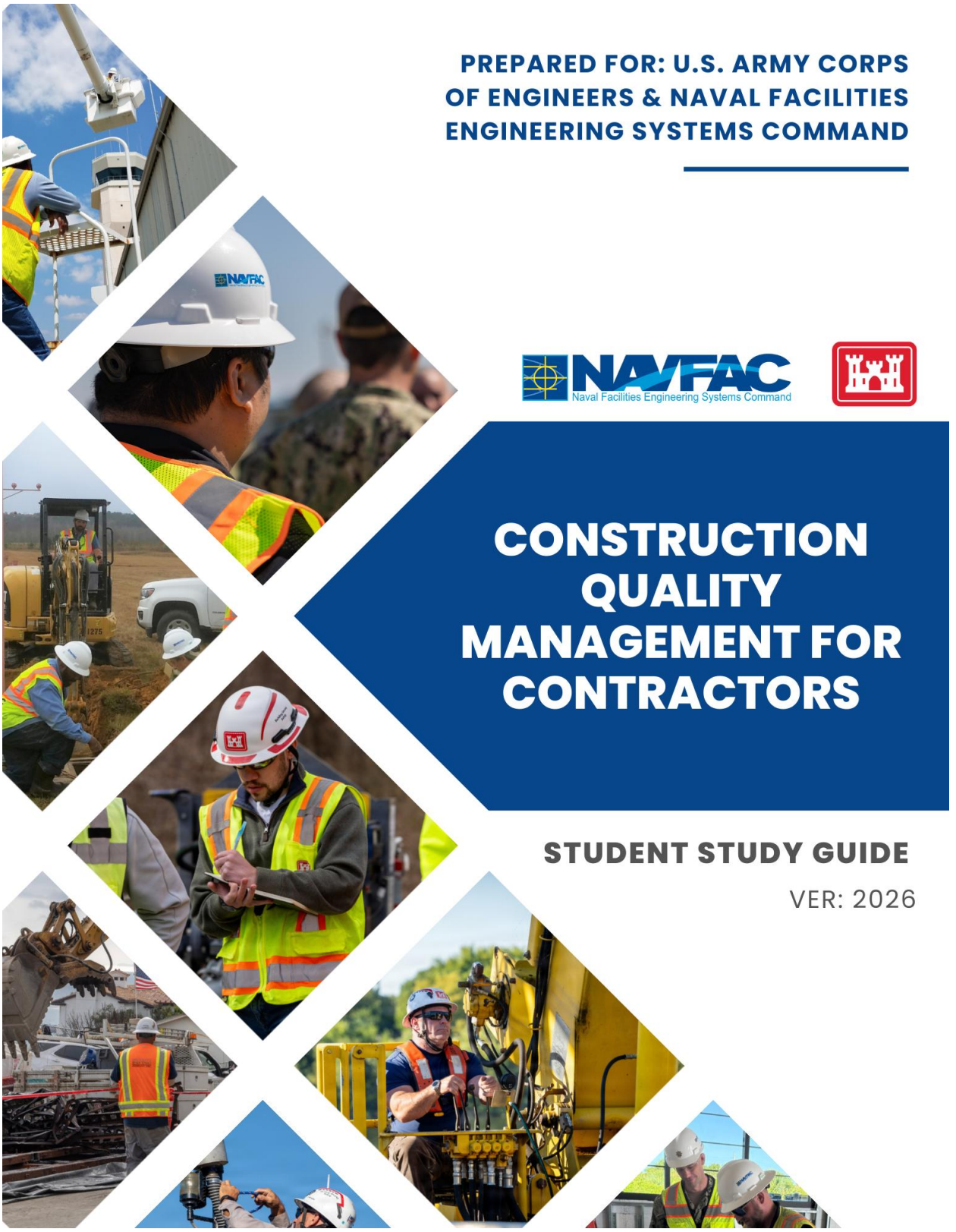

PREPARED FOR: U.S. ARMY CORPS OF ENGINEERS & NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND

NAVFAC Naval Facilities Engineering Systems Command

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

STUDENT STUDY GUIDE

VER: 2026

Construction Quality Management for Contractors (CQM-C)

Course Description

Construction Quality Management for Contractors (CQM-C) is a comprehensive course designed for both Contractor and Government personnel involved in federal construction projects. This course provides the foundational principles and practical applications of quality management as practiced by the U.S. Army Corps of Engineers (USACE) and the Naval Facilities Engineering Systems Command (NAVFAC).

Students will gain a basic understanding of the critical partnership between the Contractor's Quality Control (QC) responsibilities and the Government's Quality Assurance (QA) oversight. The course focuses on empowering contractors to effectively manage and control the quality of their own work, ensuring that construction is performed according to plans and specifications, on time, within budget, and in a safe environment.

This training program satisfies the mandatory CQM-C certification requirements for Quality Control Managers and key personnel working on USACE and NAVFAC construction contracts. Certification is valid for five years and requires recertification.

Course Objectives

Upon successful completion of this course, students will be able to:

1. Define the principles of Construction Quality Management and describe the distinct roles and shared responsibilities of the Contractor (QC) and the Government (QA).
2. Identify and interpret the key requirements of Unified Facilities Guide Specifications (UFGS) 01 45 00, Quality Control and other related UFGS.
3. Explain and apply the "Three Phases of Control" (Preparatory, Initial, and Follow-up) as the primary method for managing the quality of a definable feature of work.
4. Describe the requirements for creating, maintaining, and submitting essential quality documentation, including Daily QC Reports, submittals, test records, and Requests for Information (RFIs).
5. Outline the formal, multi-step process for project completion and turnover, including the Contractor Punch-Out, Pre-Final, and Final Acceptance Inspections.
6. Implement an effective Contractor Quality Control (CQC) program which meets the training objectives outlined by the United States Army Corps of Engineers (USACE) and Naval Facilities Engineering Systems Command (NAVFAC).

Course Contributors:
Arthur Paquette, Senior Construction Manager, NAVFAC
Mark Waddell, Senior Civil Engineer, USACE
Phillip Payne, Senior Construction Engineer, NAVFAC
Jason Neuls, Mechanical Engineer, USACE
Jill Williams- Wright, Senior Construction Engineering Technician

Construction Quality Management for Contractors (CQM-C)
Student Study Guide Table of Contents

Content	Page Number
Course Description	1
Course Objectives	1
Module 1: INTRODUCTION	5
Submodule 1.1: What is Construction Quality Management (CQM)?	5
Submodule 1.2: Contractor and Government Roles	9
Submodule 1.3: Roles, Responsibilities, and Partnering	13
Module 2: THE CONTRACTOR'S RESPONSIBILITY FOR REVIEW	17
Module 3: THE CONTRACTOR QUALITY CONTROL (CQC) PLAN	22
Submodule 3.1: Purpose and Components	22
Submodule 3.2: From Plan to Practice: Review, Acceptance, and Execution	28
Module 4: Preconstruction Meetings	34
Module 5: Submittals	38
Module 6: CONSTRUCTION QUALITY MANAGEMENT: HOW QA AND CQC WORK TOGETHER	45
Submodule 6.1: INTRODUCTION	45

Submodule 6.2: The Three-Phase Control System 50

Submodule 6.3: Documentation: The Official Project Record 56

Submodule 6.4: Testing 64

Submodule 6.5: Finishing Strong: A Guide to Special Inspections... 69

Submodule 6.6: The Finish Line - Project Completion and Turnover 82

Module 7: The Digital Job Site: Mastering Electronic Management Systems 87

Module 8: MAKING THE SYSTEM WORK 90

Appendices

Preparatory Phase Meeting Checklist 97

Initial Phase Meeting Checklist 98

Contractor Quality Control Report 99

Contractor Production Report 100

Government Quality Assurance Report 101

Deficiency / Rework Report 102

Sample Quality Control Meeting Minutes 104

Sample Quality Control Test Plan & Log	107
Sample Preparatory Meeting Minutes	108
Sample Preconstruction Conference Agenda	112

MODULE 1

INTRODUCTION

Submodule 1.1 What is Construction Quality Management (CQM)?

"PROACTIVE PREVENTION vs. REACTIVE INSPECTION"

Module 1.1 Objectives: After completing this module, you will be able to:

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

1.1.1 The CQM Partnership: Construction Quality Management (CQM) is a vital partnership between the Government and the contractor. This training, developed in collaboration with the Associated Builders and Contractors (ABC), Associated General Contractors (AGC), the U.S. Army Corps of Engineers (USACE), and the Naval Facilities Engineering Systems Command (NAVFAC), is designed to familiarize all quality personnel with CQM policies and procedures.

Core Philosophy: The core of CQM is ensuring construction is performed according to plans and specifications, on time, within budget, and in a safe environment. It is a proactive philosophy focused on preventing deficiencies before they occur, rather than reacting to them after the fact.

1.1.2 Official Definitions and Core Principles

The CQM program is built on a foundation of clear definitions and the legal requirements outlined in the Federal Acquisition Regulation (FAR) and Unified Facilities Guide Specifications (UFGS).

Quality: Conformance to the contract's requirements, as established in the specifications and drawings.

Construction Quality Management (CQM): The combination of the Contractor's Quality Control (CQC) system and the Government's Quality Assurance (QA) system. Working in partnership, these two systems ensure the final product meets the contract's quality standards.

Contractor Quality Control (CQC): CQC is the contractor's total system for taking ownership of quality. It requires the proactive management and documentation of all work, including that of

subcontractors and suppliers, to ensure full compliance with the contract documents. The legal basis for this responsibility is found in FAR Clause 52.246-12, Inspection of Construction, which states “The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements.”

