>
<td>SM</td>
<td>112.2</td>
<td>9.4</td>
<td>114.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>350</td>
<td>10/19</td>
<td>SV</td>
<td>BLDG #424 AL. TO BASEMENT WALL - EAST SIDE</td>
<td>SM</td>
<td>113.6</td>
<td>10.1</td>
<td>114.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>351</td>
<td>10/19</td>
<td>SV</td>
<td>115' SOUTH OF NE CORNER OF BLDG. #444</td>
<td>(E)</td>
<td>ML</td>
<td>103.6</td>
<td>21.9</td>
<td>111.8</td>
<td>17.6</td>
</tr>
</tbody>
</table>

1. Sand Volume (SV), Moisture Content (MC)
2. When Soil Class is estimated, note by letter (E).
3. This method is used for control of sand/cohesionless materials exhibiting flat or reversed shape compaction curves.
4. Enter Difference from Optimum Moisture to Field Moisture.
SOIL COMPACTION CHECKLIST  Delete this checklist – it is not a true checklist.

CESAS FORM 865-1
Fully Described Location of Test
Accurate Elevation of Test
(D) Weight of Sand and Cone Constant
(F) Density of Sand Constant
(G) Volume of Hole Greater Than 0.05 cubic feet
MOISTURE DETERMINATION:
Rapid Drying Method Comparable to Oven Method?
(U) Optimum Moisture Taken From Family of Curves
(V) Maximum Dry Density Taken From Family of Curves
%Compaction -- Exceeds Spec Requirement (85%, 90%, 95%)?
Variation of Moisture Content Does Not Exceed 5%?
Form Signed? Results May Vary With Technicians
ONE OR TWO POINT COMPACTION TEST  (CESAS FORM 865-2)
Correct Testing Procedure  (ASTM D1557 “Modified” Compaction)
(2) Weight of Mold Constant
(8 & 9) %Moisture and Dry Unit Weight (Density) Plotted On Family of Curves
(8) %Moisture on Dry Side of Optimum
CESAS FORM 1177  SUMMARY OF FIELD DENSITY REPORTS
Unique Maximum Dry Densities and Optimum Moisture Determined From “Family of Curves”
(Should Not Be The Same Number)
FAMILY OF CURVES
One and/or Two Points Plotted on Family of Curves
%Moisture From One-Point Test Is Plotted On Dry Side Of “Line of Optimums”
### Standard Compaction Test ASTM D 698

**Procedure A** 25 Blows per each of 3 Layers, with a 5.5 pound rammer and a 12 inch drop, using a 4 inch diameter mold.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Elev. or Depth</th>
<th>Classification</th>
<th>Spg</th>
<th>LL</th>
<th>PL</th>
<th>%Pass No. 4</th>
<th>%Pass 3/4 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3 - 1.0</td>
<td>Reddish Brown, Lean Clay (CL), with some Sand, a little Gravel, and a trace of Mica &amp; roots.</td>
<td>2.74</td>
<td>38</td>
<td>22</td>
<td>81.4</td>
<td>91.6</td>
</tr>
<tr>
<td>2</td>
<td>0.3 - 1.0</td>
<td>Reddish Brown, Clayey Silty Sand (SM), with a little Gravel, and a trace of Mica &amp; roots.</td>
<td>2.74</td>
<td>39</td>
<td>29</td>
<td>83.2</td>
<td>93.6</td>
</tr>
<tr>
<td>3</td>
<td>0.3 - 1.0</td>
<td>Reddish Brown, Lean Clay (CL), with some Sand, a trace of Gravel, and a trace of Mica &amp; roots.</td>
<td>2.72</td>
<td>46</td>
<td>24</td>
<td>94.3</td>
<td>97.9</td>
</tr>
</tbody>
</table>

**Sample No.**
- 1
- 2
- 3

**Laboratory No.**
- k6/715
- k6/716
- k6/717

**Natural water content, percent**
- 17.9
- 26.4
- 18.1

**ASTM D4718**
- UnCorr / Corrected
- UnCorr / Corrected
- UnCorr / Corrected
- UnCorr / Corrected
- UnCorr / Corrected

**Optimum water content, percent**
- 18.5
- 15.1
- 18.1
- 15.1
- 18.2
- 17.2

**Max. Dry Density, lbs/ft³**
- 106.3
- 111.6
- 105.8
- 108.4
- 107.2
- 108.1

**Remarks:**
Other tests conducted in General accordance with ASTM's D422, D4318, D2216, D854, and D2487. "Uncorrected" values for optimum water content and maximum dry density are based upon minus No. 4 sample. "Corrected" values are based upon the required usage of ASTM D4718 where adjustments were made based upon percentages of gravel.

**Project**
Camp Merrill Landfill Closure Cap

**Area**
Dahlonega, GA

**Requisition No.**
W33SJG61031539

**Work Order No.**
415e

**Hole No.**
#1, #2, #3

**Lab No.**
k6/715 k6/716 k6/717
### Gradation Curves

**U.S. Standard Sieve Opening in Inches**

<table>
<thead>
<tr>
<th>Sieve Opening (Inches)</th>
<th>U.S. Standard Sieve Numbers</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>0.166</td>
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<tr>
<td>0.060</td>
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<td>0.030</td>
<td>70</td>
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<td>0.020</td>
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<td>0.015</td>
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<td>0.010</td>
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<td>0.005</td>
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<td>0.003</td>
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<td>0.002</td>
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<tr>
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</table>

**Hydrometer**

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<td>8</td>
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<tr>
<td>9</td>
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**Grain Size in Millimeters**

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<th>1000</th>
<th>100</th>
<th>50</th>
<th>25</th>
<th>10</th>
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<tbody>
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<td>1.0</td>
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<tr>
<td>0.5</td>
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<td>0.0625</td>
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**Percent Coarser by Weight**

<table>
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<tr>
<th>Percent Coarser by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
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<td>90</td>
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<tr>
<td>10</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
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</tr>
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</table>

**Percent Finer by Weight**

<table>
<thead>
<tr>
<th>Percent Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
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<td>90</td>
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<tr>
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### Sample Data

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<th>Classification</th>
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<th>Project</th>
<th>Lab No.</th>
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<th>Date</th>
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<td>103.0</td>
<td>Dark Gray, Clavey Inorganic Silt High Liquid Limit (MH), with a little sand size, a trace of sand size wood fragments and mica.</td>
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**Notes:**
- Conducted in General Accordance with ASTM D422, D4318, D954, & D2487.
Exhibits – Bituminous Worksheets Show examples instead of blank forms. Highlight what to review when performing a QA check.

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY OF BITUMINOUS MIX COMPONENTS</th>
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<tr>
<td>PROJECT</td>
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<td>JOB</td>
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<tr>
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<td>UNITS (Grams)</td>
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<tr>
<td>COARSE AGGREGATE</td>
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<tr>
<td>MATERIAL</td>
</tr>
<tr>
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<tr>
<td>1. WEIGHT OF OVEN - DRY AGGREGATE</td>
</tr>
<tr>
<td>2. WEIGHT OF SATURATED AGGREGATE IN WATER</td>
</tr>
<tr>
<td>3. DIFFERENCE (Line 1 minus 2)</td>
</tr>
<tr>
<td>APPARENT SPECIFIC GRAVITY, G = Line 1/Line 2</td>
</tr>
<tr>
<td>FINE AGGREGATE</td>
</tr>
<tr>
<td>MATERIAL PASSING NUMBER</td>
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<td>SIEVE</td>
</tr>
<tr>
<td>SAMPLE NUMBER</td>
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<td>4. WEIGHT OF OVEN - DRY MATERIAL</td>
</tr>
<tr>
<td>5. WEIGHT OF FLASK FILLED WITH WATER AT 20°C</td>
</tr>
<tr>
<td>6. SUM (Line 4 + 5)</td>
</tr>
<tr>
<td>7. WEIGHT OF FLASK + AGGREGATE + WATER AT 20°C</td>
</tr>
<tr>
<td>8. DIFFERENCE (Line 6 minus 7)</td>
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<tr>
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<tr>
<td>FILLER</td>
</tr>
<tr>
<td>SAMPLE NUMBER</td>
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<tr>
<td>9. WEIGHT OF OVEN - DRY MATERIAL</td>
</tr>
<tr>
<td>10. WEIGHT OF FLASK FILLED WITH WATER AT 20°C</td>
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<td>11. SUM (Line 9 + 10)</td>
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<tr>
<td>12. WEIGHT OF FLASK + AGGREGATE + WATER AT 20°C</td>
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<tr>
<td>13. DIFFERENCE (Line 11 minus 12)</td>
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<td>APPARENT SPECIFIC GRAVITY, G = Line 3/Line 12</td>
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<td>BINDER</td>
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<td>14. WEIGHT OF PYCNOMETER FILLED WITH WATER</td>
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<tr>
<td>15. WEIGHT OF EMPTY PYCNOMETER</td>
</tr>
<tr>
<td>16. WEIGHT OF WATER (Line 14 minus 15)</td>
</tr>
<tr>
<td>17. WEIGHT OF PYCNOMETER + BINDER</td>
</tr>
<tr>
<td>18. WEIGHT OF BINDER (Line 17 minus 15)</td>
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<tr>
<td>19. WEIGHT OF PYCNOMETER + BINDER + WATER TO FILL PYCNOMETER</td>
</tr>
<tr>
<td>20. WEIGHT OF WATER TO FILL PYCNOMETER (Line 19 minus 17)</td>
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<tr>
<td>21. WEIGHT OF WATER DISPLACED BY BINDER (Line 16 minus 20)</td>
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**Gradation of Material**

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<th>Percent Passing</th>
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Desired:

**Combined Gradation for Blend - Trial Number**

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Blend:

Desired:

**Combined Gradation for Blend - Trial Number**

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Blend:

Desired:

DD Form 1217, Dec 86

Previous edition of this form is obsolete.
## MARSHALL METHOD - COMPUTATION OF PROPERTIES OF ASPHALT MIXTURES

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<td>THICKNESS (Inches)</td>
<td>WEIGHT (Grams)</td>
</tr>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>(d - e)</td>
<td>(d / g)</td>
<td>(b + g)</td>
<td>(100 - 100)</td>
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</table>

*From conversion table

COMPUTED BY

CHECKED BY

DD FORM 1218, DEC 65

PREVIOUS EDITION OF THIS FORM IS OBSOLETE.
### BITUMINOUS MIX CURVES

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**RECAP OF MARSHALL TEST RESULTS**

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<td>UNIT WEIGHT - TOTAL MIX</td>
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<tr>
<td>STABILITY</td>
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<td>FLOW</td>
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<td>PERCENT VOIDS - AGGREGATE ONLY</td>
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<td>PERCENT VOIDS - TOTAL MIX</td>
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<tr>
<td>PERCENT OF TOTAL VOIDS FILLED WITH BITUMEN</td>
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<table>
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<table>
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<th>UNIT WEIGHT - TOTAL MIX (g/cm³)</th>
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<table>
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<tbody>
<tr>
<td>PERCENT BITUMEN</td>
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**TECHNICIAN (Signature):**

**PLOTTED BY (Signature):**

**CHECKED BY (Signature):**

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DD Form 1219, DEC 85

PREVIOUS EDITION OF THIS FORM IS OBSOLETE
CHAPTER 15 QUALITY ASSURANCE (QA) TOOLS .........................15-1
15-1 TOOLS AVAILABLE TO ASSIST THE QA ............................................. 15-1
  15-1.1 Purpose ........................................................................................................... 15-1
  15-1.2 References ....................................................................................................... 15-1
  15-1.3 Responsibilities .............................................................................................. 15-1
  15-1.4 Definitions ....................................................................................................... 15-1

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  15-3.2 ASME BPVC ................................................................................................... 15-4
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  15-4.1 In-expensive Common Item ............................................................................. 15-4
  15-4.2 Unusual Tools .................................................................................................. 15-5
  15-4.3 Additional Tools .............................................................................................. 15-5
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  15-5.2 Field Office Quality Assurance Assistance Visits ......................................... 15-8
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15-6 ANNEXES, EXHIBITS, AND TEMPLATES ..................................................... 15-8
  15-6.1 Sample IR Inspection Report (Excerpts on Masonry) ..................................... 15-9
  15-6.2 Sample Photo of Image Being Analyzed ....................................................... 15-13

SAD QAFG – Chapter Version Control

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CHAPTER 15    QUALITY ASSURANCE (QA) TOOLS

15-1    TOOLS AVAILABLE TO ASSIST THE QA

15-1.1 Purpose
This chapter addresses helpful tools utilized as part of the QA process. The chapter is not meant to be an all inclusive guide and will be expanded as the manual is developed. This chapter covers items ranging from small hand tools to high tech equipment available at some of the District Offices.

15-1.2 References
Not applicable.

15-1.3 Responsibilities
It is the responsibility of AE/RE’s to budget for and equip the office and personnel with suitable QA tools. The planning and purchasing of large dollar QA tools are typically handled by the District Office and may be retained in the District Office or distributed to centrally located field offices.

15-1.4 Definitions

a). None
15-2  GENERAL

The tools utilized to assure quality construction are many and varied. They range from mental alertness and awareness, to tangible items, such as, books, codes, drawings, submittals, manufacturer’s catalogs, etc, as well as hand tools and instruments. The most valuable tool is a desire, instinct or some individual, internal motivation to learn how and why things occur, work or exist in their particular form. Some individuals are born with an innate ability for the task of “quality assurance”. Others have to develop these qualities, often, with much commitment to accomplish the task at hand.

