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CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

Student Study Guide

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Unless otherwise noted, the words, "he, him, or his" refer to both men and women.

All forms used in this guide were current as of January 2004. Students should update their guides with the latest forms as they become available.

FOREWORD

This training package has been developed to help familiarize contractor personnel with the Construction Quality Management concepts and procedures.

This guide was designed to be used as a workbook during the training program. It is intended that, after the training, it be included in your office bookshelf as a helpful tool to be used when needed. Updated material may be issued as necessary as errata sheets.

Questions pertaining to interpretation and explanation of this guide and suggestions for revisions and improvements should be forwarded to:

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STUDENT STUDY GUIDE
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Module 1: INTRODUCTION

Submodule 1: What is Construction Quality Management (CQM)?

"PROACTIVE PREVENTION vs. REACTIVE INSPECTION"

Objectives: After completing this submodule, you will be able to:

- State the purpose of Construction Quality Management.
- Discuss the reasoning behind the Corps/NAVFAC policy on CQM.
- Discuss various characteristics that are peculiar to the construction industry.
- Define Contractor Quality Control (CQC).

  Define Government Quality Assurance (QA).

A. ***Introduction and Instructional Procedures:***
This training is presented as a result of partnering efforts with the Associated Builders and Contractors (ABC), Associated General Contractors (AGC), the U.S. Army Corps of Engineers (USACE), and the Naval Facilities Engineering Command (NAVFAC). This is appropriate as Construction Quality Management is a partnering effort between the Government and the contractor. The purpose of this training is to familiarize all quality control personnel, and other contractor management personnel, with CQM policies, requirements, and procedures. In addition to the filmed portions, this training package includes this Study Guide and pertinent classroom exercises provided by your Facilitator. As we proceed through the training, the broader and more general portions of the information will be presented on videotape/DVD. At the end of each segment (module or submodule), the Facilitator will stop the tape/DVD and give you any necessary detailed information. Then, you should read the text for that submodule and proceed to the related discussions and exercises.

B. ***Instructional Content:*** The content of this training package will include, in Module 1, an introduction covering the broad aspects of CQM, including its definition; discussions of quality control procedures and benefits; the characteristics of the construction industry and the responsibilities of the Government and the contractor. In Modules 2 through 6, the various reviews, plans, conferences, reports, and management requirements are described. In Module 7, the information in the first six modules will be integrated into a discussion of the ways and means of making the CQM system work effectively so that the level of quality required in the Corps' and NAVFAC's worldwide construction program is achieved. An optional module, Module 8, is an overview of the Resident Management System (RMS). RMS is a software package that automates and simplifies many project activities used by USACE. Optional Module 9, covers NAVFAC's WEB Construction Management (CM) system.

C. ***History of Construction Quality Management:*** In 1961 a new clause containing but two sentences began appearing in Department of Defense (DoD) solicitations. These same two sentences can still be found today in the Contract Clause entitled "Inspection of Construction" [subparagraph (b)]. These sentences require a contractor to be responsible for achieving and documenting contract quality. By 1968 the Construction Quality Management system had grown into a fairly loose structured process varying from field office to field office in which more paragraphs were placed into the contract defining specific items that were to be accomplished to better manage the task. Most often, in these early years, there were a wide variety of responses on how to manage quality into the job. The Corps and NAVFAC were faced with something of a balancing act. The contractor was either given great latitude in how he organized the effort to get quality or given specific expectations and processes. Over the years, the Corps and NAVFAC have tried many variations and made some very specific choices. With the involvement of industry representatives, including the AGC, it was recognized that the relatively structured method used today was the preferred contract method. The system has some very specific processes, these include the three-phases of control system, formal deficiency /rework items tracking systems, and well-defined submittals. On many jobs, the Corps and NAVFAC specify the contractor's manpower quantity and qualifications. And, of course, this training for contractor personnel is now a contract requirement. Keep in mind that these choices are not free -- there is a cost for them and by putting them into the job, the Corps and NAVFAC have made a choice from a spectrum of possibilities. By entering into a Corps or NAVFAC contract, the contractor has agreed to follow the chosen methods.

D. ***Construction Quality Management:*** CQM is the performance of tasks, which ensure that construction is performed according to plans and specifications, on time, within a defined budget, and a safe work environment. For purposes of this training, quality is defined as conformance to properly developed requirements. For a construction project, quality begins with requirements carefully developed, reviewed for adherence to existing guidance, and ultimately reflected in criteria and design documents which accurately address these needs. Therefore, the designer establishes the quality standards and the contractor, in building to the quality standards in the plans and specifications, controls the quality of the work. The purpose of CQM is the Government's efforts, separate from, but in coordination and cooperation with the contractor, assure that the quality set by the plans and specifications is achieved. CQM is the combined effort of the contractor and the Government. The contractor has primary responsibility for producing construction through compliance with plans, specifications, and accepted standards of the industry. CQM, if used as outlined in this course, enables contractor and Government personnel to be proactive and, thereby, prevent mishaps and deficiencies from occurring. Continuing to work in a reactive mode and relying on inspection to achieve required quality of product means that CQM is either not understood or that the philosophy has not been adopted.

E. ***Contractor Quality Control:*** The primary function of contractor quality control (CQC) is to assure that the completed project meets all quality requirements of the contract. To guide the contractor in this task, a CQC plan must be prepared to ensure that the required standards of quality construction are met. In the CQC plan, the contractor defines the procedures by which he will manage and control his own, all subcontractor's and supplier's' activities so that the completed project complies with contract requirements. At the end of this submodule is a list (Table 1.1-1) entitled Components of CQC.

F. ***Government Quality Assurance:*** Quality Assurance (QA) involves the means by which the Government protects its interests. Through reviews, inspections, and tests, the Government assures that CQC is working effectively, and that the end product complies with the quality established by the contract.

G. ***The Corps' and NAVFAC's CQM System:*** (Engineer Regulation) ER1180-1-6 and NAVFAC's P-445, and other references provide guidance to Corps and NAVFAC personnel in performing effective CQM in the field. While these regulations provide minimum requirements, each project must be tailored to suit its specific conditions and requirements.

H. ***The Benefits of CQM:*** Both the contractor and the Government must be interested in effective CQM. The benefits to the Government are many: work is performed according to plans and specifications, on time, within a defined budget, easily maintained, and a safe work environment. This can be summarized as "Getting our money's worth!" The benefits to the contractor are increased profit and production, better communication, planning, improved organizational skills, and outstanding performance evaluations to obtain future contracts.

I. ***Characteristics of the Construction Industry:***

1. The construction industry has become highly specialized because of the changing market. Increased technology and regulation have resulted in increasing numbers of specialty contractors (such as general building, heavy construction, and special trade contractors) that make coordination and management more difficult for the general contractor and complicates both CQC and QA.

2. Whether large or small, specialized or general, success for all contractors is based on their ability to:

   - manage personnel,
   - control costs,
   - finance work,
   - estimate jobs,
   - schedule the work,
   - manage cash flow,
   - manage an effective safety program, and
   - maintain an effective quality control system.

3. Over 80% of all construction companies are small firms that gross less than $500,000 annually. For every 1,000 firms in operation, 110 to 130 firms enter the field each year. A similar number leave the field each year. It is a fact that the rates of entry and failure are among the highest of all industries.

4. Construction projects are difficult to manage because:

   - construction projects are unique by nature, making standardization difficult,

   - construction operations involve many skills that are nonrepetitive and do not lend themselves to an assembly line approach,

   - construction projects are, to a large degree, dependent upon environmental conditions which are beyond the contractor's control, and

   - subject to varied regulations from numerous government agencies.

5. For the contractor, adequate technical performance is not sufficient to ensure profit. There simply is too much competition and too little profit. The typical gross profit on a commercial building project is 5%. After deducting home office overhead, the before tax gross profit is reduced to 2-3%. After taxes, the net profit percentage is minuscule. Construction contracting is a very high risk, volatile business. To run a successful and profitable business, contractors must employ effective management.

J. ***In the Future:***

1. New government regulations will impose more restrictive requirements, especially in the areas of environmental concerns, occupational health and safety, and employment.

2. There will be a greater degree of influence from the client/customer, to include their involvement in project design and construction, and the requirement to assure full documentation and timely response to all comments from them.

3. Items that will be of significant benefit to both the Government and the contractor are:

   - the improvement of QC and QA requirements;

   - construction-oriented management information systems, such as the Corps' Resident Management System (RMS) and NAVFAC's WEB CM system;

- formal partnering, involving all stakeholders, will become a way of doing business;

- there will be increased contractual requirements for exchange of data in electronic format for all communication required during the course of the project; i.e., drawings on Computer Aided Drafting and Design (CADD), correspondence, RFIs, submittals, invoices, contract changes, as-built drawings, reports, schedules, and electronic bid documents;

- Increased performance based requirements, less prescriptive;

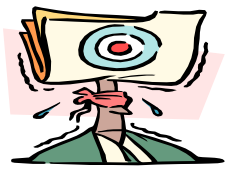
- More reliance on design-build; and

- More consideration on life cycle requirements as opposed to just construction.

4. Conversion to metric units and metric size components will require careful coordination, and

5. International competition will introduce ISO 9001: 2000 series standards of quality management on an important sector of our industry.

K. ***Conclusion:*** The construction industry will continue to be presented with complex, difficult challenges. To face the increasing challenges, we must have the best tools and properly utilize them. Even with a sound system structure, CQM requires the combined efforts of QC personnel and QA personnel to achieve our shared goals – a safe work environment, quality construction, built on time and within budget. The traditional, adversarial roles of Government versus contractor must be abandoned in favor of success through joint implementation of an effective construction quality management system. The CQM system presented here will, with our joint efforts, always be successful in providing desired quality.



EXERCISE

Submodule 1.1

1. In construction, what establishes the quality requirements?

2. What is the purpose of CQM?

3. Define CQM.

4. What are the two principal areas of CQM activity? Define each.

5. What are the benefits of CQM to the contractor? To the Government?

6. What two factors have caused the construction industry to become highly specialized?

7. Why are construction projects difficult to manage?

8. What factors will influence both the Government and the construction industry in the future?

Table 1.1-1

Components of CQC

Specification Sections
- 01330 Submittal Procedures
- 01450N Quality Control
- 01451A Contractor Quality Control
- 01525N Construction Safety
- 01770N Close-out Procedures
- 01781 Operation and Maintenance Data

Quality Control (QC) Plan
- List of Definable Features of Work (DFOW)

Preconstruction Conference

Preconstruction Safety Conference

Project Schedule
- List of Definable Features of Work (DFOW)

QC Plan Meeting

QC/QA Coordination Meeting or Mutual Understanding Meeting (Navy)

Three Phases of Control System
- Preparatory Control Phase and report
- Initial Control Phase and report
- Follow-up Control Phase

Safety
- Conduct and document daily safety inspections
- Activity Hazard Analysis (AHA)

Quality Control (QC) Documents
- Contractor Quality Control Daily Report
- Contractor Production Report
- Preparatory Phase Checklist
- Initial Phase Checklist
- Deficiency/Rework Items List
- Testing Plan and Log
- Submittal Register
- Contractor’s Submittal Transmittal Form
- AHA

Submittals
    List of Definable Features of Work (DFOW)

Offsite Fabrication, Testing and Inspection

Material Receipt and Check-Out

Deficiency/Rework Items Tracking and correcting

Non-compliance notice

Request for information (RFI)

Control Testing and recording/reporting

System Testing

Training of Government personnel in operation and maintenance of equipment

Commissioning

Punch-out Inspection

Pre-final Inspection

Final Acceptance Inspection

As-built drawings

Operation and Maintenance Manuals
    Operation and Maintenance System Instructions (OMSI)

Warranties

Turnover of keys and spare materials

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Module 1: INTRODUCTION

Submodule 2: Contractor Quality Control

Objectives: After completing this submodule, you will be able to:

- Differentiate between "inspection" and "control."
- Describe, in general, the contractor's and the Government's responsibilities in CQM.
- Describe the benefits of CQC to the contractor, the Government, and the client/customer.

A. ***Control Versus Inspection:*** The contractor has the contractual responsibilities to control construction quality and inspect the work. These are two distinct processes. Control is a continual system of planning future activities. Inspection is the process by which ongoing and completed work is examined. Inspection is ongoing or "after-the-fact" while control is "preventive." The objectives of control are to ensure that the contractor is adequately prepared to begin a phase of work, to eliminate deficiencies, and to follow through in accomplishing the work in accordance with the contract. The objective of inspection is to ensure that the work was accomplished in accordance with contract provisions. The control process is sometimes neglected. This course will emphasize the control aspects of the contractor’s management system.

B. ***Responsibilities:*** By the contract, the responsibility for quality control is vested in the contractor. Historically, the construction industry accepted a system of control in which the contracting agency or owner continually advised the contractor on what was correct, what was wrong, and what remained to be done to comply with the contract. This not only restricted contractors and burdened contracting agencies and owners, but it placed the responsibility for control of construction quality with the contracting

agency or owner. Under the Construction Quality Management system, QC responsibility now belongs with the contractor. Government QA personnel are responsible for periodically verifying that the contractor's system of quality control is working effectively and that construction complies with contract requirements. In doing this, the Corps and NAVFAC are actually performing quality assurance, not assuming responsibility for quality control.

C. ***Benefits to the Contractor:***

- Effective CQC will greatly reduce the largest unnecessary cost to the contractor--the tear out and replacement cost stemming from deficient workmanship and materials.

- An effective CQC program causes work to be done correctly the first time. The contractor benefits from earlier completion, reduced field overhead costs, and the ability to do a greater volume of business.

- Reduced costs result in greater profits for the contractor.

- High quality performance improves the reputation and image of the contractor leading to possible future contracts.

- Since safety is an integral part of CQC, the contractor benefits by experiencing less lost-time and fewer insurance claims, which result in greater profit.

- Contractor personnel take pride in delivery of a quality product. While this benefit cannot be measured quantitatively, it is a real and very important benefit.

D. ***Benefits to the Government:***

- Manpower is more effectively used, which helps the contract administration offices to maintain effective operations in a time of diminishing resources.

- Effective CQC results in fewer deficiencies and corrective efforts, which may lead to an earlier completion since there is a reduction in corrective work by contractor forces.

- Public relations and client/customer satisfaction are improved when projects are completed on time.

- As with contractor personnel, Government personnel take pride in the delivery of a quality product.

- Cost and time growth are minimized.

E. ***Benefits to the Client/Customer*** : Effective CQC can be simply stated--a quality product delivered safely, on time, and within the budget.

F. ***Presenting the Program:*** It is the responsibility of both the Government and the contractor to develop and promote the CQC program. This effort in "partnering" will be a much more pleasant experience than the traditional use of enforcement to ensure that a quality product is delivered.

EXERCISE

Submodule 1.2

1. What is the difference between INSPECTION and CONTROL?

2. Who has contractual responsibility for quality control?

3. Is the following statement TRUE or FALSE: "CQC is principally concerned with inspection?" Explain.

4. How does the contractor benefit from effective CQC?

5. Name the benefits of effective CQC that accrue to the Government.

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CONSTRUCTION QUALITY MANAGEMENT
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Module 1: INTRODUCTION

Submodule 3: Contractor and Government Responsibilities

Objectives: After completing this submodule, you will be able to:

- Discuss the specific responsibilities of:
  - Contractor personnel engaged in CQC.
  - Government personnel engaged in QA.
- Discuss how the responsibilities of contractor and Government personnel interrelate and are mutually supportive.
- Discuss partnering relationships.

A. **Quality Control Personnel:** As stated previously, CQC is a contractor responsibility. The role and responsibilities of the contractor in CQC are clearly specified in the contract documents. The contractor is required to place a competent representative, the QC Manager, on the site to oversee the CQC system. He must have full written authority to act for the contractor on all CQC matters.

QC Manager's responsibilities per the specification include but are not limited to:

- Controlling the quality specified in the plans and specifications,
- developing and maintaining an effective CQC system,
- stopping work,
- performance of all control activities and tests, and
- preparation of acceptable documentation of CQC activities.

Contractor personnel must remember that only the Contracting Officer has the authority to change the contract. Therefore, all communication concerning contract changes must be with the Contracting Officer and/or an authorized representative of the Contracting Officer. No directions concerning the project work can be accepted from a third party, including representatives of the facility user or of the base, or post.

B. **The Government:** The role and responsibilities of the contractor in CQC are clearly specified in the contract documents. The roles and responsibilities of Government QA personnel are distinct. They are required to assure that the specified standard of workmanship with the specified materials and within the limits of the contract are provided. Further, they must require the contractor to maintain the quality specified in the plans and specifications from the very beginning.

Another responsibility of QA personnel is to conduct onsite business only with the contractor's QC Manager/superintendent. They should not deal directly with subcontractors and individual craftsmen, but should coordinate through the prime contractor.

QA personnel are trained to observe all activities of the CQC staff and to recommend to the Contracting Officer require changes in the CQC organization and/or system, if the contract requirements are not being met.

C. **Communications**: Most contractors want to build a quality product within the terms of the contract, as they perceive them. However, it is critical that the contractor and the Government interpret the plans and specifications in the same way. This requires clear and effective communication between Government and contractor. This is the very heart of the Construction Quality Management program, and is dependent on mutual cooperation. QA personnel must maintain an honest, candid, professional attitude; the contractor must respond in the same manner.

D. **Partnering:** Partnering is a long-term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participant's resources. Partnering relationships are based upon trust, dedication to common goals, understanding and assistance to reach each others individual expectations and values.

Partnering is not a legally binding relationship. Rather it is a commitment and agreement between the parties to:

- Remove organizational impediments to open communication within the team.

- Provide open and complete access to information (except information specifically excluded by law, regulation, or ethical requirements).

- Empower the working level staff to resolve as many issues as possible.

- Reach decisions by consensus as much as possible and when consensus is not possible, achieve resolution in a timely manner using an agreed upon process for resolving disagreements.

- Take joint responsibility for maintaining and nurturing the partnering relationship.

Partnering should not be interpreted as a means to open the door to the compromise of contract requirements established in the plans and specifications. The quality of the project is established by those requirements and the contractor is bound to provide the level of quality specified.

Partnering is entered into either formally or informally. A formally partnered job requires a trained, independent facilitator. Informally partnered jobs are those where there is no independent facilitator, but the parties meet using a mutually determined agenda and agreement on goals and procedures is informally reached. In either case, a written partnering charter is developed and signed by all stakeholders. The final result is the development of trust and effective communications.

E. **Summary:** Effective Construction Quality Management requires the complete cooperation of the contractor and the Government. When this partnership works effectively, the project will run smoothly and efficiently. The contractor improves his profit margin and the end product will satisfy the client/customer.

EXERCISE

Submodule 1.3

1. What is the role and responsibilities of the contractor in CQC?

2. What are the responsibilities of the contractor's QC Manager?

3. What are the QA responsibilities of the Government?

4. Name the items upon which partnering relationships are based.

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Module 2: CONTRACTOR'S REVIEW

Objectives: After completing this module, you will be able to:

- State the contractor's responsibilities for reviewing contract plans.
- Describe the benefit of proper layout drawings.
- State the importance of requesting clarifications from the Government.
- Discuss the need for review of design extensions, designs for design-build projects, and designs for value engineering change proposals.

A. **Review Plans and Specifications:** Contract clause, "Specifications and Drawings for Construction," requires the contractor to review plans and specifications and request clarification where necessary. The term "Request for Information (RFI)" and other similar terms are often used to ask for clarification of the contract. Examples of items that CQC personnel shall review are as follows:

- Site conditions and restraints: Check for proper utility interface with existing facilities. Verify location of utilities in the facility, waste disposal, site location, site survey control point, etc.
- Proper allowance for maintenance space and access: The contractor is required by the contract to prepare layout drawings of equipment to assure that adequate maintenance access has been provided. The importance of the CQC participation and assurance of compliance with this requirement is critical to proper coordination. This will avoid many potentially costly conflicts.
- Conflicts and discrepancies between plans and specifications.

These examples are not meant to be all inclusive but merely to point out the type of situations that can lead to added costs to both the contractor and the government if proper reviews are not performed by CQC personnel.

B. **RFI Process:** The contractor should include procedures in the QC plan for

a RFI process. Each RFI may be handled by separate letter, by pre-printed forms, or on the daily QC report, as mutually agreed. The questions should be specific and clearly presented. The answers should be documented as mutually agreed. When the contractor notes a discrepancy, a recommended solution should be included with the RFI. The prime contractor has the responsibility to coordinate the work of all the subcontractors and suppliers. When a subcontractor or supplier submits a RFI, the prime contractor has to review the request and coordinate it among his offices and with other firms. Under no circumstance should the RFI be passed to the Government without this coordination being accomplished. For design-build contracts the designer of record must answer RFI's concerning the contractor's design and extensions of design required by the plans and specifications.

C. **Contractor Furnished Designs:** In addition to the need for coordination review of Government furnished plans and specifications, the QC Manager must review contractor furnished designs.

Examples are:

- Design-Build: In this type of contract, the contractor's QC efforts must include design quality control. The QC plan must include details of reviews to be implemented to ensure that the design will comply with the criteria provided. Some quality is also defined in the Government's Request For Proposals (RFP).

- Extensions of Design: Many contracts contain requirements for the contractor to provide designs such as pre-engineered metal buildings, fire alarm and protection systems, cathodic protection, etc. It becomes critical that the contractor designs are coordinated with all other aspects of the project so that proper interfaces are maintained. Where extensions of the design are required (structural steel details, concrete reinforcement drawings, etc.) by the contractor, subcontractors, or suppliers they must be coordinated with other activities. This coordination review is performed with other contractually required submittal reviews.

D. **Value Engineering Change Proposal (VECP):** The Government's value engineering program is based on a partnering philosophy. It recognizes that the Government and the contractor share common goals and that, by working together in a spirit of cooperation, we can produce a quality facility while saving the taxpayer money. The QC Manager should review any VECP to assure proper coordination with all affected elements of the

project. After acceptance of the VECP, the QC Manager must ensure that changes are discussed in the control meetings for all other applicable work to assure full benefit of the savings is achieved.

E. **Design-Build:** The QC Manager must be in place for the design phase of design-build contracts and must take an active role in the review and coordination of the design, to include, but not be limited to constructibility, operability, environmental, review of all drawings and specifications, coordination between the different disciplines and trades to prevent any interferences between different components, coordination with suppliers, selection of materials and equipment to assure utilities connectivity and physically fitting into provided spaces, etc.

EXERCISE

Module 2

1. Name three instances of contractor extensions of designs.

2. Name some possible areas that must be addressed during the contractor's coordination review of plans and specifications.

3. What are the responsibilities of the QC Manager during the design phase of a design-build project?

4. The following (4A through 4F) are extracts from specifications and drawings for a recent designed project. They all contain errors, omissions, or inconsistencies that were discovered during the review. Examine the "highlighted" area(s) of each, and indicate what clarification is needed.

Exercise	Clarification Needed
4A	

4B

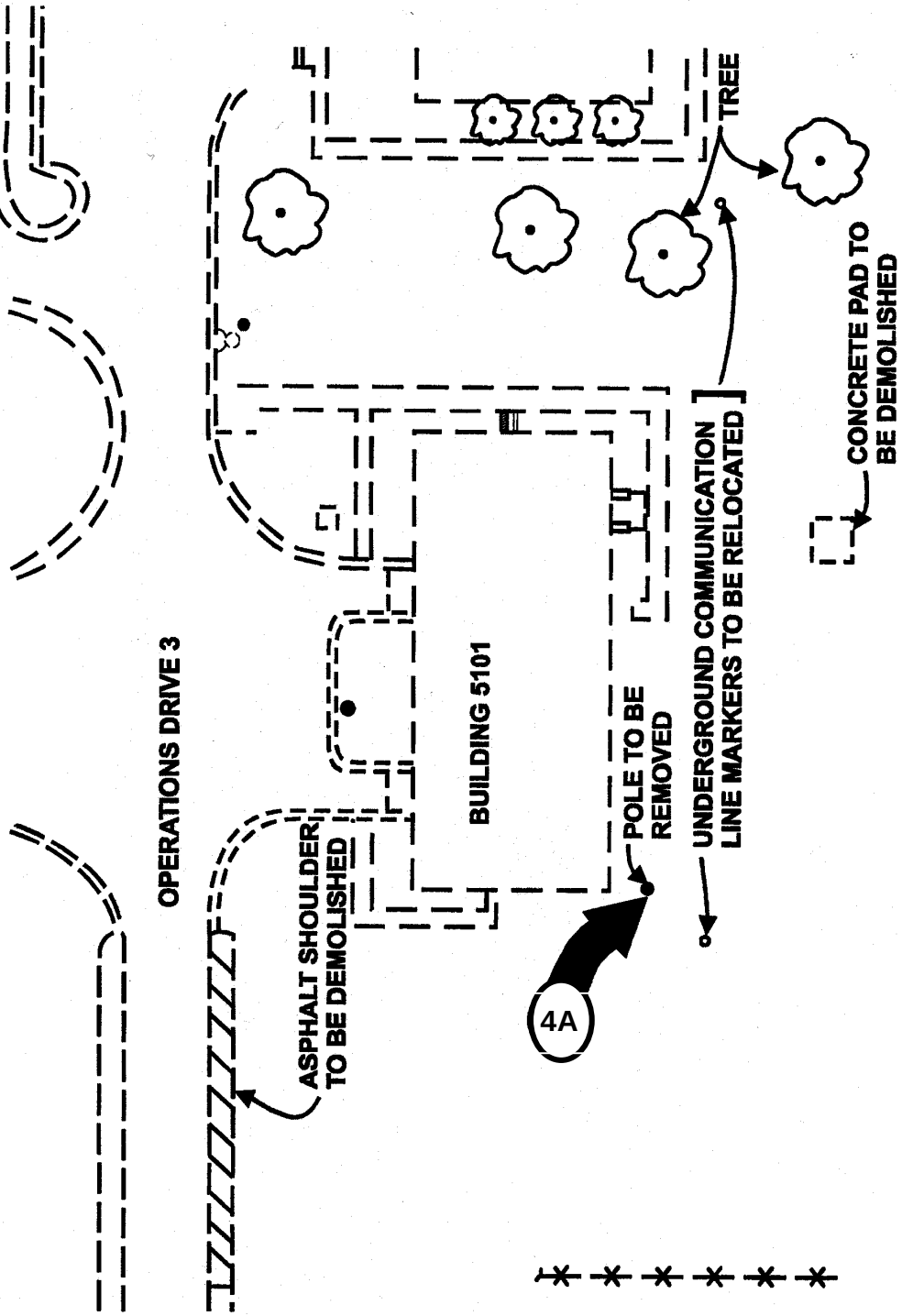
4C

4D

4E

4F

EXERCISE QUESTION 4A:



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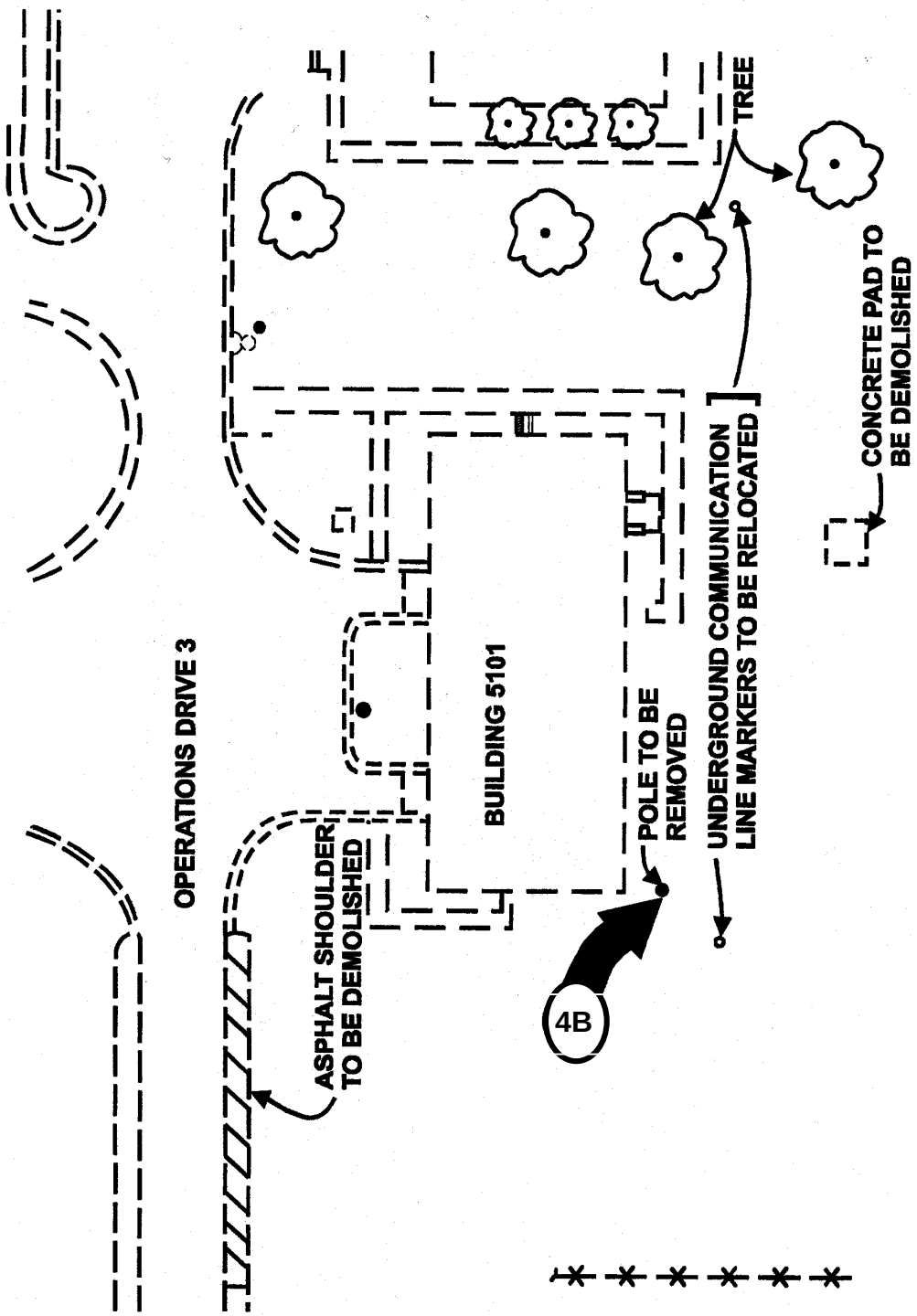
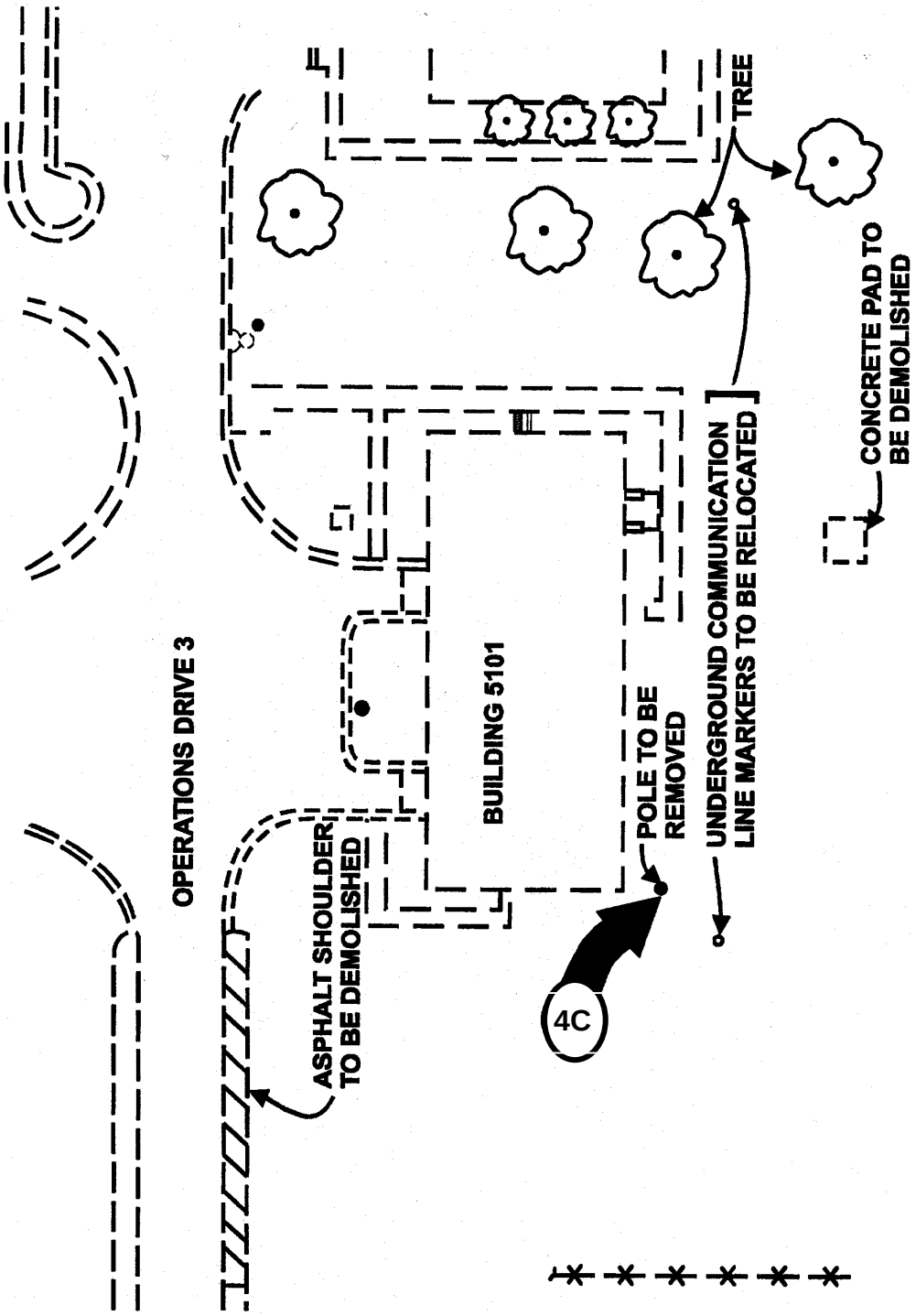
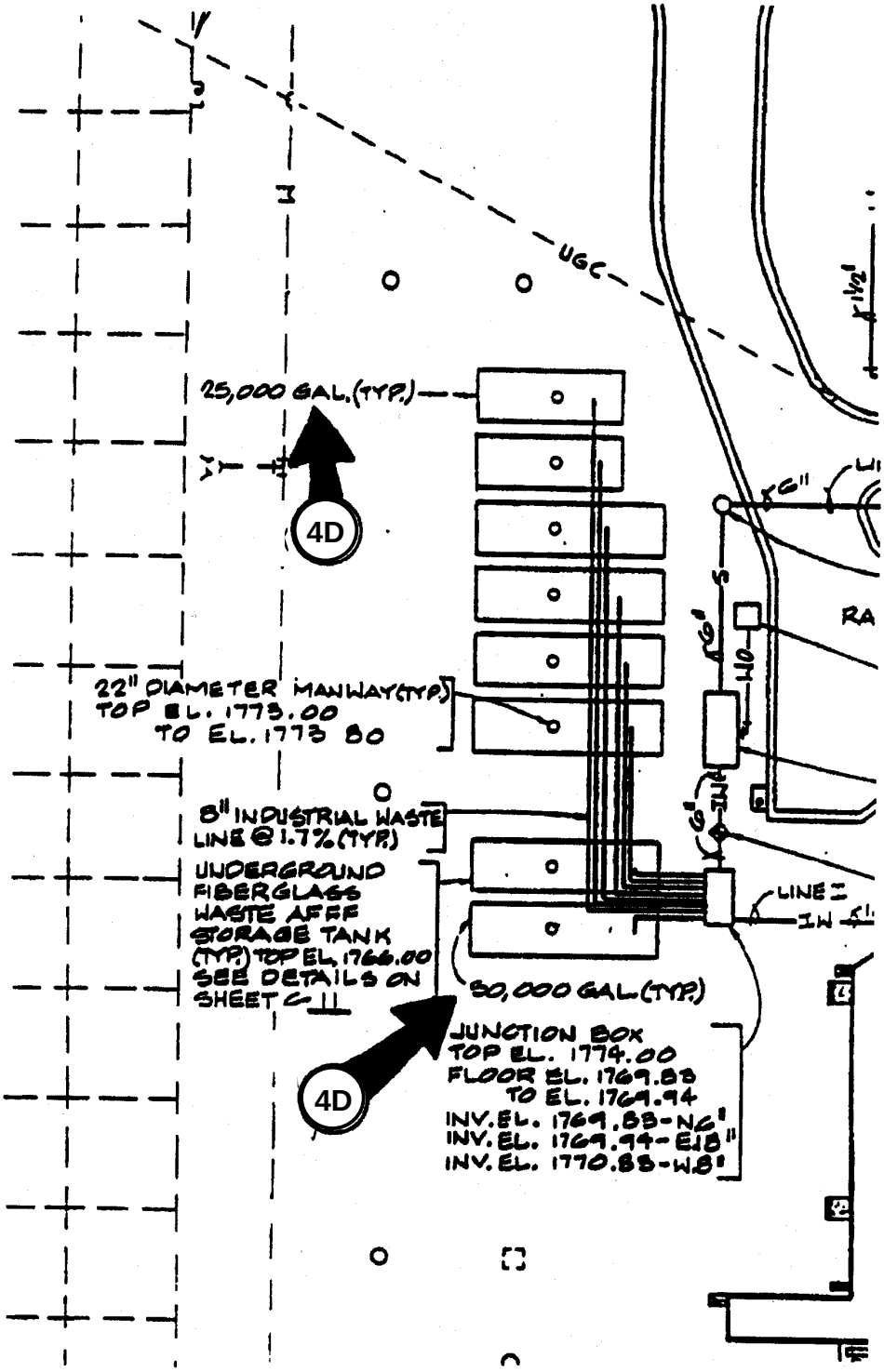


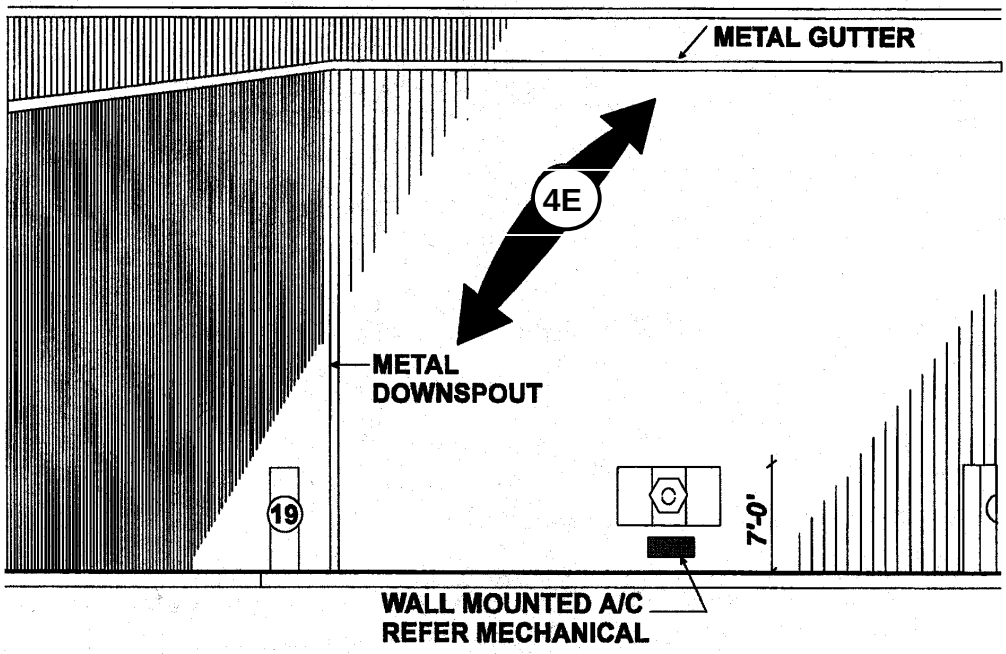
EXERCISE QUESTION 4C:

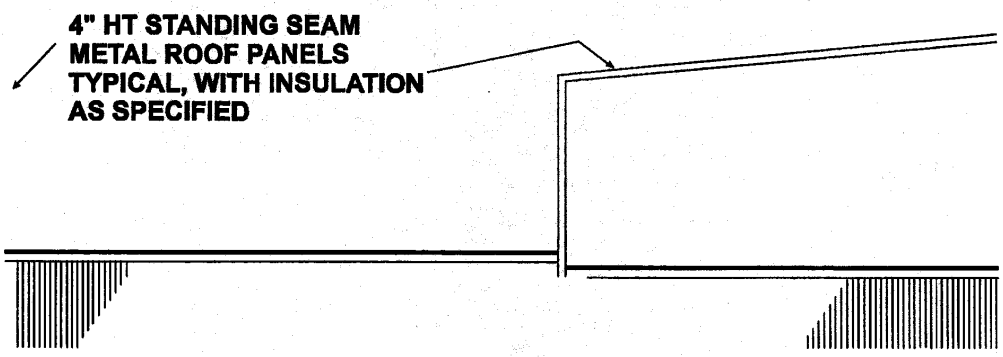


EXERCISE QUESTION 4D:

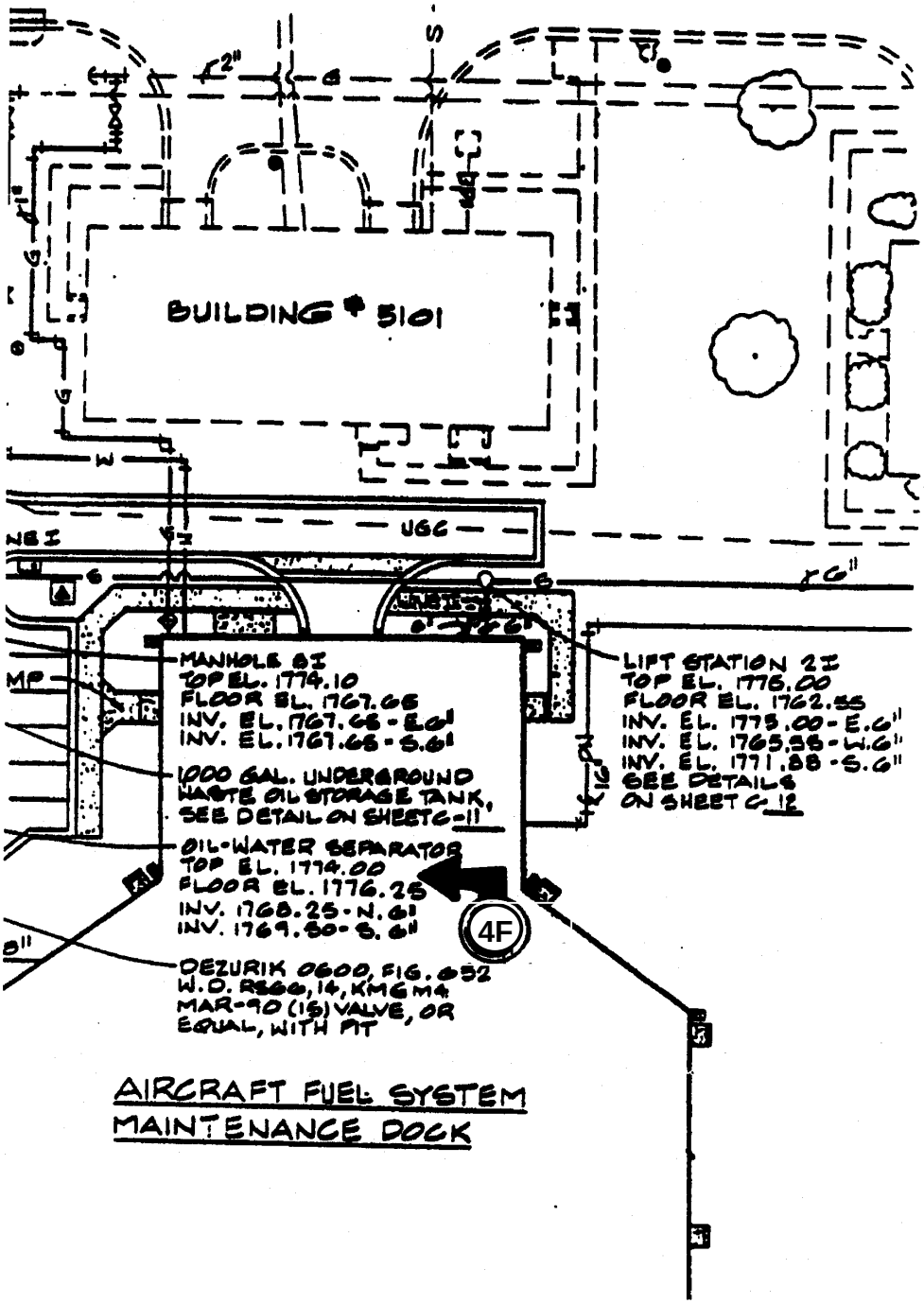


EXERCISE QUESTION 4E:





EXERCISE QUESTION 4F:



NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

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CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

Module 3: QUALITY MANAGEMENT PLANNING

Submodule 1: Purpose and Components

Objectives: After completing this submodule, you will be able to:

- Identify the components of a QA Plan.
- Define the Quality Control (QC) Plan.
- Identify the components of the QC Plan.

A. **The Quality Assurance Plan:**

1. The QA Plan is a Government document used as a management tool. It is required by ER 1180-1-6 and by P-445. It is not a contract requirement. The components of a QA Plan are:

   - Government staffing requirements.
   - Functions of each QA team member.
   - Government training requirements.
   - Government pre-award activities.
   - Definable Features of Work (DFOW) list.
   - Government surveillance and testing activities.

2. The QA Plan ensures that all team members are following the same plan and achieves better coordination of the government's QA activities. Just as important, the contractor will be receiving consistent guidance and will be able to respond to requirements in a more effective manner. For construction quality management to be effective, quality control and quality assurance must be coordinated and compliment one another.

Area/resident engineers and Resident Officer in Charge of Construction (ROICC) require QA personnel to become fully aware of the QA Plan as well as the CQC requirements. The DFOW list in the QA Plan will later align with the QC Plan, the schedule and the submittal register. Based upon this knowledge, the groundwork is established for **Government/ contractor partnership.**

B. **The Quality Control Plan:**

- The Contractor's QC Plan is the foundation upon which quality work is based. It is an outline of the planned quality control procedures, and is vital to the quality control system. The plan must be comprehensive, detailed, and logical if the contractor's quality control system is to be effective. While experience and knowledge of the construction industry are necessary in developing a good QC Plan, the contractor must consider fully the specific contract requirements and special factors peculiar to a project as well. It is pertinent that the QC Manager is the author or co-author of the QC Plan to assure that all quality requirements contained in the contract are included and that the QC Manager is thoroughly familiar with the plan. The detailed requirements for a QC Plan are in specification section 01450N Quality Control and 01451A Contractor Quality Control.

- The QC Plan must be received, reviewed, and formally accepted by the Contracting Officer or their representatives before any construction work can begin. In some cases, this requirement can be met by an interim plan. If an interim plan is provided by the contractor it must include, as a minimum, his general plan for quality control, plus the specifics for the work he is about to begin. A final acceptable plan must be received within the time specified in the contract. The contractual requirements are found in Section 01451A or Section 01450N of the contract.

- Resident Management System (RMS) is a Corps' data management system that provides an easy mechanism for developing a QC Plan based on contractor input. RMS is discussed in detail in optional Module 8.

- See optional Module 9 for NAVFAC's WEB CM capability for submission of the QC Plan.

C. **Quality Control Plan Components:**

There are differences between USACE and NAVFAC requirements for structuring the QC Plan. For details of the content and format see specification section 01450N Quality Control, paragraph entitled QUALITY

CONTROL (QC) PLAN or 01451A Contractor Quality Control, paragraph entitled Content of the CQC Plan. These specification sections can be accessed at http://www.ccb.org/docs/ufgshome/UFGSToc.htm. The QC Plan shall include, as a minimum, the following:

- Table of Contents – A listing of the major sections identified with tabs in the order of the bulletized items following hereafter.

- QC Organization – The QC organization must be identified, including a chart showing the organizational structure and lines of authority. The contractor must provide sufficient quality control personnel to satisfy all contract requirements. The contractor's quality control staff may vary in size, depending on the work being performed at a point in time. The personnel of this staff shall be fully qualified by experience and technical training as required in the specifications to perform their assigned duties. In any case, the contractor must indicate how he intends the staff to meet all requirements. This assures that the contractor has identified needs in advance, is planning to satisfy those needs, and is not overlooking or underestimating requirements.

- Names and Qualifications – The names, qualifications, and classification of each member of the contractor's quality control team must be provided. The QC Manager and the Alternate QC Manager must be employees of the prime contractor. This information may be provided in phases, as work progresses; however, the Government must receive the information before an individual begins work. This includes subcontractors and supplier personnel assigned QC duties. Include the CQM course certification for the QC Manager and the Alternate QC Manager as required by the specifications.

- Duties, Responsibilities and Authorities of QC Personnel – Provide a listing of assigned quality control activities for performance by the prime contractor, subcontractors, offsite fabricators, and suppliers. If the contractor delegates quality control duties, the plan must indicate how he will assure the effectiveness of the quality control efforts. Include a list of duties, responsibilities and authorities of each person in the QC organization.

- Outside Organizations – Provide a listing of outside organizations such as architectural and consulting engineering firms that will be employed by the contractor and a description of their services.

- Appointment Letters – Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for implementing and managing the QC program as

QC Manager and Alternate QC Manager to implement and manage the three phases of control and their authority to stop work which is not in compliance with the contract. The QC Manager shall issue letters of direction to the (Assistant QC Manager – on NAVFAC contracts) and all other QC specialists outlining their duties, authorities, and responsibilities. Copies of the letters shall be included in the QC Plan.

- Submittal Procedures and Initial Submittal Register – A listing of procedures for scheduling and managing submittals, including those of designers of record, consultants, architect-engineers, subcontractors, offsite fabricators, suppliers, and purchasing agents. Include a listing of procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval.

- Testing Laboratory Information – Performance of control testing is to be included in the QC Plan. If a commercial laboratory is to be used, the plan must indicate both the laboratory to be used and the test methods to be employed. Provide testing laboratory information required by the paragraphs entitled “Accreditation Requirements” or “Construction Materials Testing Laboratory Requirements”, as applicable (for NAVFAC contracts). If technicians employed by the contractor will be performing the tests, the plan must indicate who will perform specific tests and their qualifications. Specifics relative to test report submissions are to be addressed, including format, content, and consistency of all documentation.

- Testing Plan and Log – A testing plan and log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test. The specifications require giving advance notice to the Government of the times when tests will be conducted.

- Procedures to Complete Construction Deficiencies/Rework Items – A listing of the procedures to identify, record, and track construction deficiencies/rework items from identification through corrective action. It is noted that this plan must also include design deficiencies/rework items if the contract is a design-build contract

- Documentation Procedures – Documentation procedures including proposed report formats.

- List of Definable Features of Work - A list of the definable features of work (DFOW). A DFOW is a task which is separate and distinct from other tasks and has separate control requirements. As a minimum, each section of the specifications can be considered as a DFOW. However, there may be more than one definable feature under a section of the specifications. Masonry, landscape, plumbing, interior electrical, are examples. Another definition of a DFOW is an activity in the project schedule that results in a physical product. The list shall be cross-referenced to the contractor's construction schedule and the specification sections. For projects requiring a progress schedule, the list of DFOWs shall include, but not be limited to, all items of work on the schedule. For projects requiring a network analysis schedule, the list of DFOWs shall include, but not be limited to, all critical path activities.

- Procedures for Performing the Three Phases of Control - The Three Phases of Control are the core of the Construction Quality Management system. The QC Plan is the means by which the contractor assures himself that his construction, to include his subcontractors and suppliers, complies with the requirements of the contract plans and specifications. If the project is design-build, the plan also assures compliance with the RFP. The controls shall be adequate to cover all construction operations, including both onsite and offsite fabrication, and will be keyed to the construction schedule. The three phases are as follows:

  - Preparatory Phase. This phase shall be performed **prior to beginning** work on each definable feature of work. Use the preparatory phase checklist when conducting this phase meeting. Safety is a consideration.

  - Initial Phase. This phase must be accomplished **at the beginning** of a definable feature of work. Use the initial phase checklist when conducting this phase meeting. Safety is a consideration.

  - Follow-Up Phase. Daily checks shall be performed to assure continuing compliance with contract requirements. Safety is a consideration.

- Personnel Matrix (NAVFAC contracts specific) – A personnel matrix showing, for each section of the specification, who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document the testing.

- Procedures for Completion Inspection - Provisions for the QC Manager to conduct completion inspections of the work and develop a “punch list” of items which do not conform to the contract requirements. The QC Manager shall make a second completion inspection to ascertain that all "punch list" items have been corrected and so notify the government. The completion inspections and any "punch list" item corrections will be accomplished within the time stated for completion of the work. The plan must include project completion turnover procedures. These may include:

  - warranty information.
  - O & M manuals
  - system operation and sequence verification
  - final system testing
  - instruction and training procedures
  - punch-out
  - pre-final inspection to include the Government
  - final inspection to include the client/customer "punch list"
  - “punch list” correction and verification
  - turnover of extra materials and spare parts
  - turnover of keys
  - completed as-built drawings

D. **References:** Specific QC requirements are found in the construction contract. Although not part of the construction contract, primary references on the QC Plans are (Engineer Pamphlet) EP 715-1-2, "A Guide to Effective Contractor Quality Control." and Naval Facilities Engineering Command’s “Effective Quality Control” pamphlet. These pamphlets are an excellent source of information. They are concise and to the point, indicating the areas to be addressed in developing an effective, well-planned contractor quality control system. They are a valuable aid for both Government and contractor personnel in understanding quality control.

EXERCISE
Submodule 3.1

1. Define the Quality Assurance Plan.

2. Define a Quality Control Plan.

3. Name the components that must be addressed by the Quality Control Plan.

4. Name the actions that must be accomplished relative to the QC Plan before construction can begin.

5. Name the phases of the "Three-Phase Control," and indicate when each is implemented.

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FOR CONTRACTORS

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Module 3: QUALITY MANAGEMENT PLANNING

Submodule 2: Review and Acceptance

Objectives: After completing this submodule, you will be able to:

- Describe the process used to review the contractor's Quality Control (QC) Plan by comparing it to the requirements of the contract provisions and determining its feasibility.

- State the basic concepts which the government uses to accept or return a QC Plan.

A. **Quality Control Plan Review Participants:** There are three individuals who are normally involved in the review of the QC Plan; they are the area/ resident engineer or ROICC/SGE, the project engineer or AROICC/ AREICC, and the onsite QA personnel.

B. Two Major Steps in the Review Process:

- Examination of the QC Plan in light of the requirements of the specifications.

- Determination of the QC Plan's feasibility. This requires the reviewers to have a good working knowledge of contract requirements.

If problems are discovered, it is necessary to identify those points in the plan that needs change or clarification.

C. **Assure Minimum Requirements Are Met:**

- Determine that the plan provides adequate control of the DFOWs.

- Examine the proposed QC staffing and organization to ascertain if it complies with contract specifications. Determine if the contractor has provided the names and qualifications (in resume format) of the

individual(s) responsible for QC of each DFOW, tests, submittal controls, and reports.

- Check that the level of authority and responsibility delegated to the contractor's QC Manager is clearly defined.

- Assure that the QC Plan:

  - clearly assigns individual control and test duties,

  - defines the capacity in which individuals will be working, and

  - indicates what tests will be used.

- Determine that the plan addresses the procedures for processing submittals.

- Check that the plan specifies which contractor (prime, subcontractor, offsite fabricator, or supplier) will be performing what portions of QC.

- Assure that report forms include required features and reporting items.

D. **Acceptance of the QC Plan:** If the initial review reveals that changes are necessary, the changes must be made by the contractor before the plan can be accepted. Acceptance of the plan is contingent on satisfactory QC performance once construction is underway. The Government always reserves the right to require necessary changes in the QC Plan and in contractor operations so as to obtain the specified quality. After the plan has been accepted, if some part of the plan isn't working, the Government may require changes to be made.

E. **Commencement of Construction:** Until an interim or final QC Plan is accepted, construction cannot begin.

F. **Changes to the QC Plan:** If the contractor wants to make changes in the QC Plan during construction, the Government must be notified in writing. The contractor cannot implement any change until the Government has formally accepted the changes in writing. If deficiencies are occurring, the plan needs to be studied to see if the problem is non-adherence or if revisions should be made to correct shortcomings in the QC Plan.

G. **Distribution:** After the QC Plan has been reviewed, changed as necessary, and accepted, copies are distributed to all personnel involved in QC activities. The Government provides copies to onsite QA personnel.

H. **Example Quality Control Plan:** An example of a QC plan is provided in the exercise section of this submodule. Included with the plan is a letter of transmittal from the contractor to the Area Engineer or ROICC.

EXERCISE AND EXAMPLE

Submodule 3.2

Following is an **example** of a CorpsQC Plan, but it is not complete. Review this plan and comment on how it could be improved to meet the contract requirements.

NOTE: Navy Students - Example of Navy QC Plan is in the Navy Forms Section of the Reference/Glossary.

Keyes Construction Co., Inc.
General Contractor
5318 Madison St.
Denver, Co 80200

May 19, 20xx **Serial No. MC-4**

Area Engineer
U.S. Army Corps of Engineers
563 W. Granger
Colorado Springs, CO 80900

RE: One Tactical Equipment Shop
DACA92-97-C-0111
Ft. Carson, CO

Gentlemen:

We are submitting, herewith, our Quality Control Plan for the above referenced project for acceptance.