Government Quality Assurance (QA): The Government’s process for monitoring and verifying that the CQC system is effective and that the work meets contract requirements. The Government QA system is not a substitute for the contractor's quality control but a validation that the CQC program is performing effectively.

A complete Construction Quality Management system is achieved through the partnership and combined efforts of the Contractor's Quality Control system and the Government's Quality Assurance system. The CQM Equation: This relationship can be summarized as: CQM = CQC (Contractor) + QA (Government).

1.1.3 Benefits of an Effective CQM System

A successful CQM program offers significant benefits to all parties involved.

Benefits to the Government:

- "Getting our money's worth" through responsible stewardship of taxpayer dollars.
- Work is performed correctly, on time, and within budget.
- Delivering of facilities that are not only compliant with the contract but are also durable and easily maintained, ensuring long-term value and operational readiness for the end-user.
- Ensures a safe work environment, reducing project risks and protecting personnel.

Benefits to the Contractor:

- Increased profit and production by reducing costly rework.
- Better communication and planning across the project team.
- Outstanding performance evaluations Contractor Performance Assessment Reporting System (CPARS) for future contracts.
- Improved organizational skills and a safer work environment which minimizes costly delays and accidents.

1.1.4 Characteristics of the Modern Construction Industry

The construction industry is a dynamic and challenging field, characterized by unique complexities.

Economic Scale: The U.S. construction industry is a major economic driver, with projected market spending expected to reach $2.24 trillion in 2025.

High Risk, High Failure: Despite its size, the industry is volatile. Many firms do not survive long-term, underscoring the need for effective Construction Quality Management practices to ensure stability and success.

Project Uniqueness: Each construction project is unique, making standardization difficult. Operations are non-repetitive and highly dependent on environmental conditions and varied regulations. To succeed, contractors must excel in managing personnel, maintaining cash flow, scheduling, and implementing robust safety and quality control systems.

1.1.5 Current and Future Trends

The construction industry is continuously evolving, driven by new technologies and regulations.

Digital Transformation: Electronic information management systems and Building Information Modeling (BIM) are becoming standard. BIM integrates digital models with schedules and workflows, often enhanced by Artificial Intelligence (AI) to automate clash or discipline conflict detection, optimize schedules, and improve quality control.

Partnering and Risk Management: There is a growing emphasis on collaborative partnering and proactive risk management to identify and solve potential problems before they impact the project.

Increased Regulation: The industry faces more restrictive requirements, particularly concerning environmental protection, occupational health and safety, and client involvement.

1.1.6 Conclusion

Effective CQM is a collaborative effort. The old adversarial model has been replaced by a partnership where the contractor's QC and the Government's QA staff work together toward the common goal: delivering high-quality construction safely, on time, and within budget.

EXERCISE 1.1

1. According to FAR Clause 52.246-12, who is responsible for maintaining an adequate inspection system to ensure work conforms to contract requirements?

2. What is the primary purpose of Construction Quality Management (CQM)?

3. In the equation CQM = CQC + QA, define what CQC and QA represent.

4. List two key benefits of effective CQM for the contractor and two for the Government.

5. What are two major trends currently influencing the construction industry?

SUBMODULE 1.2

CONTRACTOR AND GOVERNMENT ROLES

Submodule 1.2 Objectives: After completing this submodule, you will be able to:

- Differentiate between "control" and "inspection."
- Describe the distinct responsibilities of the contractor and the Government in CQM.
- Explain the benefits of Contractor Quality Control (CQC) for the contractor, the Government, and other stakeholders.

1.2.1 Control vs. Inspection: A Fundamental Difference

While the contractor is contractually responsible for both controlling quality and inspecting the work, these are two distinct processes. Control is a proactive, forward-looking process of planning and management. It involves preparing for upcoming work, managing resources, and implementing procedures to prevent deficiencies before they happen. Effective control ensures work is done correctly the first time. In contrast, Inspection is a reactive, "after-the-fact" examination of ongoing or completed work. Its purpose is to verify that the work is accomplished in accordance with the contract.

Historically, the construction industry often relied on a reactive model where the owner or "Government Inspector" would inspect and identify issues for the contractor to fix. The modern CQM philosophy focuses to proactive control, which is a more efficient and cost-effective approach making the contractor fully responsible for the quality of the product being delivered.

1.2.2 Clearly Defined Responsibilities

The CQM system establishes clear lines of responsibility, moving away from the outdated model where the Government directed the contractor's work.

The Contractor's Responsibility is Quality Control (QC). The contractor is solely responsible for all aspects of quality control. This includes planning, managing, and inspecting the work to ensure it complies with the contract requirements. The CQC system, as mandated by the contract, must be robust enough to deliver a product that meets the specified quality standards without relying on the Government for direction.

The Government's Responsibility is Quality Assurance (QA). The Government's role is Quality Assurance, not quality control. QA personnel are responsible for verifying that the CQC system is functioning effectively. QA personnel monitor processes, review documentation, and perform targeted QA inspections to ensure the final product meets the contract's quality standards. The

Government's QA activities provide an independent check but do not relieve the contractor of their responsibility for quality.

1.2.3 Benefits of an Effective CQC System

A well-executed CQC program creates a win-win scenario for everyone involved. For the contractor, the primary benefits are increased profitability by reducing costly rework and an improved reputation, leading to better performance evaluations in the Contract Performance Assessment Reporting System (CPARS) and a more competitive position for future contracts. For the Government, benefits include the efficient use of resources, allowing personnel to focus on assurance rather than day-to-day management, and timely project completion due to fewer deficiencies and delays. Ultimately, for all stakeholders, an effective CQC system delivers a high-quality product, on time, on budget, and in a safe work environment fostering pride in accomplishment for both the Contractor and Government teams. By embracing a "partnering" mindset, both parties can work together to achieve these mutual benefits.

EXERCISE 1.2

1. Explain the difference between 'control' and 'inspection' as defined in the CQM process?

2. Who holds the contractual responsibility for implementing and managing Quality Control (QC)?

3. Is the following statement TRUE or FALSE: “The Government’s Quality Assurance (QA) activities relieve the contractor of their responsibility for quality control.” Explain your answer.

4. Describe two significant ways the contractor benefits from an effective CQC program.

5. Name two key benefits that the Government gains from an effective CQC System.

CLASSROOM DISCUSSION EXERCISES 1.2:

6. Scenario: A Government QA inspector is walking the project site and notices a rebar spacing issue in a foundation that is scheduled to be placed tomorrow. The QC Manager is not immediately available. The QA inspector is very experienced and knows exactly how to fix the issue. Should the QA inspector direct the subcontractor's crew to make the correction? Discuss why or why not, referencing the defined roles of QA and CQC.

7. Scenario: A contractor is consistently late with reports which are in addition often incomplete. This is causing delays and extra work for the Government QA team, who have to constantly follow up. How does this situation demonstrate a failure to achieve the "Benefits of an Effective CQC System" for both the contractor and the Government?

Submodule 1.3

ROLES, RESPONSIBILITIES, AND PARTNERING

Submodule 1.3 Objectives: After completing this submodule, you will be able to:

- Discuss the specific responsibilities of contractor personnel engaged in CQC.
- Discuss the specific responsibilities of Government personnel engaged in QA.
- Explain how the responsibilities of contractor and Government personnel interrelate.
- Define the principles of a successful partnering relationship as outlined in UFGS 01 30 00.

1.3.1 Clearly Defined Roles and Responsibilities

A successful CQM program depends on each party clearly understanding and executing their distinct roles as defined in the contract. The Contractor's responsibility is Quality Control (CQC). The CQC staff acts on behalf of the contractor to manage, control, and document all construction activities to produce a quality product that complies with the contract. The central point of contact for the contractor is a competent QC Manager, who must have full authority to act on all CQC matters. Key responsibilities of the QC Manager include developing and maintaining an effective CQC system, controlling all work to meet contract requirements, performing and documenting all control activities and tests, and, crucially, stopping any work that does not conform to the contract.

The Government's responsibility is Quality Assurance (QA). The QA staff acts on behalf of the Government to verify that the contractor's system is effective and that the final product meets the quality standards established in the contract. Their responsibilities include assuring that materials and workmanship comply with the contract and recommending changes to the CQC system if it is not meeting requirements. The official point of contact for the Government QA team is the contractor's designated representative (the QC Manager or Superintendent). QA personnel must not direct the contractor's workforce; all communication must flow through the prime contractor's representative.

It is critical for all parties to remember that **ONLY THE CONTRACTING OFFICER HAS THE AUTHORITY TO MAKE CHANGES TO THE CONTRACT**. No directions concerning changes to the work, schedule, or cost can be accepted from any other party.

1.3.2 Partnering: The Foundation of a Successful Project

As outlined in UFGS 01 30 00 Administrative Requirements, partnering is a commitment between the contractor, the Government, and other stakeholders to achieve mutual goals through a business relationship based on trust, open communication, and shared objectives. While not legally binding, it is a pledge to work together professionally and solve problems collaboratively. The core commitments include establishing trust, working toward shared goals, empowering the lowest working level possible to make decisions, and using an agreed-upon process to resolve issues efficiently. It is critical to understand that partnering does not permit the compromise of contract requirements. Partnering simply creates a collaborative environment to achieve those requirements more effectively.

The contract will typically specify whether Formal Partnering or Informal Partnering is required. Formal Partnering is generally for larger, more complex projects and is guided by a neutral, third-party facilitator, whose services are typically procured by the contractor. Informal Partnering is for smaller projects and is managed internally by the Government COR without a third party facilitator. In both cases, the process results in a written Partnering Charter signed by all participants, which documents the team's shared goals and the formal process for resolving disputes.