The best tool to be used in establishing quality of construction is a good, thorough knowledge of the contract requirements, i.e. the plans and specifications for the job. Each project is unique. Even though the contract requirements may have been developed using standard plans or specifications, each will be different due to the difference in contractors, personnel, materials, workmanship and techniques.

A good library consisting of commercial standards is necessary to determine if materials, equipment and workmanship are in compliance. It is impossible to determine if the requirements are met if we do not know what the requirements are.

The use of hand-tools for access and verification of compliance should be limited as the primary responsibility for quality is the contractor. Attendance at the preparatory phase and initial phase meetings will minimize the requirements for the use of these tools by government personnel. If used at all, they would be of most advantage in the follow-up phases.
15-3 ONLINE TOOLS – WHOLE BUILDING DESIGN GUIDE (WBDG) WEBSITE AND INFORMATION HANDLING SERVICES (IHS) STANDARDS

Many referenced standards are generally available through an on-line standards provider such as Information Handling Services (IHS) that can be accessed through the Whole Building Design Guide website (http://www.wdbg.org/).

15-3.1 Specs and Standards Product
The Specs and Standards product provides access to over 350,000 standards from more than 450 organizations, in excess of 344,000 military documents and links to procurement information. You can search for documents by key word, document number, organization, FSC or document type. USACE has access to the following:

- AASHTO - American Association of State Highway and Transportation Officials
- A.G.A. - American Gas Association
- ANSI - American National Standards Institute
- API - American Petroleum Institute
- ARI - Air-Conditioning and Refrigeration Institute
- ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
- ASME - American Society of Mechanical Engineers
- ASTM - American Society for Testing and Materials
- AWS - American Welding Society, Inc.
- AWWA - American Water Works Association
- BHMA - Builders Hardware Manufacturers Association
- IEEE - Institute of Electrical and Electronics Engineers
- IESNA - Illuminating Engineering Society of North America
- MSS - Manufacturers Standardization Society of the Valve and Fitting Industry
- NACE International
- NEMA - National Electrical Manufacturers Association
- NFPA - National Fire Protection Association
- SMACNA - Sheet Metal and Air-Conditioning Contractors National Association, Inc.
- SSPC - Society for Protective Coatings
- UL - Underwriters Laboratories, Inc.
15-3.2 ASME BPVC
This product provides simple desktop searching of the ASME BPVC, including text, figures, equations, tables and related standards

15-3.3 CatalogXpress®
This product provides an internet based solution to quickly locate product and component information by keywords, brand names, part or model numbers, standards, National Stock Numbers (NSNs), Mil Specs, manufacturer names, and more. It includes millions of catalog pages from over 16,000 manufacturers.

15-3.4 Accessing IHS Products
Access the WBDG website via http://www.wbdg.org. The following directions will take you to the standards:

- Choose the DoD Seal on the right. This will open the DoD Unified Criteria Program web page.
- A link to IHS is contained in the drop-down menu beneath the USACE seal - “Non-Government Standards - IHS”.
- Click on this link. The web site will automatically log you in to the IHS subscription via your “.mil” domain (IP address).

15-4 TYPICAL QAR TOOLS AND THEIR USES
The following tools are listed as a suggestion only, and tools will be added as deemed necessary in the course of verification:

15-4.1 In-expensive Common Item
- Ground Fault Circuit Interrupter (GFCI) Circuit Tester – detects mA leakage. Dial in various amounts of leakage to see at what level the GFCI trips for protected receptacles. Can also be used to check polarity of any receptacle wiring.
- GFCI Receptacle Tester – test 15A and 20A, 125V, receptacles for proper GFCI operation.
- Flashlights
- Tape Measure
- Multi-purpose tool
- Camera
- Magnets
- Inspection Mirror
- Thermometer
• IR Thermometer – relative cheap device that can be used to quickly check surface temperatures of items such as diffusers without the QAR having to climb up to the diffuser.
• Light Meter – pocket-size instrument for measuring illumination levels.
• Sheet and Plate Gage – pocket size hardened steel gage for measuring US Standard thickness of steel, sheet and plate with decimal equivalents on the reverse side.
• Torpedo Level
• 8’ Level
• Wire Gage – pocket size gage for measuring American Standard wire gage with decimal equivalents on the reverse side.

15-4.2 Unusual Tools
• Bolts, rods, or other heavy metal items – these items commonly found lying around jobsites can be used to sound masonry walls when checking grouting or to check concrete floor for the extent of delaminating areas.
• Stiff wire – can be used to check depth of saw cut joints.
• A golf ball – a golf ball can be used for sounding floors such as when dropped on VCT floors to check for proper adherence.
• Quarters – Did you know that a quarter is 1.75mm thick? This sometimes comes in handy in the absence of a tape measure when measuring the depth of ponding water on floors.

15-4.3 Additional Tools
• Ground Resistance Tester – measures resistance to ground.
• Insulation Resistance Tester (Megger) – instrument for measuring resistance and insulation resistance.
• Chain drag
• Pulse Velocity
• Flow Hoods
• Rebar Locators
• Handheld Ground Penetrating Radar
• Dry Film Thickness Gages
• Wet Film Thickness Gages
• Glass Thickness Gage – typically a 2”x 4” plastic card used to determine thickness of installed glass.
• Moisture Meter – determines percent moisture in lumber or suitability of plaster for painting. Can also be used to detect moisture beneath the surface such as in place roof insulation.
• Psychrometer – portable instrument that measure moisture in the air. Provides dry and wet bulb readings.
• Sound Level Meter – measures dB levels.
• Contractor’s Level and Leveling Rod – used for land survey and verification.

15-4.4 Infrared Thermography

Infrared thermography is the process of acquisition and analysis of thermal information from thermal imaging devices. The use of infrared thermography in building inspection has drastically increased over recent years due to the availability, reliability, ease of use, and decrease in cost of infrared cameras. Here are a few of the reasons thermography is important:

• Non-contact and non-invasive technique
• It’s fast
• Produces an image
• Safe
• Environmentally benign
• Versatile

IR Building Inspections can be used to identify temperature differences that may indicate problems. Some of the most frequent IR verifications are used to address:

• Building Performance
• Insulation Verification
• Locate Air Leakage
• Moisture Intrusion
• Mechanical and Electrical System Performance – such as leaking steam valves, overheating breakers, misaligned pump shafts, etc…
• Structural Verification – such as improperly grouted masonry walls (see photo – grout columns are darker – the pattern tells the story)

Sample IR Inspection Reports can be found in part 15-6 of this chapter.
15-5  QA SERVICES AVAILABLE FROM DISTRICTS WITHIN SAD

15-5.1 Savannah District, Environmental & Materials Unit
For QA testing and inspection services, SAD has available aggregates, concrete, soils, rock, and miscellaneous materials capability through the Savannah District Environmental & Materials Unit (EMU) located in Marietta, GA. Experienced personnel are available at the EMU office to assist with any materials related questions. The EMU office maintains current Validation through ERDC’s Materials Testing Center laboratory Validation Program. Capability for testing and inspection include a minimum of the following:

USACE District, Savannah Environmental & Materials Unit
Michael P. Wielputz, P.E.
200 N. Cobb Pkwy, Bldg 400, Suite 404
Marietta, Georgia  30062
(678) 354-0310
Expiration Date:  February 23, 2009

Aggregate:   ASTM C40 C117 C127 C128 C136 C88 C131 C142 C566 C702 D75 D5821
Bituminous:  ASTM D2726 D3666
Concrete:    ASTM C31 C39 C138 C172 C173 C231 C1064 C42 C470 C511 C617 C1077
Soils:      ASTM D421 D422 D698 D854 D1140 D1556 D1557 D2166 D2216 D2217 D2434 D2435 D2487 D2488 D2850 D3740 D4220 D4318 D4767 D5084
Masonry:    ASTM C109 C1019

Other miscellaneous testing and inspection capabilities are available from the EMU office upon request. For any questions concerning materials testing, contact Michael Wielputz. Materials testing workshops for Soil Classification, Soil Density Control, and Concrete are also provided by the EMU office, which includes a blending of classroom instruction and hands-on testing efforts for the learning experience. Further experience includes background in the following materials capabilities:

- Commercial Materials Laboratory Audits/Inspections for the WES Materials Testing Center.
- Participating with Construction QA Teams.
- Providing Onsite Technical Assistance with Asphalt Cement Concrete (ACC) and Portland Cement Concrete (PCC) Pavement projects.
- Materials Contract Specification & Test Data Review.
- Asphalt & Concrete Plant Inspections.
- Conduct Training Workshops (Soil Classification, Density Control, Concrete Testing, ACC & PCC Design, Production, and Placement).
• Provide Roller Compacted Concrete Expertise (Design, Construction, & QA Evaluation).

The EMU office was established in June 1998 and now serves as a unit in Savannah District’s Soil Section. Overall, the EMU technical staff specializes in QA, field investigations, inspections, sampling events, contract data review, and conducting geotechnical training sessions.

15-5.2 Field Office Quality Assurance Assistance Visits

QA Assistance Visits are available from both Jacksonville and Savannah Districts. Request for assistance and details for scheduling should be addressed to the Quality Assurance Section Chiefs in each District.

    CESAS-CD-TQ    912-65-5094
    CESAJ-CO-CQ    904-232-1128

15-5.3 Infrared Thermography Inspections, Savannah District

The Quality Assurance Section in Savannah has IR cameras and trained individuals to assist others. For more information contact CESAS-CD-TQ. Minimal cost of travel, per diem, and labor are associated with this service.

15-6 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.
15-6.1 Sample IR Inspection Report (Excerpts on Masonry)

**Description**
Darker areas are the grouted cells. There is little evidence that around the door is grouted. Appears to be no grout above second bond beam.
NOTE: Bond Beam was cut for stair landing structural support. Bond beam was not offset around the SS. Difficult to tell if cells below or above are grouted. Areas with unplanned openings are highly suspect.
Description

Numerous voids on this wall. Corners do not contain the required grout columns. Reinforcing and grouting around windows appears to have voids. 2' bearing of lintels should be checked at all wall openings.
Obvious Grouting Problems!
15-6.2 Sample Photo of Image Being Analyzed
This photo shows a very good job of grouting masonry walls.
CHAPTER 16  TECHNICAL EXPERTISE IN SAD................................. 16-1

16-1 GENERAL........................................................................................................ 16-1
  16-1.1 Purpose ......................................................................................................... 16-1
  16-1.2 References .................................................................................................... 16-1
  16-1.3 Responsibilities ............................................................................................ 16-1
  16-1.4 Definitions ................................................................................................... 16-1

16-2 PROCEDURES................................................................................................... 16-2
  16-2.1 Technical Specialist Database ....................................................................... 16-2
  16-2.2 SAD Regional Construction Experts ............................................................... 16-2

16-3 TECHNICAL EXPERTS.................................................................................. 16-3

16-4 ANNEXES, EXHIBITS, AND TEMPLATES............................................... 16-3
  16-4.1 Nomination Form .......................................................................................... 16-4
  16-4.2 Suggested Listing .......................................................................................... 16-5

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CHAPTER 16  TECHNICAL EXPERTISE IN SAD

16-1  GENERAL

16-1.1 Purpose
To provide standard procedures and information for determining and identifying appropriate technical experts for consultations. This will provide quick web based reference guide for district and field personnel to resolve critical problems during construction and design.

16-1.2 References


16-1.3 Responsibilities
SAD will maintain and administer the web program. SAD’s Technical Expertise Manager will serve on USACE & SAD Independent Technical Review Teams and District Quality Control and Quality Assurance Teams.

The Chiefs of the Engineering and Construction Divisions are responsible for training of the design and construction personnel and nominating individuals to serve as experts in their fields. All nominations shall be forwarded thru the geographic District for final approval by SAD.

AE/RE shall promote the use of the web based programs in the field and nominate individuals for supporting the construction technical program.

The Technical Expert web based manager shall coordinate with District Branch Chiefs and AE/REs.

Supervisors are responsible for insuring that team members are aware of the web based resource and provide training in its use. Additionally they should encourage the nomination of individuals to serve as technical experts in the system.

16-1.4 Definitions
Not Applicable
16-2  PROCEDURES

16-2.1 Technical Specialist Database
Web based intuitive data base that lists technical expert resources in technical subjects such as:

- Cost Engineering
- Geotechnical Engineering
- Hydraulic Engineering
- Coastal/Navigation
- Hydraulic Engineer Flood Protection/Eco-system restoration
- Hydraulic Modeling
- Other Technical Specialist.

The web based program can be accessed at

16-2.2 SAD Regional Construction Experts
Web based data base that lists technical expert resources in construction subjects such as:

- Fire Alarm Systems
- Fire Sprinkler systems
- Cost Engineering
- Elevator Systems and code requirements
- Mechanical Systems Commissioning and Systems
- Electrical systems
- Force Protection
- RMS/QCS
- Roofing Systems
- Structural
- Energy Policy Act
- Masonry
- Concrete
- Laboratory Testing
- Other technical Specialist.

The web based program can be accessed at
16-3 TECHNICAL EXPERTS

Nominations for inclusion into the Technical expertise shall be forwarded to the Web based manager. Exhibit 16-4.1 is a hard copy of the nomination sheet. CD and EN Chiefs shall endorse the nomination of the technical expert and forward for approval to the SAD Technical Manager.