Very truly yours,

Warren J. Cooper
Construction Manager

Keyes Construction Company, Inc.
5318 W. Madison
Denver, Colorado 80200

WC/1d

cc: Field
File

QUALITY CONTROL PLAN
KEYES CONSTRUCTION COMPANY, INC.
FOR CONSTRUCTION OF
ONE TACTICAL EQUIPMENT SHOP
FORT CARSON, COLORADO
CONTRACT NO. DACA92-97-C-0111
MAY 20xx

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Keyes Construction Co., Inc.
General Contractor
5318 Madison St.
Denver, Co 80200

May 19, 20xx Serial No. MC-5

Army Engineer
U.S. Army Corps of Engineers
563 W. Granger
Colorado Springs, CO 80900

RE: One Tactical Equipment Shop
DACA92-97-C-O111
Ft. Carson, CO.

Gentlemen:

This is to introduce Morton S. McCray for the position of Contractor's Representative for Quality Control on the above referenced project.

Very truly yours,

Warren P. Crossen
Construction Manager

Keyes Construction Company, Inc.
5318 Madison St.
Denver, Colorado 80200

WC/1d

cc: Field
File

Keyes Construction Co., Inc.
General Contractor
5318 Madison St.
Denver Co. 80200

May 19, 20xx

Morton S. McCray
Quality Control System Manager
3636 Belview Avenue
Colorado Springs, CO 80900

RE: Quality Control
One Tactical Equipment Shop
DACA92-97-C-0111

Dear Mr. McCray:

This is a Letter of Direction to you outlining your duties and responsibility as our Quality Control Representative on the above referenced project.

You will be responsible for preparing and maintaining the Submittal Register Form 4288 for the duration of the project. You are required to check all shop drawings for accurate dimensions and to ensure compliance to applicable specifications and drawings as to the quality of materials being proposed for the project. This also applies to all subcontractors, offsite fabricators, and suppliers.

You will make, on a continuing basis, sufficient daily follow-ups to ensure that all workmanship and materials in the construction of this project are in conformance with the specifications and drawings.

You will be responsible for all testing as required by the specifications, a qualified testing laboratory will be furnished to you, as outlined in The Keyes Construction Quality Control Plan.

You will be present during all testing and coordinate all such tests as required in accordance with the specifications and the Corps of Engineers Representative.

The quality control system will include three phases of control and tests. Primarily, Preparatory Phase, Initial Phase, and Follow-up Phase. You are directed to Section 01451A/01450N, paragraph 3.6 for specific instructions outlining these control phases. All control phases and tests shall be recorded

daily on the Quality Control Report and submitted the following work day covered by the report to the government Representative. All test results shall be submitted in triplicate copies, not later than three calendar days after the tests are performed.

You are directed to review The Keyes Construction Quality Control Plan as well as the Project Specifications, Amendments and Drawings, in their entirety. If there is an item not understood, you are to consult your Quality Control Support Team.

The Quality Control Support Team will consist of the Project Superintendent and Keyes Construction Project Management.

Sincerely,

Warren P. Crossen
Construction Manager

WC/1d

cc: Field
Corps of Engineers

QUALITY CONTROL PLAN
ONE TACTICAL EQUIPMENT SHOP
FORT CARSON, COLORADO
CONTRACT NO. DACA92-97-C-0111
MAY 20xx

1.0 PURPOSE

This document establishes the Quality Control System of Keyes Construction Company, Inc. to provide the necessary supervision, control phases and tests of all items of work, including that of suppliers and subcontractors, that will ensure the compliance of all work with the applicable specifications and drawings in respect with the contractor-furnished equipment, materials, workmanship, construction, finish, functional performance, and identification.

2.0 POLICY

Keyes Construction Company, Inc. through the utilization of a Quality Control System, strives to obtain a uniform, high quality level of workmanship throughout all phases of procurement, fabrication, construction and installation of equipment and facilities, to assure this end, the following principles will be observed:

A. Assure the highest quality by maintaining supervised controls and written instructions governing quality control procedures and practices, establish clearly defined responsibility and authority for compliance.

B. Conform to all contractual requirements, specifications, applicable military standards and the Keyes Construction Company, Inc. Quality Control Plan. Compile accurate records of test certifications and other required documentation.

C. Notify Project Management, and the government of quality discrepancies for immediate corrective action. Assure that corrective action is implemented properly.

D. The Quality Control System Manager will be housed in a space separate from the Project Management staff and shall be under the supervision of Keyes Construction Company, Inc. home office.

3.0 **ORGANIZATION**

3.1 Quality Control System Manager - Reports to and receives his authority directly from Keyes Construction Company, Inc. management. The Quality Control System Manager shall formulate and implement as required the written procedures and instructions contained in this plan. Actual practices are not limited to this plan and where a discrepancy exists between this plan and the contract requirements, the contract requirements shall prevail. Consults with project supervisory personnel to assure compliance with the quality control requirements of the contract. Coordinates the quality control efforts of subcontractors and suppliers to correspond with the overall Quality Control Plan. He shall provide direct feedback and advise the government representative regarding the effectiveness and capability of the quality control organization, including but not limited to coordination, field engineering, office engineering, accounting for government- furnished property, etc. He will be physically on the project site for the duration of the contract work. He will review and coordinate submittals and approvals for contractor furnished materials and equipment, conduct tests, and follow-ups of subcontractor's work as required to ensure compliance with contract plans and specifications.

3.2 Contractor's Other Personnel - Quality control functions will be carried out by other contractor's personnel to include the Project Superintendent who will be physically on the job-site for the duration of the contract work.

He will assist the Quality Control System Manager in other areas as required to fully implement the Quality Control Plan. The QC system manager may delegate such duties to other contractor's personnel who may be assigned to the project on a temporary basis such as Field Engineers and Superintendents.

3.3 Commercial Testing Firms

Commercial testing firms to be utilized are:

Testing Laboratory, Inc.
2003 E. Willard St.
Denver, Colorado 80900

4.0 **PROCEDURES**

4.1 Control of Onsite Construction - The Quality Control System Manager will perform sufficient control phases and tests of all work, including that of subcontractors to ensure conformance to applicable specifications and drawings with respect to the materials, workmanship, construction, finish, functional performance, and identification.

The Quality Control organization will perform at least three phases of control for all definable features of work, as follows:

a. Preparatory Phase - Performed prior to beginning each definable feature of work. Notify the Government and other appropriate persons at least 24 hours in advance of the meeting.

(1) Review contract requirements.

(2) Check to assure that all materials and/or equipment are on hand and have been tested, submitted, and approved as required.

(3) Check to assure that provisions have been made to provide required control testing.

(4) Examine work area to assure that all preliminary work has been accomplished.

(5) Review hazard analysis.

b. Initial Phase - Performed at the beginning of a definable feature of work. Notify the Government and other appropriate persons at least 24 hours in advance of the meeting.

(1) Check preliminary work.

(2) Check new work for compliance with contract documents.

(3) Review of control testing.

(4) Establish level of workmanship.

(5) Check for use of defective or damaged materials.

(6) Check for omissions and resolve any differences of interpretation with the Government representative.

(7) General check of dimensional requirements.

(8) Check safety compliance.

c. Follow-Up Phases - Perform daily checks to assure continued compliance with workmanship established at the initial phase.

(1) Assurance of continuous compliance with contract drawings and specifications .

(2) Daily control testing.

4.2 Receiving and Warehousing - Inspection of permanent construction materials received will be performed by the Quality Control System Manager, or other contractor personnel. Visual inspection will be made for:

Identification

Damage

Completeness

Evidence of compliance with approvals

Proper documentation

Results of receiving inspection will be recorded on an appropriate report form and will be made available to the Government.

4.3 Offsite Control - Facilities of offsite fabricators and suppliers will be surveyed as required to assure that all requirements of the contract drawings and specifications are met and maintained and to assure delivery of quality products. The results of each survey will be recorded on an appropriate form and will be made available to the Government. The fabricator or supplier will be notified of any deficiencies and will be required to submit a report of corrective actions taken. The contractor will inform the Government of offsite surveys.

4.4 Documentation - The Quality Control System Manager will maintain current records of all control activities and tests. These will include factual evidence that the required control phases and tests have been performed, including the number and results; nature of defects, causes for rejection, etc.; proposed remedial action; corrective actions taken; contractor's records will cover both conforming and defective features and will include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records on an appropriate form will be furnished to the Government daily.

4.5 Drawing and Document Control - Contract drawing, work orders and change orders issued for construction will also be issued to the Quality Control System Manager. It is the responsibility of the Office Engineer to issue all technical information to the Quality Control System Manager. It is the responsibility of the Quality Control System Manager to maintain this technical information and keep it current and recorded as it is revised. No technical information will be replaced or revised without receipt of properly authorized change notice, revision, or equal.

4.6 Materials Certification - Copies of all purchase orders or subcontracts requiring receiving inspection will be given to the Quality Control Department for receiving and record purposes. When the purchase order requires vendor certification of materials, equipment, or supplies, such certification shall be verified as to accuracy and conformance and may be used in lieu of a test for those properties covered by the certification. Copies of all certifications received will be maintained in the Quality Control folder and will be available to the Government upon request or submitted to him as provided in the contract specifications.

4.7 Workmanship Inspection - Items which will be embedded in the concrete placements or areas which will be covered up by a following operation will be inspected by the Quality Control System Manager. The Quality Control System Manager shall verify by signature that all items installed are in accordance with the contract drawings and specifications prior to the placement of concrete or covering. Any corrective action required will be recorded.

4.8 Calibration of Equipment - All contractor furnished measuring and test equipment shall be calibrated and maintained to traceable government standards. Records of these calibration certifications

will be maintained by the Quality Control Department and made available to the Government upon request.

a. Each instrument will be plainly and permanently numbered, the equipment will be operated only by those persons directly responsible for the equipment or personnel under their cognizance.

b. Each piece of equipment will be checked for accuracy as recommended by manufacturer for frequency of calibration. Required calibration of measuring and test equipment will be conducted by a certified laboratory.

c. Measuring and test equipment dropped, damaged, or believed to be inaccurate will be removed from services and recalibrated.

4.9 Final Inspection and Test - Prior to final inspection or start of tests, all systems being inspected or tested shall be completed and accepted by the Quality Control System Manager, after this acceptance, the final inspection and test may proceed in accordance with the following steps:

a. Verify the test personnel have a working knowledge of the special characteristics of the instruments being used.

b. Note the particular inspection or test requirements and criteria for successful completion of the required inspection or test.

c. Upon satisfactory verification of these requirements the test may proceed. Each reading will be verified and documented by the Quality Control System Manager. All functional validations or tests will be performed by the Quality Control Department unless otherwise noted. No functional test will be performed by the Quality Control Department unless otherwise noted. No functional test will be accepted without properly authorized and approved test procedures.

d. The general requirement of final acceptance will include, but not be limited to, the following:

(1) General appearance

(2) Workmanship

(3) Cleanliness of areas and equipment

(4) Identification of equipment

(5) Painting

(6) Removal of unused material and temporary facilities

(7) Condition of job files and completion of paperwork

4.10 Revision Policy - Activities, programs, and procedures not covered in this Quality Control Plan or proposals or additions to these standards, shall be discussed at meetings held for that purpose at such times and places the Quality Control System Manager may select, and shall take such action to request acceptance from the government to incorporate such revisions as deemed necessary. A record shall be kept of such meetings and interested parties present, together with the subject matter reviewed. Such meetings shall be held as required by changes in the contract specifications for the purpose of reviewing the QC plan, to entertain revisions, additions or deletions. Accepted revisions shall be incorporated in the plan as first revision, second revision, etc., a revised index page shall be included.

5.1 TESTING METHODS

All testing will be in accordance with the applicable section of the specifications.

6.0 RECORDING FORMS

The contractor quality control personnel will perform all tests as indicated in the contract specifications using the appropriate Corps of Engineers ASTM, or other approved test methods. The following list itemizes some of the forms which the contractor quality control personnel intend to use. This list is not all inclusive and may be revised and updated as conditions require. The contractor's records will be available for review by the Government.

a. Subcontractor Daily QC Report - To be filled out daily by the subcontractors quality control personnel covering the day's quality control activities, approved by the Prime Contractor's Quality Control System Manager, and placed in the Prime Contractor's file.

b. Construction Quality Control Daily Report - To be used by the Quality Control System Manager to report the day's quality control activities of the Prime Contractor and all subcontractors, submitted to the government daily.

c. Trip Report - Used to report activities covering offsite trips. Will be submitted with the contractor's Quality Control Daily Report.

Daily QC reports and all attachments will be submitted in duplicate on the first working day following the day covered by this report.

a. Copies of all inspection and test reports including data and calculation sheets will be submitted with the daily QC report.

b. Quality Control System Managers' reports will contain notations specifically defining the phase of control on each day's activities and note compliance or non-compliance with previous phases when applicable.

c. The Government will be notified 24 hours in advance of all tests to be performed in the field.

d. Concrete Placement Card - To be filled out prior to, during and after concrete placement to document that preparatory, initial and follow-up phases have been made for concrete placement. A copy of this report is to be included with the daily QC report.

e. Concrete Summary - Provides a running summary of concrete test results. To be kept in contractor's files and made available to the Government upon request.

f. Density Test Summary - Provides a running summary of soil testing results. To be kept in contractor's files and made available to the Government upon request.

7.0 QUALITY CONTROL PROCEDURES

7.1 Surveillance of Subcontractors' Operations - Surveillance of the subcontractors' operations is the responsibility of the Quality Control System Manager. Major discrepancies that come to his attention will be recorded and transmitted to the related subcontractor. The contractor's Quality Control System Manager has authority to act directly with subcontractor representatives on routine quality control activities. If the discrepancy is related to a concrete placement or will be covered by preceding operation, a

resolution will be made prior to the item being covered. Major discrepancies will be followed up on a daily basis, upon correction of the major discrepancy, the date corrected will be noted and by whom.

There is one Quality Control System Manager for the Keyes Construction Company, Inc. with support of the Project Superintendent and Keyes Construction Company, Inc. Project Management. Surveillance of the subcontractors operations is the responsibility of the Quality Control System Manager. The Contractor's Quality Control System Manager has authority to act directly with subcontractor representatives on routine quality control activities.

In addition to the Contractor's Quality Control System Manager, the Mechanical and Electrical Contractor's Superintendent will act as their quality control engineer and will be directly responsible to the Contractor's Quality Control System Manager, and the Keyes Construction Company, Inc. Quality Control Support Team.

7.2 Inspection Acceptance Procedures - All construction work shall be in accordance with the contract drawings and specifications. All rework or changes which change existing engineering drawings or specifications must be authorized. All construction work will be recorded on the Quality Control System Manager's report. Work found in compliance with the drawings and specifications will be so noted. If discrepancies are found, they will be handled in accordance with inspection discrepancy procedures.

7.3 Inspection Discrepancy Procedure - Intended as an inspection system whereby all discrepancies in quality, workmanship, materials, equipment, supplies, and/or unauthorized deviations from engineering requirements on specifications can be called to the attention of responsible supervision personnel.

a. Discrepancies will be recorded on the Quality Control Daily report form. Each discrepancy will be assigned a number by the recording Quality Control System Manager. A concise statement locating the discrepancy and description of the discrepancy will be filled in by the Quality Control System Manager.

b. When material, equipment, supplies, or workmanship, that does not conform to the contract drawings or specifications are rejected, the rejecting Quality Control System Manager

will initiate a discrepancy report and immediately furnish copies to the contractor's Project Manager and Superintendent or Subcontractor's Job Representative.

c. Upon reviewing the discrepancy report, the Project Manager or his representative and the Quality Control System Manager will examine the rejected items. If in their opinion, any of the rejected items can be reworked to a usable condition, the discrepancy report will be so noted. However, if, in their opinion, the item cannot be reworked either from a practical and economical standpoint, the item shall be scrapped and an entry made on the discrepancy report concluded to that effect.

d. Upon completion of rework on items specified for rework, the Quality Control System Manager will be notified and he will re-inspect the item(s) to the original requirement plus the rework information on the discrepancy report. If it is found acceptable, the discrepancy report will be so noted. From this point on, the item(s) will be handled in the normal manner. If, however, the item(s) is still not acceptable to the Quality Control System Manager due to poor workmanship, etc., arising from the rework, we will treat this item as a first time rejection and this will be resubmitted for inspection only after further rework.

e. The discrepancy report log will be periodically reviewed by the Project Manager with the Quality Control System Manager to formulate a disposition of each listed uncorrected discrepancy. They will establish timetables for final resolution of all discrepancies.

7.4 Concrete Testing Procedures - Field testing of concrete and preparation, handling, curing, and testing of cylinders will be in accordance with ATSM and CRD Standards as set forth in paragraph 5.1.

In addition, the following ASTM Standards will be followed:

C 173-73	Air content of freshly mixed concrete by the volumetric method.
C 47O-73T	Molds for forming concrete tests cylinders vertically.
C 617-73	Capping cylindrical concrete specimens.

C 683-71T Compressive and flexural strength of concrete under field conditions.

a. Test cylinders will remain in the area where they are prepared for the first 24 hours properly protected as set forth in ASTM 31-69. They will then be transported to the laboratory, removed from the mold and immersed in a tank of saturated lime water until time of testing. Transportation from work area to laboratory area on the job-site will be in boxes containing wet sand or sawdust and will be protected from freezing.

b. Field test specimens for concrete paving shall be in accordance with paragraph 13 of the contract specifications.

8.0 DEFINABLE FEATURES OF CONSTRUCTION WORK

General Requirements

a. Special project procedures to include coordination of work, project meetings, submittals, and quality control.

b. Administrative Requirements.

c. Environmental Protection.

d. Job Conditions.

Site Work

a. Excavation, Trenching and Backfilling for utilities Systems to include sewer, gravity, drainage, and water lines.

b. Clearing and grubbing, backfilling for buildings.

c. Grading.

d. Fence, chain-link.

e. Concrete for sidewalks and curbs.

f. Bituminous Paving.

Concrete

a. Concrete materials, concrete procedures, concrete formwork, forms, form ties and accessories, concrete reinforcement, concrete finishing, concrete curing and grouting.

b. Testing.

Masonry

a. Masonry procedures, mortar, mortar accessories, unit masonry, cavity wall construction to include bringing inner and outer wythes up simultaneously, reinforcement, wall ties, flashing, and cleaning.

b. Acceptance of Sample Panel.

c. Testing.

Metals

a. Structural steel, framing to include metal materials and methods, metal fastening, metal joints, welding, expansion control, and miscellaneous metals

b. Steel Roof Decking.

c. High Strength Bolts.

Thermal and Moisture Protection

a. Damproofing

b. Fireproofing

c. Sealants

Doors and Windows

Metal doors and frames, special doors, metal windows, glazing and miscellaneous hardware, caulking.

Finishes

a. Ceramic tile.

b. Gypsum wallboard.

c. Acoustical treatment to include metal suspension system for acoustical tile and lay-in panel ceiling.

d. Resilient flooring.

e. Painting.

f. Furring (metal).

Specialties

a. Metal toilet partitions

b. Fire extinguisher cabinets

c. Toilet accessories

Equipment

Fueling system for motor vehicles

Furnishings

Lockers

Special Construction

a. Pre-engineered structures

b. Liquid storage tanks

Mechanical

a. Insulation to include:

(1) Pipes

(2) Ducts

(3) Equipment

(4) High density inserts, insulation protective shields, clips or U bolt support for multiple pipe hanger supports.

b. Plumbing systems

(1) Waste/vent piping to include; underground soil piping, above ground soil piping.

(2) Interior piping rough-in to include; galvanized, black iron and copper, including drains, fittings, valves, and piping supports.

(3) Plumbing fixtures to include flush valves, faucets, and accessories.

(4) Cleaning and operational testing.

c. Heating systems

(1) Equipment and system accessories

(2) Fuel oil/gas piping and supports

(3) System testing and balancing

d. Air distribution systems

(1) Equipment and accessories.

(2) Duct work to include galvanized supports, dampers, louvers, diffusers, duct line support and fire dampers.

e. Automatic temperature control systems

(1) Equipment and materials

(2) Installation of materials and equipment

(3) System testing

f. Sprinkler Systems

(1) Equipment

(2) Piping and supports

(3) Accessories

Electrical

a. Exterior Electric Distribution, Aerial

(1) Pole setting.

(2) Placement of crossarms, pins, insulators, pole line hardware and conductors.

(3) Placement of fuse cutouts, surge arresters, reclosers, potheads, pole mounted transformers to include grounding conductors, grounding conductor testing and cable terminations.

b. Exterior electrical distribution, underground

(1) Duct line excavation, placement of ducts and miscellaneous materials.

(2) Placement of in ground junction or pull boxes and manholes.

(3) Placement of duct bank concrete encasement.

(4) Transformer pad placement.

(5) Mounting of pad mounted transformers.

(6) Cable placement to include splicing, fire-proofing, and cable terminations.

(7) Grounding conductors and testing.

c. Electrical distribution, interior

(1) Wiring methods to include conduit rough-in, raceway boxes, outlet boxes, panelboard cabinets, placement of conductors and conduit placement below the slab for slab-on-grade construction.

(2) Wiring devices, panelboards, switch-boards, and lighting fixtures.

(3) Motors and transformers.

(4) Testing.

d. Fire Detection and Alarm System

(1) Wiring methods to include conduit, ground rods, detectors, control panels, power supply, door holders, audible fire alarm and annunciator panel.

(2) Testing.

SAMPLE

KEYES CONSTRUCTION COMPANY, INC.

DAILY QUALITY CONTROL REPORT

Daily Report No.: Date:_____
Contract No.:_____

Project Title & Location:_____
Weather: _____ Precipitation: _____ in. Temp: _____ Min. _____ Max.

1. Contract/Subcontractors and Area of Responsibility:

NUMBER:	TRADE :	HOURS :	EMPLOYER :	LOCATION/DESCRIPTION WORK

2. Operating Plant or Equipment. (Not hand tools)

Plant/Equipment	Date of Arrival/Departure	Date of Safety Check	Hours Used	Hours Idle	Hours Repair

3. Work performed today: (Indicate location and description of work performed by prime and/or subcontractors by letter in table above).

4. Results of control activities: (Indicate whether P - Preparatory, I - Initial, or F - Follow-up Phase. When a P or I meeting is conducted, complete attachment 1-A or 1B, respectively. When network analysis system is used, identify work by use of I-J numbers.)

5. Test performed as required by plans and/or specifications:

6. Material received:

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

8. Offsite surveillance activities, including action taken:

_____
_____
_____
_____
_____
_____
_____

9. Job Safety: (Report violations; corrective instructions given; corrective actions taken).

_____
_____
_____
_____
_____
_____
_____
_____

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications).

_____
_____
_____
_____
_____
_____
_____

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above.

_____
Authorized QA Mgr at Site Date

SAMPLE

Preparatory Phase Checklist

Contract No.: _____ Date: _____

Definable Feature: _____ Spec Section: _____

Government Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

Name	Position	Company/Government
1.		
2.		
3.		
4.		
5.		
6.		
7.		

(List additional personnel on reverse side)

II. Submittals

1. Review submittals and/or submittal log 4288. Have all submittals been approved?
   Yes _____ No _____

   If No, what items have not been submitted?

   a. _____
   b. _____
   c. _____

2. Are all materials on hand? Yes _____ No _____

   If No, what items are missing?

   a. _____
   b. _____
   c. _____

3. Check approved submittals against delivered material. (This should be done as material arrives.)

   Comments _____
   _____

III. Material storage

Are materials stored properly? Yes _____ No _____

If No, what action is taken? _____
_____

IV. Specifications

1. Review each paragraph of specifications.

_____
_____
_____

2. Discuss procedure for accomplishing the work.

_____
_____
_____
_____

3. Clarify any differences.

_____
_____
_____

V. Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file.

If not, what action is taken? _____
_____

VI. Testing

1. Identify test to be performed, frequency, and by whom.
_____
2. When required?_____
_____
3. Where required?_____
_____
4. Review Testing Plan._____
_____
5. Has test facilities been approved?_____
_____

VII. Safety

1. Review applicable portion of EM 385-1-1._____
_____

2. Activity Hazard Analysis approved? Yes _____ No _____

VIII. Corps of Engineers comments during meeting.

_____
CQC REP

SAMPLE

Initial Phase Checklist

Contract No.: _____ Date:_____

Definable Feature: _____

Government Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

Name	Position	Company/Government
1.		
2.		
3.		
4		
5		
6.		

(List additional personnel on reverse side)

II. Identify full compliance with procedures identified at preparatory. Coordinate plans, specifications, and submittals.

Comments: _____

_____

_____

_____

_____

III. Preliminary Work. Ensure preliminary work is complete and correct. If not, what action is taken?

_____

_____

_____

_____

IV. Establish Level of Workmanship.

1. Where is work located? _____
2. Is a sample panel required? Yes _____ No _____
3. Will the initial work be considered as a sample? Yes _____ No _____
   (If yes, maintain in present condition as long as possible).

V. Resolve any differences.

Comments:

_____

_____

VI. Check Safety.

Review job conditions using EM 385-1-1 and job hazard analysis.

Comments: _____
_____
_____

_____
CQC REP

SAMPLE

CONTRACT NO. DACA 92-97-C-O111

Report No._____

Date _____

CONCRETE PLACEMENT CARD

LOCATION _____

TIME: START _____FINISH_____CUBIC YARDS_____

	STATUS		STATUS
A-LINE & GRADE		G-GROUND BUSSES &/OR WIRES	
B-SURFACE PREPARATION		Size	
		Location	
C-FORMS		Adequately Support	
Alignment		Welding	
Stability		H-ELECTRICAL BOXES & PANELS	
Form Surface		Size	
Special Blockouts		Location	
Safety of Work Area		Adequately Supported	
(runways, scaffold		Sealed Against Conc.	
& ladders)		I-PIPING	
Form Treatment		Size & Material	
Chamfer Strips		Location	
Cleanness		Support	
D-REINFORCEMENT		Sleeves	
Size		Leak Test	
Location		J-WATERSTOP	
Spacing		Size-Type	
Splices		Location	
Tie Wires		K-EXPANSION JOINT MAT.	
Chairs & Spacers		Size-Type	
E-EMBEDMENTS		Location	
Anchor Bolts		L-OTHER FEATURES (List)	
Embedded Steel			
F-CONDUITS			
Size			
Location			
Adequately Supported			
Flush Coupling or			
Stud-out Req't			
Clear of Obstruction			
Concrete Tight			

REMARKS_____

_____
.C. System Manager

SAMPLE

CONCRETE SUMMARY

Report No._____

Date _____

TEST	DATE	CLASS	FIELD SPEC		7 DAY	28 DAY	OTHER	LOCATION & REMARKS
			SLUMP	% AIR	SLUMP % AIR			

SAMPLE

KEYES CONSTRUCTION CO., INC.
ONE TACTICAL EQUIPMENT SHOP
CONTRACT NO. DACA 92-97-C-O111

Report No. _____
Date _____

TRIP REPORT

COMPONENT_____

VENDOR_____

SPEC REF._____

PURPOSE OF TRIP _____

_____

_____

CONTACT_____

PERSONNEL PRESENT_____

_____

_____

SUMMARY_____
_____
_____
_____
_____

_____
Q.C. System Manager

SAMPLE

PERMANENT MATERIALS REPORT

Project: _____

Location: _____

Materials: _____

_____

_____

Supplier: _____

Subcontractor: _____

Freight Line: _____

Damage Report: _____

_____

_____

_____

_____

_____

Inspected By:_____

_____
Quality Control System Manager

SAMPLE

DEFICIENCY REPORT NO.

Contractor:_____

Date: _____ Contract No.: _____

Location: _____

Reference Specifications Paragraph:_____

Reference Contract Drawing Sheet No.: _____

Deficiency: _____

_____

_____

_____

_____

Corrective Action:_____

_____

_____

_____

_____

Acknowledged: _____

_____ _____

Area Representative & Date Corps of Engineers Field Rep.

SAMPLE

Laboratory Field

Test Type	Depth Elev.	Max. Dry Density	O.M.C. %	Dry Density	Moisture %	Compact. %	Soil Type	Spec. Reg.	Passed Failed	Remarks

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

Module 4: POST-AWARD ORIENTATION (PRECONSTRUCTION CONFERENCES AND THE COORDINATION MEETING (MUTUAL UNDERSTANDING MEETING - NAVY)

Objectives: After completing this module, you will be able to:

- State the objective of the Post-Award Orientation/Preconstruction Conference.
- State the purposes of the Coordination Meeting or the Mutual Understanding Meeting (Navy).

A. **General:** There are three, and possibly four, conferences/meetings held prior to the commencement of physical work. The first covers all aspects of the contract and is called the Post-award Orientation Conference/ Preconstruction Conference. The Preconstruction Conference is required by FAR 52.236-26. The second is the Preconstruction Safety Conference required by FAR 52.236-13I. The third covers Construction Quality Management and is called the Coordination Meeting or the Mutual Understanding Meeting (Navy). These meetings are a specific contract requirement. The fourth, optional meeting in NAVFAC contracts, is the QC Plan meeting which can be requested by the contractor/QC Manager or called by the ROICC. The meeting is held to clarify requirements for the development of the QC Plan.