EXERCISE 1.3

1. What are two primary responsibilities of the contractor's QC Manager, and what key authority must they possess?

2. What is the primary function of the Government's Quality Assurance (QA) personnel?

3. Who is the only individual with the authority to make a change to the contract?

4. Describe the proper communication channel for a Government QA inspector who observes a deficiency with a subcontractor's work.

5. Is the following statement TRUE or FALSE: "A partnering agreement allows the contractor to negotiate a lower level of quality than what is specified in the contract." Explain your answer.

CLASSROOM DISCUSSION EXERCISES 1.3

6. Scenario: The QC Manager, who has stop-work authority, discovers a subcontractor using non-fire-rated sealant on pipe penetrations in a fire-rated wall. This is a critical life-safety feature. The drywall crew is scheduled to cover up the wall in the next hour. The Site Superintendent tells the QC Manager, "Don't stop them, it will impact the schedule. It's a small detail inside a wall that the Government will never notice." What must the QC Manager do, and why is this decision critical to the integrity of the entire CQM system?

7. Scenario: During a partnering meeting, the team establishes a shared goal to "expedite the submittal process." Later, a submittal for an off the shelf item is found to have a minor deviation from the contract. The contractor suggests that to support the "expedited submittal" goal, the Government should just approve it to keep things moving. How should the Government QA representative respond, referencing the principles of partnering?

MODULE 2

THE CONTRACTOR'S RESPONSIBILITY FOR REVIEW

Module 2.1 Objectives: After completing this module, you will be able to:

- State the contractor's contractual responsibility to review all plans and specifications.
- Describe the key elements of an effective RFI.
- Contrast the contractor's review responsibilities in Design-Bid-Build vs. Design-Build projects.
- Describe the process for internal design clarifications in a Design-Build project.
- Explain the roles of the QC Manager and the Design Quality Control Manager (DQCM) in a Design-Build project.

2.2 The Requirement for Contractor Review

A contractor's responsibility for quality begins long before the first shovel breaks ground. It starts with a thorough review of the contract itself, where the primary goal is to identify potential issues, conflicts, or omissions before they become problems. Federal Acquisition Regulation (FAR) Clause 52.236-21, Specifications and Drawings for Construction, requires the contractor to review plans and specifications and to promptly request clarification on any conflict, error, or omission. This proactive review is a foundational activity of CQC and is the Quality Control Manager's first line of defense against costly mistakes.

2.3 Tools for Clarification and Change

2.3.1 Request For Information (RFI)

When the Quality Control Manager's review uncovers an issue, they must use the correct formal communication tool. A Request for Information (RFI) is used to ask a question or request clarification. The Quality Control Manager submits an RFI when they find a conflict, an error, or an ambiguity within the contract documents and the goal is to *understand* the existing requirements. An effective RFI is a professional document that must include a clear problem statement, references to the specific contract documents, a proposed solution, and an indication of any time or cost impacts.

2.4 Review Responsibilities: Design-Bid-Build vs. Design-Build

The contractor's review responsibilities differ significantly based on the project delivery method. It is essential to understand the two primary types:

- Design-Bid-Build (DBB): This is the "traditional" method. The Government hires an architect/engineer to create a 100% complete design. The Government then puts that finished design out for bid. The winning contractor's job is simply to build exactly what is shown on the plans. The Government owns the design and is responsible for its accuracy.
- Design-Build (DB): In this method, the Government provides a basic set of requirements, often called a Request for Proposal (RFP). The contractor's team, which includes their own architects and engineers, is responsible for creating the final design *and* building the project. The contractor owns the design and is responsible for its accuracy.

This fundamental difference in design ownership changes the responsibilities of a QC Manager. On a Design-Build project, it is essential that the QC Manager is in place and takes an active role during the design phase to ensure a quality, constructible, and sustainable project.

2.4.1 Review in a Design-Bid-Build (DBB) Project: Constructability

In a DBB project, The QC Managers primary role is to perform a thorough constructability review of the Government-provided design. Fulfilling the requirement of FAR Clause 52.236-21, The QC Manager is looking for errors and omission on the project the Government has provided. Quality Control review focuses on:

- Conflicts & Discrepancies: Finding clashes between drawings, specifications, and different engineering disciplines (e.g., a duct hitting a beam).
- Site Conditions: Verifying that the design works with the actual site conditions (e.g., utility locations, elevations).
- Coordination: Ensuring subcontractor scopes are aligned.

Review in a Design-Build (DB) Project: Design AND Construction Quality

In a DB project, The QC Managers responsibility is much greater. The Quality Control Manager is not just reviewing a finished design; they are responsible for the quality of the design *as it is being developed*. The QC effort is broader and more complex:

1. The Design Quality Control Manager (DQCM): This is a separate, dedicated engineer or architect on your team responsible for managing the Design Quality Control Plan (DQCP) and ensuring the design itself is error-free.

2. The QC Manager's Role: The on-site QC Manager must be involved throughout the design phase, providing critical input on constructability, operability, and ensuring the design can be built efficiently and safely in the field.
3. Internal Clarifications: When the Contractor's design team has a question or finds a conflict within their own design, they must use an internal RFI process to resolve it with their Designer of Record (DOR). An RFI is only sent to the Government if the issue involves the Government's original RFP requirements.

2.4.2 Extension of Design

In a traditional Design-Bid-Build (DBB) contract, the Government provides a 100% complete design and holds the liability for that design. The contractor's job is simply to build exactly what is on the paper. However, modern construction involves highly specialized systems that are proprietary or require niche engineering.

An Extension of Design is a specific carve-out within a DBB contract. It occurs when the Government's Designer of Record provides the *performance criteria* (what the system must achieve) but shifts the responsibility for the *final engineering and layout* (how the system will achieve it) to the construction contractor.

It is often more efficient and accurate for the manufacturer or specialized subcontractor to finalize the design of proprietary systems. For example:

- Fire Protection: The Government dictates the required water density and hazard classification. The contractor's specialized Fire Protection Engineer calculates the exact pipe sizes, routing, and sprinkler head placement based on the specific building dimensions.
- Pre-Engineered Metal Buildings (PEMB): The Government provides the footprint and wind/snow load requirements. The PEMB manufacturer’s engineers design the specific structural steel framing to meet those loads.
- Cathodic Protection & Roof Trusses: These require specialized engineering analysis based on the specific site conditions or chosen manufacturer's products.

2.5 Value Engineering Change Proposals (VECP)

The value engineering clause (FAR 52.248-3) in a contract allows contractors to propose cost-saving changes or VECPs to the project's design or specifications. Through a formal submission process, the contractor can submit VECP to propose a cost-saving change that allows both the contractor and the Government to share in the savings, without compromising the project's essential functions, performance, or quality.

EXERCISE 2

1. A contractor is installing a new sanitary sewer line. On the drawings, the proposed line is shown to run through an existing underground electrical duct bank.

    A. On a Design-Bid-Build (DBB) project, who should the contractor submit the RFI to?

    B. On a Design-Build (DB) project, what is the contractor's first step?

2. What are the five key things that should be in every RFI to make it a good one?

3. On a Design-Build project, when is the Design QCM required to be in place and who do they work for?

4. What is the main goal of a VECP (Value Engineering Change Proposal)?

CLASSROOM DISCUSSION EXERCISES 2

5. Scenario (Design-Build): The contractor's team is designing a new facility. During an internal review, the civil designer realizes that the most direct route for the new sewer line will conflict with an existing underground electrical duct bank shown on the Government's preliminary site plans. What is the contractor's team's responsibility, and what is the correct process to resolve this?

6. Scenario (Design-Bid-Build): On a Design-Bid-Build project, the QC Manager receives an RFI from their electrical subcontractor. The RFI simply asks, "Drawing E-101 shows light fixtures in Room 102 are Type 'A', but spec section 26 51 00 says to use Type 'B'. Which one is it?" Why is immediately forwarding this RFI to the Government a failure of the CQC system, and what specific steps should the QC Manager take to properly "vet" this RFI before submission?

MODULE 3

THE CONTRACTOR QUALITY CONTROL (CQC) PLAN

SUBMODULE 3.1

PURPOSE AND COMPONENTS

Submodule 3.1 Objectives: After completing this submodule, you will be able to:

- State the purpose of the Contractor Quality Control (CQC) Plan.
- Identify the key components of an acceptable CQC Plan.
- Describe the Government's role in the review and acceptance of the CQC Plan.
- Explain why the CQC Plan is considered a "living document."

3.1.1 The Blueprint for Quality

The Contractor Quality Control (CQC) Plan is the contractor’s comprehensive, written plan detailing exactly how they will manage and control the quality of the work to ensure it complies with the contract. It is the single most important document for the CQC system. It is not merely a document to satisfy a contract requirement; it is a vital tool to be used daily by the entire project team.

As required by UFGS 01 45 00 Quality Control, this plan or an interim plan must be submitted to the Government for acceptance before any on-site production work can begin.

3.1.2 Key Components of an Acceptable CQC Plan

As required by UFGS 01 45 00 Quality Control, the CQC Plan is not a single document but a comprehensive package that serves as the contractor's complete foundation for quality in construction. A well-organized plan with a table of contents and numbered pages is easy for the Government to review and for the Contractor use.

The CQC Plan must contain the following sections:

- Description of the Quality Control Organization: A narrative introducing the QC team and acknowledging the commitment to implement the Three-Phase Control system.