The technical manager shall assure the nomination once approved is loaded into the Web based system.

16-4 ANNEXES, EXHIBITS, AND TEMPLATES

The following page(s) contain examples, charts, diagrams, etc… referenced in this Chapter.
16-4.1 Nomination Form

Nomination Form

Name
Title
Office
Phone Number:
E-mail address
Field of Expertise
License or Certification
Qualifications
Supervisor concurrence
Division Chief’s endorsement
### 16-4.2 Suggested Listing

Table 16-1  Technical Expertise

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<td>Pervious Concrete</td>
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<td>Lead Abatement</td>
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CHAPTER 17 LABOR REQUIREMENTS

17-1 GENERAL

17-1.1 Purpose
This procedure establishes the guidance actions required by all Construction Division’s Field Offices to enforce the Labor Standards of construction contracts under their supervision and administration.

17-1.2 Applicability
This procedure applies to all Construction Division Field Offices and projects.

17-1.3 References
a. FAR 52.222-6 Davis-Bacon Act (Jul 2005)
b. FAR 52.222-4 Contract Work Hours And Safety Standards Act – Overtime Compensation (Sep 2000)
c. FAR 52.222-7 Withholding of Funds (Feb 1988)
d. FAR 52.222-8 Payrolls and Basic Records
e. FAR 52.222-9 Apprentices and Trainees (Jul 2005)
f. FAR 52.222-10 Compliance with Copeland Act Requirements (Feb 1988)
g. FAR 52.222-11 Subcontracts (Labor Standards) (Jul 2005)
h. FAR 22.4, Labor Standards for Contracts Involving Construction
i. ER 1110-1-8, Labor Relations
j. EP 415-1-260 Chapter 10

17-1.4 Responsibilities
The ACO/COR has the primary responsibility to assure that prime and subcontractors comply with the labor provisions of their contracts. Each Area and Resident Office is required to designate a Point of Contact in each of their Offices who will be responsible for labor compliance.
17-1.5 Definitions

a. **CIRS** – Contract Industrial Labor Relations Specialist: Usually an employee of the Office of Counsel that has the responsibility to monitor the District Labor Relations Program. In addition to monitoring the program, the CIRS is normally responsible for obtaining the General Wage Determination to be included in each contract and to compile the District’s Semi-Annual Labor Standards Enforcement Report.

b. **Davis-Bacon Act** - Requires contractors providing labor on federally funded construction projects to pay at least the prevailing wage being paid in the area surrounding the location where the work is performed. The Davis-Bacon Act applies to laborers and mechanics. It does not apply to workers whose duties are primarily administrative, executive or clerical. Contractor employees employed in a bona fide executive, administrative, or professional capacity are not deemed to be laborers and mechanics. Working foremen who devote more than 20 percent of their time during a workweek to labor or mechanic duties are laborers and mechanics for the time such spent. May not apply in some locations.

c. **Wage Determination** - Included in the contract (usually an attachment to section 0800) is the General Wage Determination which list the labor/mechanic classifications that are anticipated to be performed along with the corresponding wage rate and fringe benefits if applicable.

d. **Contract Work Hours and Safety Standards Act – Overtime Compensation** - Sets the standard work week to forty hours and requires contractors to pay at least time and one-half for all hours worked over forty in a week. The contractor must keep a standard seven day work week and can not vary the start and end days in order to avoid paying overtime.

e. **Payrolls and Basic Records** - Requires contractors providing labor on Federally fund construction projects to submit weekly payrolls to the Contracting Officer and to maintain records of such for a period of three years thereafter. The act requires specific information to be included on the payrolls and maintained in the records.

f. **Service Contract Act** - If the contract is a service contract and not a construction contract then the Davis Bacon Act does not apply. The Service Act covers persons engaged in a recognized trade or craft or manual labor occupation. Payrolls are not required to be submitted on service contracts. The Service Contract regulations require that contractors and subcontractors maintain records containing the following information pertaining to each service employee performing work under a contract subject to the Act for each workweek during performance of the contract: (a) name, address and social security number; (b) work classification(s); (c) rate of wage and fringe benefit paid or rate of fringe benefit payments instead thereof; (d) total daily and weekly compensation; (e) daily and weekly hours worked; and (f) deductions, rebates, refunds from total daily or weekly compensation.
17-2 PRE-AWARD

During preparation of the request for proposal it is important that the CIRS is made aware of all the labor classifications that are anticipated to be needed to complete the work so that a complete General Wage Determination can be obtained from the Department of Labor. It is recommended that Construction Division provide a list. Having a complete wage determination will reduce the time consuming processing of SF 1444, Request for Authorization of Additional Classification and Rate.

17-3 POST AWARD

The ACO and/or the COR is delegated the responsibility from the Contracting Officer to monitor and enforce the labor standards requirements of the contract. A sufficient number of compliance checks (labor interviews and payroll verifications) should be performed to assure that the contractors are in compliance with the requirements of the contract. The ACO/COR should appoint a Point of Contact in their office who will be responsible for the overall labor compliance (payrolls, labor interviews, etc). The Quality Assurance (QA) personnel are responsible to conduct labor interviews on their projects and assist with review of payrolls as necessary.

17-4 PRE-CONSTRUCTION CONFERENCES

The ACO/COR must emphasize the Labors Standards requirements of the contract at all pre-construction conferences and will advise the prime contractor that:

- It is important that the prime contractor and all subcontractors, at all tiers, have a complete understanding of and comply with the contract labor requirements.
- The Contractor, and/or their authorized representative, will not have employees working out of classification. In the case where a worker has a split classification, the contractor and subcontractors must keep accurate records to show the hours and specific classifications of work the employee actually performs.
- An SF 1413, Statement and Acknowledgement, must be submitted with in 14 days after award of any subcontract.
- The Quality Assurance Representative and other Corps personnel should be monitoring labor standards and performing labor interviews on site.
- The contractor and subcontractors should review the wage determination included in the contract and if any labor classifications that they intend to use in completion of the contract are not included in the determination a SF 1444, Request for Authorization of Additional Classification and Rate, must be submitted.
- They should complete and return forms WD-10, Wage Survey, if requested by the Department of Labor. The WD-10 is use by DOL to collect wage data used in making wage determinations.
17-5 SUBMITTAL OF PAYROLLS (FAR 52.222-8 PAYROLLS AND BASIC RECORDS)

- When payrolls are received from the contractor, each payroll should be logged in on ENG Form 3180R. The payroll number, week ending date, number of employees and man hours worked columns of the form should be completed. If applicable the number of contractor and subcontractor employee interviews conducted and the date the payroll is checked for compliance will also be recorded on ENG Form 3180. There should be one ENG 3180R completed for each contractor/subcontractor on the project. The ENG 3180R should be filed in the folder with the payrolls for the applicable contractor or can alternatively be kept in a binder marked Payroll Records with the contract number. The payrolls are to be filled in a separate folder for each contractor or subcontractor and placed in the contract file.

- Prior to filing, the payrolls must be checked to make sure they are properly numbered, contain complete data and have been submitted timely. This is also a good time to perform compliance checks and verify labor interviews.

- The payroll heading must show the name and location of the project, contract number and the name of the contractor and subcontractor.

- Payrolls must be numbered consecutively and have the week ending date, fall on the same day of the week throughout the contract. For periods of “no work” a payroll or Statement must be submitted and marked “no work”. In the event that a payroll is missing, notify the contractor immediately. The last payroll must be marked “Final Payroll”. Do not make final payment to the contractor until the all payrolls have been submitted.

- Statement of Compliance (DD 879) must accompany each payroll and must have an original signature of the payroll clerk. The statement of compliance must be marked as to whether fringe benefits are paid in cash or paid for approved programs. If fringe benefits are not applicable to a particular job, the statement will be marked “N/A”.

- Payrolls must show each employee’s full name, address, social security number (the first time the employee appears on the payroll), labor classification, hourly rate of pay, daily and weekly number of hours worked (regular and overtime), gross earnings, fringe benefits paid, if any, all deductions, and actual wages paid.

- Payrolls for all contractors and subcontractors (at all tiers) should be submitted weekly within seven to fourteen calendar days after the regular payment date of the payroll covered.

- In the event that a contractor falls behind in the submittal of payrolls, the contractor should be notified of the deficiency in writing. If the contractor does not immediately correct the situation retainage in the amount of 10% of earnings should be withheld from the next progress payment. In the event that the contractor does not correct the deficiency by the time for the second progress payment after notification has been made the ACO/COR may consider suspension of all payments, as allowed by FAR 52.222-8, Payrolls and Basic Records, paragraph (c), until the deficiency has been corrected.
17-6 LABOR INTERVIEWS

Conducting labor interviews is the most important way to ensure that contractors are complying with the wage determination in their contracts. The extent of labor interviews will be noted on Quality Assurance Reports.

- Interviews of contractor and subcontractor employees to determine correctness of classification, rates of pay (including fringe benefits) and compliance with overtime requirements must be performed. Labor interviews will be recorded on SF1445. Note that the interview form requires the signatures of the employee being interviewed and the interviewer.

- The number of labor interviews needed to verify compliance will very depending on the number of trades, number of subcontractors, number of workers, etc. Additional interviews may also be necessary if a violation is detected or reported. During the first few months of the contract one labor interview should be performed for each labor classification employed by each contractor/subcontractor on the contract. Throughout the remaining period of performance labor interviews should be performed when a new subcontractor begins work on the contract, when workers on a crew have significantly changed and a few per month taken randomly on workers that have not been previously interviewed. Be alert for 3rd and 4th tier subcontractors that may only be providing labor.

- Conduct interviews over several project visits, not in large segments at one time. Give careful attention to the work the employee is performing and the tools the employee is using, particularly in the laborer classification. Laborers normally do not actually use the tools of the trade.

- Not all laborers on dredging projects are subject to labor interviews. For example, laborers and management on a Hopper Dredge, with the exception of the drag tender, are not subject to labor provisions due to association with professional mariner organizations and unions. Consult the local CIB for labor interview requirements on maritime dredging projects.

- Perform interviews at a time that is not overly disruptive to the work being performed.

- Explain Privacy Act provisions to each employee prior to conducting the interview. Employee statements are confidential. Do not divulge their content to the contractor without the written consent of the employee. The employee needs to indicate and sign the back of the form stating he/she objects or does not object to the information given on the form being made known to the employer.

- A list of the names of the employees interviewed and the date of the interview, should be kept and filed along with the labor interview sheets (SF 1445) and the payroll files.

- To complete the compliance check the data on the labor interview forms must be checked against the contractor and subcontractor payrolls when the applicable payroll has been submitted. Verify that the data on the labor interview (labor classification, wage rate, etc) agrees with the data on the payroll. In the event that the data does not agree and there appears to be a possible violation of regulations the contractor should be notified in writing and requested to explain and correct the situation as applicable.
- RMS has a section under the QA/QC tab for scheduling and documenting labor interviews. After performing the interview and completion of the SF 1445, all labor interviews should be recorded in RMS.

17-7 **PAYROLL COMPLIANCE CHECKS:**

- Approximately one weekly payroll per month for each contractor/subcontractor should be checked for compliance. Payrolls with weeks containing overtime work should be selected if possible. Payrolls corresponding to weeks in which a labor interview was performed must also be checked to verify the data collected during the interview.

- Don’t forget to notate each compliance check on the applicable ENG Form 3180.

- Refer to the General Wage Decision for each contract during review of contractor payrolls for labor classifications and rates of pay.

- Check to see if the payroll contains complete information and that the statement of compliance is properly completed.

- Check to see that deductions shown on the payroll are allowable. Federal, State, local and FICA taxes, union dues and health insurance are acceptable deductions. If a deduction is made to pay back advanced funds, this must be itemized on the face of the Statement of Compliance and noted: “without discount or interest”. Deductions, such as for uniforms, room and board, credit union, etc., must be voluntarily consented to by the employee in writing and in advance of the period in which work is to be performed. A copy of the signed consent must be available for inspection upon request. Payrolls showing deductions required by court process to be paid to another are acceptable. A copy of the court order must be available for inspection.

- Check to see that each employee is correctly classified and that the wage paid is at least the minimum required by the wage determination. All classifications must be exactly as shown in the labor determination included in the contract or as approved on a SF 1444.

- In the case where a worker has a split classification, the employee must be paid at least the minimum rate for the classifications of work the employee actually performs.

- If additional classifications are needed because they are not included in the contract wage determination, notify the contractor by letter that they must request an additional classification on SF 1444 and flag the payroll file for follow up. Once an additional classification and rate have been approved, a determination must be made as to whether or not any back wages are due.

- Check to see if at least time and one-half is being paid for all hours worked over forty in a week. If classifications are split (more than one classification), then overtime is paid at the rate of the classification being performed. The forty hours is calculated starting on the first day of the normal work week. The starting day of the week cannot be varied to avoid paying overtime wages. For OCONUS locations requirements may vary.
Check to see if the payrolls contain a disproportionate employment of laborers to journeymen/mechanics. This is an indicator that the laborers may be improperly classified and should be followed up with on-site interviews to determine if they are correctly classified.

If discrepancies appear on a payroll, the prime contractor should be notified by letter and requested to submit a supplemental or corrected payroll. A supplemental or corrected payroll must be marked as such and refer to the original payroll and the date, show the corrections made, and forwarded to Corps office without delay. Do not give the original payroll back to the contractor. An original payroll, once submitted to the Corps, cannot be returned to the contractor.