B. **The Post-award Orientation Conference/Preconstruction Conference:**

- The Post-award Orientation Conference/Preconstruction Conference is conducted as soon as possible after contract award and prior to the commencement of any physical work. The objective of the Post-award Orientation Conference/Preconstruction Conference is to review the contract clauses to include accident prevention, administrative requirements, personnel requirements, and procedural matters. This conference is very important because it establishes the ground rules for administering the contract.

- Contractor quality control normally is not discussed in detail at this conference. The subject is so important it deserves special attention and the personnel attending may not be involved in the day-to-day on-site activities. The degree of quality control-related discussion depends largely on the scope and magnitude of the contract and on the individuals from each organization that are present.

- This meeting is scheduled, convened and conducted by the Government. It is a Government responsibility to take detailed minutes of the conference and provide copies to all participants.

C. The Preconstruction Safety Conference:

- This meeting is held to review and discuss the contractor's safety program. If possible, it should be held after the initial receipt of the contractor's Accident Prevention Plan (APP).

- To achieve a mutual understanding with the contractor or his/her APP.

D. **The Coordination Meeting or the Mutual Understanding Meeting (Navy):**

- This meeting is scheduled, convened and conducted by the Government. Normally, this is the area, resident, project engineer or the SGE, AROICC/AREICC and QA Representative. As with the Preconstruction Conference, this meeting must be held before any physical work begins.

- The purposes of the Coordination Meeting or the Mutual Understanding Meeting (Navy) are:

  - To achieve a mutual understanding with the contractor of his/her role in quality control.

  - To review the QC Plan with the contractor. The Government must receive and review the QC Plan before the meeting. Acceptance of the plan can be accomplished after the meeting.

  - To establish a good working relationship between the Government and the contractor.

- Personnel, both Government and contractor, who will be directly involved in construction quality management should be present. They will be working together on a day-to-day basis on the quality

management aspects of the project, and they need to come to mutual understandings before the project actually begins. If subcontractors are to be involved in quality control, their responsible personnel should also attend, so that they can receive the information they need “first-hand.”

- The Coordination Meeting or the Mutual Understanding Meeting (Navy) will normally include a full spectrum of CQM requirements. A sample Coordination Meeting or the Mutual Understanding Meeting Navy Agenda is included at the end of this module.

- It is the Government’s responsibility to take detailed minutes of the meeting and provide copies to all participants. It is vital that everything of importance is included in these minutes, since verbal understandings tend to be remembered differently by different individuals. If any disagreement occurs between the government and the contractor, the minutes will prove invaluable. These minutes must be signed by both the contractor and the government.

  NOTE: NAVFAC - QC Manager's responsibility to take meeting minutes.

E. **QC Plan Meeting:**

The purpose of the QC Plan meeting is to develop a mutual understanding of the QC Plan requirements prior to plan development and submission.

EXERCISE

Module 4

1. What is the objective of the Post-award Orientation Conference/Preconstruction Conference?

2. Why is the Post-award Orientation Conference/Preconstruction Conference important?

3. Who schedules, convenes, and conducts the Coordination Meeting or the Mutual Understanding Meeting (Navy)?

4. What are the primary purposes of the Coordination Meeting or the Mutual Understanding Meeting (Navy)?

5. Who attends the Coordination Meeting or the Mutual Understanding Meeting (Navy)?

SAMPLE

COORDINATION MEETING OR THE MUTUAL UNDERSTANDING MEETING (NAVY) AGENDA

I. Introduction

- A. Area/Resident Engineer or ROICC/SGE
- B. Project Engineer or AROICC/AREICC
- C. Quality Assurance Personnel
- D. Contractor Personnel

II. CQC Specifications

III. Contractor Quality Control System

- A. Quality Control Staff
  1. "Chain of Command"
  2. Individual Responsibilities
- B. Submittals
  1. Scheduling (ENG Form 4288R) Updates
  2. ENG Form 4025R
  3. Follow-up of Disapprovals
- C. Testing
  1. Frequency
  2. Who Performs/Qualifications
  3. Lab Approval
  4. Documentation with Auditable Trail

D. Quality Control Daily Reports

1. Contractor Name and Address

2. Project Name, Contract Number, Location, Date, and Report Number

3. Weather

4. Contractor/Subcontractor Area of Responsibility

5. Materials/Equipment Delivered to Job Site

6. Record any Preparatory, Initial, and Follow-up Phase activities held. Note results of surveillance or necessary corrections.

7. Testing Performed and Results Noted

8. Verbal Instructions Received

9. Controversial Issues

10. Signed by the QC Manager

E. Definable Features of Work

F. Three-Phases of Control System

1. Preparatory

a. Shop Drawings

b. Work to be built upon

c. Equipment

d. Control Testing

e. Government Furnished Equipment (where applicable)

f. Sample Panels

g. Construction Methods

h. Safety and Activity Hazard Analysis

l. Recordkeeping

j. Notification of Government Representative

2. Initial

a. Contract required with respect to quality

b. Corrective measures

c. Recordkeeping

d. Notification of Government Representative

e. Safety and Activity Hazard Analysis

3. Follow-Up

a. Continuing Quality

b. Corrective Measures

c. Recordkeeping

G. QC Plan

1. Correct Deficiencies

2. Discuss

a. Procedure to be followed when deficiencies are discovered.

b. Cooperation

3. Changes to the Plan

a. Required to revise plan if something proves to be incorrect after construction begins.

b. Proposed changes must be submitted in writing to Area/Resident Engineer or ROICC and accepted.

4. Administration of the QC Plan is the sole responsibility of the contractor.

H. Punch-Out Inspection

1. Deficiencies noted by QC Manager

2. Corrected prior to Pre-final/Final Inspection

I. Pre-final/Final Inspection

1. Conducted with contractor, Government, and using agency or customer personnel.

2. Additional punch-list items noted.

3. Payment withheld until corrected.

IV. Government Quality Assurance

V. Discussion

VI. Safety meetings held today reported on the daily report.

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

Module 5: SUBMITTALS

Objectives: After completing this module, you will be able to:

- State the purpose of submittal procedures.
- Describe Government responsibilities for submittal review and/or approval.
- Describe contractor responsibilities for the scheduling and control of submittals.
- List the information the contractor must furnish on the submittal control document (ENG Form 4288R - Submittal Register).
- List the information the contractor must furnish on the transmittal form (ENG Form 4025R).

A. **General:**

1. Submittals are classified as “Government Approved” (GA) or "For Information Only" (FIO). For design-build contracts, submittals may also be classified as "designer of record approval" or "Government reviewed extension of design." Submittals which will normally require Government approval are: extensions of design, critical materials, variations, or those involving equipment whose compatibility with the entire system must be checked. Submittals not requiring Government or designer of record approval are for information only. It is imperative that the contractor's QC Manager reviews all submittals because the Government only spot checks FIO submittals. This emphasizes the Government's reliance upon contractor QC approvals. The Contract Clause entitled "Specifications and Drawings for Construction," and specification Section 01330 SUBMITTAL PROCEDURES, 01331N Design Submittals, and 01332 Construction Submittals. discuss specific definitions and procedures. The Submittal Register, (Engineer Form) ENG Form 4288R, identifies those submittals requiring Government or designer of record approval.

2. Use of ENG Form 4025R: The contractor must use ENG Form 4025R, “Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer’s Certificates of Compliance,” for transmitting submittals. A sample ENG Form 4025R is provided in the sample section of this module. Instructions for use are contained on the back of the form.

3. Typical submittals are categorized into the following submittal identifications (SD):

   SD-01 Preconstruction Submittals
   SD-02 Shop Drawings
   SD-03 Product Data
   SD-04 Samples
   SD-05 Design Data
   SD-06 Test Reports
   SD-07 Certificates
   SD-08 Manufacturer’s Instructions
   SD-09 Manufacturer’s Field Reports
   SD-10 Operation and Maintenance Data
   SD-11 Closeout Submittals

4. The primary responsibility for overall management and control of submittals lies with the contractor.

B. **Purpose:** Submittals are required by the contract in order to 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 for an item before it is needed for construction. Submittals are indispensable in assuring and controlling construction quality and must be given the attention required.

C. **Contractor Submittal Responsibilities:**

- The contractor must integrate the submittal process into his QC Plan. He must delegate submittal responsibilities to the proper individuals on his staff.

- Submittals are considered by the Government to be important. The contractor must assure that onsite management and, for design-build, the designer of record remains attentive to submittal procedures at all times.

- QC personnel and designer of record are responsible for ensuring, through detailed review, that all submittals are in full compliance with the contract.

- The contractor must review the Government prepared Submittal Register and add any needed additional submittals. For design-build projects, the designer of record prepares the submittal register.

- The contractor must check the submittal schedule requirements against the Network Analysis System (NAS) or other approved construction schedule.

- The contractor constantly maintains and adjusts dates on the register as required by the contract activities to ensure the document reflects current information.

- All variations must be fully described, identified and justified in the transmittal package. This is explained in specification Section 01330 and in the instructions on ENG Form 4025R. If a variation is not identified on ENG Form 4025R, the Government may rescind any inadvertent approval.

- The contractor assures that work must not be permitted to begin without properly approved submittals.

- The “Buy American Act - Construction Materials” must be considered in the submittal process because it significantly impacts what will be acceptable on Government projects.

D. **Government Submittal Responsibilities:**

- The Government will prepare a list of submittals required for each contract. This list will be prepared on a submittal register (ENG Form 4288R). The annotated submittal register will be incorporated into the specifications prior to advertisement. For design-build contracts, the designer of record identifies the required submittals in the specifications and prepares the submittal record.

- Review a minimum 10% of FIO submittals.

- Review and approve submittals that are required to be GA. For design-build contracts, the Government will review submittals for conformance with the contract which includes the solicitation requirements and the contractor's accepted proposal.

- An important aspect of the Government's quality assurance role is to enforce submittal requirements. In the course of the project, if it is determined that the contractor's quality control personnel are not properly satisfying submittal requirements, corrective action will be taken.

E. **Controlling and Scheduling:**

1. Submittal activities may be required to be incorporated into the construction schedule in order that submittal progress can be tracked in conjunction with overall progress. Care must be taken that the schedule accurately reflects the status on ENG Form 4288R.

2. Regardless of the type schedule specified, ENG Form 4288R, "Submittal Register, " is used for submittal control and scheduling. (A sample ENG Form 4288 is provided in the sample section of this module.) Generally, the information required is self-explanatory. However, several items need clarification.

    - The NAS activity code, is used only when a network schedule is required and for those submittals that have been included as activities.

    - Item Number is to be completed by the contractor.

    - The Contractor Schedule Dates Columns should project when submittals will be submitted, when approval is needed, and when the material is needed. This information should be updated every 30 days as required by the specification.

3. Software for microcomputers which automates the submittal register has been developed by the Government. This will be useful to both the contractor and the Government. The Resident Management System (RMS) is discussed in a later module.

4. NAVFAC's WEB CM will be used for the processing of submittals.

EXERCISE

Module 5

1. What is the purpose of submittals?

2. What is the process the contractor must use to request a variation?

3. What are the contractor's submittal responsibilities?

4. What are the Government's submittal responsibilities?

5. What information must the contractor provide in his submittal control document (ENG Form 4288R - Submittal Register)?

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

CONTRACTOR

SPECIFICATION SECTION

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.

ENG FORM 4288-R, JAN 97 EDITION OF MAR 95 IS OBSOLETE. PAGE ____ OF ____ PAGES (Proponent: CEMP-CE

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

_____

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

ENG FORM 4025-R, MAR 95 *(ER 415-1-10)* EDITION OF SEP 93 IS OBSOLETE. SHEET ___ OF ___ (Proponent: CEMP-CE)

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

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).

F -- Receipt acknowledged.

FX -- Receipt acknowledged, does not comply as noted with contract requirements.

G -- Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

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Module 6: QUALITY MANAGEMENT FOR CONSTRUCTION PROJECTS

Submodule 1: Introduction

Objectives: After completing this submodule, you will be able to:

- Define the function and importance of Construction Quality Assurance.
- Define the function and importance of Contractor Quality Control
    - for construction contracts
    - for design-build contracts

A. **Quality Assurance:** The primary function of quality assurance is to obtain completed construction that meets all contract requirements. Assurance is defined as a degree of certainty. Quality assurance personnel continually assure--or make certain--that the contractor's work complies with contract requirements.

B. **Quality Assurance Personnel:** The role of quality assurance personnel is to assure that the CQC system is functioning properly. To do this, QA personnel:

- Examine the quality control methods being used to determine if the contractor is properly controlling design activities in design-build contracts.
- Examine the quality control methods being used to determine if the contractor is properly controlling construction activities.
- Make certain that the necessary changes are made in the contractor's QC system, if excessive construction deficiencies occur.
- Assist the contractor in understanding and implementing the contract requirements.
- Examine ongoing and completed work.

- Review QC documentation to assure adequacy.

C. **Contractor Quality Control:** The primary function of CQC is the successful execution of a realistic plan to ensure that the required standards of quality construction will be met. In CQC, the contractor defines procedures to manage and control his own, designer of record, consultant, architect-engineer, all subcontractor and all supplier activities so that the completed project complies with contract requirements. For design-build contracts this includes providing and maintaining a Design Quality Control plan as a part of the overall contract QC plan. This plan, as a minimum, must assure that all documents are reviewed by a technically competent, independent reviewer specifically named in the plan. This review cannot be performed by the same designers that produced the product. The design QC plan shall be managed by a Design QC Manager who has verifiable engineering or architectural design experience or is a registered engineer or architect. The Design QC Manager is under the supervision of the QC Manager.

D. **Quality Control Personnel:** As stated previously, CQC is a contractor responsibility. This includes:

- Produce the quality specified in the plans and specifications, and for design-build contracts in the Request for Proposal, as well as the contractor's accepted proposal,

- Develop and maintain an effective CQC system,

- Perform all control activities and tests, and

- Prepare acceptable documentation of CQC activities.

The contractor also is required to place a competent representative onsite to oversee the CQC system. He must have full authority to act for the contractor on CQC matters. His responsibilities include workmanship, methods, and techniques to ensure that all work is performed properly by qualified and careful craftsmen. For design-build contracts, responsibility also includes design quality and the performance of constructibility, operability and environmental review of the design.

EXERCISE

Submodule 6.1

1. What is the primary function of QA?

2. What is the role of QA personnel?

3. What is the primary function of CQC?

4. What are the roles of QC personnel?

5. For design-build contracts what additional requirements must be included in the QC plan?

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Module 6: QUALITY MANAGEMENT FOR CONSTRUCTION PROJECTS

Submodule 2: Three-Phase Control System

Objectives: After completing this submodule, you will be able to:

- Define the purpose of control of onsite construction through the Three-Phase Control System.
- List the responsibilities of QC personnel regarding the three-phase control system.

A. **Purpose:**

The primary purpose of the Three-Phase Control System is to require the contractor to plan and schedule the work to ensure that he is prepared to start each new definable feature of work. **The three phases of control (preparatory, initial, and follow-up) are the core of the Construction Quality Management System. When they are performed as outlined in the specifications, success in completing the work to comply with requirements of the contract is enhanced.** In Module 3, Submodule 1, the three-phase control system was mentioned as a required part of the contractor's quality control plan.

B. **Three-Phase Control Responsibility:**

- Develop, schedule and implement procedures for tracking control phase meetings for definable features of work in the QC Plan.
- Notify appropriate personnel of time, date and agenda.
- Conduct Meetings (preparatory and initial).
- Safety considerations and Activity Hazard Analyses (AHAs).
- Document actual discussions and provide minutes to attendees.

- Monitor work in place through follow-up phase.

- Conduct additional control phase meetings, as needed.

C. **The Three-Phase Control System:**

1. **Preparatory Phase:** This phase shall be performed prior to beginning work on each definable feature of work. Perform this work as detailed below:

   - A review of each paragraph of applicable specifications and references.

   - A review of contract plans.

   - A check to assure that all materials and/or equipment have been tested, submitted, and approved.

   - A check to assure that provisions have been made to provide required control inspection and testing.

   - Examination of the work area to assure that all required preliminary work has been completed.

   - A physical examination of required materials, equipment, and sample work to assure that they are on hand and conform to approved shop drawings or submitted data.

   - A review of the appropriate activity hazard analysis.

   - Discussion of procedures for constructing the work including the review of repetitive deficiencies.

- The Government shall be notified in advance of beginning any of the required action of the preparatory phase as required in the QC specifications.

- This phase shall include a meeting conducted by the QC Manager and attended by the superintendent, other CQC personnel (as applicable), and the foremen responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the QC Manager and attached to the daily CQC report.

2. **Initial Phase:** This phase must be accomplished at the beginning of a definable feature of work. The "Initial Phase" will verify that control for the work developed in the "Preparatory Meeting" is implemented and the work is performed to the level of workmanship mutually agreed to. Perform this work as detailed below:

   - Review minutes of Preparatory Meeting.
   - Check preliminary work.
   - Verify adequacy of controls to ensure full contract compliance.
   - Establish level of workmanship.
   - Resolve all differences.
   - Check safety to include compliance with the safety plan and activity hazard analysis. Review the activity hazard analysis with workers.

   • The Government shall be notified in advance of the beginning of the Initial Phase as required in the CQC specifications.

   • The QC Manager is in charge of the Initial Phase Meeting. Separate minutes of this phase shall be prepared by the QC Manager and attached to the daily CQC report. The initial phase shall be repeated for each new crew to work onsite, or any time established level of workmanship is not being met.

3. **Follow-up Phase:** Daily checks shall be performed to assure continuing compliance with contract requirements, including safety and control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work. QC personnel should continually refer back to the standards set in the "Preparatory and Initial Phases."

D. **Cautionary Note:** QC personnel, in the midst of day-to-day duties, can easily fall into the trap of only working to detect deficiencies when in fact their role is to <u>prevent</u> deficiencies.

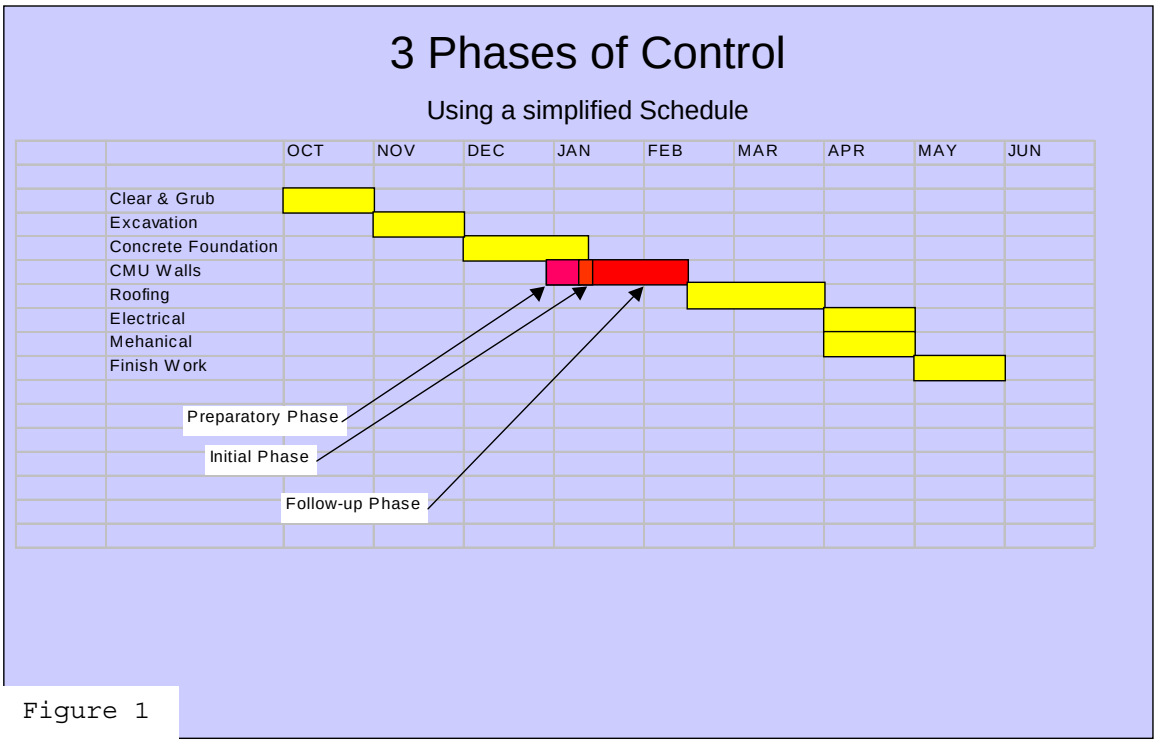
3 Phases of Control
Using a simplified Schedule
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
Clear & Grub
Excavation
Concrete Foundation
CMU Walls
Roofing
Electrical
Mehanical
Finish Work
Preparatory Phase
Initial Phase
Follow-up Phase

Figure 1

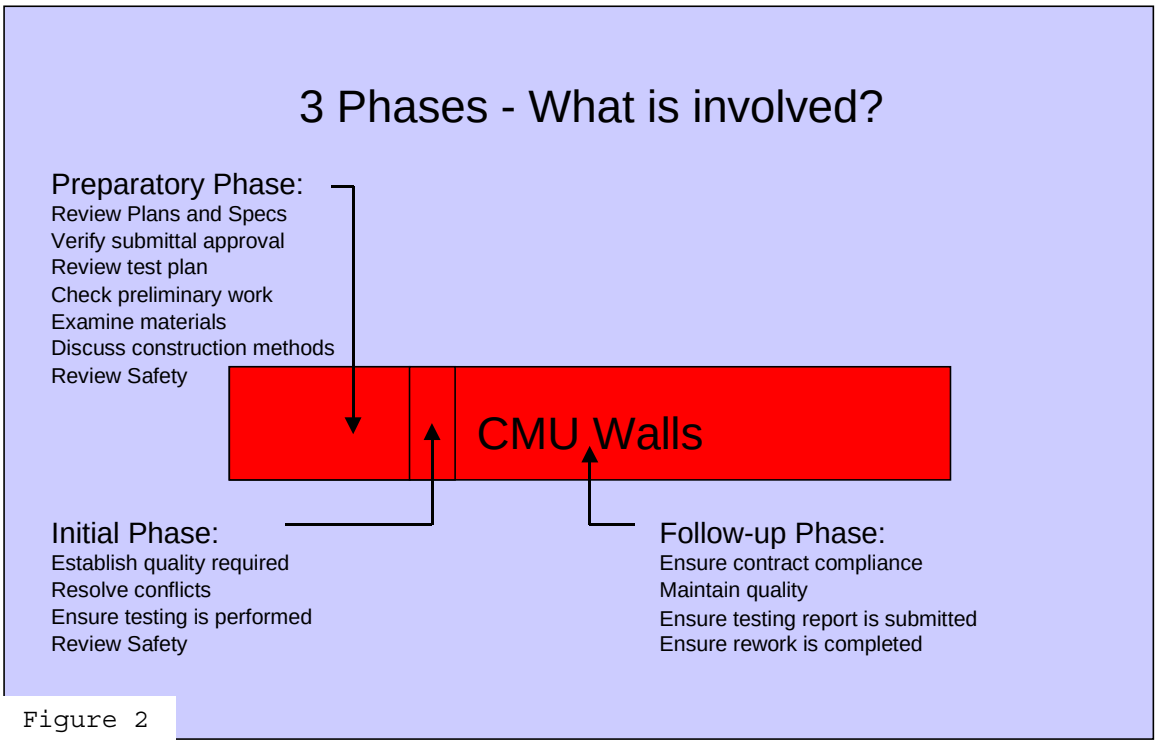

Figure 2

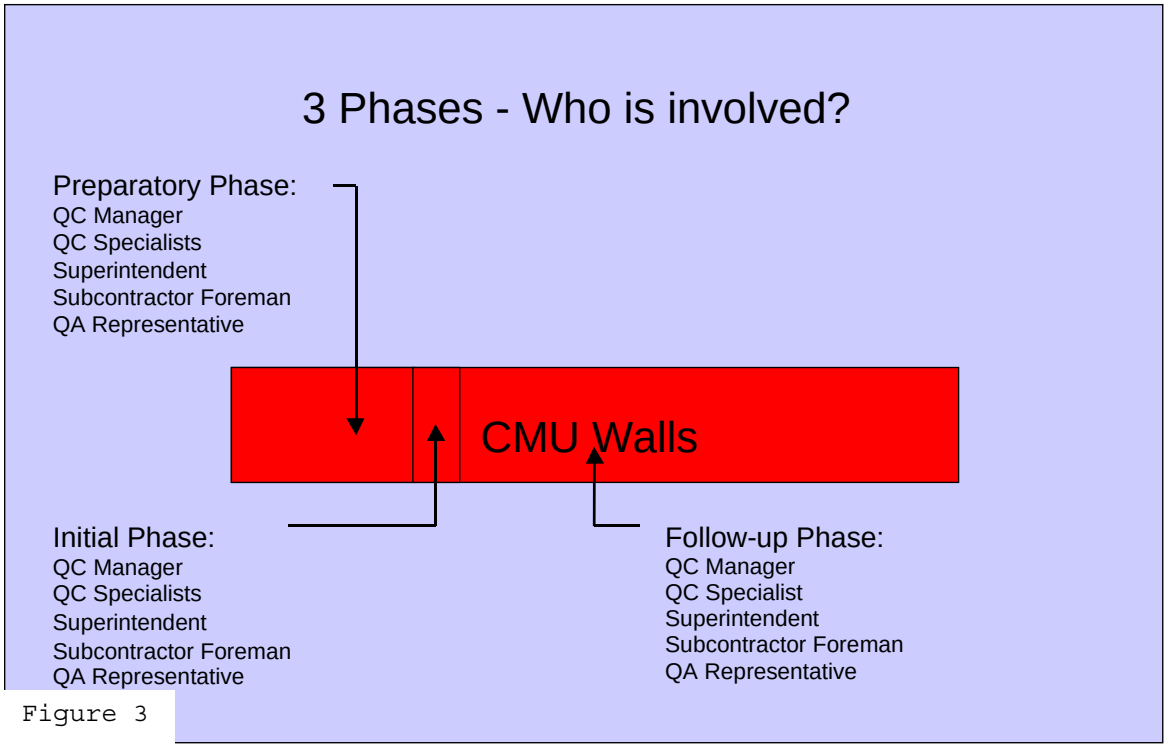

Figure 3

EXERCISE

Submodule 6.2

1. What is the primary purpose of the three-phase control system?

2. Regarding the three-phase control system, what are the responsibilities of quality control personnel?

PRACTICAL EXERCISE

Submodule 6.2

PREPARATORY PHASE MEETING EXERCISE

You are involved in the construction of a $22,000,000 two-bay hanger at March Air Force Base in California. Included in the project is 2,000 feet of 24-inch diameter storm drainage pipe. Manholes are to be installed every 300 feet. Storm drainage pipe is listed in the Quality Control Plan as a definable feature of work. The contractor plans to use reinforced concrete pipe and pre-cast manholes.

SCOPE: Install 2,000 feet of 24-inch storm drainage pipe. Pre-cast manholes shall be installed every 300 feet.

Task: Prepare to attend preparatory meeting to begin the work. Use the checklist included as a guide.

Assumptions: Pipe is on site
Submittals are approved
Excavation permit is issued
Safety plan covers the work and is satisfactory
Layout work is complete

You are: Resident Engineer or ROICC/SGE

Project Engineer or AROICC/AREICC

Onsite Quality Assurance Person

TEAM 1

PRACTICAL EXERCISE

Submodule 6.2

PREPARATORY PHASE MEETING EXERCISE

You are involved in the construction of a $22,000,000 two-bay hanger at March Air Force Base in California. Included in the project is 2,000 feet of 24-inch diameter storm drainage pipe. Manholes are to be installed every 300 feet. Storm drainage pipe is listed in the Quality Control Plan as a definable feature of work. The contractor plans to use reinforced concrete pipe and pre-cast manholes.

SCOPE: Install 2,000 feet of 24-inch storm drainage pipe. Pre-cast manholes shall be installed every 300 feet.

Task: Perform preparatory meeting to begin the work. Use the checklist included as a guide.

Assumptions: Pipe is on site
Submittals are approved
Excavation permit is issued
Safety plan covers the work and is satisfactory
Layout work is complete

You are: Project Superintendent

Quality Control Manager

Site Work Subcontractor's Superintendent

Storm Drainage System Second Tier Subcontractor's Foreman

Safety Engineer

TEAM 2

SAMPLE

Preparatory Phase Checklist

Contract No.: _____ Date: _____

Definable Feature: _____ Spec Section: _____

Government Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

Name	Position	Company/Government
1.		
2.		
3.		
4.		
5.		
6.		
7.		