- The Organizational Chart: A chart showing the QC organization, names, titles, and lines of authority up to a home office executive and not field staff to prove independence.
- Names and Qualifications: Resumes and required CQM course certifications for each person in the QC organization.
- Duties, Responsibilities and Authority of QC Personnel: A description of the specific duties and responsibilities for each person on the team.
- Outside Organizations: A list of any outside firms (e.g., testing labs, consultants) that will be employed.
- Appointment Letters: Formal letters signed by a corporate officer appointing the QC Manager and Alternate, explicitly granting them the authority to stop work.
- Submittal Procedures and Initial Submittal Register: The process for managing, reviewing, and certifying submittals, including the initial register.
- Testing Laboratory Information and Testing Plan and Log: Information on all testing labs and a comprehensive log of all required tests.
- Procedures for Tracking Deficiencies / Rework: The formal process for managing the Rework Items List.
- Reporting Procedures: A description of documentation to be maintained, including proposed report formats.
- Procedures for Design Changes/Variations: The internal process for reviewing and justifying any proposed changes.
- List of Definable Features of Work (DFOW): A comprehensive list of all distinct work tasks, linked to the construction schedule.
- Procedures for Performing and Tracking the Three Phases of Control: A detailed explanation of how Preparatory, Initial, and Follow-up phases will be conducted.
- Coordination of Special Inspections: The plan for scheduling and coordinating with any required independent Special Inspectors.
- Procedures for Completion Inspection: The procedure for conducting the contractor's own internal punch-out inspection.
- Training Procedures and Certifications Log: Procedures for coordinating and documenting all required training and certifications.

3.1.3 Government Review and the "Living Document" Principle

Government Role: Acceptance, Not Approval: The Government reviews the CQC Plan for compliance with the contract and for feasibility. The Government then "accepts" the plan, which signifies that the plan, as written, meets the contract requirements. This does not relieve the contractor of their sole responsibility for quality.

A "Living Document": The CQC Plan is not a static document. It must be actively used and updated throughout the project's life to reflect any changes in personnel, subcontractors, or procedures. All revisions must be submitted to the Government for review and acceptance before being implemented.

3.1.4 The Design Quality Control (DQC) Plan (for Design-Build Projects)

On a Design-Build contract, the QC Manager is also responsible for developing and implementing a Design Quality Control (DQC) Plan as part of the overall CQC Plan. This is managed day-to-day by a specialized Design Quality Control Manager (DQCM) who must coordinate actions with the QC Manager. Design is not permitted to start without prior acceptance of the Design Quality Control Plan.

The DQC Plan formalizes the quality process for the design itself. Key components include:

- Names of the Designer of Record (DOR): A list of the specific, licensed professionals responsible for each design discipline.
- The Formal Communication Plan: A strategy for design meetings, identifying key decision points, and detailing how the Government will be included in the design process to eliminate surprises.
- The Life Safety and Fire Protection Plan: A separate, detailed plan for the inspection and testing of all life safety systems, prepared by the Fire Protection DOR for review by the NAVFAC Fire Protection Engineer and the Installation Fire Chief.
- Procedures for Design Document Submission: A commitment to follow established procedures (e.g., FC 1-300-09N) for submitting coordinated, conflict-free design documents.

3.1.5 The Government's Internal Quality Assurance (QA) Plan

Government QA representatives are required by NAVFAC P-445 and USACE ER 1180-1-6 to develop their own internal Quality Assurance (QA) Plan. It is crucial to understand that this QA Plan is a separate and distinct document from the CQC Plan. This is a guide for the Government Representatives, outlining how the Government teams will strategically monitor and verify effectiveness of the contractor's quality control efforts.

Essential components of the Government's QA Plan include:

- QA Organization and Staffing: An internal organizational chart and list of responsibilities for the Government team.
- List of Definable Features of Work (DFOW): A list of all project DFOWs, typically assigned a risk level (High, Medium, Low) to prioritize surveillance efforts.
- The QA Surveillance Plan: A schedule of planned QA activities tied to the DFOW list, defining the type and frequency of Government surveillance for Preparatory, Initial, and Follow-up phases.
- The QA Testing Plan: A list of all independent assurance tests the Government plans to perform to verify the contractor's QC testing.
- Documentation and Reporting Procedures: The process for how the QA team will document their activities in the official Government QA Report.
- Identify Government QA Training needs.

EXERCISE 3.1

1. The Quality Control Manager's CQC Plan is submitted, but the signed Appointment Letter for the QC Manager is missing the sentence granting them the "authority to stop work." Why is this a critical omission, and what will be the result?

2. List any four distinct components that, according to UFGS 01 45 00, that must be included in a CQC Plan *before* it can be considered complete by the Government.

3. Under a Design-Build contract, what is the name of the additional, separate plan they must include as part of their CQC Plan, and what is its single most important procedural requirement?

4. The project is underway, and the contractor needs to hire a new electrical subcontractor to replace the one that defaulted. What must the QC Manager do regarding the CQC Plan, and why is this necessary?

5. A new Government QA technician arrives at a large, complex hospital project and feels overwhelmed. According to NAVFAC P-445 and USACE ER 1180-1-6, what specific section of the Government's internal QA Plan should this technician consult to strategically prioritize their daily surveillance activities?

CLASSROOM DISCUSSION EXERCISES MODULE 3.1

6. Scenario: A Government QA reviewer receives a CQC Plan. The organizational chart shows the QC Manager reporting directly to the on-site Project Manager. During the Mutual Understanding and Coordination Meeting, the contractor argues that this structure is better for team communication. As the Government representative, how do you respond, and why is the reporting structure so important?

7. Scenario: It is three months into a project, and the QC Manager quits. The contractor's Project Manager immediately sends an email to the Government stating, "Our Alternate QC Manager, Susan Smith, will be taking over as the primary QC Manager, effective today." Susan is fully qualified and was named as the alternate in the accepted CQC Plan. Is this email sufficient? Discuss the formal process required and why it matters.

SUBMODULE 3.2

FROM PLAN TO PRACTICE: REVIEW, ACCEPTANCE, AND EXECUTION

Submodule 3.2 Objectives: After completing this submodule, you will be able to:

- Describe the Government's process for reviewing the CQC Plan for compliance and feasibility.
- Explain the critical distinction between Government "acceptance" and "approval" as defined by NAVFAC P-445 and USACE ER 1180-1-6.
- Detail the formal procedure for managing changes to the CQC Plan.
- Explain why the accepted CQC Plan is the essential "foundation upon which contractor quality control is established."

3.2.1 Bringing the Foundation to Life: The Government Review

In Submodule 3.1, we detailed the required components of the Quality Control Manager's CQC Plan—the blueprint for quality and the foundation upon which the contract's quality of work is based. Now, the focus will be on what happens after The Quality Control Manager submits the plan. It becomes the legally binding foundation for the quality operations through a formal Government review and acceptance process. As a QC Manager, understanding this process from the Government's perspective is vital. The Government's QA team, guided by the principles in NAVFAC P-445 and USACE ER 1180-1-6, will perform a two-fold review of the Quality Control Manager's plan to answer two fundamental questions: "Is it compliant?" and "Will it actually work?"

The Compliance Check: First, the Government QA representative will use the contract specification, UFGS 01 45 00, as a checklist. They will go through the Contractor Quality Control Plan paragraph by paragraph to ensure every single required item—from the organization chart to the testing log to the appointment letters—is present and complete. If any contractually required item is missing, the CQC plan is non-compliant and will be returned to the contractor for correction and resubmission.

The Feasibility Assessment: Second, and just as important, the QA representative uses their professional judgment to determine if the Contractor's Quality Control Plan is realistic and effective. A plan can meet all the checklist items but still be unworkable. For example, is the proposed QC staffing level adequate for the size and complexity of the project? Are procedures

for the Three Phases of Control detailed and logical, or just vague promises? A plan that is not feasible will not be effective, and it too will be returned for revision.

3.2.2 Acceptance of the QC Plan

If the CQC Plan fails either the compliance or feasibility review, it will be returned with written comments that must be addressed. If the plan is satisfactory, the Government will formally “accept” it.

CRITICAL CONCEPT: Acceptance vs. Approval: As stressed in both P-445 and ER 1180-1-6, the Government accepts the CQC Plan; it does not "approve" it. This is a critical legal and philosophical distinction. Acceptance is the Government's formal acknowledgment that the CQC Plan, as written, meets the minimum requirements of the contract. "Approval" would wrongly imply that the Government is taking on partial ownership or responsibility for the CQC Plan success.

The Foundation of Quality: The accepted Contractor Quality Control (CQC) Plan serves as the formal basis for all quality-related activities on the project. It is critical to understand that this plan belongs to the Contractor, who retains sole responsibility for successfully implementing it and for the quality of the final product. The Government's acceptance is not an "approval" that shifts liability; rather, it is a formal acknowledgment that the Contractor's proposed plan meets the minimum requirements of the contract. This acceptance is the necessary permission to begin building upon that quality foundation. As mandated by UFGS 01 45 00, no on-site production work is authorized to start until the Government has formally accepted the CQC Plan in writing.

3.2.3 Execution: Using the "Living Document"

The most common mistake a contractor can make is to treat the accepted CQC Plan as a document to be filed away. It is a "living document," meant to be used and updated as needed to be in compliance with the contract. The project will inevitably change, and when it does, the CQC plan must change with it.

Personnel Changes: In the event of a personnel change for the QC Manager, a formal revision to the CQC Plan must be submitted for Government acceptance. The revision package must include the new individual's resume and a signed appointment letter. The replacement QC Manager cannot assume their duties until the Government provides acceptance of the revision.