**17-8 DEFICIENCIES AND VIOLATIONS:**

Where deficiencies are discovered as a result of regular compliance checks, additional random sampling of payrolls will be reviewed carefully to determine the extent of the deficiencies.

If minor violations are found and are readily correctable, a letter will be sent to the contractor citing the discrepancies and the corrective action required, including the submission of a supplemental payroll.

Evidence will be obtained that restitution was made in the form of copies of cancelled paychecks, payroll receipts, or signed notarized statements from the employees that they have received payment. This evidence will be incorporated into the contract files.

In the event corrective action is not taken, violations are not readily correctable, are aggravated or willful, or the amount of restitution appears to exceed $500, the District CIRS will be notified so that further investigative action can be taken.

If a substantial trend of employer non-compliance appears after performing the above checks, or other evidence of non-compliance arises, notify the District CIRS.

**17-9 APPRENTICE PROGRAMS**

Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of each perspective trainee program. The program should provide the registration of the apprentice or trainee and the ratios and wage rates prescribed in the applicable program.

If labor interviews or payroll checks indicate that apprentices are employed then a check to insure that there is a bona fide apprenticeship program must be performed. In addition to verifying that there is a bona fide program the rate of pay and the ratio of apprentices to journeymen must also be verified. A letter should be sent to the contractor requesting the applicable information on the apprenticeship program. See FAR 52.222-9 Apprentices and Trainees for additional information.
17-10 POSTERS

Federal law requires the following to be posted at the construction job site: (a) Notice of Minimum Wage and Overtime Requirements (WH-1321), (b) Equal Employment (OFCCP 1420), (c) Right to Safe Work Place (3165-09R), (d) Contract General Wage Decision, and (e) applicable wage determinations. For the purpose of these postings the contractor must maintain a bulletin board located at the project site in a conspicuous place easily accessible to all contractor and subcontractor employees. The posters shall be in both English and Spanish and can be downloaded from the DOL Wage and Hour Division web site.

17-11 SEMI-ANNUAL REPORT TO DEPARTMENT OF LABOR

Semi Annually the District will submit a request for information concerning basic labor information. This information is available thru RMS.

17-12 DEPARTMENT OF LABOR (DOL)

Advise Office of Counsel immediately if you are contacted about a labor issue by any Department of Labor office. Do not have meetings with Department of Labor personnel without letting Office of Council know. Determining and correcting problems with labor compliance early on should help avoid labor violations.

Corps employees will fully cooperate with the Department of Labor personnel conducting investigations. Do not inform contractors of Department of Labor officials impending visits to conduct investigations unless the official expresses a desire for a scheduled joint meeting with a contractor. Notify the District CIRS promptly whenever a Department of Labor investigator undertakes an investigation at a construction project. No meetings should be held with Department of Labor personnel and contractor personnel without prior notification and the presence of the District CIRS.

17-13 TRAINING AND RESOURCES

AE/REs will require all Quality Assurance Representatives and others involved in checking payrolls to review the Labor Compliance notebook from the District CIRS, which provides further guidance in the administration of the Labor Standards Enforcement Program. It is also recommended that all employees with responsibility for labor law enforcement read the FAR clauses referenced above.
Additional Labor compliance training needed by field office personnel can be achieved through the District’s Office of Council. Field office personnel should contact the Office of Council if they need more assistance. The CIRS and District Office of Council, is available to answer any questions concerning contract labor compliance.

Department of Labor Wage and Hour Division has a web site at http://www.dol.gov/esa/whd/. Forms, Handbooks, access to the Wage Determination OnLine and much more is available. Select government contracts off the home site to access information applicable to our work.

17-14 RECORDS

Payrolls, labor interviews, letters and any other documentation concerning violations and resolution of such will be kept with the official contract file by the respective Area/Resident Engineer Field Offices. Payrolls and basic records shall be maintained by the contractor during the course of the work and preserved for a period of 3 years thereafter.

17-15 ANNEXES, EXHIBITS, AND TEMPLATES

Forms are shown below and are available for download at http://www.gsa.gov/forms/ and http://www.dol.gov/esa/whd/.
### 17-15.1 ENG Form 3180-R, Contractor Payroll Record

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</thead>
<tbody>
<tr>
<td>DOLLAR VALUE</td>
<td>DATE WORK</td>
</tr>
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**PROJECT, LOCATION AND DESCRIPTION OF WORK**

<table>
<thead>
<tr>
<th>WAGE DETERMINATION NO. &amp; DATE</th>
<th>BID OPEN DATE</th>
<th>SUBCONTRACTOR (Name and Address)</th>
<th>SF 1413 SUBMITTED (Date)</th>
</tr>
</thead>
</table>

**PRIME CONTRACTOR (Name and Address)**

<table>
<thead>
<tr>
<th>FOR:</th>
<th>STARTED (Date)</th>
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</table>

<table>
<thead>
<tr>
<th>P.R. NO.</th>
<th>W, E DATE</th>
<th>CHECKED BY &amp; DATE</th>
<th>DATE SUBMITTED TO DIST OFF</th>
<th>NUMBER EMPLOYED</th>
<th>NUMBER INTERVIEWED</th>
<th>DATE INTERVIEW INFO COMPARED</th>
<th>MANHOURS WORKED</th>
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<thead>
<tr>
<th>P.R. NO.</th>
<th>W, E DATE</th>
<th>CHECKED BY &amp; DATE</th>
<th>DATE SUBMITTED TO DIST OFF</th>
<th>NUMBER EMPLOYED</th>
<th>NUMBER INTERVIEWED</th>
<th>DATE INTERVIEW INFO &amp; P.R ENTRY COMPARED</th>
<th>MANHOURS WORKED</th>
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</thead>
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*All work performed under this contract has been covered by payrolls from the prime or subcontractors. These have been checked and found to be correct.*

(Date) (Title) (Signature)
<table>
<thead>
<tr>
<th>PH NO.</th>
<th>W-E DATE</th>
<th>CHECKED BY &amp; DATE</th>
<th>DATE SUBMITTED TO DIST OFF</th>
<th>NUMBER EMPLOYED</th>
<th>DATE INTERVIEW INFO &amp; P.I. COMPARED</th>
<th>HOURS WORKED</th>
<th>SF 1413 SUBMITTED (Date)</th>
<th>PH NO.</th>
<th>W-E DATE</th>
<th>CHECKED BY &amp; DATE</th>
<th>DATE SUBMITTED TO DIST OFF</th>
<th>NUMBER EMPLOYED</th>
<th>DATE INTERVIEW INFO &amp; P.I. COMPARED</th>
<th>HOURS WORKED</th>
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(Reverse of ENG FORM 3160-R)
## 17-15.2 SF 1445, Labor Standards Interview

### LABOR STANDARDS INTERVIEW

<table>
<thead>
<tr>
<th>CONTRACT NUMBER</th>
<th>EMPLOYEE INFORMATION</th>
</tr>
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<tbody>
<tr>
<td>LAST NAME</td>
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<tr>
<td>FIRST NAME</td>
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<table>
<thead>
<tr>
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<table>
<thead>
<tr>
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<th>CITY</th>
<th>STATE</th>
<th>ZIP CODE</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>SUPERVISOR’S NAME</th>
<th>LAST NAME</th>
<th>MI</th>
<th>WORK CLASSIFICATION</th>
<th>WAGE RATE</th>
</tr>
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<tbody>
<tr>
<td>__ _ _ _ _ _</td>
<td>__ _ _ _ _ _</td>
<td>__ _</td>
<td>__ _ _ _ _ _</td>
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</table>

### ACTION CHECK BELOW

<table>
<thead>
<tr>
<th>CHECK BELOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES __ _</td>
</tr>
</tbody>
</table>

- Do you work over 8 hours per day?
- Do you work over 40 hours per week?
- Are you paid at least time and a half for overtime hours?
- Are you receiving any cash payments for fringe benefits required by the posted wage determination decision?

### HOW MANY HOURS DID YOU WORK ON YOUR LAST WORK DAY BEFORE THIS INTERVIEW?

### TOOLS YOU USE

### DATE OF LAST WORK DAY BEFORE INTERVIEW (YYMMDD)

### DATE YOU BEGAN WORK ON THIS PROJECT (YYMMDD)

### THE ABOVE IS CORRECT TO THE BEST OF MY KNOWLEDGE

<table>
<thead>
<tr>
<th>EMPLOYEE’S SIGNATURE</th>
<th>DATE (YYMMDD)</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>INTERVIEWER</th>
<th>SIGNATURE</th>
<th>TYPED OR PRINTED NAME</th>
<th>DATE (YYMMDD)</th>
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<tr>
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### INTERVIEWER’S COMMENTS

<table>
<thead>
<tr>
<th>WORK EMPLOYEE WAS DOING WHEN INTERVIEWED</th>
<th>ACTION (If explanation is needed, use comments section)</th>
<th>YES __ _</th>
<th>NO __ _</th>
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<table>
<thead>
<tr>
<th>IS EMPLOYEE PROPERLY CLASSIFIED AND PAID?</th>
<th>ARE WAGE RATES AND POSTERS DISPLAYED?</th>
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<tbody>
<tr>
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### FOR USE BY PAYROLL CHECKER

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<thead>
<tr>
<th>IS ABOVE INFORMATION IN AGREEMENT WITH PAYROLL DATA?</th>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>__ _ _ _ _ _</td>
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</tbody>
</table>

### CHECKER

<table>
<thead>
<tr>
<th>LAST NAME</th>
<th>FIRST NAME</th>
<th>MI</th>
<th>JOB TITLE</th>
<th>SIGNATURE</th>
<th>DATE (YYMMDD)</th>
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<tbody>
<tr>
<td>__ _ _ _ _ _ _</td>
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<td>Prescribed by GSA - FAR (48 CFR) 53.222(g)</td>
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17-12
17-15.3  SF 1444, Request for Authorization of Additional Classification and Rate

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND RATE

1. TO:  ADMINISTRATOR, Employment Standards Administration
        WAGE AND HOUR DIVISION
        U.S. DEPARTMENT OF LABOR
        WASHINGTON, D.C. 20210

2. FROM: REPORTING OFFICE

3. CONTRACTOR

4. DATE OF REQUEST

5. CONTRACT NUMBER

6. DATE BID OPENED (SEALED BIDDING)

7. DATE OF AWARD

8. DATE CONTRACT WORK STARTED

9. DATE OPTION EXERCISED (IF APPLICABLE) (S.C.A ONLY)

10. SUBCONTRACTOR (IF ANY)

11. PROJECT AND DESCRIPTION OF WORK (ATTACH ADDITIONAL SHEET IF NEEDED)

12. LOCATION (CITY, COUNTY AND STATE)

13. IN ORDER TO COMPLETE THE WORK PROVIDED FOR UNDER THE ABOVE CONTRACT, IT IS NECESSARY TO ESTABLISH THE FOLLOWING RATE(S) FOR THE INDICATED CLASSIFICATION(S) NOT INCLUDED IN THE DEPARTMENT OF LABOR DETERMINATION

   NUMBER: ____________________  DATED: ________________

   a. LIST IN ORDER: PROPOSED CLASSIFICATION TITLE(S); JOB DESCRIPTION(S); DUTIES; AND RATIONALE FOR PROPOSED CLASSIFICATIONS (S.C.A ONLY)

   (Use reverse or attach additional sheets, if necessary)

   b. WAGE RATE(S)

   c. FRINGE BENEFITS PAYMENTS

14. SIGNATURE AND TITLE OF SUBCONTRACTOR REPRESENTATIVE (IF ANY)

15. SIGNATURE AND TITLE OF PRIME CONTRACTOR REPRESENTATIVE

16. SIGNATURE OF EMPLOYEE OR REPRESENTATIVE

   TITLE

   CHECK APPROPRIATE BOX REFERENCING BLOCK 13.

   □ AGREE  □ DISAGREE

TO BE COMPLETED BY CONTRACTING OFFICER (CHECK AS APPROPRIATE: SEE FAR 22.1019 (S.C.A) OR FAR 22.406-3 (DBA))

□ THE INTERESTED PARTIES AGREE AND THE CONTRACTING OFFICER RECOMMENDS APPROVAL BY THE WAGE AND HOUR DIVISION. AVAILABLE INFORMATION AND RECOMMENDATIONS ARE ATTACHED.

□ THE INTERESTED PARTIES CANNOT AGREE ON THE PROPOSED CLASSIFICATION AND WAGE RATE. A DETERMINATION OF THE QUESTION BY THE WAGE AND HOUR DIVISION IS THEREFORE REQUESTED. AVAILABLE INFORMATION AND RECOMMENDATIONS ARE ATTACHED.

(Send copies 1, 2, and 3 to Department of Labor)

SIGNATURE OF CONTRACTING OFFICER OR REPRESENTATIVE

   TITLE AND COMMERCIAL TELEPHONE NO.

   DATE SUBMITTED

PREVIOUS EDITION IS USABLE

STANDARD FORM 1444 (REV. 1-2001)
Prepared by GSA/FAR (48 CFR) 52.22207

17-13
### Payroll Form

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<td></td>
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</table>

**Notes:**
- For Contractors, Optional Use: See Instructions Form WH-347H (Int.)
- U.S. Department of Labor
- Payroll Form
- WH-347H
SAD QUALITY ASSURANCE FIELD GUIDE - Hard copies are uncontrolled

SASCD-T is the proponent for this manual

17-15
### 17-15.5 SF 1413, Statement and Acknowledgement

#### STATEMENT AND ACKNOWLEDGMENT

OMB No.: 9000-0014 Expires: 01/31/2008

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the FAR Secretariat, (OIB), Regulatory and Federal Assistance Division, GSA, Washington, DC 20405; and to the Office of Management and Budget, Paperwork Reduction Project (9000-0014), Washington, DC 20503.