(List additional personnel on reverse side)

II. Submittals

1. Review submittals and/or submittal log 4288. Have all submittals been approved?
   Yes _____ No _____

   If No, what items have not been submitted?

   a. _____
   b. _____
   c. _____

2. Are all materials on hand? Yes _____ No _____

   If No, what items are missing?

   a. _____
   b. _____
   c. _____

3. Check approved submittals against delivered material. (This should be done as material arrives.)

   Comments _____
   _____

III. Material storage

Are materials stored properly? Yes _____ No _____

If No, what action is taken? _____
_____

IV. Specifications

1. Review each paragraph of specifications.
_____ _____
_____
_____

2. Discuss procedure for accomplishing the work.

_____
_____
_____
_____

3. Clarify any differences.

V. Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file.

If not, what action is taken? _____
_____

VI. Testing

1. Identify test to be performed, frequency, and by whom.
_____ _____
2. When required?_____
_____
3. Where required?_____
_____
4. Review Testing Plan._____
_____
5. Has test facilities been approved?_____
_____

VII. Safety

1. Review applicable portion of EM 385-1-1._____
_____
2. Activity Hazard Analysis approved? Yes _____ No _____

VIII. Corps of Engineers comments during meeting.

_____
QC Manager

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Module 6: QUALITY MANAGEMENT FOR CONSTRUCTION PROJECTS

Submodule 3: Documentation

Objectives: After completing this submodule, you will be able to:

- Explain the purpose and importance of the Contractor Quality Control (CQC) Report.
- List the components of the CQC Report.
- Explain the purpose and importance of the Government Quality Assurance (QA) Report.
- Discuss the review and use of quality management reports.

A. Quality Management Record Keeping:

A comprehensive record keeping and information exchange system is an indispensable quality management tool. In addition to identifying specific deficiencies, careful report analysis will also detect patterns in the team's performance. If these patterns are detrimental, early detection and correction will save time, effort, and money for both the Government and the contractor.

B. The Contractor Quality Control Report:

- The requirement for the contractor to submit daily QC reports is established in the QC specification. As discussed previously, the Coordination Meeting or the Mutual Understanding Meeting (Navy) should include a detailed discussion of reporting procedures, information required in the reports, and the importance of the reports. The QC Report is to be submitted at a prescribed time every day, and all information relating to QC activities is to be included in the report.

  - There is no form specified for the QC Report. Note: For contracts using RMS/QCS, QCS does mandate a specific form. However, there are sample forms included in the contract and

they are highly recommended to be used. Regardless of the form and format used, it must include the information outlined in the QC specification. (A sample QC Report is located in the sample section of submodule 3.2.)

- Major elements of information required in the QC Report include, but are not limited to the following:

  - Contractor/subcontractor and their area of responsibility.

  - Operating plant/equipment with hours worked, idle, or down for repair.

  - Work performed each day, giving location, description, and by whom. When a Network Analysis System (NAS) is used, identify each phase of work performed each day by NAS activity number.

  - Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

  - Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

  - Submittals reviewed, with contract reference, by whom, and action taken.

  - Off-site surveillance activities, including actions taken.

  - Job safety evaluations stating what was checked, results, and instructions or corrective actions.

  - Instructions given/received and conflicts in plans and/or specifications.

  - Attach QC Specialists' and Design QC Manager's reports.

  - Contractor's verification statement.

- When activities are completed, they must be so noted on the daily QC Report. The Government conducts a final follow-up inspection for completed activities.

- The QC Manager may attach separate reports for subcontractor work, or these reports may be combined into one consolidated report.

- The QC reports must present an accurate and complete picture of QC activities. QC reports should not concentrate only on work items that have been completed, but also must provide evidence of control activities. They should be precise, factual, legible, as objective as possible, and emphasize QC actions.

- QA personnel evaluate QC reports as they are received. If statements are discovered in the report that are contrary to QA personnel's knowledge of the work, action will be taken to resolve the differences. The contractor may be asked to submit a supplemental report containing corrections.

C. **The Government Quality Assurance Report:**

The QA report is the Government's record of project-related events and is prepared for each visit day. The QA report is not intended to duplicate information contained on the QC report.

D. **Deficiency Tracking System/Rework Items List:**

Included as a part of the CQC program is a requirement for a formal deficiency tracking system. As outlined in the accepted QC plan, it shall consist of a cumulative list of job deficiencies/rework items. This includes items identified by QA personnel, QC staff, testing failures, etc. This list shall be continually maintained with dates of corrective action. The system is subject to review by the government. If the QCS Module (Contractor Module-RMS) is used/required there is a deficiency tracking system in it.

EXERCISE

Submodule 6.3

1. What are the major components of the sample Quality Control Report in submodule 3.2?

2. How often are Quality Control and Quality Assurance Reports required?

3. Following (3a through 3e) are situations relating to documentation and three-phase control. Read the situations carefully, and respond to the requirement(s) accompanying each.

   a. The G. J. Company has a contract for rehabilitation of three barracks. The work consists primarily of addition of partitions and installation of A/C equipment and duct work. On the day duct work installation started, the Daily Report stated: "Started installing duct work today. Everything looked okay." Is this report feature adequate? EXPLAIN.

   b. The G. J. Company continues work on rehab contract. Today's activities involve the continuation of insulating duct work. After several review sessions with the contractor with regard to proper

documentation of activities, his comments were, "Insulation of duct work being done in accordance with specifications, vapor barrier was ripped in a couple of places and insulator was a little light in use of staples." Rewrite the contractor's comments to make them acceptable.

c. The Paw Power Construction Company has a contract for construction of a high-rise administration building. Work was in early stages of construction and a subcontractor had just completed backfilling sanitary sewer lines. The utilities sub foreman had been designated as QC Manager for this portion of the work. His report was attached to the main report. A preparatory and initial phase have been performed and recorded earlier. This report stated, "All work completed in accordance with directions received at preparatory phase."

(1) Is it permissible to accept sub-reports attached to the Daily Report?

(2) Is it permissible to reference the preparatory phase?

(3) Is anything missing?

d. Results of Surveillance: Bowers installed base of manhole #2 approximately 10 ft. east of its correct location. Pipe between manholes #6 and #2 is being removed and the pipe between manholes #3 and #2 is being extended to a new location for manhole #2.

(1) What does this report say?

(2) Rewrite the report so that it states clearly what is intended.

e. You are the QC Manager. You are to begin installation of ceramic floor and wall tile. Both the floor and the wall are to receive a setting bed. The floor has floor drains, and waterproofing has been completed. The wall has electrical receptacles.

(1) Who would you want at the initial phase of the work?

(2) What would you check?

(3) What items should be contained in the QC Report covering the Initial Phase?

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Module 6: QUALITY MANAGEMENT FOR CONSTRUCTION PROJECTS

Submodule 4: Testing

Objectives: After completing this submodule, you will be able to:

- Discuss the objectives of contractor and Government testing.
- Describe contractor testing procedures.
- List testing requirements.

A. **Importance of Testing:**

Testing is an extremely important part of CQM. If tests are not performed properly, there are many construction procedures and materials that cannot be confirmed as adequate. Visual observation alone is insufficient.

B. **Types of Tests:**

1. QC Testing: The contractor performs control testing to determine whether construction procedures and materials are producing the desired contractual product.

2. QA Testing: The government performs assurance testing to verify that the contractor's control testing is adequate.

C. **Procedures:**

1. The contractor must outline proposed “testing procedures” as defined in Section 01451A and/or Section 01450N in the QC Plan. These proposed procedures must be discussed at the Coordination Meeting or the Mutual Understanding Meeting (Navy). Any disagreement regarding testing procedures must be settled before construction begins.

2. The contractor must provide a list of required control tests and specify whether the tests are to be performed by an independent, approved testing

laboratory, or through the use of his own personnel and facilities. For CORPS contracts “approved testing laboratory” means laboratories that have been validated by the Materials Testing Center (MTC) at Waterways Experiment Station in Vicksburg, MS.

3. Regardless of which method of testing the contractor uses, he is required to assure that specified laboratory procedures are used and that laboratory facilities are certified.

4. QC testing is verified in a random manner by QA testing. QA tests are unannounced sporadic tests that repeat QC tests. QA testing can be performed by :

   a. Government personnel using the contractor's equipment and facilities,

   b. An independent testing laboratory, or

   c. A field office, district, or division government laboratory.

5. QC personnel must be knowledgeable concerning laboratory and testing procedures. They must be able to visually recognize proper and improper testing procedures. All involved personnel should become aware of the methods to be used for and the extent of QC testing.

6. Before testing begins, the following questions should be answered and verified against the approved QC Plan:

   a. Has all required testing been identified?

   b. Are test reporting requirements understood?

   c. Have laboratory facilities and testing equipment been verified as acceptable?

   d. Are laboratory personnel qualified?

   e. Has the calibration of equipment been verified as accurate?

   f. Is there a procedure for documenting corrective steps?

7. After QC testing has begun, a thorough examination must be made of the test reports submitted to ascertain that:

a. Reports are being submitted for all tests performed,

b. Reports are complete and accurate, and

c. Failing tests must be retested and cross referenced to the original failing test.

D. **Test Tracking System:** In accordance with Section 01451A and Section 01450N, the contractor must establish and maintain a system to track verification, control and acceptance tests. Each planned test type and frequency must be entered into the tracking system prior to beginning work. Results and dates of individual tests are to be added to the system as they are performed. Any failing test results will have retests performed, entered into the system and cross referenced. The tracking system must be reviewed frequently to assure that any activity underway is having all planned tests performed as scheduled.

EXERCISE

Submodule 6.4

1. Define QC testing.

2. Define QA testing.

3. Who performs QC tests?

4. Who performs QA tests?

5. What questions should be answered before testing begins?

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FOR CONTRACTORS

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FOR CONTRACTORS

Module 6: QUALITY MANAGEMENT FOR CONSTRUCTION PROJECTS

Submodule 5: Completion of Work

Objective: After completing this submodule, you will be able to:

- Describe project completion procedures.

Quality Management Completion Procedures:

- Testing of Completed Systems: Testing of completed systems shall be performed as required by the technical specifications of the contract.

- Contractor Punch-Out: Near the completion of all work or any increment thereof, the contractor prepares a punch list and makes corrections. Quality Assurance personnel will not prepare the contractor's deficiency list. The contractor should correct deficiencies promptly so that project schedules are met. All major deficiencies noted during this contractor's punch-out inspection must be corrected prior to the pre-final inspection.

- Pre-Final and Final Inspections: Participating in the pre-final and final inspections will be QA personnel and QC personnel. The QC Manager will assure that all deficiencies noted during the pre-final inspection are corrected prior to the final inspection, and report the status of corrective actions to the Government. The client/customer is invited to the final inspection. Any deficiencies noted at these inspections by client/customer personnel, whether design or construction related, will be examined by the Government and the contractor notified if corrective action is required under the terms of the contract. All significant deficiencies must be corrected prior to turnover.

- Complete As-Built Drawings: As-built drawings are updated continually throughout the project. During the final stages of construction, the QC Manager will review and complete these drawings. While the status of as-built drawings is a concern throughout the project, it is of particular significance, as the project comes to an end, to prevent any loose ends.

- Operations and Maintenance (O&M) Manuals: The QC Manager will assure submittal of all required operation and maintenance data in accordance with scheduled submittal dates.

- Instruction and Training Procedures: If the contract requires operation and maintenance training of client/customer personnel, the QC Manager will make certain all specified training has been conducted by qualified instructors.

- Materials Turnover: The QC Manager will verify that all required keys, spare parts and materials have been sorted, identified, and demonstrated to be usable prior to final inspection.

- Warranty: The QC Manager will ensure that all warranty information is provided. Procedures for warranty notification and correction should be in place. FAR Clause 52.246-21 Warranty of Construction, states the general warranty period for construction work is one year from the time of acceptance by the government unless stated otherwise in the specifications. If the manufacturers of individual components provide a longer warranty, this extended warranty period accrues to the government. If the contractor repairs or replaces a component of the project during the warranty period then this component is warranted for one year from the repair or replacement date.

EXERCISE

Submodule 6.5

What is the appropriate chronological order for the quality management completion procedures listed in this submodule? Explain.

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Module 7: MAKING THE SYSTEM WORK

Objectives: After completing this module, you will be able to:

- List problems, which may occur during construction.
- Name and discuss the means by which requirements may be enforced.
- List corrective measures that may be taken by the Government and the authority for each.

A. **Problem Categories:** Problems encountered during construction vary according to the specific project. Most problems, however, fit into one or more of the following categories:

- Delays. There may be delays in submittals, in the correction of deficiencies, or because of lack of contractor's acceptance of the CQC principles.
- Planning and Control. Many problems can be caused by a lack of planning and control and a failure to take corrective action in the planning and control process.
- Testing. Improper, inadequate, or untimely testing can adversely affect the project.
- Documentation. Problems occur because of late, incomplete, or incorrect documentation. Making a written record of quality control action and test results is as important as taking the actions. The CQM reporting system may cause appropriate action to be taken, or may be the basis of settlement of expensive claims at a future date, after people directly involved are no longer available. If documentation is inadequate, communications break down, and then the legal positions of both the government and the contractor are jeopardized.
- Misunderstanding of CQC Responsibility. This problem is often the result of a lack of review of the contract QC requirements, a lack of familiarity with the QC Plan, or failure to communicate roles to other personnel involved in the QC process. For example, completion

testing on all component systems, e.g. Duct Air Leakage Tests (DALTS), Testing and Balancing Systems (TABS), HVAC Controls System, electrical hi-pot tests. When possible, these misunderstandings should be solved at the field level.

Personal one-on-one discussion and actions at the field level often provide acceptable solutions to the problems. If discussions with onsite personnel are not fruitful, the problem must be elevated to the next level. The important thing is for the problem to be identified early so that it can be prevented or corrective action can be taken. If an agreement cannot be reached, the Government makes the final determination.

B. **Government Options:** Proper effective QC can prevent adverse Government actions. However, if efforts at the field level do not bring the desired result, the Government has no choice but to initiate action under the Contract Clauses of the contract that provide the means for enforcing contract compliance.

- Requiring contractor removal and replacement of deficient materials and/or workmanship - Contract Clause, Inspection of Construction, FAR 52.246-12.

  - This contract clause allows the Government to require the contractor to expose, test, and ultimately remove and replace deficient work.

  - If necessary the Government may employ another contractor to make the corrections performed if he refuses to correct it himself. If adversarial relationships develop, which could be costly to the contractor, a copy of directive type letters to the contractor should be furnished to the surety company.

- Withhold Payment - Contract Payment Clause.

  - Grounds for withholding payment include the contractor's failure to:

    · Perform in accordance with the terms of the contract,

    · Provide the Quality Control Plan giving assurance of his intent and ability to comply with quality standards,

    · Build to quality standards.

- While the Government is obligated to pay for satisfactorily completed work, it has no obligation to pay a contractor for deficient work.

- Requiring removal of unqualified personnel - Contract Clause, Material and Workmanship, FAR 52.236-5. If contractor personnel are deemed to be incompetent, careless, or otherwise objectionable, the Government can require the removal of such personnel from the project. However, under other provisions of the contract, if the Government deems the QC staff to be too small, but not incompetent, it may direct the addition of personnel.

- Requiring the contractor to assume personal supervision - Contract Clause, Superintendence by the Contractor, FAR 52.236-6. If the contractor does not provide an adequate superintendent, the contract allows the Contracting Officer to require the contractor to assume personal supervision of the work.

- Halting Work. Another Government option is halting work until deficiencies are corrected.

  - The Contracting Officer may direct the contractor to cease work and any item or work feature pending satisfactory correction of any deficiency in that work--particularly if the defective work is to be become inaccessible if further work proceeds.

  - If the contractor refuses to stop and correct the deficiency immediately, a letter from the Contracting Officer may be issued, directing the contractor to cease that particular operation.

- Issuing an unsatisfactory performance appraisal.

  - If the contractor fails to correct serious deficiencies in his performance, he may be cited as unsatisfactory at the conclusion of the project.

  - Interim unsatisfactory appraisals may be issued at any time before construction is completed. This will afford the contractor the opportunity to correct his deficient operations and avoid issuance of a final unsatisfactory appraisal at contract closeout.

  - Even a single unsatisfactory appraisal can have an effect on future awards of Corps and NAVFAC contracts to that contractor.

- Conversely, outstanding work by a contractor is reflected in outstanding performance appraisals, safety awards, and public recognition.

- Terminate the Contract - Contract Clause, Default (Fixed-Price Construction) FAR 52.249-10. The most drastic type of action is to terminate the contract. In most cases, termination for default is not in the best interest of the Government. Termination action is taken <u>only after all else fails</u>.

C. **Making the "System" Work:** The QC Manager must act quickly and confidently when problems are discovered. He cannot sit back and hope that problems will correct themselves. His job is to control construction quality by taking action to make certain that problems are corrected and prevented. The Government is serious about CQC and will hold the contractor responsible for contract compliance.

D. **Quality Assurance Personnel:** Quality Assurance personnel will use the ASSESSMENT WORKSHEET FOR CONTRACTOR QUALITY CONTROL PROGRAM, to evaluate the contractor's CQC system. The results of this assessment can be used to provide a final performance rating to the contractor at the end of the project. (NAVFAC contracts only! For sample of form see NAVFAC P-445.)

EXERCISE

Module 7

1. Name the categories of problems that normally occur during construction.

2. What options are available to the Government under the Contract Clauses of the contract?

3. Analyze the cases on the following pages and answer the questions included with each. Be prepared to discuss your answers with other members of the class.

   a. Contractor is constructing a commissary. The contract was awarded in April, which allowed for sufficient time to enclose the building before onset of cold weather. Building is scheduled to be complete in May of next year, which necessitates doing the inside finish work during winter months. The client/customer has scheduled delivery of equipment and stock for June. Work was progressing satisfactorily and the contractor was about to start roofing operations in mid-September when the resident engineer discovered the contractor was installing untreated lumber for edge strips, curbing,

etc., which was in violation of the specifications. Work was stopped, and after some investigation, contractor advised the resident engineer that the best delivery on treated lumber was eight weeks, which would delay enclosing the building and ultimately delay turnover to the client/customer. The contractor requested waiver of treated lumber requirement.

(1) Where did the contractor's control system break down?

(2) Where did the Government assurance system break down?

(3) What are the resident engineer's courses of action?

b. Contract involves construction of a major barracks complex including 25 dormitories. Project is 75% complete and occupied by troops when the client/customer complains that the opaque panel in the lower window section is allowing precipitation to penetrate during driving rain. The leaks have stained carpet and ceiling tile. Investigation reveals that leaking panels are improperly glazed and do not conform with the contract drawings and specifications. All windows had been factory glazed and were warehoused onsite. Although a vinyl strip covered the glazing, careful examination of the windows prior to, and after, installation would have revealed the construction deficiency.

(1) Identify the steps within the CQC system that failed, thereby creating the construction deficiency.

(2) Identify the steps within the Government's QA system that failed to detect the breakdown in the contractor's QC system.

(3) Keeping in mind that there are 4,200 windows involved in the contract, what corrective measure should the resident engineer employ?

(4) What action should be taken on remaining buildings not

completed?

(5) Assume, because of the magnitude of the problem, that the contractor and window manufacturer refuse to comply with your directive; what tools in the contract does the resident engineer resort to?

c. Contract is for a large barracks complex involving 47 buildings. There are 1,500 fan coil units to be installed throughout the project. As the fan coil units were delivered to the site, the mechanical subcontractor discovered that the units contained 1/2" valve in lieu of a 3/4" as indicated on the contract drawings. Contractor's shop drawings also indicated a 3/4" valve. Contractor immediately advised the resident engineer of the discrepancy. The contractor further advised that the supplier's standard unit is furnished with a 1/2" valve and requested permission to use units as delivered. All units were delivered in one large shipment, and some were needed for immediate installation.

(1) Was the subcontractor quality control system working?

(2) Where does the supplier fit into the problem?

(3) What measures should Government QA personnel now employ?

(4) In this instance, should the resident engineer investigate possible design error in specifying a 3/4" valve?

d. Project includes several masonry buildings requiring joint reinforcement. Contractor proceeded with sample masonry panel erection without approved materials despite Government QA personnel objection. Contractor has now completed wall erection on one building and Government QA personnel discover the contractor is using wrong joint reinforcement. Contractor superintendent states bar joists will be erected tomorrow morning.

(1) What questions first come to mind as to the effectiveness of the contractor's quality control system?

(2) Where did the Government's quality assurance role first break down?

(3) What Contract Clauses should be employed by the resident engineer at this point in time?

e. Project is a small flood control dam with reinforced concrete outlet structure. Contractor testing requirements are specified in detail, and require full-time quality control personnel at concrete batch plant. Concrete production has commenced, and after one week concrete cylinder breaks indicate extremely low compressive strength. It is immediately discovered that the plant measuring devices had not been calibrated.

(1) What is the government's first corrective action to be taken?

(2) What apparent deficiency existed in the contractor's quality control system?

(3) Basically, where did the Government quality assurance role fail?

(4) What Contract Clauses must now be employed by the Government?

f. On an underground electrical distribution project, the contractor was to install a run of 2/0 cable in the system. The project had been completed and accepted two years ago, when it was discovered that this run of cable was #2 instead of 2/0 and totally inadequate for the future load.

(1) What corrective measure, if any, is available to the Government to have the deficient cable replaced?

(2) Should the contractor's quality control system and Government's assurance system prevent isolated instances of this type? How?

g. The contract for construction of the outlet works at a flood control and recreation reservoir required steel gates. The prime contractor to a fabricator in Los Angeles subcontracted the gates. All CQC requirements on the gates were delegated to the fabricator. The resident engineer arranged for Government periodic QA visits to the plant. The plant inspector advised the resident engineer that the welding procedures and the welders had not been certified prior to commencement of fabrication. The QC contained no entry on this subject.

(1) In this instance, what role does the prime contractor assume?

(2) Where did the prime contractor fail in the quality control system?

(3) Where did the Government's QA role break down?

(4) What steps does the Government take now?

h. The contract was for construction of multipurpose classrooms at the Air Force Academy. The rooms were to receive carpet that had been color-coordinated with the room furnishings. Carpet was scheduled for delivery August 1, which allowed only 3 weeks for laying and completion of project prior to start of classes. Carpet was delivered August 1, and it was immediately discovered that the carpet did not adequately match the approved sample.

(1) Could the CQC system have prevented this? How?

(2) Did the Government fail in its QA role by not inquiring as to the status of carpet manufacture?

(3) What steps should the Government take now?

i. Contractor on a major multi-building project started his first concrete placement this morning. Contractor is placing a monolithic foundation using a leased concrete pump truck. Two-thirds of the foundation had been placed when the concrete pump failed. No standby placement equipment was available as required by the contract, which created a cold joint before the pump could be repaired.

(1) What was the first step that failed in the contractor's QC program?

(2) How could the Government's QA role have prevented this incident?

(3) Would proper QC reports alerts to a failure of this type in the system?

(4) What corrective measures should the Government employ to prevent further incidents of this type?

j. An airfield project involved placement of a concrete apron for helicopters. The specifications required the use of jet fuel-resistant joint sealant. The sealant was required to be Government tested and approved prior to use. The specifications further required that the joints be sealed immediately after the curing period. Contractor started placement of concrete when it was discovered that the sealant had not been submitted for testing.

(1) In what meeting should the testing requirements of the contract be discussed in general?

(2) At what phase should this specific testing have been discussed?

(3) Within the Government's QA role, where should we have detected this deficiency?

(4) What corrective measures does the resident engineer use now?

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Module 8: QUALITY CONTROL SYSTEM (QCS) and RESIDENT MANAGEMENT SYSTEM (RMS)

Submodule 1: Introduction and Overview

(Module 8 is mandatory for Contractors having Corps of Engineer contracts. It is optional for Contractors having NAVFAC contracts since some QCS - QC functions may be similar to NAVFAC jobs. Module 8 serves as an overview of a typical computer based construction information management.)

Objectives: After completing this submodule, you will be able to:

- List the benefits of the RMS and QCS applications for controlling Contract Administration and Construction Quality Management.
- List major output products of the QCS and RMS applications.

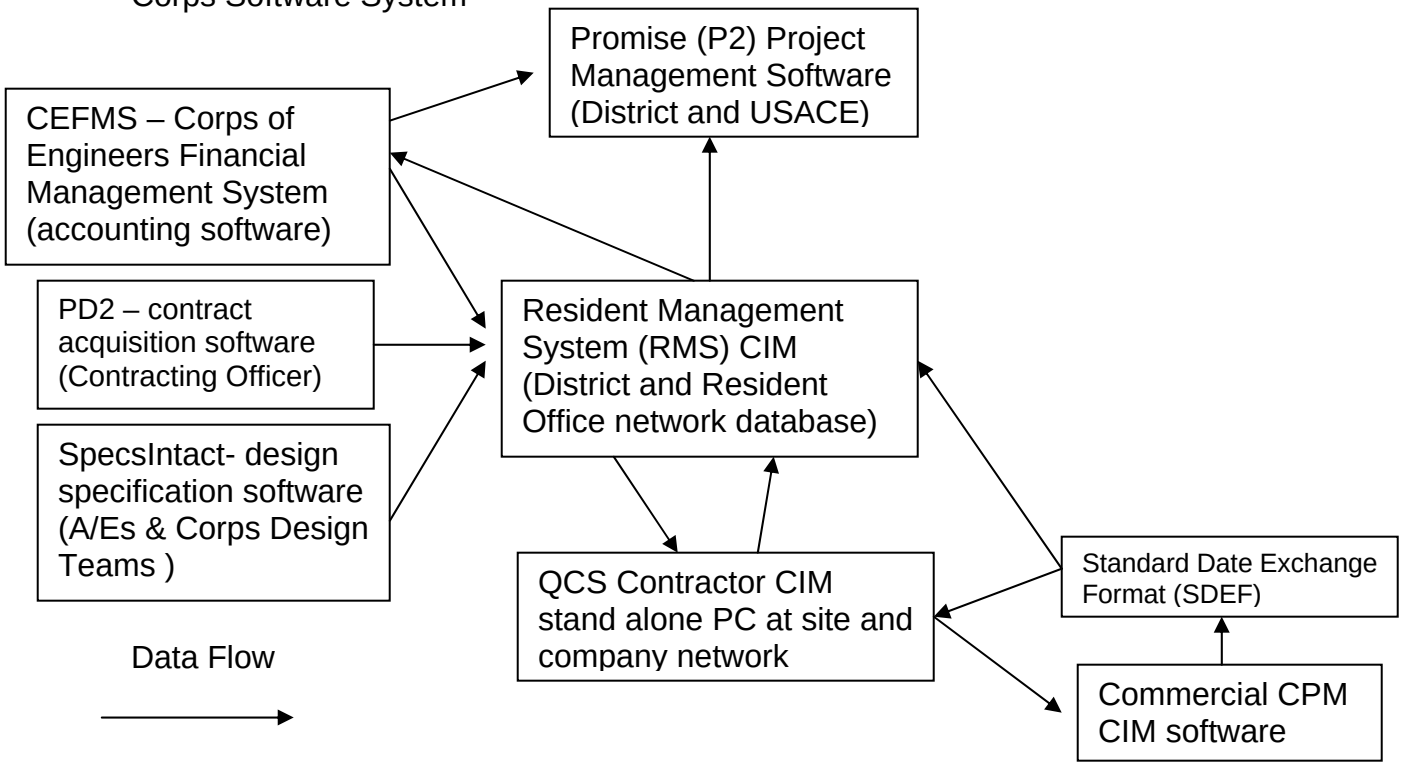
A. Introduction and Background:

Resident Management System (RMS) is a construction information management (CIM) system the Corps of Engineers developed to control construction quality management and contract administration. It has two modules; “RMS” used by Contracting Officer and “QCS” used by Contractor. RMS started in late 1980s developed by a Resident Engineer, Mr. Haskell Barker, Los Angeles District. Early DOS based RMS used a simple database to provide simple automated methods to use desk top PCs for Resident Office construction quality management and contract administration. As computers became more powerful and “windows” made construction applications more “user friendly,” RMS transformed to an integrated Construction Management Information system used at Resident Office, Contractor Offices and Corps District-level Management. In 2001 RMS was mandated by USACE for use Corps-wide.

RMS is maintained by the RMS Center and has become a powerful CIM application. RMS uses an inter-relational database that feeds project construction phase data into Corps financial (CEFMS) and project management (Promise 2 (P2)) applications. RMS can import contractor generated CPM schedules and resource data from a commercial application like P3 using the Standard Data Exchange Format.
"RMS” has a network-based module, used by Corps Resident Engineer and “QCS” module used by Contractor. Both are simple to learn and use. When QCS and RMS are used from the very start of the contract and maintained current, users have found it to be an outstanding tool to increase productivity, improve

contract administration and help document construction quality.