Procedural Changes and the "Living Document"

The project will inevitably change, and when it does, the CQC Plan must be formally updated. If the Contractor decides to change a core procedure, such as the method for tracking

deficiencies or using a different subcontractor or supplier for a critical task, the QC Manager is required to submit a revision to the CQC Plan for Government acceptance.

Example: Changing a Third-Party Testing Lab

Let's walk through a common scenario. The accepted CQC Plan identifies "ABC Testing" as the accredited laboratory for all concrete testing. Halfway through the project, ABC Testing informs the Contractor that they are closing their local branch and can no longer service the project. The Contractor must now hire "XYZ Labs" to complete the remaining tests.

The QC Manager cannot simply start using the new lab. They must formally revise the CQC Plan by taking the following steps:

- Gather Documentation: The QC Manager must first obtain all required credentials for the new lab, "XYZ Labs." As required by UFGS 01 45 00, this includes their certificate of accreditation (e.g., from the USACE Materials Testing Center, NVLAP, or another specified authority) and the scope of that accreditation.
- Prepare the Revision: The QC Manager prepares a formal revision package. This is not an email; it is a contract submittal. The package must include:
    - A transmittal letter providing an explanation of the for the change.
    - The updated section of the CQC Plan, with "ABC Testing" removed and "XYZ Labs" added.
    - Copies of the new lab's accreditation and certifications as an attachment.
- Submit for Acceptance: The revision package is formally submitted to the Government for review and acceptance.
- Await Acceptance Before Proceeding: This is the most critical step. No tests performed by "XYZ Labs" are contractually valid until the Government has provided written acceptance of the CQC Plan revision. Proceeding without acceptance puts the Contractor at risk, as any tests performed by the unapproved lab could be rejected, forcing the Contractor to re-test at their own expense.

This formal process ensures that the CQC Plan remains an accurate, "living document" that reflects the current reality of the project and that all parties, including critical third-party agencies, are verified to meet the contract requirements at all times.

Government-Required Changes: The Government also reserves the right to require the Contractor to change their plan if it proves to be ineffective. If rework becomes excessive, submittals returned or rejected at high rate, or schedule not being met, the government can request the contractor provide additional QC personnel or revisions to the QC Plan. The

Government can, and will, require the Contractor to revise the procedures to get the project back on track.

The accepted CQC Plan is the foundation upon which quality work is based. It is the rulebook that both Contractor and Government have agreed to. Using it, following it, and keeping it current is the key to a successful project and a strong partnership with the Contractor QC and Government QA.

EXERCISE 3.2

1. A CQC Plan includes a compliant organizational chart and all required resumes. However, the Government QA reviewer returns the plan as "unacceptable" because the proposed QC staff of one person for a highly complex, fast-paced project is not realistic. Which part of the two-fold review process did the plan fail?

2. What is the critical difference between the Government's "acceptance" of a CQC plan versus "approving" it?

3. A contractor's project is delayed because their CQC Plan was rejected three times for being incomplete. According to the principles discussed, what is the most likely cause of this failure?

4. Why is a CQC Plan referred to as "the foundation upon which quality work is based "?

CLASSROOM DISCUSSION EXERCISES 3.2

5. Scenario: On a large airfield paving project, the contractor's approved Concrete QC Specialist, John Doe, who is named in the CQC Plan, resigns. The contractor immediately brings in a new, fully certified concrete technician, Jane Smith, to take his place. The Site Superintendent, anxious about an upcoming critical runway placement, tells the QC Manager to have Jane start her duties immediately.

   Question:
   In the context of the CQC Plan being a "living document," what is the first formal action the QC Manager must take before Jane Smith can legally begin work as the project's Concrete QC Specialist?

6. Scenario: A Government QA reviewer receives a CQC Plan. The organizational chart shows the QC Manager reporting directly to the on-site Project Manager. The Project Manager is a highly respected and experienced professional. During the Coordination Meeting, the contractor argues that this structure is better for team communication and that the Project Manager will support the QC Manager's decisions. As the Government representative, how do you respond, and why is the reporting structure so important?

7. Scenario: A CQC Plan proposed having only one QC Inspector for a very large, complex project. During the review, the Government QA team was concerned this was insufficient but found that the plan met all other checklist requirements of UFGS 01 45 00, so they "accepted" it. Six months later, multiple deficiencies are occurring because the single QC inspector is overwhelmed. The contractor tells the Government, "You accepted our plan with one inspector, so you share the responsibility for these issues." How should the Government QA representative respond, based on the principle of "Acceptance vs. Approval"?

MODULE 4

PRECONSTRUCTION MEETINGS

Module 4 Objectives: After completing this module, you will be able to:

- Differentiate between the purpose and attendees of a Post Award Kick-Off (PAK) Meeting for Design-Build and a Preconstruction Conference for Design-Bid-Build.
- Describe the sequence and purpose of the key quality-focused meetings as defined by UFGS 01 45 00.
- Understand the purpose of Design Review meetings on a Design-Build contract.
- Understand the purpose of the QC Plan.
- Understand the purpose of the Coordination and Mutual Understanding Meeting.

4.1 Getting Started: A Sequence of Critical Meetings

On any government construction project, success depends on clear communication and shared understanding. This is established through a formal sequence of meetings, each with a distinct purpose. It is essential for the contractor's Quality Control (QC) Manager to be an active participant in these meetings, as they are the primary forum for establishing quality expectations and resolving issues. The first major meeting held depends on the type of contract.

4.2 The Project Kick-Off: DB vs. DBB

The first major meeting is the formal "kick-off" for the entire project, bringing all stakeholders together. The focus of this meeting differs significantly between Design-Build (DB) and Design-Bid-Build (DBB) contracts, as outlined in UFGS 01 31 19.05 20 POST AWARD MEETINGS.

4.2.1 For Design-Build (DB): The Post Award Kick-Off (PAK) Meeting
On a Design-Build project, the first meeting is the Post Award Kick-Off (PAK) Meeting. It is a comprehensive, collaborative session with a heavy emphasis on the upcoming design phase. Required attendees include the Government's Design Manager (DM) and Construction Manager (CM), key stakeholders, and the contractor's team, including their Project Manager, Lead Designer of Record (DOR), Quality Control Manager (QCM), and Design Quality Control Manager (DQCM). The objective is to establish a mutual understanding of the facility design requirements and for the contractor to explain how their technical proposal will fulfill them. Key administrative topics are discussed, but the primary focus is aligning on the design path forward.

4.2.2 For Design-Bid-Build (DBB): The Preconstruction Conference
On a traditional Design-Bid-Build project the Government provides the contractor with a 100% complete design. Therefore, the first major meeting is the Preconstruction Conference, which serves as the formal kick-off for the construction phase. As required by FAR 52.236-26, this meeting is led by the Government's Construction Manager and attended by key Government and contractor personnel. Its objective is to introduce the teams and establish the overall "ground rules" for administering the construction contract. The Construction Manager will typically follow a checklist to discuss administrative requirements such as submittals, scheduling, security, and payment procedures.

4.3 Design Review Meetings (for Design-Build Only)

Throughout the design phase of a DB contract, a series of Design Review Meetings are held, typically corresponding to design milestones (e.g., 35%, 65%, 95%). These meetings are a formal forum where the contractor presents the design to the Government. The Government's Design Manager leads the review process to adjudicate comments and ensure the design conforms to the RFP requirements. It is critical for the Contractor Quality Control Manager and the Government's Construction Manager to be involved in these meetings to track design progress against the schedule and to identify any potential changes that could impact the construction cost or schedule.

4.4 Pre-Construction Quality Meetings

Regardless of the contract type, UFGS 01 45 00 outlines the specific meetings dedicated to establishing the CQC system.

4.4.1 The Optional QC Plan Meeting: As per UFGS 01 45 00, the contractor has the right to request a meeting with the Government team *before* writing their CQC Plan. The purpose is to proactively clarify requirements and agree on foundational elements like the List of Definable Features of Work (DFOW), preventing a cycle of plan rejections.

4.4.2 The Coordination and Mutual Understanding Meeting: This is the most important meeting for the project's quality teams. As detailed in UFGS 01 45 00, it is held *after* the contractor has submitted the CQC Plan but *before* it is formally accepted. The purpose is for the contractor to explain their proposed CQC system in detail and to achieve a mutual understanding with the Government's QA team on how quality will be managed. The QC Manager is responsible for preparing detailed minutes will be prepared and must be signed by all parties.

EXERCISE 4

1. What is the main difference in focus between a Post Award Kick-Off (PAK) Meeting and a Preconstruction Conference?

2. A contractor is new to Government projects and is unsure how to structure their CQC Plan. According to UFGS 01 45 00, what meeting can they request *before* submitting their plan to gain clarity?

3. What is the primary purpose of the Coordination and Mutual Understanding Meeting? When would additional meetings be conducted?

4. On a Design-Build project, what is the purpose of the Design Review Meeting(s)?

CLASSROOM DISCUSSION EXERCISES 4

5. Scenario: The contractor has just been awarded a large, complex Design-Build hospital project. The Government's Project Manager wants to skip the formal PAK meeting and just have a quick introductory phone call to "get things moving faster." As the contractor's Project Manager, how should you respond?

6. Scenario: The Government receives a meeting request from a newly awarded contractor's Project Manager. The PM wants to schedule the Coordination and Mutual Understanding Meeting for next week. However, when the Government QA representative reviews the preliminary project documents, they see that the contractor has not yet officially submitted a proposed Quality Control Manager (QCM) or a CQC Plan.

   What should be the Government QA representative's response to the contractor's Project Manager? Should they agree to hold the meeting? Explain your reasoning based on the principles of CQM and the function of this specific meeting.