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<th>2. DATE SUBCONTRACT AWARDED</th>
<th>3. SUBCONTRACT NUMBER</th>
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<tbody>
<tr>
<td>4. PRIME CONTRACTOR</td>
<td>5. SUBCONTRACTOR</td>
<td></td>
</tr>
<tr>
<td>a. NAME</td>
<td>a. NAME</td>
<td></td>
</tr>
<tr>
<td>b. STREET ADDRESS</td>
<td>b. STREET ADDRESS</td>
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</tr>
<tr>
<td>c. CITY</td>
<td>d. STATE</td>
<td>e. ZIP CODE</td>
</tr>
<tr>
<td></td>
<td>c. CITY</td>
<td></td>
</tr>
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</table>

6. The prime contract does not contain the clause entitled "Contract Work Hours and Safety Standards Act -- Overtime Compensation."

7. The prime contractor states that under the contract shown in Item 1, a subcontract was awarded on the date shown in Item 2 to the subcontractor identified in Item 5 by the following firm:

a. NAME OF AWARDING FIRM

b. DESCRIPTION OF WORK BY SUBCONTRACTOR

<table>
<thead>
<tr>
<th>8. PROJECT</th>
<th>9. LOCATION</th>
</tr>
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<tbody>
<tr>
<td>10a. NAME OF PERSON SIGNING</td>
<td>11. BY (Signature)</td>
</tr>
<tr>
<td>10b. TITLE OF PERSON SIGNING</td>
<td></td>
</tr>
</tbody>
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#### PART II - ACKNOWLEDGMENT OF SUBCONTRACTOR

13. The subcontractor acknowledges that the following clauses of the contract shown in Item 1 are included in this subcontract:

- Contract Work Hours and Safety Standards Act - Overtime
- Apprentices and Trainees
- Payrolls and Basic Records
- Compliance with Copeland Act Requirements
- Withholding of Funds
- Subcontracts (Labor Standards)
- Disputes Concerning Labor Standards
- Contract Termination - Debarment
- Compliance with Davis-Bacon and Related Act Regulations
- Certification of Eligibility

<table>
<thead>
<tr>
<th>14. NAME(S) OF ANY INTERMEDIATE SUBCONTRACTORS, IF ANY</th>
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</table>

<table>
<thead>
<tr>
<th>15a. NAME OF PERSON SIGNING</th>
<th>16. BY (Signature)</th>
<th>17. DATE SIGNED</th>
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<tbody>
<tr>
<td>15b. TITLE OF PERSON SIGNING</td>
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PREVIOUS EDITION IS NOT USABLE

STANDARD FORM 1413 (REV. 7/2008)
Prescribed by GSA/FAR (48 CFR) 19.222(c)
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SAD QAFG – Chapter Version Control

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<td>31 May 08</td>
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CHAPTER 18   DREDGING

18-1  GENERAL

18-1.1 Purpose
This prescribes responsibilities and procedures for dredging operations performed by and for
U.S. Army Corps of Engineers district offices. Methods and procedures are established for the
Contractor Quality Control (QC) and Quality Assurance (QA) management of safe dredging
operations in the nation’s waterways. Environmental protection is the prevention/control of
pollution to the nation’s water resources.

18-1.2 Applicability
Dredging contracts are awarded for channel maintenance, new channel dredging, and dredging
for other purposes such as harbor or docking facility shoal removal, beach nourishment, or levee
construction. Contractor’s QC system is planning and executing work meeting contract
requirements. The Government QA role is to assure the Contractor's QC System is working
correctly and work meets contract requirements. QAR’s protect Government’s interest. In
addition to typical construction QA procedures and contract requirements, QAR’s on a dredging
contract must be familiar with hydraulic, hopper and mechanical dredge operations,
hydrographic and topographic survey, special environmental and safety contract requirements
and permit restrictions. Dredging contracts have unique issues such as expensive operating plant
and equipment (marine and land based), increased risk for injury, marine work safety and
environment hazards, GPS telemetry, Silent Inspector, turtle deflectors, turbidity testing,
endangered species monitoring etc.. New construction may include underwater blasting. Beach
fill projects may have additional concerns like vibration monitoring of nearby multistory
buildings, structures, or environmental light restrictions or noise control concerns.

18-1.3 References
The following list of references is available to personnel performing Construction Contract
Management functions to assist on the performance of assigned functions:

   a.    FAR 52.246-12, Inspection of Construction
   b.    FAR 52.236-13, Accident Prevention (Stop Work Clause)
   d.    EP 715-1-2 A Guide to Effective Quality Control


18-1.4 Definitions
Not Applicable

18-2 DREDGING CONTRACT TYPES

During bidability, constructability, operability, and environmental reviews ("BCOE" reviews) construction personnel with appropriate technical, contract administration and dredging experience (both office and field) should reviews plans and specifications to ensure that: contract type and payment measure are correct for the project’s conditions; and that specifications and drawings including typical sections use consistent terminology and definitions.

18-2.1 Unit Price (U/P) Contracts
Due to high risk for Variations in Estimated Quantity, U/P contracts are preferred for dredging work to achieve the least cost for the work.

18-2.2 U/P – Excavation Volume Measurement (Borrow Pit)
This is the standard contract used when excavation of material is a priority. The contract should show required and allowable over depth with estimated quantities for each. Bid quantities totals should reflect required with allowable over depth. Disposal sites should be shown on the contract drawings. Payment surveys shall be done in a timely manner by the Government or, the Contractor with CO approval. Assure specifications are written to allow use of all types of dredge plant capable of efficiently, effectively, and safely performing work at the site in an environmentally sound manner. Assure hydrographic surveys specified in contract are sufficient to verify contract requirements are met.
18-2.3 U/P – Fill Volume Measurement (Average End Area)
This is the standard contract when material is needed to create a levee or nourish beaches with sand. The contract should define scope of work, show required and allowable over depth with estimated material quantities based on fill template. When the template is subject to scour or wave action there should be allowance for the Contractor to place fill above payment template top tolerance for use to fill scour using a "cut and fill" concept. Base bid quantities on top tolerance of the template. Require payment topographic survey in a timely manner. Assure specifications are written to allow use of all types of dredge plant capable of efficiently, effectively, and safely performing work at the site in an environmentally sound manner. Assure topographic surveys specified in the contract are sufficient to verify contract requirements are met.

18-2.4 U/P = Time Measure (Rental)
Rental contracts are used when timely surveys are difficult to accomplish and quantities of material cannot be accurately estimated. Typically rental contracts are used for active or erratic shoaling difficult to predict prior to bid opening, or rapidly fluctuating river stages exist. Specifications should require adequate plant to complete the contract in a defined time. Require QARs on board mechanical or hydraulic dredges when working on a time and materials basis for pay.

Require Silent Inspector telemetry for hopper dredges. Require full documentation of Effective, Ineffective and Lost time be documented by the Contractor in the crane, cutter head or hopper drag head Operator's logbook.

18-2.5 U/P Scow Measure
Scow measure is an infrequent type contract used when the Contractor is at high risk for insufficient credit for work performed due to rapid shoaling or significant changes in bottom conditions. There should be full time QA if possible. Each scow should have a load chart based on geometry of each scow submitted to determine volume of displacement per foot draft. Each scow should have bow and stern drafts recorded at start and end of each load. Measurement for payment should be developed on acceptable typical water/material ratio (bulking factor or insitu density). This can be developed by test digging and hydrographic survey of material removed versus volume of material and water in scow.

18-2.6 Lump Sum Contracts
Lump sum method of payment for dredging contracts may be used when the CO determines rate of shoaling in a navigation channel is slow and predictable over the length of contract performance. Acceptance surveys are performed to ensure all material is removed from the required prism. Use of lump sum contract requires approval by CESAD.
A. Allowable over depth - additional depth or width outside the required prism (See figure below)

Allowable over-depth in excess of two feet or the use of zero allowable over-depth requires the prior approval of the SAD Commander. New work dredging in hard materials (e.g., dense clays, rock, or manmade materials), should be dug as deep as authorized (required depth, required over-depth, required advance maintenance and allowable over-depth) to ensure future maintenance of authorized project limits could be perform.

B. Side Slopes. (Slope line or Box Cut)

Side slopes may be dredged: along the contract prism side slope or by using equivalent box cut at the base of the side slope for required dimension. Material removed using box cut is payable up to amount of material above prism side slope line. Before using a box cut, environmental permit restrictions and integrity of structures adjacent to channel should be checked.

C. Zero Allowable Over-depth. If zero allowable over depth is specified, contract must clearly show all material within the required prism must be removed. Contractor may dredge below the required depth to ensure material is removed; however, contract documents must make clear no payment will be allowed for volume removed below required prism.
18-3 QUALITY ASSURANCE REPRESENTATIVE (QAR RESPONSIBILITIES)

18-3.1 Preparation for Duties
Each QAR (including hired A/E Services Contractor) is a Government’s representative to assure the CQC system is working. QAR’s must be trained and knowledgeable to do their job. As part of the contract specific QA Plan required in ER 1180-1-6, the AE/RE and assigned Project Engineer are responsible to identify and evaluate qualifications of QAR’s and if needed provide appropriate training. QAR’s are responsible to professionally develop their technical knowledge through OJT, self-study and diligent study during formal training. For Dredging QAR positions, on-the-job training of newly assigned QAR’s by an experienced QAR is essential. Prior surveying experience is desirable. QAR’s should study applicable Engineer Regulations and Technical Manuals. QAR’s should have an onsite copy of the contract (including drawings), EM 385-1-1, the CQC Plan, the Dredge Safety Management Plan (DSMP), Activity Hazard Analysis (AHA) and EP 415-1-261 (Volume 2) Quality Assurance Representative Guide for ready reference.

18-3.2 Being Familiar with Contract Requirements
QAR’s prime responsibility is to assure that work is being accomplished in accordance with Contract requirements. QARs should be familiar with all construction documents. QARs should not rely on their familiarity with past contracts even if it is at the same location. Each contract incorporates changes to policy, procedures, techniques and permit requirements. QARs should pay particular attention to specifications for changed conditions, misplaced material, locations of obstructions (underwater cables, pipelines, or sunken vessels) and project limits of width, depth, allowable over-depth, and side slopes. QAR’s must investigate and understand all Special Conditions in the environmental permit and documents as applicable to the project. Sample environmental permits and documents include but may not be limited to EPA Offshore Dredged Material Disposal Site (ODMDS) Section 104 document, DA Regulatory Permit, State Water Quality Permit, Dredged Material Management Plan (DMMP), Site Material Management Plan, etc. Occasionally the environmental permit requirements are in conflict with the requirements of the contract. When this is encountered, immediately notify the AE/RE.

18-3.3 Knowledge of Plant and Equipment
QAR’s should be familiar with all types of dredges, and equipment to be used; capabilities, and operating procedures. QAR’s should understand proposed dredge operation, progress of work, and become familiar with operator handling of equipment.

18-3.4 Locations of Control Points, Tide & Stream Gages
QAR’s shall know locations of borrow/dredge areas, ODMDS, range markers, tide and stream gages (temporary and permanent ), bench mark locations and datum used., navigation buoys (lighted and unlighted), base lines, and control points located on drawings. QAR’s shall ensure that the Contractor protects and maintains range stakes, gages, and baseline stakes. They shall
further ensure that the Contractor provides lights on critical control points during hours of darkness.

18-3.5 Regulations for Lights and Signals in Navigable Waterways

All dredging operations under the supervision of the Corps of Engineers must comply with the General Regulations of the Department of the Army and the U. S. Coast Guard as stated respectively in the following Federal Regulations: “Title33 m 201.1 to 2U.16W” and “Title33 CFR 201.1 to 201.16” and “Title 33CFR, 80-18 to 80.31a”. These regulations govern signal lights, day signals, channel markers and passing other vessels or floating plant working in navigable channels, etc. Of particular importance is to assure night lighting of floating pipelines, work barges or other floating plant. QAR’s are to become familiar with these regulations and to assure that they are complied with. QAR shall notify Contractor of violations and report these to ACO.

18-3.6 Other Preparations

A. Upon a new assignment, QAR’s should confer with Project Engineer/Resident Engineer concerning special instructions. He/she should be provided a copy of the contract including, project manual, drawings, permits, applicable charts or maps, dredging report forms, log book, Personal Protective Equipment including Personal Flotation Device with a light, necessary tools, instruments, and office supplies.

B. Upon reporting to site, QAR should confer with Contractor’s representative in charge of operations relative to layout of work, range control, grade control, tide or stream gages, safety requirements, and other matters pertinent to that particular job.

C. During "Mobilization" an initial Corps safety inspection of plant and equipment is generally made by Construction or Safety personnel prior to starting work (See attached checklist). A safety check will be made during each visit to the dredging equipment and results noted in QA Report. Violations will be recorded in the RMS punch list and should be called to the attention of the contractor’s safety officer and follow-up verification performed. If after a reasonable amount of time the correction is not made, the ACO shall be notified.