Corps Software System

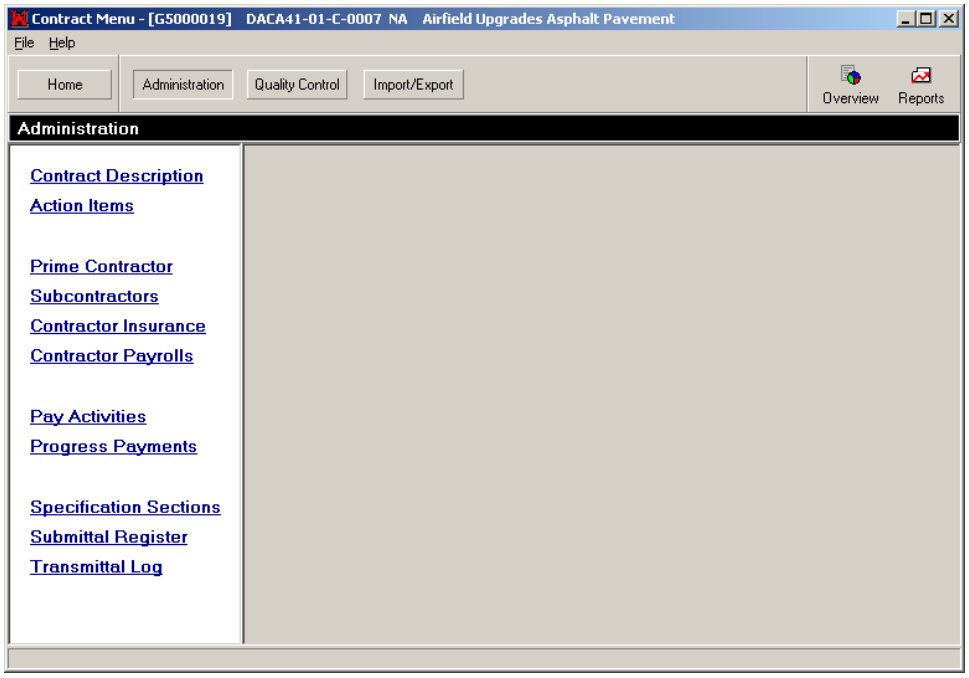


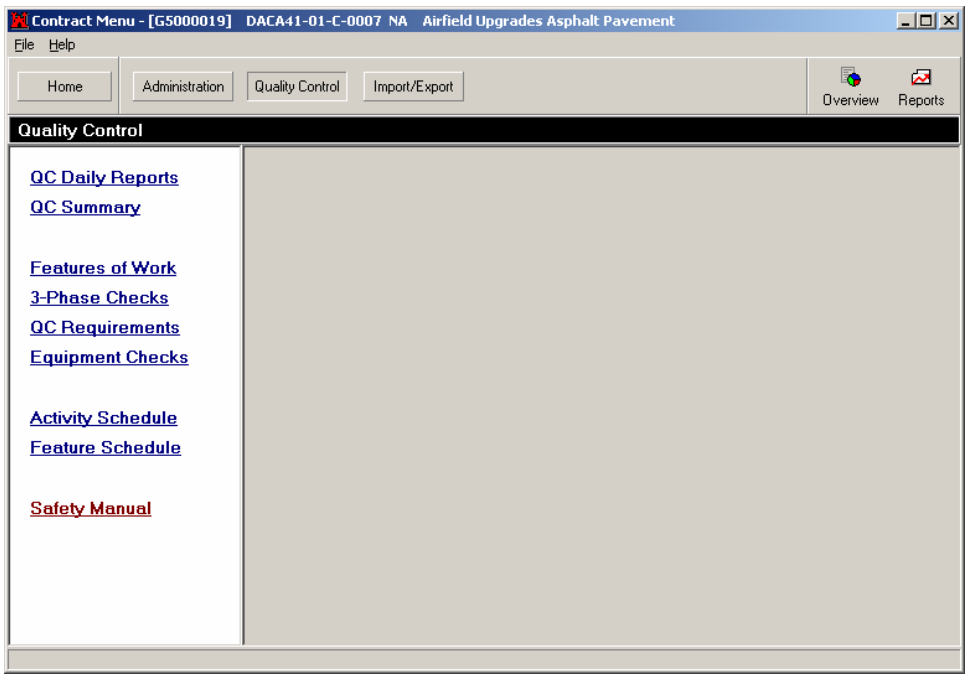
Construction management functions QCS Supports - QCS module of RMS supports following:

Project Construction Activity Planning and Scheduling
Quality Control

- QC and Production Reports
- Procurement Reports
- Submittal and RFI Management
- Contract Administration
- Progress Payments
- Correspondence Tracking
- Safety Administration and Accident Reporting
- Contract Modification Processing
- Management Reporting
- Single-Entry Data Communications with CEFMS and P2

QCS IN CONTRACTS - *Quality Control System* (QCS) is the Contractor's Quality Control module of the Government's *Resident Management System* (RMS). This software has been implemented as Corps' standard worldwide. QCS is to be used on a daily basis by Contractor while performing his normal duties. QCS is specified in Corps contracts in Section 01312 where required computer hardware and detailed execution instructions are described. QCS has templates of most required forms and required reports. Data entry for these are described in detail in the QCS and RMS User's Guides. Two primary screens of QCS, "ADMINISTRATION" and "QUALITY CONTROL" show major QCS functions.





- **Correspondence Management** – QCS / RMS indexes and tracks all incoming and outgoing correspondence related to a contract. This feature allows Contractor and Contracting Officer to maintain a complete historical record of correspondence and effectively relate it to contract and construction management activities over the life of the contract.

- **Submittal Register and Transmittal Control -** A powerful feature of QCS/RMS is it imports the submittal register data file generated by designers from SpecsIntact specifications software. After contract award Contractor can import this data file for the start of his procurement and submittal planning. Once QCS submittal register is completed by Contractor it is exported to the Government RMS database and submittal status can be tracked by Contractor QC Staff, Submittal Reviewers, Contractor and Contracting Officer's Management. Used correctly it ensures more timely review and transmittal turn around.

- **Construction Schedules - QCS** facilitates schedule analysis showing proposed schedule and effect of logic changes. QCS makes maintaining a current schedule and analysis cross-reference among past schedules for delay analysis *much easier.* RMS contains a Standard Data Exchange (SDEF) module and a Schedule Analysis module. The SDEF provides a capability to import and export scheduling and work activity data with several commercial scheduling systems such as Primavera and Open Plan. It is an independent piece of software, which also enables conforming commercial system to communicate with each other. Use of this feature will not only speed up a complex task, but will also help reduce number and size of construction-related disputes and claims.

- **Quality Control Data -** Contractor QC Staff can easily input data for Quality Control daily reports, Phase Checklists, Subcontractor List, Testing Schedules, On-site Equipment Lists, Deficiency Tracking List, Request For Information. Formats built in and once input are available for Contractor management use. Export of updated *quality control data* on a daily basis to the Government provides Area Engineer and District-level managers with construction-related data for decisions and monitoring at levels above Resident Office.

- **Cost Control and Payment -** Contractor can use QCS payment item features for cost control, and tracking of invoices and progress payment requests. Since QCS integrates with RMS and CEFMs, it allows faster quality assurance and contract administration activities by Corps field construction personnel to facilitate prompt payment.

- **Contract Administration** – QCS supports construction contract administration by importing government furnished RMS start data. This allows Contractor and Contracting Officer field construction staffs input construction contract payment and modification data. RMS allows *contract change requests* and *contract modifications* tracking during the contract.

Construction Management Uses - QCS payment, schedule and QC data exported to RMS is standardized for integration with CEFMs and P2 and allows higher levels of Contractor and Corps Management to track a contract's status and allows earlier identification of project-related issues. C*ontract status data* consists of *budget* and *schedule* information plus a field report.

INFORMATION FOR FIELD USE OF QCS

(Note - This portion can be used by QC Managers to train Staff using the QCS software.)

QCS is Government furnished to Contractors without cost. Contractor needs to access http://216.86.193.60/qcs. User's Guides and installation instructions available on Internet website maintained by the RMS Center. Training necessary to learn QCS program usually requires ½ day of instruction and demonstration. QCS setup file is available from the website (http://216.86.193.60/qcs)

QCS program directly benefits Contractor QC Staff in:

- **Daily QC Report.** Provides fully integrated Daily Reporting for Quality Control personnel as required by the contract.
- **Punch List Items**. Provides the mandated Deficiency Tracking System required by the contract.
- **Scheduling.** Provides an easy means to import schedule Activities by importing from commercial scheduling packages (e.g., Primavera).
- **Submittals.** Provides a comprehensive program to submit, process and track Transmittal of Submittal items required by the contract (e.g., ENG Forms 4288 and 4025).
- **Payment.** Automates the Payment Request Process (ENG Form 93) for monthly progress updates.
- **Subcontractors.** Provides comprehensive information on items requiring action by Subcontractors, including work items not yet complete, outstanding submittal actions required, status of Insurances and payrolls, etc.

- **QC Requirements.** Provides complete tracking for *Transfer Property, Installed Property, Quality Control Testing,* and *User Schooling* as required by contract.
- **Three-Phase Inspection.** Provides a tool to alert the contractor of prior similar difficulties and challenges from current and previous contracts for use in the Preparatory, Initial, and Follow-up inspection process (Lessons Learned, Safety Checks, Inspection techniques, etc.).
- **Action Items.** Provides a comprehensive report mechanism itemizing outstanding items or items requiring attention covering all area of the contract administration process.
- **Reports.** The QCS reports are available in each major area and many can be sorted or tailored for desired output.

B. Approach to Data Management:

Corps and Contractor fully integrate QCS/RMS by update data exchanges. Corps provides QCS software package and RMS start data to Contractor's jobsite field office and company office for contract administration and quality control uses. Contractor exports data updates to Corps Resident office on a regular basis by E-mail or on disk.

C. Benefits:

- Reduces input. Once data is entered one time on easy to use input screens, the computer draws on that data for a wide variety of input-output products. Many items are either drawn from other databases (such as Network Analysis data), or selected through "look-up tables" eliminating the need to completely type them.

- Merges data drawn from the RMS and QCS databases to produce useful tools to perform QC and QA functions.

- Provides reports for key suspense items and data.

D. Major CQM Output Products of QCS and RMS:

- *Preconstruction Conference and Coordination Meeting* minutes and agenda.

- Submittal Registers, submittal tracking, and completed (filled in) Transmittal Forms.

- Three-Phase Control checklists, agenda, and meeting minutes.

- A deficiency tracking system.

- Daily QC Reports and QA Reports.

- Various closeout documents (including Installed Property, Transfer Property, User Schooling, etc.).

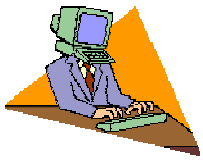
E. Other QCS and RMS Features:

- Tracks pay estimate data, and generates pay requests. Carries scheduling activities and resource data input from commercial scheduling packages (i.e., Primavera©).

- Track variety of personnel data, subcontractor listings, correspondence, RFI, and safety items.

- Once start data is input, QCS / RMS automatically prints heading data onto numerous reports and forms at correct place. Most contracts will include some CQM forms but as QCS versions are updated forms may slightly change. Current forms and reports are available from Resident Office office.

- Because data is being entered and a contract QCS/RMS data base is built early in a job, software allows QC and QA staff to effectively manage an assortment of QC/QA items.



EXERCISE

Submodule 8.1

1. What is the Corps' standard software package used on construction projects?

2. What are the benefits of RMS and QCS?

3. What are the major output products of QCS?

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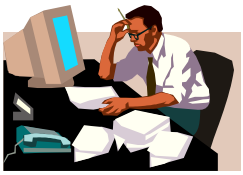

Module 8: QUALITY CONTROL SYSTEM (QCS) AND RESIDENT MANAGEMENT SYSTEM (RMS)

Submodule 2: Quality Control Components

Objective: After completing this submodule, you will be able to:

- Describe three major QC components included in QCS.

A. Preparatory and Initial Phase Meeting Agendas and "Check" Databases:

- Preparatory, Initial, and Follow-up Control phases provide common structure for CQM System in Corps contracts. Included in QCS and RMS is a large database (+/- 12,000 items) of useful quality control data:

  (1) Repetitive deficiencies list developed from lessons learned on past similar Corps contracts

  (2) "Checks," requirements that are "flagged" as being worth special attention.

  Past deficiencies and Checks are linked to definable features of work or specification section number. Once Definable Features of Work are agreed to by QC and QA, a feature of work is selected by Contractor from an available list; QCS then generates an agenda for preparatory or initial control phase meetings. This agenda includes a comprehensive checklist on the definable feature of work to review at the meetings.

- In addition, QC and QA staffs can review contract drawings and specifications to make additions to the special interest "Checks" on any definable feature of work. QCS application will generate information on appropriate form or meeting agenda.

- For QC Manager's use, QCS also automatically generates on meeting agenda forms required applicable tests, submittal status, and relevant contract data, such as schedule activities.

B. Submittal Process in QCS and RMS:

Using QCS linked with RMS makes transmittal tracking and submittal item managing easier. Once data for a submittal item is entered in the system, it never needs to be re-described. By entering dates and action codes promptly, QCS output documents make procurement, submittal tracking and material control easy for QC personnel. QCS integrates important submittal dates to corresponding work break down activities in the construction schedule. Submittal items not yet approved or materials not yet received can be easily identified during Preparatory Phase reports generated by QCS. Outstanding submittal items will be reflected as *Outstanding* on *Pay Estimate Worksheets*. QCS automatically generates and numbers transmittal forms ENG 4025, complete with contract data and items selected for transmittal.

C. QC/QA Deficiency Tracking System:

QCS includes *Punch List Items* that represent a data management feature for entering and keeping track of deficiencies found on the project. Deficiencies can be sorted by various categories for managing correction status. Corps' RMS software has a similar function for tracking government Punch List Items during the contract. Contractor by contract requirements and Corps QA Staff (by Engineering Regulation) must maintain formal deficiency tracking. QCS fulfills this by using software tools. Punch list process involves using entering data in easy to understand input screens and offers a variety of output reports.

D. Summary:

The submodules only provide Contractor and Corps management level overview of QCS and RMS software with general descriptions of major QCS components. QCS and RMS are like any commercial CIM application, data must be entered daily and maintained current. As new users learn QCS and work with it they will find ways that QCS makes their job easier. To be successfully used to best advantage QCS and RMS requires a partnering effort between Contractor and Corps' field office staffs and may require District level support. Each District is responsible for training Corps employees in RMS and to assist Contractor staff use QCS at Corps jobsites.

EXERCISE

Submodule 8.2

What are three major QC components included in RMS?

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Module 9: NAVFAC's Web-based Construction Management System (WebCM)

Objectives: After completing this module, you will be able to:

- Identify functionality available in WebCM.
- List the benefits of WebCM.
- List the major CQM output components of WebCM.

A. Introduction:

WebCM is the principle construction management tool used for the administration of construction contracts in NAVFAC's ROICC Offices. Essentially all projects could (and eventually will) be managed through this web site. WebCM provides a structure for project documents and correspondence, submitting requests for information, daily reports, project submittals and other contract documentation. To help defray the cost of construction administration costs associated with Naval Facilities Engineering Command construction contracting, NAVFAC has contracted with Primavera Systems, Inc. to establish a web-based Project Collaboration site, using PrimeContract®. This service is provided to the Contractor by NAVFAC. This web-based program will serve as a collaborative mechanism for EFD/EFA, ROICC, Customer, and Contractor personnel as they Partner and work together to manage the project. All of the functionality in WebCM is associated with construction administration and Quality Control/Assurance to some extent. WebCM is the standard project collaboration system that will be used throughout NAVFAC.

B. WebCM Functionality:

- Correspondence:
    - The Contractor and the Government will have their own correspondence sent and received file folders.
    - Attachments can be made in the form of a photo, another document, drawing, etc.
    - Contains auto audit tracking features.

- The correspondence folder is separated into three processes: Speed Memos, Correspondence Received and Correspondence Sent

- Daily Reports:
  - Contractor will be able to generate and submit the Production Report, QC Report, Preparatory Phase Checklist, Initial Phase Checklist, and Rework List.
  - The Production Report captures information at the site such as materials delivered, labor hours, equipment used, work completed, remarks on safety at the site, and additional comments.
  - The Quality Control Report (QC Report) captures much more detailed information on the work completed at the job site.
  - The Preparatory Phase Checklist captures information specifically for the First Phase of Control. This form documents the meetings that occur on each Definable Feature of Work to ensure an understanding exists regarding approved submittals, material storage, requirements of the specifications/plans, testing, safety, etc.
  - The Initial Phase Checklist captures information specifically for the Second Phase of Control. This form documents the establishment for workmanship quality required by the contract. Any problems or deficiencies incurred are resolved so the follow on work (3rd Phase of Control) can be installed with no or a minimum of deficiencies.
  - Attachments can be made in the form of a photo, another document, drawing, etc.
  - Routed to the Government for review.
  - Government will be able to generate the QA Report and Non-Compliances
  - Contains auto audit tracking features.

- Submittals:
  - Will import submittal register from a comma-delimited file.
  - The Contractor initiates submittals against the register.
  - Routed to the Government for review or file.
  - Contains auto audit tracking features.

- Requests for Information (RFIs):
  - Can be generated by either the Contractor or the Government.
  - Routed to the other for response.
  - Contains auto audit tracking features and log generation.

- Invoices/Payrolls/Labor Interviews:
  - File folders for the storage of these documents.

- Schedules:
    - File folders for the storage of native schedule files, PDF versions of the schedule and reports.
    - Contains auto document and audit tracking features.

- Safety/Environmental
    - File folders for the storage of safety and environmental related documents.
    - Government will be able to generate Safety Audits.
    - Contains auto document and audit tracking features.

- Photos
    - File Folders for the storage of project photos
    - Ability to view a variety of photo formats
    - Ability to redline photos.
    - Contains auto document and audit tracking features.

- Constructibility Reviews
    - Provides a link to DrChecks.
    - DrChecks is a website for the generation, management, and tracking of constructibility review comments for NAVFAC and other Federal Agencies.

- Commissioning
    - File folder for the storage of all Commissioning related documents.
    - Contains auto document and audit tracking features.

- Schedule Integration
    - Functionalities in WebCM have the schedule integration feature built into it. Daily Reports, RFIs, Submittals, etc. can be referenced to its respective Schedule Activity ID. This feature makes the schedule the central document for data retrieval from all documentation in WebCM.

- Other folders also exist for the storage of the Contract Drawings, Contract Specifications, Contract Modifications, Meeting Minutes, Reports, etc.

C. Benefits of Using WebCM:

- Usage of Industry's cutting edge software technology.

- Instant upgrades that are transparent to the user.

- Reduced response time on RFIs, Submittals, etc.

- Enhanced project communication between all project stakeholders.
- Real time project status management and data retrieval.
- Better visibility of projects to Navy clients.
- Better visibility to Contractor & Government Senior Management.
- Reduced administration expenses.
- Real time collaboration and problem solving.

D. Major CQM Output Products of WebCM:

- Submittal Register, submittal tracking (date/time stamping in GMT time).
- Three-Phase Control checklists, agenda, and meeting minutes.
- Deficiency tracking system.
- Daily QC and QA Reports.
- Daily Production Reports.
- Schedule Integration throughout system for data retrieval and report writing.
- Central storage area for all CQM and Production documents.

E. Summary:

The information provided in this module is only an overview of NAVFAC's WebCM system. A web-based training system is available that covers navigation, search techniques, running system reports and indepth knowledge of each functionality covered above. NAVFAC provides the web-based training and access to WebCM when a contractor has an active construction contract with NAVFAC.

EXERCISE

Module 9

1. What are the benefits of using WebCM?

2. List the major CQM output products of WebCM.

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

NOTES
CONSTRUCTION QUALITY MANAGEMENT
FOR CONTRACTORS

LIST OF ACRONYMS

ABC	Associated Builders and Contractors
ACO	Administering Contracting Officer (NAVFAC)
AE	Area Engineer
A-E	Architect-Engineer
AGC	Associated General Contractors
AHA	Activity Hazard Analysis
ALnO	Activity Liaison Officer (NAVFAC)
AREICC	Assistant Resident Engineer in Charge of Construction (NAVFAC)
AROICC	Assistant Resident Officer in Charge of Construction (NAVFAC)
CADD	Computer-Aided Drafting and Design
CC	Contract Clauses
CCNCN	Construction Contract Non-Compliance Notice
CEFMS	Corps of Engineers Financial Management System
CO	Contracting Officer
COAR	Contracting Officer's Authorized Representative (NAVFAC)
COR	Contracting Officer’s Representative
COTR	Contracting Officer's Technical Representative (NAVFAC)
CQC	Contractor Quality Control
CQM	Construction Quality Management
CSI	Construction Specifications Institute
DACA	Department of the Army Construction Army
DACW	Department of the Army Civil Works
DALTS	Duct Air Leakage Tests
DFOW	Definable Feature of Work (NAVFAC)
DoD	Department of Defense
EFA	Engineering Field Activity (NAVFAC)
EFD	Engineering Field Division (NAVFAC)
ENG Form	Engineer Form
EM	Engineer Manual
EP	Engineer Pamphlet
ER	Engineer Regulation
FAR	Federal Acquisition Regulations
FIO	For Information Only
FOIA	Freedom of Information Act
GA	Government Approved

HQUSACE	Headquarters U.S. Army Corps of Engineers
HVAC	Heating, Ventilating, and Air Conditioning
ISO	International Organization for Standardization
ITR	Independent Technical Review
NAS	Network Analysis System
NAVFAC	Naval Facilities Engineering Command (NAVFAC)
OICC	Officer in Charge of Construction (NAVFAC)
O&M	Operations and Maintenance
P	Publication (NAVFAC)
P2	Promise 2
PCO	Procuring Contracting Officer (NAVFAC)
PL	Project Leader (NAVFAC)
PWC	Public Works Center (NAVFAC)
PWD	Public Works Department (NAVFAC)
PWO	Public Works Officer (NAVFAC)
QA	Quality Assurance
QA REP	Quality Assurance Representative (NAVFAC)
QAR	Quality Assurance Report
QC	Quality Control
QCM	Quality Control Manager
QCS	Quality Control System
RE	Resident Engineer
RFI	Request For Information
RMS	Resident Management System
ROICC	Resident Officer in Charge of Construction (ROICC)
SCS	Supervisory Contract Specialist (NAVFAC)
SD	Submittal (Description) Identification
SDEF	Standard Data Exchange
SGE	Supervisory General Engineer (NAVFAC)
TABS	Testing, Adjusting, and Balancing System
UFGS	Unified Facilities Guide Specifications
USACE	U.S. Army corps of Engineers

VE	Value Engineering
VECP	Value Engineering Change Proposal
WebCM	Web-based Construction Management System (NAVFAC)

REFERENCES

The following references are applicable to this course. You are encouraged to have current copies available for students to use during the course. Reference websites:
Contract Clauses: http://www.arnet.gov/far/
UFGS: http://www.ccb.org/docs/ufgshome/UFGSToc.htm
Corps: http://www.usace.army.mil/publications/
Navy: http://navfacilitator.navfac.navy.mil/projects/p-445.pdf

CONTRACT CLAUSE, ACCIDENT PREVENTION, FAR 52.236-13.

CONTRACT CLAUSE, BUY AMERICAN ACT -- CONSTRUCTION MATERIALS, FAR 52.225-5 AND 52.225-9.

CONTRACT CLAUSE, DEFAULT (FIXED PRICE CONSTRUCTION), FAR 52.249-10.

CONTRACT CLAUSE, INSPECTION OF CONSTRUCTION, FAR 52.246-12.

CONTRACT CLAUSE, MATERIAL & WORKMANSHIP, FAR 52.236-5.

CONTRACT CLAUSE, PRECONSTRUCTION CONFERENCE, FAR 52.236-26.

CONTRACT CLAUSE, SITE INVESTIGATION & CONDITIONS AFFECTING THE WORK, FAR 52.236-3.

CONTRACT CLAUSE, SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION, FAR 52.236-21.

CONTRACT CLAUSE, SUPERINTENDENCE BY THE CONTRACTOR, FAR 52.236-6.

CONTRACT CLAUSE, VE -- CONSTRUCTION, FAR 52.248-3.

UFGS 01330, SUBMITTAL PROCEDURES.

UFGS 01450N, CONSTRUCTION QUALITY CONTROL.

UFGS 01451A, CONTRACTOR QUALITY CONTROL.

UFGS 01451N, DESIGN AND CONSTRUCTION QUALITY CONTROL.

EM 385-1-1, SAFETY AND HEALTH REQUIREMENTS MANUAL.

EP 11-1-4, VE BENEFITS AND THE CONSTRUCTION CONTRACTOR.

EP 415-1-261, QUALITY ASSURANCE REPRESENTATIVE'S GUIDE.

EP 715-1-2, A GUIDE TO EFFECTIVE CONTRACTOR QUALITY CONTROL.

ER 1180-1-6, CONSTRUCTION QUALITY MANAGEMENT.

CORPS OF ENGINEERS FORMS

The Forms in this Section are for training purposes only. Your Facilitator will provide you with information on how to obtain current forms.

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

CONTRACTOR

SPECIFICATION SECTION

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:

FROM:

CONTRACT NO.

CHECK ONE:
☐ THIS IS A NEW TRANSMITTAL
☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*

PROJECT TITLE AND LOCATION

CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT SPEC. PARA. NO. *e.*	CONTRACT REFERENCE DOCUMENT DRAWING SHEET NO. *f.*	FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

DATE

ENG FORM 4025-R, MAR 95 *(ER 415-1-10)* EDITION OF SEP 93 IS OBSOLETE. SHEET ___ OF ___ (Proponent: CEMP-CE)

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

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).

F -- Receipt acknowledged.

FX -- Receipt acknowledged, does not comply as noted with contract requirements.

G -- Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

NAVFAC FORMS

The Forms in this Section are for training purposes only. Your Facilitator will provide you with information on how to obtain current forms.

REQUEST FOR INFORMATION (RFI) TRANMITTAL AND REPLY: RFI#_____

The RFI system is intended to provide an efficient and formal mechanism for responding to contractor's request for information. It is NOT an authority to proceed with a changed condition. If you consider the RFI response a changed condition, written notice to the ROICC is required in accordance with contract provisions.

From: (Contractor) _____ Date: _____

To: (ROICC) _____

Subj: Contract N_____-C-_____, _____

Specification Section _____ Paragraph _____

Drawing _____ Details_____

Information Required: _____

_____

_____

_____

A response to this RFI is required by _____

Schedule Activities being effected, by order of most impact: _____

_____ _____

_____ QC Manager

.....

From: (Designer)_____ Date: _____

To: (ROICC) _____

Recommendation: _____

_____

_____

_____

_____

_____

Designer

.....

From: (ROICC) _____

To: (Contractor) _____

Reply: _____

_____

_____

_____

Clarification Only (No additional time or costs)

_____

Project Engineer

REQUEST FOR INFORMATION (RFI)

I. BACKGROUND

Requests for information represent a convenient, formal procedure to record, track and monitor contractor questions concerning a particular construction contract. The use of the three-part Request for Information (RFI) format encourage the contractor to submit questions in writing and research the questions prior to submission by requiring the contractor to reference specifications and drawing numbers as part of the question. Secondly, the three-part format encourages the use of the designer in the RFI process to clarify the intent and interpretation of the plans and specifications and to provide advice on questions that arise during construction. Finally, the RFI three-part form provides a convenient mechanism for a written ROICC response, assuring clear and concise answers to a contractor questions. Rapid and correct responses to RFIs keep contract work moving smoothly and provide one of the best chances to resolve a question before letting it grow into a change or dispute.

II. RFI FORM

The use of the standard RFI format should be encouraged by the ROICC at all pre-construction conferences and a supply of the RFI forms should be made available to the contractor. On larger and more complex projects, the government often provides specific contract provisions relating form and processing of RFIs. The status of all outstanding RFIs should be discussed at the quality control meeting and recorded into the minutes.

III. RFI PROCEDURES

RFIs are processed in a manner similar to the procedures established for processing of contractor submittals. The contractor should transmit the original and three copies of all RFIs to the designer and send one copy (5th) to the ROICC directly. The ROICC copy assures that the RFI will be tracked and expedited, as necessary, by the ROICC. A written response for all RFIs is expected in an average of seven working days, but more complex questions may require a longer time. RFIs requiring a response in less than seven working days may be expedited through facsimile and electronic mail. These should be managed by exception to ensure they are answered as quickly as possible.

ROICC responses to RFIs must be carefully considered and drafted to preclude misinterpretation, misdirection or contract change. The ROICC should review the content of the designer's recommendation to assure contractual adequacy. If an answer to an RFI clearly indicates that the contractor is due an equitable adjustment for any direction given, the ROICC should send a Request for Proposal (RFP) with an RFI response. The ROICC should also set up a Proposed Change Order (PCO) number and file for this change. A RFI response in NOT intended to be an authority to proceed with a changed condition. If the contractor considers the RFI response a changed condition, written notice is required in accordance with contract provisions.