MODULE 5

SUBMITTALS

Module 5 Objectives: After completing this module, you will be able to:

- State the purpose of submittal procedures.
- Describe Government responsibilities for submittal review.
- Describe contractor responsibilities for the scheduling and control of submittals.
- Explain how the Submittal Register regulates the flow of materials to the job site.
- List the information the contractor must furnish on the Submittal Register (ENG Form 4288-R or equivalent).
- List the information the contractor must furnish on the transmittal form (ENG Form 4025-R or equivalent).

5.1 Purpose of Submittal Procedures

5.1.1 The submittal process is a formal, contractually required procedure governed by UFGS 01 33 00 SUBMITTAL PROCEDURES.

Its primary purpose is to verify that the contractor's proposed materials, equipment, and methods of construction comply with the contract documents before they are procured and incorporated into the work.

5.1.2 Effective submittal management is a critical quality control function that:

* Prevents the use of non-compliant materials, avoiding costly rework and delays.
* Ensures proper coordination between different trades and systems.
* Provides a detailed record of the materials and equipment approved for the project.

5.1.3 Submittal Approval Codes

Upon review, each submittal is assigned a disposition code that dictates the contractor's next steps. These codes provide a clear and standardized response to the contractor. Common approval codes include:

- **Approved**. The submittal is technically compliant and approved for use. The contractor may proceed with procurement and installation. No resubmission is required.
- **Accepted**. The submittal fulfills the contract requirements, and the Government acknowledges receipt without taking exception. The contractor may proceed, but retains full responsibility for the item's performance, coordination, and final compliance. No resubmission is required.
- **Approved as Noted**. The submittal is approved, provided the contractor incorporates the government's comments or corrections. The contractor may proceed, but must

ensure all notations are addressed. Resubmission is typically not required unless specified.

- **Revise and Resubmit**. The submittal contains deficiencies and does not meet contract requirements. It must be revised by the contractor to address all government comments and resubmitted for another review cycle before any work can proceed.
- **Rejected**. The submittal is technically non-compliant and disapproved. It requires significant revision and resubmission.

5.2 Understanding Common Submittal Types (SD-Codes)

The Submittal Register categorizes every required submittal using a standard "SD" code. Understanding these codes is essential for providing the correct documentation. Common types include:

- SD-01 Preconstruction Submittals: Critical plans and administrative documents (e.g., CQC Plan, project schedule).
- SD-02 Shop Drawings: Detailed drawings showing fabrication and installation details.
- SD-03 Product Data: Manufacturer's technical information (e.g., catalog cuts).
- SD-04 Samples: Physical examples of materials that establish a standard for quality.
- SD-05 Design Data: Calculations and analyses (e.g., concrete mix designs).
- SD-06 Test Reports: Formal reports documenting the results of a required test.
- SD-07 Certificates: Written statements attesting that a product or person meets a requirement.
- SD-08 Manufacturer's Instructions: Step-by-step installation instructions.
- SD-09 Manufacturer's Field Reports: A report from a manufacturer's representative from a site visit.
- SD-10 Operation and Maintenance Data: Manuals for the end-user.
- SD-11 Closeout Submittals: All documentation required to close out the project (e.g., As-Built drawings).

5.3 Contractor and Government Responsibilities

The submittal process involves distinct responsibilities for both the contractor and the Government.

5.3.1 Contractor Responsibilities, Control and Certification:

The contractor has the primary responsibility for the overall management and control of submittals. Key responsibilities include:

- Scheduling: In accordance with UFGS 01 33 00, the contractor must coordinate the Submittal Register with the project schedule.
- Internal Review: The QC Manager must perform a detailed review of every submittal.
- Certification: The contractor must apply a certification stamp to the transmittal form for every submittal in accordance with contract specifications.
- Variation Identification: The contractor must clearly identify any proposed variation from the contract requirements on the transmittal form.

5.3.2 Government Responsibilities

The Government's primary role in the submittal process is to perform quality assurance by systematically reviewing contractor submissions to ensure they comply with the contract documents. This oversight is crucial for verifying that the final construction will meet all specified technical and quality requirements. Key government responsibilities include:

- Establishing the Initial Submittal Register: The Government is responsible for preparing and providing the initial list of all submittals required for the project on Design-Bid-Build contract. Normally the Government provides the initial submittal register in the Request for Proposal (RFP) only Division 01 specifications for Design-Build contracts.
- Conducting Compliance Reviews: The Government's technical team performs detailed reviews of submittals to verify full compliance with the contract. The scope of each review is determined by the submittal's specific classification, such as Government Approved (GA), For Information Only (FIO), or Conformance Review (CR). The Government is required to review no less than 10% of all FIO Submittals.
- Enforcing Procedural Requirements: The Government enforces all contractual submittal procedures. This includes the authority to reject and return any submittals that are uncertified by the contractor, incomplete, or otherwise non-compliant, thereby upholding project quality standards.

5.4 The Submittal Register

The Submittal Register is the project's master tracking log, listing every item the contractor must submit for government review. It serves a critical dual purpose: it is both a quality compliance checklist and a dynamic scheduling tool used to regulate the flow of materials and equipment to the job site. This entire process is formally governed by UFGS 01 33 00 SUBMITTAL PROCEDURES.

5.4.1 Establishing the Initial Register: DBB vs. DB Contracts

The responsibility for creating the initial "master checklist" register depends on the project's contract type:

- On a Design-Bid-Build (DBB) Contract, the Government is responsible for preparing and providing the *initial* Submittal Register. This is because the Government's team created the full design before construction began and therefore knows exactly what items must be verified.
- On a Design-Build (DB) Contract, this responsibility shifts to the contractor's Designer of Record (DOR). Because the DOR is creating the design, they are responsible for generating the full technical submittal list. The Government's role is limited to providing the initial register for only the Division 01 Specifications (general project rules) normally provided in the Request for Proposal.

5.4.2 Using the Register to Manage the Timely Flow of Material

Once established, the contractor uses the Submittal Register (often on a standard form like ENG Form 4288-R) as a management tool to actively manage the project schedule. The contractor must populate the log with key dates derived from the construction schedule to forecast deadlines and prevent delays. This turns the register from a simple list into a powerful procurement and logistics tool.

The contractor must furnish, at a minimum, the following information on the submittal register per UFGS 01 33 00:

- Column (a) Activity Number
- Column (g) Contractor Submit Date
- Column (h) Contractor Approval Date Needed
- Column (i) Contractor Material Needed On Site

5.5 The Transmittal Form: The Submittal Cover Sheet

The Transmittal Form (e.g., ENG Form 4025-R) serves as the official cover sheet for every submittal package. The contractor must furnish key information on this form, including: project name and contract number, the specific Submittal Item Number, a clear description of the item, the Contractor's Certification Stamp, and a section for identifying Variations.

5.6 Handling Variations from the Contract

Per UFGS 01 33 00, a variation is any proposed deviation from what is required by the contract drawings and specifications

5.6.1 Considering Variations: The Government will only consider a variation if it is advantageous to the Government and meets the intent of the design.

5.6.2 Proposing Variations: The contractor must submit a separate written request to the Contracting Officer, clearly identify the variation on the transmittal form provide a detailed justification explaining why it is beneficial to the Government and all supporting technical data.

5.6.3 Warranting that Variations are Compatible: By submitting a request, the contractor is warranting (or guaranteeing) that they have investigated the proposed change and verified that it is fully compatible with all other parts of the work.

EXERCISE 5

1. What is the primary purpose of the submittal process as defined by UFGS 01 33 00?

2. What is the Government's primary responsibility regarding the Submittal Register at the beginning of a project on Design Bid Build contracts?

3. What is the Quality Control Manager’s single most important responsibility before sending any submittal to the Government?

4. According to UFGS 01 33 00, what are the four key pieces of information (Column a, g, h, i) that a contractor must add to the Submittal Register to coordinate it with the project schedule?

5. What two critical items must be included on a Transmittal Form (e.g., ENG Form 4025-R)?

6. A contractor submits a different brand of paint than the one specified, but they do not mark the "variation" box on the transmittal form. The Government, not realizing it is a different brand, stamps it "Approved." Is this paint now acceptable to use? Explain your answer based on UFGS 01 33 00.

CLASSROOM DISCUSSION EXERCISES 5

7. Scenario: The specification for a project requires a specific brand and model of water heater (Brand X, Model 100). Your supplier informs you that Brand X, Model 100 is on backorder for six months, but they can provide Brand Y, Model 200 immediately. The Brand Y unit has a slightly better energy efficiency rating and is the same price. As the QC Manager, what is the correct and complete process for proposing this substitution?

8. Scenario: During your internal review of a rebar shop drawing submittal (a GA submittal), you notice that the fabricator has detailed some of the connections differently than shown on the structural drawings. The fabricator's detail is structurally sound and easier to build, but it is a clear deviation from the contract drawings. What are your responsibilities as the QC Manager in this situation? Can you just stamp it "Certified" and send it to the Government for them to decide?

MODULE 6

CONSTRUCTION QUALITY MANAGEMENT:

HOW QA AND CQC WORK TOGETHER

SUBMODULE 6.1

INTRODUCTION

Submodule 6.1 Objectives: After completing this submodule, you will be able to:

- Define the function and importance of Government Quality Assurance (QA) as outlined in NAVFAC P-445 and USACE ER 1180-1-6.
- Define the function and importance of Contractor Quality Control (CQC) as required by UFGS 01 45 00.
- Explain how QA and CQC work together as two separate but complementary parts of a single team.
- Describe the key differences in CQC for Design-Bid-Build vs. Design-Build projects.