D. GPS, Horizontal and Vertical Control. No dredging can proceed with accuracy without installation of Geospatial Positioning Satellite (GPS) or horizontal control (Easting/Northing coordinates) and applicable datum and calibration for tide data. Prior to beach or levee fill Contractor should layout horizontal and vertical control. Established control monuments, stationing and grade stakes are needed for QAR’s to check work for proper position and elevation. In dredging, taking soundings or turbidity samples, locating work; “fixing” dredge position, placing range markers, buoys, etc. are all dependent on GPS control. The contractor shall maintain accurate GPS data described by the contract documents. To ensure that the work meets the specified requirements, the QAR must be familiar with horizontal and vertical control. The QAR should verify that the contractor is performing checks on range markers, range targets, tide and stream gages, dredging buoys, etc. to ensure they remain properly located and calibrated.
during the contract. He should also periodically check the Contractor's determination of dredge location.

18-4 **TOUR OF DUTY**

The normal tour of duty is 8-hours per day for five days per week, however, the tour may be changed to conform to work requirements. Many dredging projects operate 24 hours per day and require multiple QAR shifts. When the incoming QAR does not report as scheduled during a multi-shift job, the on-duty QAR will notify his supervisor immediately and shall remain on duty until relieved or directed to leave. In event of sickness or emergency, the QAR should notify his supervisor immediately.

18-5 **QAR AUTHORITY**

The QAR is the ACO's representative at the job site and has responsibility to ensure the work is performed in accordance with the contract. The QAR shall understand the extent and limits of their authority when assigned to the contract. The following authorities are generally applicable throughout the Corps of Engineers and may be used by the QAR, unless specifically instructed otherwise by their supervisor. These authorities apply to contract dredging but should also govern hired labor operations where applicable.

- QAR’s may direct the Contractor to comply with contract requirements and instructions from the ACO that are within the scope of contract. If the Contractor refuses to comply, the QAR shall notify ACO.
- QAR’s may direct suspension of operations (stop work order) at any work location where a safety hazard exists that endangers life, or limb or may cause serious damage to existing work or property. Immediately after issuing a "stop work" verbal instruction, the ACO shall notify the Contractor’s On-site representative in writing, cite specific safety violation, date, time and the person who received the verbal instruction.
- QAR’s have authority to interview the Contractor’s non-supervisory personnel to determine whether their classifications and wage rates are in accordance with contract requirements.
- QAR’s may direct suspension of work in dredge operations when disposal site discharge waters or digging plumes exceed "turbidity" tolerance as described in specifications or permit. The QAR’s shall direct prompt corrective action. No operations shall resume until conditions has been corrected.
- QAR’s are only authorized to use the Contractor’s labor and equipment necessary for transportation of authorized persons to and from contract work sites for surveillance of operations.
• QAR’s are not authorized to:
  o Change any provision of the contract plans and specifications.
  o Perform final acceptance of the work in-progress (acceptance surveys).
  o Support the contractor verbally or in writing in the interpretation or application of the contract requirements when there is a dispute.
  o Direct the contractor in methods of operations and procedures to be followed in accomplishing the work except as described in the contract documents.

18-6 RELATIONS WITH THE PUBLIC

QAR’s must always be aware they are representatives of U.S. Army Corps of Engineers and United States Government. QAR’s should answer questions directly related to the project and be familiar with their District’s public affairs policy in relation to public contact. QAR’s should be courteous and respectful to visitors, show concern for their safety, offer assistance as needed. QAR’s should cooperate with local public officials in matters related to work, to extent legally possible, within their authority.

18-7 ACCOMODATIONS AND MEALS

Specifications require the Contractor to furnish a suitable QAR working office or area on board all dredges. When applicable, all contracts should require computer hardware and communications to support “Silent Inspector”. Typically Hopper dredge specifications require Contractor furnished meals and sleeping accommodations. QAR’s and visitors shall pay to the Dredge Captain the current meal rate civilians pay at military dining facilities. QAR’s shall report meals eaten on the dredge in the Daily QA Report.

18-8 SECURITY CONSIDERATIONS

Dredging work is generally not within restricted areas requiring any special security measures. However, work may be performed on an occasional basis that requires Government and Contractor personnel to obtain formal security clearances. These procedures may differ by specific location and QAR’s should consult with the District Security Officer for local procedures.

Work oftentimes is located on the Contractor’s plant or equipment where special considerations should be given to safeguarding personal and Government property. On rental contracts, security of the Contractor’s plant or equipment is generally the responsibility of the supervisor in charge of the dredging operations.
18-9 SAFETY PROCEDURES

18-9.1 Supplemental Safety Plans
The Contractor is required to transmit supplemental safety plan submittals describing detailed accident prevention planning and policy called Dredging Safety Management Program (DSMP). The accepted DSMP and EM 385-1-1, will be the QAR’s safety standard for assurance and enforcement. If the Contractor is a current participant in the Dredging Contractors of America (DCA)/USACE Dredging Safety Management Program (DSMP) and holds a valid Certificate of Compliance for both the Contractor Program and for the dredge(s) to be used to perform the work, the Contractor may, in lieu of submitting an Accident Prevention Plan:

- Make available for review the Contractor’s current Safety Management System (SMS) documentation
- Submit to the Contracting Officer the Certificate of Compliance for its SMS
- Submit the current dredge(s) Certificate of Compliance based on third party audit
- Submit for review and acceptance, site-specific addenda to the SMS as specified in the solicitation.

Usually, such a program lists the frequency of the DCA/USACE joint committee accident prevention conferences to be held, the persons who will conduct the meetings, and attendees. The QAR should attend these conferences and assist when requested in solving any safety problem that may arise.

18-9.2 Accident & Incident Reporting
See Chapter 8 for details on accident reporting. Some unique risks to dredging operations are collisions, groundings, accidents involving third party mariners, or other environmental issues as described below. Each of these should be reported by the QAR to their supervisor as required by local or regional policy.

- hazardous or environmental releases such as oil/fuel spills or inappropriate bilge releases
- inadvertent hopper or scow releases of dredge material outside of designated disposal sites
- turtle takes

The QAR should provide a complete description of the accident or incident, include a sketch and a statement of contributing causes, i.e. unfavorable weather and channel conditions.
18-10 PHOTOGRAPHS

QAR’s should take periodic photographs to show progress of work and other important features such as deficient work, items involved in controversies with Contractor or situations needed to supplement QAR reports or documentation records. Examples include: repeated safety violations, accidents, collisions, faulty equipment, substantial change in character of dredged materials from that indicated in the plans and specifications and damages to navigation aids and range structures. Photographs should include name of photographer, date and time the picture was taken, contract name and number, location of work, name of the Contractor and a brief description of what the picture shows. When trying to show changes, photographs of problems should be taken successively from a predetermined fixed location and distance.

18-11 SCHEDULE

The Contractor shall submit an initial schedule in accordance with Division 01 of the contract. Typically, a bar chart is normally sufficient for scheduling dredging and beach nourishment projects. For certain dredge jobs (example, clam shell berth O&M), QAR’s shall maintain contract drawings with each day of work plotted and identified by date.

18-12 CHARACTER OF MATERIAL

Careful recording of character of materials being dredged, to include estimated percentage of each type, are required to verify that the material is similar to that described in the specifications and shown in the boring logs. A sample of the materials should be obtained weekly and recorded in QAR’s daily report. Generally, QAR’s determine, based on their experience, the character of the material from a visual and physical examination of the samples. General classification of dredged materials are:

a). Clay - Cohesive soil that is plastic when wet, feels smooth and slippery to the touch, and sticks to ones fingers when wet.

b). Silt - Fine grained non-cohesive material ranging in particle size between clay and sand.

c). Sand - Small, hard grained, individually visible particles of soil up to ¼” diameter with a gritty feel.

d). Rock - Solid ledges of hard strata of substantial thickness. May have to be drilled or blasted before removal. Thin “slabs” of rock may be broken by chisel teeth or rock cutter heads.

e). Gravel - Rock fragments, mixed with sand and/or water from 3/8” to 3” in diameter.
f). **Cobbles** - Stones detached from original strata ranging from 3” to about 10” in diameter.

g). **Boulders** - Large stone worn and rounded generally over 10” in diameter.

h). **Hard Pan (Caliche)** - cemented clay, boulders, sand and gravel.

i). **Mud** - Finely powdered materials mixed with organic particles of animal and vegetable matter. It is normally dark in color and having an odor of decaying vegetable matter.

### 18-13 HYDROGRAPHIC SURVEY (FOR DREDGING PROJECTS)

Perform hydrographic surveys in accordance with EM 1110-2-1003, Hydrographic Surveying. Hydrographic surveys will be conducted, as needed, to ensure work is in accordance with contract drawings and specifications.

#### 18-13.1 Execution of Dredging Measurement, Payment, & Acceptance Surveys

FAR 52.236-16 Quantity Surveys and Alternate 1 shall be used for dredging or underwater material placement when payment is to be based on quantity surveys. Under that clause, quantity surveys may be performed by Government, A/E or Contractor as follows:

A. **USACE Forces**: Government-performed surveys using qualified in-house (hired labor) hydrographic survey forces. Consider using another District’s surveying capabilities as needed.

B. **Architect-Engineer (A-E) Contractor Forces**: If government forces are not available, then qualified, independent A-E hydrographic survey contractor forces.

C. **Dredge Contractor's Forces**: If neither Government nor independent A-E survey forces are available, then the use of the dredging contractor's forces may be used, provided that a qualified government representative is on board the contractor's vessel during the surveying operation and prior approval by the Contracting Officer.

#### 18-13.2 Survey Time Constraints

Surveys for bid documents should be completed as close to solicitation for advertisement as possible. "Before Dredge" surveys shall be completed as close to start of dredging as possible. General rule of thumb is within two (2) weeks of commencement of work in reach to be dredged. "After Dredge" surveys or "Final Acceptance" survey shall be completed as close to the end of dredging an acceptance section as possible, but generally within the time period stated in the contract.

#### 18-13.3 Disposition of Survey Data

Survey data shall be edited and plotted as expeditiously as possible, generally within two (2) days after completion of survey. Government survey data shall be made available to the
Contractor before requiring Contractor to re-dredge any work. When requested, results of government dredging surveys related to Contract Clause "Final Examination and Acceptance" shall be furnished to Contractor after acceptance section is surveyed. Final Acceptance surveys will be verified by the Contracting Officer and furnished to Contractor in writing.

18-13.4 Inspection of Dredging Surveys
Government representatives shall verify the Contractor’s survey equipment is properly calibrated and surveying techniques and equipment conform to specifications and EM 1110-2-1003. (http://www.usace.army.mil/usace-docs/eng-manuals/em1110-2-1003/toc.htm) Dredging surveys performed by Government or A-E contractor may be monitor by the Contractor’s representative.

18-14 RECORDS AND REPORTS

18-14.1 QA Reports & Logs
QAR’s will use RMS to report all QA performed during their shift. QA Daily Reports shall be in sufficient detail to protect Government interests. When 24 hour coverage is required a "Bridge Log book" will also be maintained on the dredge recording QA performed and Contractor activities. Project Engineer shall review RMS QA Reports compared to Contractor QC Reports initial and file as permanent record. ACO shall review QA Reports.

Each report should contain should also contain sea conditions, vessel traffic, tides and currents, dredge work stoppages including time stopped, time resumed, reason for stoppage, the number of personnel and equipment involved, and resolution of the problem causing the delay.

18-14.2 Reports
An important duty of the QAR is assuring preparation of the Contractor’s reports required for dredging operations. Since the type and method of operations vary throughout the SAD required reports like state environmental reports will also vary. However Corps-wide productivity report forms ENG Form 27 - Hopper and ENG 4267 Pipeline or Bucket are typically required on all contracts.

18-15 SILENT INSPECTOR

Silent inspector (SI) is a satellite telemetry based software system to monitor hopper dredge operations. Most CESAD contracts require Contractors to install SI hardware with software for dredge jobs, but is required on all hopper dredging projects. QAR’s should learn SI and must be able to do a manual data down load and review.
18-16 ENVIRONMENTAL

Ensure Contractor complies with all permits, Division 01 and approved Environmental Protection Planning. QAR’s will read and understand all Special Conditions in environmental permit and documents. Ensure requirements of environmental permits match the contractual elements of the contract.

18-17 ANNEXES, EXHIBITS, AND TEMPLATES

Not applicable to this chapter.
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CHAPTER 19 MILITARY TRANSFORMATION (MT)

19-1 PURPOSE

This document provides guidance for Quality Assurance on the MILCON Transformation program. It is not intended to provide guidance on Contract Administration.

19-1.1 References


19-1.2 Responsibilities

a). USACE – Is responsible for overall policy and guidance to Divisions and Districts.

b). SAD is responsible for providing Districts the implementation instructions:

c). Districts are responsible for developing RFP, awarding and execution of MT transformation projects in accordance with implementation instructions.

d). AE/RE is responsible for execution/construction of projects once awarded.

19-1.3 Definitions


b). UFC - Unified Facilities Criteria


e). EM – Engineer Manuals.

f). MT – Military Transformation

g). DOR – Designer of Record
19-2 BACKGROUND

The Corps of Engineers is facing an unprecedented demand to deliver facilities in a more cost effective in a timely and efficient manner. This demand was created by the time based convergence of the following three initiatives:

a. The re-stationing of tens of thousands of U.S. troops both domestically and abroad;
b. Reorganizing the Army to a more mobile and modular force
c. Closing and relocating of many existing bases (BRAC) to support this change.