(back side)

CONTRACTOR'S SUBMITTAL TRANSMITTAL

	CONTRACT NO	DATE
	TRANSMITTAL/RESUBMITTAL NO.	PREVIOUS SUBMITTAL NO (if applicable).
FROM CONTRACTOR	PROJECT TITLE AND LOCATION	
TO		

CONTRACTOR USE ONLY	REVIEWER USE ONLY	GOVT USE ONLY
List only one specification division per form *List only one of the following categories on each transmittal form and indicate which is being submitted* ☐ Contractor Approval ☐ Govt Approval ☐ Variance Request (Govt Approval)	ACTION CODES A – Approved RR – Revise and Resubmit (Disapproved) AN – Approved As Noted ANR – Approved As Noted Resubmit RA – Receipt Acknowledged	ACTION CODES A – Approved RR – Revise and Resubmit (Disapproved) AN – Approved As Noted ANR – Approved As Noted Resubmit RA – Receipt Acknowledged

ITEM	SPEC. SECT. & PARA. And/or DWG. NO.	ITEM IDENTIFICATION (Type, size, model no., Mfg. Name, drawing or brochure number)	NO. OF COPIES	RECOMMENDED ACTION	REVIEWER'S INITIALS AND DATE	ACTION	GOVERNMENT REPRESENTATIVE INITIALS, CODE AND DATE

CONTRACTOR'S CERTIFICATION AND COMMENTS: IT IS HEREBY CERTIFIED THAT THE EQUIPMENT AND/OR MATERIAL SHOWN AND MARKED IN THIS SUBMITTAL IS THAT PROPOSED TO BE INCORPORATED INTO THIS CONTRACT, IS IN COMPLIANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS, AND CAN BE INSTALLED IN THE ALLOCATED SPACES.	DATE RECEIVED BY REVIEWER	DATE RECEIVED BY GOVT
NOTE: APPROVAL BY THE GOVERNMENT OF SUBMITTED ITEMS DOESN NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH ALL THE REQUIREMENTS OF THE CONTRACT PLANS AND SPECIFICATIONS	REVIEWER'S COMMENTS	GOVT COMMENTS

CONTRACTOR'S QC REP (SIGNATURE)	DATE	REVIEWER'S SIGNATURE	DATE	GOVT REP SIGNATURE	DATE

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

CONTRACTOR

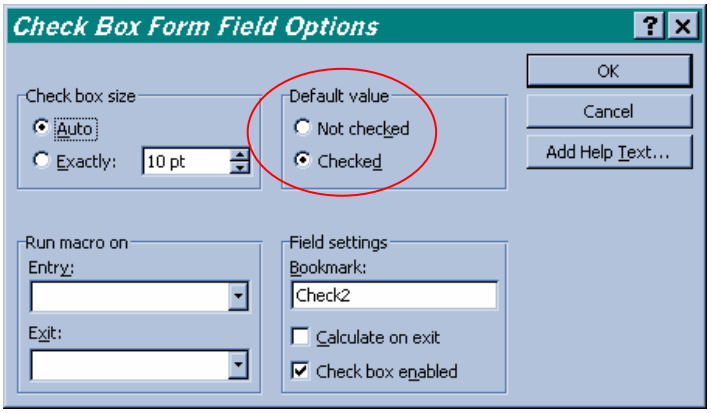
ACTIVITY NO	TRANSMITTAL NO.	SPEC SECTION NO.	DESCRIPTION OF ITEM SUBMITTED	PARAGRAPH NO.	CLASSIFICATION - GOVT. OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RECEIVED FROM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RECEIVED FROM CONTR	DATE FORWARD TO OTHER REVIEWER	DATE RECEIVED FROM OTHER REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)

Original size 8 1/2 X 14. This form reduced for printing printing purposes

Instructions for Using Report Forms in MS-Word

In the Report Header, fields that have instructional text such as "Enter Title and Location of Construction Contract Here" Prompt the user to enter the information in a specific location, governed by the field. Single mouse click anywhere in the field and the field will darken. Entry of text/data at this point will delete the instructional text in the field and will be replaced with entered text/data.

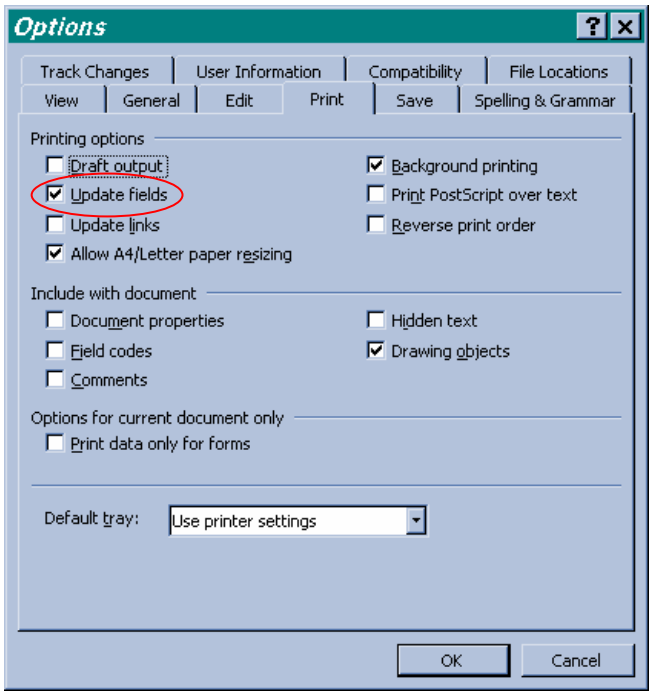
All check boxes are all defaulted as unchecked (i.e.; ☐). To check the box (i.e.; ☒), double click the box and the "Check Box Form Field Options" box will appear. In the "Default value" section of the box, click in the Radio Button for "Checked", then click on the "OK" button and the box will be checked.



The "Hour" fields where intentionally not programmed to total. If the Contractor deleted the formula in a field within the range that was to be totaled, the total would be wrong.

With the ability to [unlimitedly] expand the Contractor Production Report and Contractor Quality Control Representative Report, their Continuation Sheets are obsolete.

In the footer of each form are data fields for the Sheet number and the total number of sheets in the report (Sheet 1 of 2). The first number will generate itself when pages of the report are added. But MS-Word will not automatically update the second number. To update the NumPages field, click the field or the field results and then press F9. You can also click **Options** in the **Tools** menu, click the **Print** tab, and then select the **Update fields** check box.



PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

SPEC SECTION	DATE
Enter Spec Section # Here	Enter Date (DD/MMM/YY)

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
Enter Cnt# Here	Enter DFOW Here	Enter Sched Act ID Here	Enter Index# Here

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED? _____

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING? _____

CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)

COMMENTS: _____

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN? _____

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS. _____

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK. _____

CLARIFY ANY DIFFERENCES. _____

PRELIMINARY WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NOT, WHAT ACTION IS TAKEN? _____

TESTING	IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.
	WHEN REQUIRED?
	WHERE REQUIRED?
	REVIEW TESTING PLAN.
	HAS TEST FACILITIES BEEN APPROVED?
SAFETY	ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐
	REVIEW APPLICABLE PORTION OF EM 385-1-1.
MEETING COMMENTS	NAVY/ROICC COMMENTS DURING MEETING.
OTHER ITEMS OR REMARKS	OTHER ITEMS OR REMARKS:

QC MANAGER DATE

4296/2B (9/9/98) SHEET 2 OF 2

INITIAL PHASE CHECKLIST

SPEC SECTION	DATE
Enter Spec Section # Here	Enter Date (DD/MMM/YY)

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
Enter Cnt# Here	Enter DFOW Here	Enter Sched Act ID Here	Enter Index# Here

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

PROCEDURE COMPLIANCE

IDENTIFIY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS.

COMMENTS:

PRELIMINARY WORK

ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN?

WORKMANSHIP

ESTABLISH LEVEL OF WORKMANSHIP.

WHERE IS WORK LOCATED?

IS SAMPLE PANEL REQUIRED? YES ☐ NO ☐

WILL THE INIITAL WORK BE CONSIDERED AS A SAMPLE? YES ☐ NO ☐

(IF YES, MAINTAIN IN PRESENT CONDITION AS LONG AS POSSIBLE AND DESCRIBE LOCATION OF SAMPLE)

RESOLUTION

RESOLVE ANY DIFFERENCES.

COMMENTS:

CHECK SAFETY

REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS

COMMENTS:

OTHER

OTHER ITEMS OR REMARKS

QC MANAGER DATE

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE	Enter (DD/MMM/YY)
REPORT NO	Enter Rpt # Here

PHASE	CONTRACT NO	Enter Cnt# Here	CONTRACT TITLE	Enter Title and Location of Construction Contract Here

PREPARATORY

WAS PREPARATORY PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

INITIAL

WAS INITIAL PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

Schedule Activity No.	Description

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

Schedule Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.

Schedule Activity No.	Description

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

AUTHORIZED QC MANAGER AT SITE DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

Schedule Activity No.	Description

GOVERNMENT QUALITY ASSURANCE MANAGER DATE

4296/2 (9/98)

SHEET 1 OF 1

GOVERNMENT QUALITY ASSURANCE (QA) REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE	Enter Date (DD/MMM/YY)
REPORT NO	Enter Report # Here

CONTRACT NO	TITLE AND LOCATION
Enter Cnt# Here	Enter Title and Location of Construction Contract Here

Status

WORKING?	YES	NO	IF NO, WHY NOT:
	☐	☐	

WEATHER CONDITIONS:

Check Points

	YES	NO	REMARKS:
SUPERINTENDENT ON SITE	☐	☐	
QC MANAGER ON SITE	☐	☐	
QC REPORTS CURRENT	☐	☐	
AS-BUILTS CURRENT	☐	☐	
SUBMITTALS APPROVED FOR FOR ONGOING WORK	☐	☐	
DEFICIENCY LIST REVIEWED	☐	☐	

WORK OBSERVED/DEFICIENCIES NOTED/SAFETY ISSUES DISCUSSED/QA TESTS AND RESULTS:

Schedule Activity No	DESCRIBE OBSERVATIONS

MEETING/CONFERENCE NOTES (INCLUDING PARTICIPANTS):

Schedule Activity No.	NOTES

INSTRUCTIONS GIVEN OR RECEIVED/CONTROVERSIES PENDING:

Schedule Activity No.	INSTRUCTIONS/CONTROVERSIES

QA REPRESENTATIVE DATE

SUPV INITIALS DATE

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

CONTRACT NO Enter Cnt# Here	TITLE AND LOCATION Enter Title and Location of Construction Contract Here	DATE	Enter Date (DD/MMM/YY)
		REPORT NO	Enter Report # Here
CONTRACTOR Enter The Contractor's Company Name Here	SUPERINTENDENT Enter Superintendent's Name Here		

AM WEATHER	PM WEATHER	MAX TEMP (F)	MIN TEMP (F)
Enter AM Weather Data Here	Enter PM Weather Data Here	Enter Max Temp Here	Enter Min Temp Here

WORK PERFORMED *TODAY*

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY					
	WAS A JOB SAFETY MEETING HELD THIS DATE? (If YES attach copy of the meeting minutes)	☐ YES	☐ NO	TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
	WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
	WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	
	WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO		

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED	☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

CONTRACTOR/SUPERINTENDENT DATE

4296/1 (9/98)

SHEET 1 OF 1

REWORK ITEMS LIST

Contract No. and Title: Enter Contract # and Title Here

Contractor: Enter Contractor's Company Name Here

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

TESTING PLAN AND LOG

CONTRACT NUMBER Enter Contract # Here			PROJECT TITLE AND LOCATION Enter Contract Title and Location Here							CONTRACTOR Enter Contractor's Company Name Here	
SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			

ASSESSMENT WORKSHEET OF
CONTRACTOR QUALITY CONTROL PROGRAM

ROICC OFFICE: _____ **DATE:** _____
CONTRACT TITLE: _____
CONTRACTOR: _____ **CONTRACT % COMPLETE:** _____
SUPERINTENDENT: _____ **QC MANAGER:** _____

CATEGORY	Checklist Items	Yes	No	N/A	Date Corrected
1. CONTRACT QC SPECIFICATION 01450	1. Is the approved QC Plan maintained at the job site?				
	2. Was the QC Plan presented in a 3-ring Binder w/ Tabs to each section?				
	3. If interim QC Plan was submitted, has the final QC Plan been submitted & approved?				
	4. Does the QC Manager have a CQM Certificate?				
2. QUALITY CONTROL ORGANIZATION	5. Is there a Chart showing the Contractor's QC organization structure?				
	6. Does chart show relationship of QC organization to other elements of the company?				
	7. Does it show the relationship to subcontractors, suppliers, outside organizations?				
	8. Is the QCM responsible for conducting safety inspections?				
	9. Is the alternate QC M working on site in any other capacity at this time?				
3. NAMES & QUALIFICATIONS					
	10. Is there an approved resume of the QC Manager on file with the QC Plan?				
	11. Is there a resume of Alternate QCM?				
	12. Is acceptance of the above match qualifications & past experience / specifications?				
	13. Is the QCM aware of the requirement to be on site at all times when work / production is in progress?				
4. DUTIES & RESPONSIBILITIES					
	14. Are the duties, responsibilities and authority of the QC Manager in writing?				
	15. Is the Alternate QC Manager / other QC Specialists responsibilities in writing?				
	16. Is the QC organization as written in the specifications to be run by Prime Contractor and QCM works for prime?				
	17. Are the only duties/responsibilities of QC M is manage and implement QC program?				
	18. Does the QCM understand he is responsible for managing/coordinating 3-Phase control & documentation performed by any QC Specialists, testing Laboratory personnel, and other inspection and testing personnel required by this contract?				
5. OUTSIDE ORGANIZATIONS	19. Is there a list of Outside Organizations: design agents, consultants, subcontractors that will perform work or services for the prime?				
	20. Does this list indicate the general scope of the work and services to be performed?				
6. APPOINTMENT LETTER (S)	21. Is there an appointment letter, signed by an officer of the firm, appointing the QC M and outlining his/her duties, responsibilities and authority?				
	22. Does this letter include the authority to immediately stop any segment of work not complying with plan/spec, and the removal and replacement of any defective work?				
	23. Does this letter provide the authority for the QCM to act as the agent of the contractor?				
	24. Does the CQM certify material/equipment delivered/installed on and off site comply with plan/spec? Reports any deficiencies and what remedial action was taken?				
	25. Does he supervise/coordinate inspection/tests made by other members of the QC Organization?				
	26. Does the QCM insure the QC Staff is adequate to meet its responsibilities?				
	27. Is the QCM responsible for all testing required in the contract, and that the results are reported correctly?				
	28.Does the QCM have the authority to remove any individual from the site who fails to perform work in skillful, safe, and workmanlike manner or whose work do not comply with plans/specs?				
	29. Does the letter state QCM has no authority to deviate from plans/specs without prior approval, in writing, from the Contracting Officer or designated representative?				
	30. Does the letter state the QC Organization will be adequately staffed with qualified personnel to perform all the detailed inspections and testing specified in plans/specs?				
	31. Is a copy of the approved QC Plan in the job site file complete with up to date approved, revisions/ filled in log of submittals?				
	32. Is it also written that As-Built Drawings will be kept current by the QCM showing all deviations made from the contract drawings on a daily/weekly basis.				

CATEGORY	Checklist Items	Yes	No	N/A	Date Corrected
7. SUBMITTAL PROCEDURES	33. Were procedures provided for reviewing all shop drawings, samples, certificates, or other submittals for contract compliance, including name of person authorized to sign?				
	34. Were procedures for processing submittals discussed at the Pre-con meeting, and responsibility for approving each submittal included in plan?				
	35.Does the Submittal Register shown in the QC Plan show, all required submittals?				
8. TESTING LAB INFORMATION	36. Is there a list of all the testing laboratories to be employed by the Prime Contractor, a description of their services, and included in the submittal procedures?				
	37. Is there any indication what accreditation authority certified these testing laboratories?				
9. TESTING PLAN AND LOG	38. Is the standard Testing Plan and Log used in this QC Plan?				
	39. Does this plan show all required tests, referenced by specification section, the frequency, and person responsible for each tests?				
	40. Is the testing plan maintained by showing status of all tests required by the contract?				
10. REWORK	41. Is there written internal procedures to document and track Rework Items?				
	42. Is the standard "Rework Items List" used in QC Plan, by the contractor?				
	43. Does the contractor provide procedures to complete and sign off any deficiencies?				
	44. Does the contractor maintain at the job site up-to-date Non-Compliance Check-Off list log of deficiencies on all non-conforming work?				
11. DOCUMENTATION PROCEDURES	45. Is the Contractor using the Navy standard "Contractor Quality Control Report" forms?				
	46. Is the Contractor using the Navy standard "Contractor Production Report" forms?				
	47. Is the Contractor correctly filled out these forms and turning they in on time?				
12. 3-PHASES OF CONTROL: LIST OF DEFINABLE FEATURES OF WORK	48. Has the Contractor provided his lists of Definable Features of Work (DFOW)?				
	49. Has this list of DFOW's been cross-referenced into the production activity Schedule used by the Superintendent?				
	50. Have all Critical Path activities or Network Analysis Activities identified as DFOWs been added to this list?				
13. PREPARATORY PHASE CHECKLIST	51. Is the QC Manager using the standard "Preparatory Phase Checklist" form provided, when addressing each DFOW ?				
	52. Is the QCM actually holding Preparatory Phase Checklist meetings (planning) for each DFOW and filling out this form correctly?				
	53. Does the QCM maintain at the Job site an active file of preparatory phase meetings conducted for each DFOW, in accordance to the schedule?				
14. INITIAL PHASE CHECKLIST	54. Is the QCM using the standard "Initial Phase Checklist" forms provided, when addressing each DFOW?				
	55. Is the QCM actually holding Initial Phase Checklist meetings (workmanship) for each DFOW and filling out this form correctly?				
	56. Does the QCM maintain at the job site an active file of all initial phase meetings conducted for each DFOW, in accordance to the schedule?				
15. PERSONNEL MATRIX	57.Does the QC Plan require this Personnel Matrix?				
	58. Does this Matrix do a good job of provide/assigning QC responsibilities?				
	59. Does the matrix list by name, i.e., testing, inspections, and QC Specialists?				
16. COMPLETION INSPECTION PROCEDURES	60. Are the "Completion Inspection" Procedures outlined in the QC Plan?				
	61. Is the QC Manager responsible for the Punch-out Inspection process?				
	62. Does the contractor requests Government to attend the Pre-Final Inspection?				
	63. Does the Contractor requests customer to attend the Final Inspection?				

SCORING: Total applicable for each category = X (where X includes responses for category of "Yes" and "No" but does not include N/A
Total with "Yes" responses for category = Y

SCORE FOR EACH CATEGORY: **SCORE RATE EQUATION = Y/X**

1. CONTRACT QC SPECIFICATION: ___
2. QC ORGANIZATION: ____
3. NAMES & QUALFICATIONS: _____
4. DUTIES & RESPONSIBILITIES: _____
5. OUTSIDE ORGANIZATIONS: _____
6. APPOINT LETTER(s) ____
7. SUBMITTAL PROCEDURES: ____
8. TESTING LAB INFORMATION: ____
9. TESTING PLAN & LOG: ____
10. REWORK PROCEDURES ____
11.DOCUMENT PROCEDURES _____
12. 3-PHASE CONTROL: DFOW _
13. PREPARATORY CHECKLIST: _____
14. INITIAL PHASE CHECKLIST: _____
15. PERSONNEL MATRIX: _____
16. COMPLETION INSPECT PROCEDURES: ____

OVERALL RATING = LOWEST RATING FOR ANY CATEGORY: _____
OVERALL COMPOSITE SCORE = (ALL "YES" a nswers/All applicable answers (%): _____

CONSTRUCTION CONTRACT NON-COMPLIANCE NOTICE

CONTRACTOR/RESPONSIBLE INDIVIDUAL	NOTICE NUMBER
CONTRACT NUMBER AND TITLE	DATE
SPECIFICATION PARAGRAPH AND/OR DRAWING NUMBER	CONTRACTOR REPLY BY DATE
REFERENCE (Shop Drawing, Certification, CQC Report Number, etc.)	

DEFICIENCY IN WORKMANSHIP AND/OR MATERIAL

CORRECTIVE ACTION ACCOMPLISHED (This block filled in by Contractor)

QA REPRESENTATIVE

NAME: TITLE:

DATE NOTED: SIGNATURE: _____

TEAM LEADER

NAME: TITLE:

DATE ISSUED: SIGNATURE: _____

CONTRACTOR'S ACKNOWLEDGMENT

NAME: TITLE:

DATE RCV'D: SIGNATURE: _____

This Notice does NOT authorize any work not included in the contract and shall not constiute a basis for additional payment or time. If you are in disagreement with this Notice, contact the Resident Officer in Charge of Construction immediately.

DISTRIBUTION
Original - QC Manager (Original)
Copies to - Contractor's Home Office, QA Representative, Contract File

This is an example of a NAVY QC Plan, but it is not complete. Review this plan and comment on how it could be improved to meet the contract requirements.

CHADWICK

CONSTRUCTION COMPANY

QUALITY CONTROL (QC) PLAN

FOR CONTRACT #N63470-99-D-5555

BOSS Headquarters Building
Cheatham Annex
Williamsburg, Virginia

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TAB I. Quality Control (QC) Organization

The specific personnel assigned to this project are provided as follows:

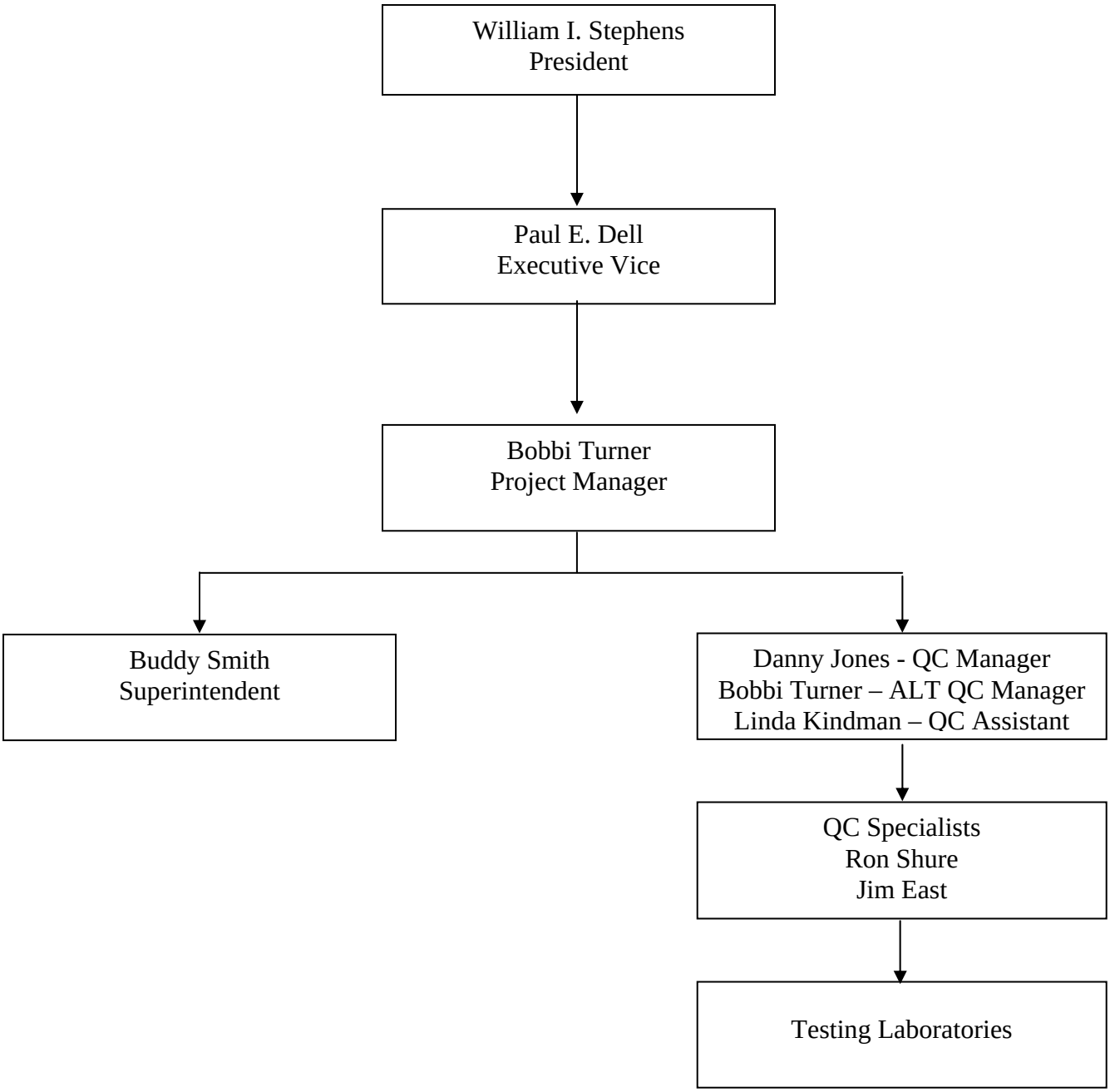
Danny Jones - Quality Control (QC) Manager
Bobbi Turner – Alternate QC Manager
Linda Kindman – QC Assistant

QC Specialists:

Ron Shure – Concrete Placements
Jim East – HVAC, DALT, TAB, Controls

CHADWICK CONSTRUCTION COMPANY

Quality Control Organization Chart



TAB II. Names and Qualifications

Chadwick Construction Company proposes that the following individuals be approved as the Quality Control Organization members for this project. Their resumes have been included for your review and approval.

Vice President – Paul E. Dell

QC Manager – Danny Jones

Alternate QC Manager – Bobbi Turner

Danny Jones
QC Manager

Work History:

6/00 - Present

Chadwick Construction Company, Hampton, VA
QC Manager

QC Manager for various projects in the Hampton, Norfolk and Virginia Beach, Virginia areas.
Camp Allen Phase 3, Norfolk, VA. Renovation of Navy Family Housing, 119 units total. Work included: demolition and reconstruct building exterior façade, interior finishes, underground utilities, asbestos and lead abatement, and site finishes.
120 Unit Barracks Renovation, Langley AFB, Hampton, VA. Work included: demolition and reconstruct building exterior finish, interior walls, floors and toiletries, underground utilities and site finishes.

8/90 – 6/00

Milton Construction Company
Superintendent and QC Manager

Repairs to Hangar 122, NAS Oceana, Virginia Beach, VA
Compressed Air Supply/Retrofit Test Cell, NAS Oceana, Virginia Beach, VA
1000 member Army Reserve Center, Fort Eustis, Virginia
Renovation to Warehouse Bay 52-65, Defense Supply Center, Richmond, VA
All renovations work included: demolition and reconstruction of Government Facilities; exteriors, interiors, floors, toiletries, utilities and Roofing.

Education/Qualifications:

- AAS in Building Construction, University of Maryland, June 1989
- AAS in Business Management, Commonwealth College, Virginia Beach, VA, 1992
- Army Corps of Engineers / Naval Facilities Engineering Command (LANTDIV), Construction Quality Management for Contractors, September 1999
- Additional Studies, Project Management, Construction Management and Safety classes.

Bobbi Turner
Alternate QC Manager

Work History:

8/98 to Present	**Chadwick Construction Company, Hampton, VA** *Project Manager* Project Manager for Renovation of the BEQ, 52, Naval Station, Norfolk, VA Responsible for numerous repair, renovation, and construction contracts. Work includes concrete installations, roof repairs, electrical repairs and renovations, and demolition and installation of heating units.
7/97 – 6/98	Assistant Project Manager for the renovation of 33 buildings containing 119 housing units, Camp Allen Phase II, Norfolk, VA Responsible for cost control, purchasing and contract administration. Assist Project Manager for the Re-Construction of 117 townhouse units at the Joint Forces Staff College, Norfolk, VA. Work included demolition and reconstruction.
9/91- 7/97	**Waterfront Marine Specialists, Hampton, VA** *Contract Specialist* Prepared estimates, takeoffs, bids and proposals. Prepared contract submittals for Government and commercial projects, including vouchers and schedules of prices. Coordinated with Owners and General Contractors on keeping project schedules. Assisted QC Manager with preparation of QC Plans.

Education/Qualifications:

- AAS in Building Construction, Virginia Tech, June 1991
- AAS in Business Management, Commonwealth College, Virginia Beach, VA, 1993
- Army Corps of Engineers / Naval Facilities Engineering Command (LANTDIV) Construction Quality Management for Contractors, 7/99
- Additional Studies, Project Management Classes (Tidewater Community College)
- Completely functional with Window 2000 programs, Word, Excel, PowerPoint and MS Project 2000.

TAB III. Duties, Responsibilities, and Authorities of the Quality Control Personnel

Paul Dell	Will perform the duties of the Vice President during the course of this contract. He will provide oversight and leadership and will coordinate the efforts of the Construction Schedule and the approval process of Quality Control staff.
Danny Jones	Will perform the duties of the QC Manager, as outlined in Section UFGS 01450, Quality Control. He will be responsible for administering and implementing the Quality Control Program as approved by the Contracting Officer. He will review all submittals, maintain an active QC Plan, perform the three phases of control on each DFOW (Preparatory, Initial and Follow-up activities), is responsible for all QC documentation, Contractor Production and QC reports, and Testing Plan and Log.
Bobbi Turner	Will perform the duties of the Alternate QC Manager, as outlined in Section UFGS 01450, Quality Control. In the absence of the QC Manager, she will perform the duties of the QC Manager. When in the QC Manager position, her duties will be the same as those listed for the QC Manager, above.