6.1.1 The CQM Relationship:

Construction Quality Management (CQM) is a relationship between the contractor and the Government. It is not an adversarial relationship. Think of it as a highly specialized team where each member has a distinct but critical role, all working toward the same goal: a successful project. The formula is simple:

Contractor Quality Control (CQC) + Government Quality Assurance (QA) = Construction Quality Management (CQM)

These two systems, CQC and QA, are separate but must work in coordination.

6.1.2 Contractor Quality Control (CQC)

Function and Responsibility: The primary function of CQC is for the contractor to control their own work. This is a "hands-on," proactive responsibility. The source for this system is the contract specifications, primarily UFGS 01 45 00, Quality Control. This specification requires the contractor to create and execute a realistic plan to ensure that every aspect of the project—from their own crews to their subcontractors and suppliers—fully complies with the contract.

The QC Managers and their Quality Control Staff are responsible for building quality into the project every step of the way.

The Role of CQC Personnel: The CQC Staff, led by the QC Manager, is responsible for:

- Executing the CQC Plan: This includes leading the Three Phases of Control for each definable feature of work (DFOW).
- Controlling All Work: Directly managing and directing the workforce to ensure correct materials and proper workmanship are used.
- Performing All Required Testing: Ensuring all contract-required tests are performed correctly and documented.
- Creating Documentation: Preparing accurate and timely reports and managing all submittals.
- Stopping Non-Conforming Work: The QC Manager must have and use the authority to stop any work that does not meet contract requirements.
- Ensuring work is performed in a safe manner.

6.1.3 Government Quality Assurance (QA)

Function and Philosophy: QA is the process by which the Government assures end product quality. Therefore, ensuring the taxpayers are "getting their money's worth". The basis for the Government's Quality Assurance (QA) system is found in NAVFAC's P-445 and USACE ER 1180-1-6. These documents establish the core QA philosophy of "Trust, but Verify." This means the Government trusts the contractor to control their own work, but it must verify that the contractor's system of quality control is effective. This verification process is how the Government ensures the CQC system is successfully meeting all contract requirements. QA is not about doing the contractor's job; it is about making certain the contractor's system works.

The Role of QA Personnel: The QA team acts as the owner's representatives. Their key verification activities include:

- System Audits: Examining the CQC methods and documentation to ensure their system is working as planned.
- Targeted Inspections: Performing random checks of ongoing work to verify compliance. This is an independent check, not a substitute for the contractor's own inspections.
- Reviewing Documentation: Checking CQC Daily Reports, test results, and submittals to ensure they are accurate and complete.

- Verifying Material: Checking material prior to installation to ensure all material has been properly approved.
- Enforcing the System: If the QA team sees that the CQC system is failing (e.g., rework is piling up), they have the responsibility to require the contractor to make necessary changes.

6.1.4 A Key Difference: CQC in Design-Bid-Build vs. Design-Build

The CQC responsibilities expand significantly on a Design-Build project.

- On a Design-Build (DB) project: The Contractor is responsible design and construction. Therefore, the Quality Control Manager's focus is on Design AND Construction Quality. As required by UFGS 01 45 00, this means the Contractor must have a separate Design Quality Control Plan (DQCP) and a Design Quality Control Manager (DQCM) to ensure the design is correct before construction starts.
- On a Design-Bid-Build (DBB) project: The Government gives the Contractor a full design. The Quality Control Manager's CQC focus is on Construction Quality—making sure the Contractor builds to the plans and specifications provided.

EXERCISE MODULE 6.1

1. What is the primary function of Government QA, and what core philosophy guides their actions?

2. What is the primary function of Contractor QC, as required by UFGS 01 45 00?

3. A Government QA inspector observes a subcontractor installing electrical conduit incorrectly. What is the QA inspector's proper course of action to maintain the CQC/QA relationship?

4. Is the following statement TRUE or FALSE: "The Government QA staff is responsible for performing all required material testing to ensure the contractor is using the right products." Explain your answer.

CLASSROOM DISCUSSION EXERCISES 6.1

5. Scenario: A Government QA inspector, a former carpenter with 20 years of experience, sees the contractor's crew struggling to frame a complex wall. He knows a faster, better way to do it. He walks over and shows the foreman how to adjust the layout and framing sequence. The foreman is grateful for the help and implements the change. Even though the QA inspector's advice was good and helpful, why was this action a major failure of the CQM process? What are the risks to the Government?

6. Scenario: The Storm Drain Bedding (Internal CQC Breakdown). On a large site development project, the contractor's QC Manager is performing a Follow-up inspection on a storm drain installation. He discovers that his subcontractor's crew is dumping excavated native clay directly back into the trench as bedding material. The contract specifications, however, explicitly require six inches of compacted, crushed stone bedding to properly support the pipe.

   The QC Manager immediately approaches the subcontractor's foreman and points out the deficiency. The foreman replies, "This is how we've always done it. The pipe is in the ground, who's going to know? Using stone will slow us down and cost me money. We're going to keep moving."
   The QC Manager's own Site Superintendent is nearby and overhears the conversation. The Superintendent tells the QC Manager, "He has a point, we are behind schedule. Let's just make a note of it and keep going."

   Question: "In this scenario, the QC Manager has correctly identified a clear contract deficiency, but both his subcontractor and his own Superintendent are pressuring him to ignore it for the sake of schedule and cost. Based on the principles of CQC from Module 6.1, what must the QC Manager do?"

MODULE 6.2

THE THREE-PHASE CONTROL SYSTEM

Submodule 6.2 Objectives: After completing this submodule, you will be able to:

- Define a "Definable Feature of Work" (DFOW) and its relationship to the project schedule.
- Name the Three Phases of Control and state the purpose of each.
- Describe the key activities the QC Manager must perform during the Preparatory, Initial, and Follow-up Phases as required by UFGS 01 45 00.
- Explain the Government's role in the Three-Phase Control process.

6.2.1 The Core of Proactive Quality Control

The Three-Phase Control system is the core of the entire CQM process. It is the contractor's formal, proactive method for planning and executing work to ensure it is done correctly the first time. As required by UFGS 01 45 00, this system must be applied to each Definable Feature of Work (DFOW) on the project. Its primary purpose is to perform detailed, "up-front" planning to prevent deficiencies, rather than just finding them later with inspection.

6.2.2 Understanding the "Definable Feature of Work" (DFOW)

A DFOW is a logical, distinct manageable task within the construction project. Think of it as a single construction task that has its own specific set of quality and material requirements. The specification, UFGS 01 45 00 requires that the list of DFOWs be directly tied to the activities on the construction schedule.

While each specification section (e.g., 03 30 00 Cast-in-Place Concrete) can be a DFOW, it is often necessary to break it down further. For example, for a single concrete placement, the Quality Control Manager might have multiple DFOWs that must be controlled separately:

- DFOW: Formwork Installation
- DFOW: Reinforcing Steel Placement
- DFOW: Concrete Placement and Finishing

A single DFOW can also involve multiple specification sections. For example:

Sample DFOW: Foundation Wall Placement
This single, schedulable Definable Feature of Work (DFOW) involves work from multiple disciplines that must be coordinated:

- UFGS 03 30 00: The concrete mix design, placement, and curing.
- UFGS 03 20 00: The reinforcing steel type, size, and spacing.
- UFGS 26 05 33: Electrical conduits embedded within the wall.
- UFGS 05 50 00: Metal fabrications like anchor bolts embedded in the top of the wall.

The QC Manager must ensure that all these elements are planned for and inspected as part of the Three Phases of Control for this sample DFOW.

6.2.3 The Preparatory Phase:

The Preparatory Phase focuses on planning and readiness. Its purpose is to answer the question: "Are we ready to start a specific DFOW?" As required by UFGS 01 45 00, this phase must be performed prior to beginning any work on each DFOW. It consists of a formal meeting led by the QC Manager and attended by the superintendent, foreman, and any other key personnel. The Government QA representative must be notified and invited. QA personnel are encouraged to participate in this meeting.

During this phase, the QC Manager must, at a minimum:

- Review all contract documents, including every applicable specification paragraph and drawing detail.
- Verify that all required submittals for that DFOW have been submitted and formally approved.
- Physically examine the materials and equipment that have been delivered to the site to ensure they are the correct, approved items and are stored properly.
- Check the work area to ensure all preliminary work is complete (e.g., ensuring the subgrade is ready before starting formwork).
- Review the testing plan to ensure all required quality control tests are scheduled and the testing lab is ready.
- Review the Activity Hazard Analysis (AHA) to ensure all safety requirements are understood.
- Discuss the procedures for accomplishing the work, including lessons learned from any past repetitive deficiencies.

The results of this meeting and all verification checks must be documented on a Preparatory Phase Checklist and attached to the CQC Daily Report.

6.2.4 The Initial Phase:

The Initial Phase ensures the work complies with contract requirements. This phase establishes the level of workmanship and answers the question “does the performance of the work meet the minimum acceptable workmanship standards”? It is performed at the beginning of the work for a DFOW. The QC Manager, superintendent, foreman, and invited Government QA representative observe the first representative portion of work being installed.

It is essential that the Government's Quality Assurance (QA) representative is notified and encouraged to attend the Initial Phase inspection. Their presence helps ensure that both the contractor and the Government have a mutual understanding of the minimum acceptable standard of workmanship before a significant amount of work is put in place.

During this phase, the QC Manager must:

- Review the minutes from the Preparatory meeting to ensure all previous agreements are being followed.
- Observe the initial installation of work to establish the minimum acceptable level of workmanship. This "first article" becomes the benchmark for all subsequent work on that DFOW. For example, the first 10 feet of a CMU wall would be inspected to set the standard for mortar joints, alignment, and cleanliness for the rest of the building.
- Verify that the craftsmen understand the quality requirements.
- Resolve any differences in interpretation of the contract requirements immediately.
- Check that all safety procedures from the AHA are being followed.