To meet this unprecedented demand, the Corps of Engineers will also be transforming the way it delivers completed projects. The design-build (D-B) methodology will be used to the maximum extent possible. The D-B Contractor will design and construct the facilities following the International Building Code, International Plumbing Code, International Mechanical Code, and the International Fuel Gas Code published by the International Codes Council (ICC); the Standards referenced within the codes; and, other design criteria specified in the RFPs.

The use of the Unified Facilities Guide Specifications is optional, and the use of the Unified Facilities Criteria is not required unless specifically noted in the RFP.

19-3 MT PROCESS

The Corps of Engineers has been designing Military Construction projects utilizing the codes since they existed. The difference now is that on Army projects, we will no longer be using our Unified Facilities Guide Specification (UFGS), but will be using “commercial” specifications and industry standards. Also, very few of our Unified Facilities Criteria (UFC), Technical Manuals (TMs), Engineer Manuals (EMs), and others, will be used.

Commercial specifications are much more open and general and do not have specific/prescriptive requirements as our UFGS do. Therefore, Quality Assurance personnel need to become familiar with the codes and standards used by the private industry to be able to perform their QA duties.

These changes do not mean the Corps of Engineers will change the way it performs quality assurance. It just means that because of the extremely large workload, the Corps of Engineers may have to be more selective on when and on what they perform the quality assurance tasks. At this time, there is no change on the MILCON S&A flat rate. Therefore, the COE should continue performing as much QA as deemed necessary to provide the customer a quality product, as long as it is within the allocated S&A funds. There will be some instances where the workload will be too much, too many tasks to be covered by QA personnel, and this is when the RE will have to be selective with the QA tasks that will be performed.

One very important point to remember; the Contractor’s Quality Control Organization is still responsible for inspecting the work, for quality control of that work, and ensuring that the work meets the contract requirements which includes compliance with the solicitation (RFP), the
building codes, and standards, as well as their accepted Proposal. The Corps of Engineers will continue performing quality assurance of the quality control organization; in other words, assessing the Contractor’s performance in meeting the RFP requirements and the accepted Contractor’s proposal.

For the Corps of Engineers to be successful in the execution of this large workload, the following strategies must be considered:

- D-B contracts must be managed as a single contract, not as a design effort and a construction effort. The Construction (CD) and Engineering (ED) PDT will need to ensure an integrated approach is taken. Construction will need to play a more significant role during the design, and Engineering will have an increased involvement during construction.
- The focus must be to solve problems together as a team.
- Increased proactive schedule management will be a critical component for success.

The bottom line is the Design-Build contractor is responsible for the performance and quality of the facility. The Contractor prepares the design of the facility, and ultimately, the facility has to perform as intended. The D-B designer’s roles to ensure technical integrity are:

- Produce Plans and Specifications
- Review Shop Drawings
- Correct Errors and Omissions
- Resolve Field Problems
- Provide Site Inspections

The majority of the risk belongs to the Contractor. For design errors and omissions, the risk is on the contractor and they are responsible for the correction.

For Design-Build, the contract is; the solicitation (RFP) and the accepted Contractor’s Proposal (including betterments). The field office must have both, to be able to administer the contract. Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc., are not part of the contract. These are "deliverables" under the contract. Design products must conform with all the provisions of the contract (RFP, Proposal and Betterments).

It must be emphasized that Quality Assurance and Quality Control are part of the quality verification (“substantiation”) process that is inherent in performance. Substantiation and quality verification occur during the RFP preparation, proposal evaluation, design development, construction, and closeout documentation (O&M, training, as-builds, and warranty) stages.
19-4  CODES AND STANDARDS

Historically, codes have provided the means to reduce risks to acceptable levels. Whether the subject of the code is building construction, property maintenance, fire prevention, electrical, mechanical or plumbing, the purpose is the same: to protect the public health, safety and welfare by regulating safe construction.

There are two types of codes, performance and prescriptive:

a. A **performance code** generally tells what is to be accomplished or what the intent is, rather than telling the designer how to meet specifically the intent of the code.

b. A **prescriptive code** describes exactly what methods and materials are to be used; indicates the size and location of components; provides specific information, charts and standards to which material, methods or components must conform; and limits, to a degree, the designer's and/or contractor’s ability to substitute materials or methods that may be as good as, or better than, those specified in the code.

Building codes contain a mix of performance and prescriptive requirements. The D-B RFP will mostly have performance requirements, with some prescriptive requirements describing specific User needs.

19-5  QUALITY CONTROL & QUALITY ASSURANCE ROLES

Quality Assurance (QA) is defined as the system by which the Government verifies that the Contractor’s Quality Control System is working effectively and that the contract requirements are being complied with. Quality control is what the contractor does internally to make sure they are meeting all the contract requirements. Quality assurance is what the Government does to make sure what the contractor is doing.

There are two major MT concepts which are imperative to the success of the quality assurance of a design-build project:

a. Quality starts with development of the RFP, not start of construction.

b. Quality must be defined by the performance of the end product, not just material and workmanship. There are several general areas in which the challenge for Government QA personnel is greater.

- Not all our contract requirements are clearly defined at the beginning. This requires us to go thru several documents (RFP and proposal) to determine what the contract requirements are.
• The need to become knowledgeable of more standards and codes than just the Corps of Engineers Guide Specifications.

• Accepting the concept that plans and specifications can change during the project without a necessary modification to the contract, as long as the change meets the RFP, Proposal and Betterments requirements.

19-5.1 QA Plan Reviews

As part of the QA process, the field office will be involved with the plan reviews of the D-B Contractor’s designs. During this process, the following should be done:

a. Review the administration requirements, which include the submittal of complete construction documents that are signed and sealed.

b. Ensure the building is properly classified according to use group, and verify the type of construction.

c. Review Fire Protection requirements, which includes fire resistant materials and construction and fire protection systems.

d. Review the occupant needs, including means of egress, accessibility and interior environment.

e. Review QC testing requirements, which are required by the Codes and Standards, and ensure compliance with RFP requirements and the Contractor’s proposal.

f. Coordinate reviews closely with customer (DPW, BCE, Fire Marshall, etc.). Ensure the customer understands the contractor’s and the Government’s responsibilities under a D-B contract; the type of reviews to be performed; and, the type of acceptable and not-acceptable comments.

g. Be careful of giving technical direction to the Contractor. Be careful on how you say it. Technical responsibility remains with the contractor.

The MT design review process will not reflect the standard design review process long established within the Corps. The design-build design review process will be more expedited, more focused on contract compliance vs. preferences or designer opinions, and separated into parts/pieces which best suit the design-builder’s construction practices and expectations.

Code compliance reviews during the design phase will be a critical part of the project. That is why it is very important to have engineering support [COE designers and E&C subject matter experts (SME)] during the design reviews and that these primary plan reviewers/SMEs are knowledgeable on code requirements.
The RFP presents the Government and the Contractor with the option of over-the-shoulder reviews, if acceptable to both parties. This is meant to facilitate better communications and quicker government design reviews, thus quicker design deliverables and to promote fast tracking. This does NOT normally require physical presence at the designer’s offices. Communication methods also include electronic and telephonic means and can even include televideo or teleconferencing. At the moment, there are no prescriptions requiring use of over-the-shoulder review processes. The industry is moving to website managed documents, where for instance, the designer can post updated .pdf design documents weekly, and the site can include the various design documentation and substantiation. There should be some type of recurring or frequent communications between the designers and the reviewers in lieu of just “throwing the design over the fence for review”. The AE/RE shall take the lead in establishing the parameters of the over-the-shoulder review process, for example, where, when, how, etc. Merely agreeing to over-the-shoulder reviews will not be sufficient; the AE/RE must document all decisions and define the process to avoid confusion.

The design team is also required by the contract to maintain a Design Configuration Management System (DCMS), so that a reviewer can easily track changes to the design during design development, thus speeding up reviews. Thus, for instance, if the designer alters or removes a feature in the design that has been previous incorporated into the design documents, the designer should fully explain this in the DCMS. After the design has been accepted by the Government, the DCMS should fully track the change, along with documentation of the DOR’s approval and the Government’s concurrence. Contractor may use DrChecks as part of the DCM. The over-the-shoulder process has the potential to greatly speed up or eliminate the need for the formal design reviews. The bottom line should be to mutually reduce costs and time from start of design to construction completion. To do this requires true partnering spirit and mutual respect for each party’s needs.

Remember, the contract DOES NOT require the use of over-the-shoulder reviews. The use of over-the-shoulder reviews must be agreed to by the Government as well as the Contractor. The AE/RE shall do his/her best to facilitate expedited design review processes; however, the process cannot be directed by the Contractor.

The following should be considered before providing Design Review comments:

a. Design review comments, in their most basic sense, are only provided where the design product provided does not demonstrate compliance with the contract. In this design-build approach, the DOR is responsible for the technical adequacy of the design. The reviewers need to make sure the design complies with the requirements in the RFP and more specifically, that the design is in compliance with current building codes. The Corps technical staff provides the AE/RE with a code compliance review.

b. Reviewers/Designer preference comments, direction to change design, scope additions, and other comments which present information in conflict with or require things not in the contract are NOT ACCEPTABLE comments.

c. Remember, the DOR has the responsibility for the technical adequacy of the design products – not the Government.
d. It is also important to remember to make clear and definitive comments. Comments in the form of questions lead to more questions and delay resolution. If something needs to be changed, be specific.

e. The design products produced by the DOR will not necessarily be to the same level of detail as produced during traditional design-bid-build processes. The AE/RE and his/her QA staff need to realize that the drawings will be developed to the level necessary to enable the construction forces to construct the facility. Since the DOR does not necessarily have to provide documents suitable for competitive bid, in many cases the drawings and specifications produced will list model numbers and manufacturers, and incorporate vendor specific shop drawings and information. Many of the construction details will come in the form of Manufacturer’s Installation Instructions provided with the product. Remember, constructability is the Contractor’s responsibility, not the field offices’ nor that of other Government reviewers. The Corps can always recommend improvements in constructability to the design-builder, but normally it shouldn’t dictate constructability considerations, as the Contractor owns the design responsibility.

19-5.2 QA on Shop Drawings and Submittals

The CQC Organization will review construction shop drawings & submittals and certify compliance. They will provide the submittals to the Designer of Record for review and approval, and then submit to the Corps of Engineers for information only (FIO).

Any deviations to the design will be reviewed and approved by the Designer of Record, prior to being sent to the Government for concurrence. Since almost all construction submittals will be FIOs, other than Division 1 submittals such as Accident Prevention Plan, Quality Control Plan, Environmental Protection Plan, etc., only about 10% of them would be reviewed by the Government, unless additional FIO submittals are required to be reviewed by the AE/RE.

It is suggested that as part of the QA Plan for each project/contract/task order, the AE/RE list the FIO submittals he wants reviewed. As a minimum, review should be performed on the first dozen or so submittals to see if the DORs are doing their job, and 10% of all remaining FIO submittals.

When reviewing submittals, the first thing we want to do is make sure that the DOR has reviewed and approved the submittal. Do not perform a technical review on shop drawings. There is no need for the owner/agent to do a technical review. The adequacy of the structural steel design, for example, is the responsibility of the DOR, not the owner/agent. The Government is not required, nor is such intended, to review all submittals.

As part of the cursory review, the field office should ensure that the DORs are enforcing the Buy American Act and Trade American Act provisions as required by section 01330. Remember, the Government needs to assist the D-B Contractor in this area since most non-government designers aren’t familiar with the Buy American Act requirements.
QA personnel must ensure that the Contractor is linking the submittal process with the construction schedule.

19-5.3 QA Inspections
The 3-phase Control System is still required to be conducted by the CQC organization. QAR attendance at the CQC 3-phase inspections is strongly recommended. The Preparatory and Initial Inspections are the cornerstones to ensuring compliance and quality of work.

It is understood that because of the much larger workload expected during FY07 thru FY10, the AE/RE may have to make decisions on how their QA staff manage their time most effectively. The AE/RE may need to determine which QA tasks are most important, such as attendance at the 3-phase inspections, and based on analyzing the risks, decide which tasks may not be performed. On the other hand, the AE/RE may determine that all QA tasks must be performed.

Based on this risk analysis, the AE/RE may also determine the number of verification inspections to be performed. For these selective inspections to work, it is recommended that checklists be developed and be used by QAs to inspect actual work. In other words, these checklists would provide a list of minimum items/requirements our QAs would verify, for each phase of construction; i.e., plumbing, mechanical, concrete, framing, etc. City code inspectors use similar lists. This does not mean that the Corps of Engineers will be doing “Code Compliance” inspections. They are the CQC organization’s responsibility.

The basic concept to keep in mind during the construction process is to perform QA verifications before anything is covered. Suggested stages are:

- Prior to placing concrete, or installing brick or sheetrock.
- Prior to covering electrical, plumbing, mechanical work, or fire-sprinkler systems.
- Prior to covering insulation and wall framing.
- Prior to covering up the floor or installing the ceiling.
- Inspect the commercial kitchen hoods and fire suppression systems.
- Inspect the Fire Detection and Fire Protection systems.

The above is very similar to what the IBC suggests.

It is strongly recommended that Corps of Engineers in-house designers and/or Plan Reviewers also perform periodic inspections (2 or 3 per project), since they will be more familiar with the codes and referenced standards than the field staff. They should also attend the pre-final inspections. These periodic inspections would be secondary checks, and could vary from one project to another. But it will be very beneficial as it will verify code compliance, and will provide the customer with the highest quality possible, based on the RFP requirements.