TAB IV. Outside Organizations

Chesapeake Steel Company
100 Steel Lane
Hampton, VA

XYZ Controls
100 Ridgeway Road
Virginia Beach, VA

Hampton Roads Mechanical
100 Corporate Lane
Hampton, VA

Soils Testing, Inc.
100 Dirt Lane
Virginia Beach, VA

Stevens Electric
100 Bainbridge Road
Norfolk, VA

TAB V. Appoint Letters

The following letters appoint the QC Manager and the Alternate QC Manager for this project. These letters outline their responsibilities and authorities relative to work on this project as pointed out by the QC Plan requirements in Section UFGS 01450N, Quality Control.

CHADWICK
Construction Company

100 Demo Blvd, Hampton, Virginia
Phone: (757) 123-4567

Date

Danny Jones
Chadwick Construction Company
100 Demo Blvd.
Hampton, VA

Subj: APPOINTMENT LETTER; QUALITY CONTROL MANAGER

Re: N62470-99-D-5555, BOSS Headquarters Building, Cheatham Annex, Williamsburg, Virginia

Dear Danny:

Please allow this letter to serve as notification of corporate appointment for you to serve as the QC Manager for the above referenced project. Your responsibilities and authorities are outlined below:

- Responsible for implementing and managing the QC program as described in the contract.
- Authorized to stop any production work that is not in compliance with the contract and direct removal/replace of all non-compliant work.
- Ensuring that construction activities are performed according to plans and specifications.
- Responsible for developing and maintaining an effective QC Plan and system.
- Responsible for the preparation of acceptable documentation of all QC activities.
- Responsible to identify, schedule and perform the three phases of control on all Definable Features of Work (DFOW) as identified in the construction schedule and cross referenced in the QC Plan.

Sincerely,

William I. Stephens
President

CHADWICK
Construction Company

100 Demo Blvd, Hampton, Virginia
Phone: (757) 123-4567

Date

Bobbi Turner
Chadwick Construction Company
100 Demo Blvd.
Hampton, VA

Subj: APPOINTMENT LETTER; ALTERNATE QUALITY CONTROL MANAGER

Re: N62470-99-D-5555, BOSS Headquarters Building, Cheatham Annex, Williamsburg, Virginia

Dear Bobbi:

Please allow this letter to serve as notification of corporate appointment for you to serve as the Alternate QC Manager, for the above referenced project. Your responsibilities and authorities are outlined below:

- Responsible for implementing and managing the QC program as described in the contract.
- Authorized to stop any production work that is not in compliance with the contract and direct removal/replace of all non-compliant work.
- Ensuring that construction activities are performed according to plans and specifications.
- Responsible for developing and maintaining an effective QC Plan and system.
- Responsible for the preparation of acceptable documentation of all QC activities.
- Responsible to identify, schedule and perform the three phases of control on all Definable Features of Work (DFOW) as identified in the construction schedule and cross referenced in the QC Plan.

Sincerely,

William I. Stephens
President

TAB VI. Submittal Procedures and Initial Submittal Register

QC Manager's Submittal Duties

The QC Manager will be responsible for reviewing and certifying that all submittals are in compliance with the contract requirements as described in the specification section UFGS 01330, Submittal Procedures, of this contract. The QC Manager is the approving authority on all submittals unless otherwise specified in the submittal log. A copy of the submittal log is provided herein. The QC Manager is responsible for ensuring that all submittals are submitted on time and to the proper authority.

Chadwick Construction Company will plan for a review period of not less than fifteen working days for submittals that are approved by the QC Manager, twenty working days for submittals that are approved by the Contracting Officer, and thirty working days for submittals that are approved by the fire protection engineer.

The QC Manager will verify all field measurements prior to approval of any submittal for equipment and/or materials to be incorporated in this project. He/she will inspect all material deliveries and assure that the materials comply with the approved submittal. He/she will review all submittals and will verify that each submittal is in accordance with the requirements of the contract documents.

The QC Manager will be responsible for the following tasks regarding submittals.

1. Note date on which submittal was received from contractor on each submittal.
2. Review each submittal and check and coordinate each submittal with requirements of work and contract documents.
3. Review submittals for conformance with project design concepts and compliance with contract documents.
4. Act on submittals, determining appropriate action based on QC organization's review of submittal.
    (1) When QC manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Actions Possible."
    (2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal to the contractor marked "not reviewed" or "review and resubmit" as appropriate.
5. Ensure that material is clearly legible.
6. Stamp each sheet of each submittal with QC certifying statement or approving statement except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.
    (1) When approving authority is Contracting Officer, QC organization will certify submittals forwarded to Contracting Officer with the following certifying statement:

“I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number [_____], is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer_____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____”
(Signature)

(2) When approving authority is QC Manager, QC Manger will use the following approval statement when returning submittals to contractor as “Approved” or “Approved as Noted”::

“I hereby certify that the (equipment) (material) (article) shown and marked in this submittal and proposed to be incorporated with contract Number [_____], is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is _____ approved for use.

Certified by Submittal Reviewer_____, Date _____
(Signature when applicable)

Approved by QC Manager _____, Date _____”
(Signature)

7. Sign certifying statement or approval statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan.
8. Update submittal register [database] as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by contracting officer.
9. Retain a copy of approved submittals at project site, including contractor’s copy of approved samples.

TAB VII. Testing Laboratory Information

Construction materials testing laboratories performing work for Navy construction contracts will be required to submit the following:

a. A copy of the Certificate of Accreditation and Scope of Accreditation by an acceptable laboratory accreditation authority.

Construction materials testing laboratories performing work for Navy construction contracts must be accredited by one of the laboratory accreditation authorities. The laboratory's scope of accreditation must include the ASTM standards listed in the paragraph titled "Construction Materials Testing Laboratory Requirements" as appropriate to the testing field. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office".

Soils Testing, Inc. will perform all testing in accordance with the specifications for the following areas:

- Excavation and Fill
- Water Distribution
- Bituminous Concrete Pavement
- Concrete

Chesapeake Steel Company will perform testing in accordance with the specifications for the following areas:

- Cold-formed metal framing

Hampton Roads Mechanical will perform testing in the following areas:

- Mechanical Insulation
- Plumbing System
- Heating, Ventilating & Air Conditioning System

XYZ Controls will perform testing in the following areas:

- Space Temperature Control Systems
- HVAC Testing/Adjusting/Balancing

Stevens Electric will perform testing in the following areas:

- Apparatus Inspection and Testing
- Three-Phase Pad-Mounted Transformer
- Overhead Transmission & Distribution
- Underground Electrical Work
- Interior Distribution System
- Automatic Transfer Switches
- Structural Telecommunications cabling and Pathway Systems
- Telephone Distribution System

TAB VIII. Testing Plan and Log

Chadwick Construction Company will provide in the Testing Plan and Log all tests required by the contract in a sequence following the construction production schedule.

The QC Manager will ensure that:

- all appropriate control procedures will be used when performing testing for this project. Such testing will include operation and/or acceptance tests, as specified in the contract documents.
- the testing procedures comply with the contract requirements.
- the facilities and testing equipment to be used are available and comply with all applicable testing standards. Labs that are to be certified will provide their accreditation letter.
- the recording forms and test identification control number system including all of the test documentation requirements have been correctly prepared.
- the results of all tests taken, both passing and failing, will be recorded in the Contractor Quality Control Report for that date. The specification paragraph reference, location of the test, and the sequential control number identifying the test will be shown on the test results.

A copy of all tests performed by a commercial testing laboratory will be provided to the Contracting Officer, turned in with the daily report. All testing to be performed will be recorded on the Testing Plan and Log.

The Testing Plan and Log (copy attached) shall be submitted as a separate submittal at the end of each month with the invoice. The Testing Plan and Log will be used/discussed at each QC Meeting.

TESTING PLAN AND LOG

CONTRACT NUMBER Enter Contract # Here			PROJECT TITLE AND LOCATION Enter Contract Title and Location Here							CONTRACTOR Enter Contractor's Company Name Here	
SPECIFICATION SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			

TAB IX. Procedures to Complete Rework Items

The QC Manager will conduct daily inspections during the Follow-up phase to ensure compliance of the work with the contract. Any work that does not comply with the contract will be noted on the Rework Items List. The Rework Items List will identify the items that require rework and the date that the item was originally discovered. This list of deficiencies will be included in the quality control documentation, as required, and will include the estimated date by which the deficiencies will be corrected. Once the rework items have been corrected, the QC Manager will make a second inspection to ensure that all deficiencies have been corrected.

The QC Manager and the subcontractor's foreman will inspect the work activity while the work is in progress and again upon its completion.

This Rework Items List will be filed by the QC Manager. This list will state the deficient item, the date it was found, the corrective action necessary, the date the work was corrected, and the name of the person verifying that the work has been satisfactorily completed.

Follow-up actions on those discrepancies that cannot be corrected at the time of discovery will be the responsibility of the QC Manager. These types of discrepancies may be contributed to faulty equipment, weather, or time restrictions.

The Rework Items List will be maintained by the QC Manager and discussed at each QC meeting. The QC Manager and superintendent will agree on a reasonable time line for correction.

Deficiencies that have been identified since the last meeting will be discussed and proposed correction dates will be scheduled.

The QC Manager shall be responsible for listing items needing rework, including those identified by the Contracting Officer. The results of all quality control inspections, including those deficiencies noted and corrected on the spot, will be recorded by the QC Manager.

A copy of this report, with results and corrective actions taken, will be forwarded to the Contracting Officer. The original report will be filed at the job site trailer and will be made available as required.

Attached is the Standard NAVFAC Rework Items List or Deficiency Log.

REWORK ITEMS LIST

Contract No. and Title: Enter Contract # and Title Here

Contractor: Enter Contractor's Company Name Here

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

TAB X. Documentation Procedures

Location of Documents: The documents listed in the following paragraphs shall be maintained by the QC Manager at the job site.

1. An approved copy of the QC Plan.
2. An up-to-date Submittal Register. A maintained submittal file providing all submittal data and warranties.
3. A maintained active list of definable features of work (DFOW) from TAB XI of the CQ Plan.
4. A maintained file on all Preparatory Phase items for each DFOW.
5. A maintained file on all Initial Phase item for each DFOW.
6. A maintained file on construction deficiencies by the Rework Items List.
7. A daily report file for both Contractor Quality Control Reports and Production Reports as identified in the quality control specification section.
8. A maintained file on all testing by the Testing Plan and Log as described in the specifications including a complete copy of all tests results.
9. The QC Manager and Superintendent will maintain the RFI Log and file. They will provide monthly updates with their invoice.
10. QC Validation: The QC Manager shall maintain a file on all QC activities, and all milestone inspections arranged by activity number and construction sequence.
11. Maintain a file of all contract modifications, arranged in numerical order.
12. The QC Manager will maintain As-Built Drawings at the job site. This file will be checked monthly.

All quality control documents will be available for review by the Government QA Reps and/or Contracting Officer.

Each designated QC Specialist is required to prepare a daily Quality Control Inspection Report. A copy of this report will be submitted to the QC Manager.

The QC Manager will summarize and consolidate these reports into a single report to be provided to the Contracting Officer daily.

Attached are the Standard NAVFAC daily reports (Contractor Production Report and Contractor Quality Control Report).

CONTRACTOR PRODUCTION REPORT (ATTACH ADDITIONAL SHEETS IF NECESSARY)			DATE	Enter Date (DD/MMM/YY)
CONTRACT NO	TITLE AND LOCATION		REPORT NO	Enter Report # Here
Enter Cnt# Here	Enter Title and Location of Construction Contract Here			
CONTRACTOR		SUPERINTENDENT		
Enter The Contractor's Company Name Here		Enter Superintendent's Name Here		
AM WEATHER	PM WEATHER		MAX TEMP (F)	MIN TEMP (F)
Enter AM Weather Data Here	Enter PM Weather Data Here		Enter Max Temp Here	Enter Min Temp Here

WORK PERFORMED TODAY

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY					
	WAS A JOB SAFETY MEETING HELD THIS DATE? (If YES attach copy of the meeting minutes)	☐ YES	☐ NO	TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
	WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)		☐ YES	☐ NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)		☐ YES	☐ NO		

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED	☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

	CONTRACTOR/SUPERINTENDENT	DATE	

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE Enter (DD/MMM/YY)

REPORT NO Enter Rpt # Here

PHASE | CONTRACT NO Enter Cnt# Here | CONTRACT TITLE Enter Title and Location of Construction Contract Here

PREPARATORY

WAS PREPARATORY PHASE WORK PREFORMED TODAY? YES ☐ NO ☐
IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

INITIAL

WAS INITIAL PHASE WORK PREFORMED TODAY? YES ☐ NO ☐
IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐
WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

Schedule Activity No.	Description

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

Schedule Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.

Schedule Activity No.	Description

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

DATE

AUTHORIZED QC MANAGER AT SITE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

Schedule Activity No.	Description

GOVERNMENT QUALITY ASSURANCE MANAGER DATE

TAB XI. List of Definable Features of Work (DFOW)

Activity Number	Trans. No.	Item Number	Section Number	Description	Prep Date	Initial Date	Comments
			02	**Site Work**			
			02220	Demolition			
			022231	Clearing and Grubbing			
			02315	Excavation & Fill			
			02361	Soil Treatment			
			02510	Water Distribution			
			02530	Sanitary Sewerage			
			02630	Storm Drainage			
			02741	Bituminous Concrete Pavement			
			02921	Turf			
			02930	Exterior Plants			
			02935	Landscape Maintenance			
			03	**Concrete**			
			03300	Cast-in-place-Concrete			
			03450	Plant pre-cast architectural concrete			
			04	**Masonry**			
			04200	Unit masonry			
			05	**Metals**			
			05400	Cold-formed metal framing and Roof Trusses			
			05500	Metal fabrications			
			06	**Wood & Plastics**			
			06100	Rough Carpentry			
			06200	Finish Carpentry			
			06650	Solid Polymer Fabrications			
			07	**Thermal & Moisture Protection**			
			07212	Mineral Fiber Blanket Insulation			
			07214	Board & Block Insulation			
			07311	Asphalt Shingles			
			07600	Flashing and Sheet Metal			
			07840	Fire stopping			
			07920	Joint Sealants			
			08	**Doors and Windows**			
			08110	Steel Doors and Frames			
			08210	Wood Doors			
			08410	Aluminum Entrances			
			08520	Aluminum Windows			
			08710	Door Hardware			
			08800	Glazing			
			09	**Finishes**			
			09100	Metal Support Assemblies			
			09250	Gypsum Board			
			09310	Ceramic Tile			
			09510	Acoustical Ceilings			
			09651	Resilient Tile Flooring			
			09655	Resilient Sheet Flooring			
			09680	Carpet			
			09721	Vinyl coated Fabric Wall Covering			
			09900	Paints and Coatings			

Activity Number	Trans. No.	Item Number	Section Number	Description	Prep Date	Initial Date	Comments
			10	**Specialties**			
			10201	Metal Wall and door lowers			
			10260	Wall and Corner Guards			
			10400	Identification Devices and Directions			
			10522	Fire Extinguishers and Cabinets			
			10675	Steel Shelving			
			10800	Toilet and Bath accessories			
			11	**Equipment**			
			11175	Linen Chute			
			11312	Packaged Lift Station			
			11458	Disappearing Metal Stairway			
			12	**Not Used**			
			13	**Special Construction**			
			13855	Analog/Addressable Interior Fire Alarm System			
			13931	Fire Extinguishing Sprinkler Systems (residential)			
			14	**Conveying Systems**			
			14100	Dumbwaiters			
			15	**Mechanical**			
			15050	Basic Mechanical Materials and Methods			
			15080	Mechanical Insulation			
			15400	Plumbing System			
			15700	Heating, Ventilating, and Cooling System			
			15901	Space Temperature Control System			
			15949	HVAC Testing/Adjusting/Balancing for small systems			
			16	**Electrical**			
			16050	Basic Electrical Materials and Methods			
			16081	Apparatus Inspection and Testing			
			16237	Single Operation Generator Set			
			16272	Three-Phase Pad-Mounted Transformer			
			16301	Overhead Transmission and Distribution			
			16303	Underground Electrical Work			
			16402	Interior Distribution System			
			16410	Automatic Transfer Switches			
			16510	Interior Lighting			
			16520	Exterior Lighting			
			16710	Structured Telecommunications Cabling & Pathway System			
			16721	Telephone Distribution System			

TAB XII. Three Phase Control Checklist

The Quality Control System and the Three Phases of Control are the means by which we will ensure that all of the members of this construction project, including subcontractors and suppliers, comply with the requirements of this contract.

Preparatory and Initial Phase Meetings will be conducted on each DFOW to ensure that all construction operations, including both on site and off site fabrication, will be keyed to the proposed construction sequence.

These meetings will include the Three Phases of Control shown below.

These phase meetings are to be conducted by the QC Manager and shall be used for each DFOW.

Preparatory Phase

This phase will be performed prior to beginning each DFOW, and will consist of the following steps:

1. A review of each paragraph of the applicable specifications.
2. A review of each of the applicable drawing sheets.
3. Verification that all materials and/or equipment have been tested.
4. Verification that all provisions to provide the required inspection and testing have been made.
5. An examination of the work area to ensure that all required preliminary work has been completed and is in compliance with the contract documents.
6. A physical examination of the required materials, equipment, and/or samples to ensure that they are on hand, conform to the approved shop drawings and/or submittal data, and have been properly stored.
7. Reviews to ensure that all safety requirements have been and are being met.
8. A discussion of the procedures for the construction of the work.
9. Documentation of the construction tolerances and workmanship standards for that phase of work.

Initial Phase

When construction crews are ready to start work on a DFOW, conduct the initial phase with the QC Manager, the superintendent, and the foreman responsible for that DFOW. Observe the initial segment of the DFOW to ensure that the work complies with contract requirements. Document the results of the initial phase in the Contractor Quality Control Report and in the Initial Phase Checklist. Perform the following for each DFOW:

1. Establish the quality of workmanship required.
2. Resolve conflicts.
3. Ensure that testing is performed by the approved laboratory.

4. Check work procedures for compliance with the Safety Plan and the appropriate Activity Hazard Analysis to ensure that applicable safety requirements are met.
5. The initial phase will be repeated for each new crew to work on site. The initial phase will also be repeated when the appropriate quality standards are not being met.

Follow-up Phase

Daily follow-up inspections will be performed to ensure continuing compliance with the contract requirements, including control testing, until the completion of that particular DFOW.

These verifications will be recorded in the Quality Control documentation.

Final follow-up inspections will be conducted and all deficiencies will be corrected for each DFOW prior to the start of additional DFOW that may be affected by the prior work.

PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

SPEC SECTION	DATE
Enter Spec Section # Here	Enter Date (DD/MMM/YY)

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
Enter Cnt# Here	Enter DFOW Here	Enter Sched Act ID Here	Enter Index# Here

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING?

CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)

COMMENTS:

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN?

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS.

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.

CLARIFY ANY DIFFERENCES.

PRELIMINARY WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NOT, WHAT ACTION IS TAKEN?

TESTING

IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.

	WHEN REQUIRED?
	WHERE REQUIRED?
	REVIEW TESTING PLAN.
	HAS TEST FACILITIES BEEN APPROVED?
SAFETY	ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐ REVIEW APPLICABLE PORTION OF EM 385-1-1.
MEETING COMMENTS	NAVY/ROICC COMMENTS DURING MEETING.
OTHER ITEMS OR REMARKS	OTHER ITEMS OR REMARKS:

QC MANAGER DATE

INITIAL PHASE CHECKLIST

SPEC SECTION	DATE
Enter Spec Section # Here	Enter Date (DD/MMM/YY)

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
Enter Cnt# Here	Enter DFOW Here	Enter Sched Act ID Here	Enter Index# Here

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

PROCEDURE COMPLIANCE

IDENTIFIY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS.

COMMENTS: _____

PRELIMINARY WORK

ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN?

WORKMANSHIP

ESTABLISH LEVEL OF WORKMANSHIP.

WHERE IS WORK LOCATED? _____

IS SAMPLE PANEL REQUIRED? YES ☐ NO ☐

WILL THE INIITAL WORK BE CONSIDERED AS A SAMPLE? YES ☐ NO ☐

(IF YES, MAINTAIN IN PRESENT CONDITION AS LONG AS POSSIBLE AND DESCRIBE LOCATION OF SAMPLE) _____

RESOLUTION

RESOLVE ANY DIFFERENCES.

COMMENTS: _____

CHECK SAFETY

REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS

COMMENTS: _____

OTHER

OTHER ITEMS OR REMARKS

QC MANAGER _____ DATE _____

TAB XIII. Personnel Matrix

QUALITY CONTROL PERSONNEL MATRIX BOSS Headquarters Bldg.					
	Legend of Abbreviations				
G	Government Agency				
QCM	Quality Control Manager				
Arch	Architect				
CE	Civil Engineering				
SE	Structural Engineer				
ME	Mechanical Engineer				
EE	Electrical Engineer				
FPE	Fire Protection Specialist				
CEL	Consolidated Engineering Laboratory				
SUB CON	Subcontractor				
N/A	Not Applicable				
Section	**Description**	**Approve Submittal**	**Review/ Certify Submittal**	**Perform & Document 3 Phases of Control**	**Perform & Document Testing**
	DIVISION 02 SITE WORK	G	QCM	QCM	N/A
02220	Demolition	QCM	QCM	QCM	N/A
022231	Clearing and Grubbing	QCM	CE	QCM	CEL
02315	Excavation & Fill	QCM	QCM	QCM	N/A
02361	Soil Treatment	QCM	CE	QCM	SUB CON
02510	Water Distribution	QCM	CE	QCM	SUB CON
02530	Sanitary Sewerage	QCM	CE	QCM	SUB CON
02630	Storm Drainage	QCM	CE	QCM	CEL
02741	Bituminous Concrete Pavement	QCM	CE	QCM	N/A
02921	Turf	QCM & G	QCM	QCM	N/A
02930	Exterior Plants	QCM	QCM	QCM	N/A
02935	Landscape Maintenance	QCM	QCM	QCM	N/A
	DIVISION 03 CONCRETE				
03300	Cast-in-place-Concrete	QCM	SE	QCM	CEL
03450	Plant-precost architectural concrete	QCM & G	SE	QCM	CEL
	DIVISION 04 MASONRY				
04200	Unit masonry	QCM	SE	QCM	CEL
	DIVISION 05 METALS				
05400	Cold-formed metal framing and Roof Trusses	QCM	SE	QCM	CEL
05500	Metal fabrications	QCM	SE	QCM	N/A
	DIVISION 06 WOODS & PLASTICS				
06100	Rough Carpentry	QCM	ARCH	QCM	N/A
06200	Finish Carpentry	QCM	ARCH	QCM	N/A
06650	Solid Polymer Fabrications	QCM	ARCH	QCM	N/A

Section	Description	Approve Submittal	Review/ Certify Submittal	Perform & Document 3 Phases of Control	Perform & Document Testing
	DIVISION 07 THERMAL & MOISTURE PROTECTION				
07212	Mineral Fiber Blanket Insulation	QCM & G	ARCH	QCM	N/A
07214	Board & Block Insulation	QCM & G	ARCH	QCM	N/A
07311	Asphalt Shingles	QCM	ARCH	QCM	N/A
07600	Flashing and Sheet Metal	QCM	ARCH	QCM	N/A
07840	Fire stopping	QCM	ARCH	QCM	N/A
07920	Joint Sealants	QCM	ARCH	QCM	N/A
	DIVISION 08 DOORS & WINDOWS				
08110	Steel Doors and Frames	QCM	ARCH	QCM	N/A
08210	Wood Doors	QCM	ARCH	QCM	N/A
08410	Aluminum Entrances	QCM	ARCH	QCM	N/A
08520	Aluminum Windows	QCM	ARCH	QCM	N/A
08710	Door Hardware	QCM & G	ARCH	QCM	N/A
08800	Glazing	QCM	ARCH	QCM	N/A
	DIVISION 09 FINISHES				
09100	Metal Support Assemblies	QCM	ARCH	QCM	N/A
09250	Gypsum Board	QCM	ARCH	QCM	N/A
09310	Ceramic Tile	QCH & G	ARCH	QCM	N/A
09510	Acoustical Ceilings	QCM	ARCH	QCM	N/A
09651	Resilient Tile Flooring	QCM & G	ARCH	QCM	SUB CON
09655	Resilient Sheet Flooring	QCM	ARCH	QCM	N/A
09680	Carpet	QCM	ARCH	QCM	N/A
09721	Vinyl coated Fabric Wall Covering	QCM	ARCH	QCM	N/A
09900	Paints and Coatings	QCM & G	ARCH	QCM	N/A
	DIVISION 10 SPECIALTIES				
10201	Metal Wall and door lowers	QCM & G	ARCH	QCM	N/A
10260	Wall and Corner Guards	QCM & G	ARCH	QCM	N/A
10400	Identification Devices and Directions	QCM	ARCH	QCM	N/A
10522	Fire Extinguishers and Cabinets	QCM & G	ARCH	QCM	N/A
10675	Steel Shelving	QCM	ARCH	QCM	N/A
10800	Toilet and Bath accessories	QCM	ARCH	QCM	N/A
	DIVISION 11 EQUIPMENT				
11175	Linen Chute	QCM & G	ARCH	QCM	N/A
11312	Packaged Lift Station	QCM & G	ARCH	QCM	MAN Rep.
11458	Disappearing Metal Stairway	QCM	ARCH	QCM	N/A
	DIVISION 12 NOT USED				
Section	**Description**	**Approve Submittal**	**Review/ Certify**	**Perform & Document**	**Perform & Document**

			Submittal	3 Phases of Control	Testing
	DIVISION 13 SPECIAL CONSTRUCTION				
13855	Analog/Addressable Interior Fire Alarm System	QCM	FPE	QCM	FPE
13931	Fire Extinguishing Sprinkler Systems (residential)	QCM	FPE	QCM	FPE
	DIVISION 14 CONVEYING SYSTEMS				
14100	Dumbwaiters	QCM & G	ARCH	QCM	N/A
	DIVISION 15 MECHANICAL				
15050	Basic Mechanical Materials and Methods	QCM	ME	QCM	SUB CON
15080	Mechanical Insulation	QCM & G	ME	QCM	SUB CON
15400	Plumbing System	QCM & G	ME	QCM	SUB CON
15700	Heating, Ventilating, and Cooling System	QCM & G	ME	QCM	SUB CON
15901	Space Temperature Control System	QCM & G	ME	QCM	SUB CON
15949	HVAC Testing/Adjusting/Balancing for small systems	QCM & G	ME	QCM	SUB CON
	DIVISION 16 ELECTRICAL				
16050	Basic Electrical Materials and Methods	QCM	EE	QCM	SUB CON
16081	Apparatus Inspection and Testing	QCM	EE	QCM	SUB CON
16237	Single Operation Generator Set	QCM	EE	QCM	SUB CON
16272	Three-Phase Pad-Mounted Transformer	QCM	EE	QCM	SUB CON
16301	Overhead Transmission and Distribution	QCM	EE	QCM	SUB CON
16303	Underground Electrical Work	QCM	EE	QCM	SUB CON
16402	Interior Distribution System	QCM	EE	QCM	SUB CON
16410	Automatic Transfer Switches	QCM	EE	QCM	SUB CON
16510	Interior Lighting	QCM	EE	QCM	SUB CON
16520	Exterior Lighting	QCM	EE	QCM	SUB CON
16710	Structured Telecommunications Cabling & Pathway System	QCM	EE	QCM	SUB CON
16721	Telephone Distribution System	QCM	EE	QCM	SUB CON

TAB XIV. Completion Inspections

A. Punch-Out Inspections – Near the completion of all work or any increment thereof established by a completion time stated in the FAR clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Include on the punch list any remaining items on the "Rework Items List" which are not corrected prior to the Punch-Out Inspection. The punch list will include the estimated date by which the deficiencies will be corrected. A copy of the punch list will be provided to the Contracting Officer. The QC Manager shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished the QC Manager shall notify the Government that the facility is ready for the Government "Pre-Final Inspection."

B. Pre-Final Inspection – The Government will perform a Pre-Final Inspection to verify that the facility is complete and ready to be occupied. Any deficiencies found by the Government during this inspection will be identified on a written punch-list and forwarded to the Contractor for correction. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted during the "Pre-Final" inspection shall be accomplished within the time slated for completion of the entire work, or any particular increment thereof if the project is divided into increments by separate completion dates.

C. Final Acceptance Inspection – The QC Manager, QC Specialists, Project Superintendent or other primary Contractor management personnel, and the Contracting Officer's representative will be in attendance at this inspection. Additional Government personnel may also be in attendance. The Contracting Officer, based upon results of the "Pre-Final" inspection, will formally schedule the Final Acceptance Inspection. Notice shall be given to the Contracting Officer at least 14-days prior to the final inspection stating that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all the contract work acceptably complete for this inspection will because for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with Contract Clause entitled "Inspection of Construction."