We mentioned a risk analysis, which can be used by the AE/REs. Many REs and AEs already perform some type of analysis on a daily basis and base their decisions on that analysis. NAVFAC uses a Risk Based Quality Assurance process for all of their construction contracts. It is a formal process in which they perform a risk analysis on every project and determine the amount of QA necessary. We do not need to use a formalized process like this, but a similar
process can be used by our AE/REs. This simplified version gives the AE/RE a format to use, to make this determination at the beginning of the project. The use of this Risk Based QA is not mandatory, but only a suggestion, and provides the AE/RE with another tool which they can use to determine the QA effort needed on each particular project, based on risk and workload. See the attached Word document for additional information. The AE/RE can revise this Word document as he/she see fit, and best for their application. If things change along the project, this evaluation can be performed again.

19-5.4 QA Testing

Each district and/or field office will have to determine what type and number of QA tests will be necessary. The field office will continue conducting, as a minimum, 5% of number of contractors’ tests. The project specific QA plan will outline the QA testing recommended for each particular project.

The Model RFP has minimal CQC testing requirements listed. Only two testing requirements are specifically listed; T&B and Commissioning for HVAC system, and a PVT for the HVAC controls. But, section 01451 requires the contractor to perform inspections called out by the various codes and standards.

The International Building Code, International Plumbing Code, International Mechanical Code, and International Fuel Gas Code (which are all referenced in the Model RFP), as well as other Standards that are referenced, have testing requirements for the Contractor to perform. The DORs will have to incorporate these testing requirements into their design/construction documents, for the Contractor to perform. Section 01451 also requires the DORs to identify “special inspection” program, where required by the codes.

All the Contractor’s testing requirements may not be known until the design is developed. The contractor’s design engineers may require testing that is not normally required by the codes or standards. Therefore, the final QC Plan with all the testing requirements may not be available until such time. Depending on the type and amount of testing determined by the DORs to be necessary for the Contractor to perform, the field office may need to augment the type and quantity of QA testing needed.

19-6 PARTNERING

The importance of effective partnering on design-build projects cannot be overemphasized. The attitude of the government and the contractor must shift from the government being an “enforcer” as it is on D-B-B with government furnished design and construction solutions. Yes, the government must still be assured that the contract requirements are met. However, much of the responsibility for that rests on the design-builder, who is ultimately responsible to make sure that the design meets the contract and industry standards. The design warranty lasts for longer than a year. If the MT process is used successfully, we should be only selecting the best qualified contractors in phase 1 of the source selection to compete for the contract and should be picking the best design solutions and approaches in phase 2.
In order for BOTH parties to succeed in MT design-build, we have to find ways – within the performance requirements of the contract – to facilitate the design-build process, to speed it up, to ensure the quality required by the contract. This requires several things – mutual trust, understanding what each party’s roles and responsibilities are and not trampling on the other party’s role or rights. Don’t do the Contractor’s job for him/her. Many times failures in quality are the result of the contractor developing attitudes such as “the government insists on inspecting to the nth degree, so we might as well let THEM do it.” Or, “let the government tell us how to design this” or “…how to fix this, because they always do.” We shouldn’t dictate processes where the industry can use existing industry standards or internally developed processes that accomplish the performance requirements.

19-7  **ANNEXES, EXHIBITS, AND TEMPLATES**

Not applicable to this chapter.
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APPENDIX A - GLOSSARY

- A -

Architect-Engineer Contract Administration Support System (ACASS) - ACASS is a web-enabled application that supports the completion, distribution, and retrieval of Architect-Engineer (A-E) contract performance evaluations (DD Form 2631). ACASS is for UNCLASSIFIED use only. An evaluation assesses a contractor’s performance and provides a record, both positive and negative, on a given contract. Each evaluation is based on objective facts and supported by contract management data, such as quality of A-E services by discipline, and assessments of the attributes of the engineering services as to accuracy, thoroughness, schedules, cost constraints, technical capability, and other contract performance requirements.

ATMP – Automated Training Management Program

ATTRS – Army Training Requirements and Resources System

Audit – Examination of inspection reports and other documentation to verify the qualification of a laboratory.

- B -

BCOE – Biddability, Constructability, Operability, and Environmental Reviews.

- C -

CIRS – Contract Industrial Labor Relations Specialist: Usually an employee of the Office of Counsel that has the responsibility to monitor the District Labor Relations Program. In addition to monitoring the program, the CIRS is normally responsible for obtaining the General Wage Determination to be included in each contract and to compile the District’s Semi-Annual Labor Standards Enforcement Report.

Construction Contractor Appraisal Support System (CCASS) - CCASS is a web-enabled application that supports the completion, distribution, and retrieval of Construction contract performance evaluations (DD Form 2626). An evaluation assesses a contractor’s performance and provides a record, both positive and negative, on a given contract. Each evaluation is based on objective facts and supported by contract management data, such as contract performance elements that evaluate quality, timely performance, effectiveness of management, and compliance with contract terms, labor standards, and safety requirements.
Command Management Review (CMR) – Quarterly review held by the Chief of Engineers to review selected CMR indicators from all HQ Directorates and discuss issues. Attended by all HQ senior leader and MSC Commanders.

Consolidated Command Guidance (CCG) – This guidance document strives to issue both the strategic and tactical guidance required for major and recurring matters of significance Command-wide. This document resides on the USACE INET website: https://corpsinfo.usace.army.mil/rm/ccg.htm.

Constructability and Biddability – the ease with which a designed project can be built and the ease with which the contract documents can be understood, bid, administered and executed.

Construction Completion – Date that the COE accepts the work (i.e. Substantially Complete… LD’s would not longer apply. Warranty starts the next day.

Contractor Quality Control (CQC) - is the construction contractor's system to manage, control and document their own, their supplier's, and their subcontractor's activities to comply with contract requirements.

Contract Work Hours and Safety Standards Act – Overtime Compensation - Sets the standard work week to forty hours and requires contractors to pay at least time and one-half for all hours worked over forty in a week. The contractor must keep a standard seven day work week and can not vary the start and end days in order to avoid paying overtime.

Controlled Document - any procedure, policy, practice, standard manual, or work instruction used to support the CDQOS. Any document whose use is mandatory to perform a function within Construction Division must be controlled. Examples include ASTM’s, NEC, QA Plans, project specific drawings and specifications.

CPAC – Civilian Personnel Assistance Center

- D -

DAU – Defense Acquisition University

Davis-Bacon Act – Requires contractors providing labor on federally funded construction projects to pay at least the prevailing wage being paid in the area surrounding the location where the work is performed. The Davis-Bacon Act applies to laborers and mechanics. It does not apply to workers whose duties are primarily administrative, executive or clerical. Contractor employees employed in a bona fide executive, administrative, or professional capacity are not deemed to be laborers and mechanics. Working foremen who devote more than 20 percent of their time during a workweek to labor or mechanic duties are laborers and mechanics for the time such spent. May not apply in some locations.

DAWIA – Defense Acquisition Workforce Improvement Act

DOR – Designer of Record
- **E** -

**EM** – Engineer Manuals

Environmental Review – refers to the protection of air, water, land, animals, plants and other natural resources from the effects of construction and operation of the project as stated in the Environmental Impact Statement or Assessment.

External Document - documents that are produced outside of construction division. (ER’s, DR’s, FAR’s, etc) Documents may be either controlled or uncontrolled.

- **F** -

Fiscal Completion – Date funding removed from CIP Accounts and any remaining funds returned to customer. (Date on the Final Cost Date from RM)

Field Office Quality Assistance (FOQA) Visits – Visits by the regional QA team to verify field office QA and contractor QC performance on ongoing contracts.

- **G** -

- **H** -

- **I** -

**IBC** – International Building Code

**IDP** – Individual Development Plan

**Inspection** – On-site examination of a laboratory in accordance with the requirements established with ASTM E329 and other related methods and procedures.

**Internal Documents** - documents that are produced and maintained by construction division or a field office (CQP’s, SOP’s, Quality Plans, etc). Internal Documents may be either controlled or uncontrolled.

**Internal Quality Audit (IQA) Visits** – Visits by the regional QA team to verify field office QA and contractor QC performance on ongoing contracts. Requirements in this manual are the basis for these audits.

- **J** -
LEED – Leadership in Energy and Environmental Design. LEED is a rating system to define and measure “green” buildings. LEED is a measurement system designed for rating new and existing commercial, institutional and residential buildings. It is based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts. The rating system evaluates environmental performance from a whole building perspective over a building’s life cycle, providing a definitive standard for what constitutes a “green building”. LEED is the US Green Building Council’s (USGBC) primary vehicle for promoting sustainable design and construction. It is a leading-edge system for designing, constructing, operating, and certifying the world’s “greenest” buildings.

69 points possible: Silver (33-38 points); Gold (39-51 points); Platinum (52+ points).

Line Item Reviews (LIRs) – joint review meetings with the customer to review all projects under design, under construction, and in the closeout or warranty phase.

Memorandum of Understanding (MOU) – documented agreement between the field office and the customer outlining transfer and warranty procedures. Agreement should also cover other key items of interest with the customer.

METL – Mission Essential Task List

MT – Military Transformation

NTP – Notice to Proceed.

Operability – the ease with which a project can be operated and maintained.

P2 - an Automatic Information System (AIS) that enables Project Management to implement its business processes and to change to its desired Project Management Business Process (PMBP) culture. Specifically, P2 is a suite of commercial off the self software applications configured to
support project execution in the Military, Civil Works, Environmental, R & D, Interagency and International Services (IIS) missions.

Payrolls and Basic Records - Requires contractors providing labor on Federally fund construction projects to submit weekly payrolls to the Contracting Officer and to maintain records of such for a period of three years thereafter. The act requires specific information to be included on the payrolls and maintained in the records.

PDT – Project Delivery Team.

Physical Completion – Date all work is completed. All deficiencies / punch list items are completed. Nothing is left outstanding.

Project Review Boards (PRBs) – internal review meetings on the status of critical of key ongoing projects, projects under design, and the status of program execution.

Process Improvements – In addition to defining and managing quality of the services and products we provide to our customers, the USACE Business Process challenges us to use best practices and seek continuous improvements. To meet the challenge of continuous improvement, we must periodically evaluate our processes, assess our success in meeting customer expectations, compare our performance to other organizations performing similar functions, and change our processes to achieve improvements. This is by definition a quality management process corresponding to the Plan-Do-Check-Act (PDCA) cycle that is the foundation of our quality management practices.

Project Management Business Process (PMBP) - an integrated set of processes that follow a project from cradle to grave. The project manager (PM) is responsible as the key member of the Project Delivery Team to coordinate the program requirements from inception to final acceptance.

- Q -

Quality - conformance to properly developed requirements. In the case of construction contracts, these requirements are established by the contract specifications and drawings. Consistent with ER 5-1-11, quality will be defined as meeting the customer’s goals and expectations, consistent with compliance with legal requirements, public policy (including Administration policy; as well as DoD, Army, and USACE policy and guidance) and professional standards.

Quality Assurance (QA) - is the system by which the government fulfills its responsibility to be certain the CQC System is functioning and the specified end product is realized.

Quality Management (QM) - is all control and assurance activities instituted to achieve the quality established by the contract requirements.
- **R** -

  Resident **Management System (RMS)** – Corps of Engineers’ Construction Management software utilized to record and report project information.

- **S** -

  **Service Contract Act** - If the contract is a service contract and not a construction contract then the Davis Bacon Act does not apply. The Service Act covers persons engaged in a recognized trade or craft or manual labor occupation. Payrolls are not required to be submitted on service contracts. The Service Contract regulations require that contractors and subcontractors maintain records containing the following information pertaining to each service employee performing work under a contract subject to the Act for each workweek during performance of the contract: (a) name, address and social security number; (b) work classification(s); (c) rate of wage and fringe benefit paid or rate of fringe benefit payments instead thereof; (d) total daily and weekly compensation; (e) daily and weekly hours worked; and (f) deductions, rebates, refunds from total daily or weekly compensation.

  **SPIRiT** – **Sustainable Project Rating Tool** – Objective measurement of SDD achievement – assigns points to specific SDD achievements. Based on US Green Building Council’s LEED (Leadership in Energy and Environmental Design) rating tool with minor changes for military application. 100 points possible: Bronze (25 points); Silver (35 points); Gold (50 points); Platinum (75 points).

- **T** -

  **TM** – Technical Manual

  **Transfer Document Date** – RMS User Guided defines it as the “Transfer Memo or Final 1354 Date which includes All/Final Cost from RM.”

- **U** -

  **UFC** - Unified Facilities Criteria

  **UFGS** - Unified Facilities Guide Specification

  **Uncontrolled Documents** - information that may be used as a reference, yet that use is not mandatory (i.e. NEC Handbooks, Civil Engineers Handbook, U.S. Gypsum Handbook, etc…).

- **V** -

  **Validation** – A process to verify that the laboratory is qualified to perform required tests for a project. Validation of a laboratory may consist of either inspection of audit as defined above.
W -

Wage Determination - Included in the contract (usually an attachment to section 0800) is the General Wage Determination which list the labor/mechanic classifications that are anticipated to be performed along with the corresponding wage rate and fringe benefits if applicable.

- X -

- Y -

- Z -