This phase is critical. If a crew starts wrong, they will continue wrong. The Initial Phase ensures the standard is set correctly. The results must be documented on an Initial Phase Checklist and attached to the CQC Daily Report.

6.2.5 The Follow-up Phase:

The Follow-up Phase assures continued compliance with contract requirements is maintained. This phase consists of daily checks performed by the QC Manager and their staff throughout the duration of the DFOW until it is completed.

During this phase, the QC Manager must:

- Perform and document ongoing checks to ensure the work continues to comply with the standard of workmanship established during the Initial Phase.
- Verify that all required control tests are being performed at the correct frequency and that the results are being documented.

- Ensure that any identified deficiencies are being corrected promptly.
- Ensure non-conforming work is not built upon nor concealed.
- Assure manufacturers' representatives have performed necessary inspections
- Continually monitor for safety compliance.

The Follow-up Phase is the proof of continuous control. These daily checks are documented in the main body of the CQC Daily Report. Failure to perform and document this phase is a failure of the CQC system.

EXERCISE 6.2

1. What is a "Definable Feature of Work" (DFOW), and what document is it directly tied to?

2. What is the primary purpose of the Preparatory Phase, and what is one critical item that must be verified during this phase?

3. What is the primary purpose of the Initial Phase, and what is established during this inspection?

4. A contractor properly documents their Preparatory and Initial phases for a roofing installation but then fails to document any daily checks for the next two weeks. This is a failure of which phase of control?

5. A concrete placement requires formwork (Spec 03 11 00), reinforcing steel (Spec 03 20 00), and the concrete (Spec 03 30 00). Could the placement of this single foundation be considered one DFOW? Explain your answer.

6. Identify the appropriate phase (Preparatory, Initial, or Follow-up) for the activities listed below by placing a P, I, or F next to each.

Activity	Phase (P, I, F)
CHECKING TEMPERATURE OF IN-PLACE CONCRETE DAILY	
OBSERVING ERECTION OF A SAMPLE PANEL OF CMU	
VERIFYING ALL SUBMITTALS HAVE BEEN SUBMITTED AND APPROVED	
DEVELOPMENT OF AN EXCAVATION PLAN	
CHECKING THE SPACING OF FIRST PLACEMENT OF SOD	
GRADATION CHECK OF STONE AT THE QUARRY PRIOR TO COMMENCEMENT OF WORK	
VERIFYING CALIBRATION CERTIFICATE OF DENSITY METER IN TESTING PLAN	
DAILY CHECK OF WORKERS' HARD HATS	
REVIEW OF CONTROLS PERTAINING TO A FEATURE OF WORK	
A LIFT OF CONCRETE FAILED TO ACHIEVE THE REQUIRED COMPRESSIVE STRENGTH	

MODULE 6.3

DOCUMENTATION: THE OFFICIAL PROJECT RECORD

Submodule 6.3 Objectives: After completing this submodule, you will be able to:

- Explain the critical importance of quality management documentation.
- List the detailed components of the CQC Daily Report per UFGS 01 45 00.
- Explain the purpose and process for maintaining a Deficiency Tracking System (Rework Items List).
- Explain the purpose of the Government's Quality Assurance (QA) Report.
- Identify the topics and contractor responsibilities for the Weekly QC Meetings held during construction.

6.3.1 The First Rule of Construction: "If it isn't written down, it didn't happen."

Documentation is not just paperwork; it is a contract deliverable, as important as the steel and concrete the Contractor installs. A comprehensive record-keeping system serves two primary purposes:

- It is a real-time management tool. Careful analysis of reports can detect negative trends, allowing for early correction that saves time and money.
- It is the official historical record. Should any disputes arise years later, clear, factual, daily documentation is the most reliable evidence of what actually occurred.

6.3.2 The Contractor's Story: The CQC Daily Report

The CQC Daily Report is the contractor's official narrative of all quality control activities. As required by UFGS 01 45 00, this report must be submitted to the Government every workday. However, all calendar days are required to be account for throughout the life of the contract. It is the primary tool for documenting *all* of the work. Its required content includes everything from the contractors on site and work performed (identified by NAS activity number) to all tests, safety checks, and control phase activities.

The CQC Daily report must be signed by the QC Manager with the verification statement to certify its accuracy and compliance, "*On behalf of the contractor, I certify that this report is completed 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".

6.3.3 The Deficiency Tracking System: The Rework Items List

While the CQC Daily Report documents what happens each day, the Deficiency Tracking System is the Quality Control Manager's formal management tool for deficiencies not immediately corrected. As outlined in the accepted CQC Plan and required by UFGS 01 45 00, the Quality Control Manager must maintain a cumulative "Deficiency/Rework Items List."

When does an item go on the list?

The rule is simple: If a deficiency is not corrected by the end of the same workday/shift it was discovered, it must be added to the Rework Items List. Minor issues found and fixed immediately should be noted in the CQC Daily Report, but they do not need to be added to this cumulative list. Anything that will linger into the next day or shift requires formal tracking.

What must the list include?

This is the Quality Control Manager official to-do list for fixing problems. For each item, they must track:

- What the deficiency is and where it is located.
- The activity ID number associated with the item.
- The date the item was discovered.
- The date the item will be corrected by.
- The date the item was actually corrected.
- It must include deficiencies identified by the Contractor's QC staff, by the Government QA team, or from any failed tests.

How is the list used?

The Rework Items List is a powerful management tool with serious contractual implications:

- Weekly Review: The list must be reviewed at every single weekly QC Meeting to track progress.
- Controlling the Sequence of Work: This is a critical enforcement tool. No successor task may advance beyond the Preparatory Phase meeting until all deficiencies affecting it have been cleared from the list. For example, the Contractor cannot start the Preparatory Phase for painting a wall until the deficiency for a hole in that same wall has been corrected and accepted.

- Project Completion: All deficiencies must be confirmed as corrected by the QC Manager and concurred with by the Government's Quality Assurance staff before the contractor can begin their completion inspections.

Failure to properly maintain and act upon this list is a serious failure of the CQC system and can be grounds for the Government to take action against the contractor.

6.3.4 The Government's Story: The QA Report

The Government's QA team also prepares a daily report. The QA Report is an internal Government document and is not shared with the contractor. Its purpose is to document the Government's assurance activities for their own records, creating the official Government narrative of the project.

While the format can vary, the QA Report should not simply duplicate the CQC report. Instead, it focuses on documenting the *assurance* activities performed that day. Key information in a QA report includes:

- Surveillance Activities: A description of which features of work were inspected (e.g., "Performed random follow-up surveillance on DFOW S-02, Structural Steel").
- Meetings Attended: A record of any meetings attended, such as Preparatory or Initial Phase meetings.
- Communications: A summary of important discussions held with the QC Manager or other contractor personnel.
- Deficiencies Observed: A factual note of any deficiencies found and, critically, confirmation that these deficiencies were pointed out to the contractor's QC Manager.
- Review of Contractor's Documentation: A statement confirming the review of the CQC Daily Report and whether it was found to be accurate.
- Tests Witnessed or Performed: A record of any QC tests witnessed or any independent QA assurance tests taken.

The Government will complete a QA Report for each visit day. This ensures the information is recorded while it is fresh, timely and a factual record of the Government's oversight activities. This record is vital for supporting Contractor Performance Assessment Reporting System (CPARS) and serves as the Government's official documentation in case of any disputes or claims.

6.3.5 Weekly Quality Control (QC) Meetings: Driving Quality during Execution

Once construction is underway, the focus shifts from planning to the planning and execution of work. As per UFGS 01 45 00, the primary tool for managing this phase is the weekly Quality Control (QC) Meeting. Led by the Contractor's QC Manager, this weekly meeting is a practical, forward-looking planning session for the core on-site team.

The specification provides a detailed, mandatory agenda for these meetings to proactively manage quality. The required topics include:

- Review Previous Minutes: Ensure accountability by confirming all action items from the last meeting were completed.
- Review Schedule and Deficiencies/Rework: Assess progress against the approved schedule and review the status of all open items on the Rework Items List.
- Review Status of Submittals and RFIs: Manage the flow of project information by identifying any overdue submittals or RFI responses that could cause delays.
- Review the Three-Week Look-Ahead Schedule: Proactively plan for upcoming work. This is the most important part of the meeting, where the QC Manager must verify that all prerequisites (like approved submittals) are complete for all work scheduled to start in the next three weeks.
- Review Testing Plan and Log: Verify that quality is being proven with objective data by reviewing the status of all required tests and addressing any failures.
- Resolve QC and Production Problems: Provide a forum for the project team to collaboratively solve problems and discuss the status of any pending change orders.
- Address Potential Revisions to the CQC Plan: Discuss any necessary updates to the CQC Plan to ensure it remains a "living document" reflecting current project conditions.
- Review Safety and Environmental Compliance: Ensure holistic project compliance by reviewing the effectiveness of the Accident Prevention Plan (APP) and other environmental plans.
- Review Closeout Status: Keep an eye on end-of-project goals by reviewing progress on Commissioning (Cx), operator training, and the Indoor Air Quality (IAQ) Management Plan.

The QC Manager is responsible for preparing detailed minutes of this meeting and providing a copy to the Contracting Officer within two working days, creating a continuous, documented record of quality management activities.

The Value of QA Attendance: A Partnership Opportunity. While Government Quality Assurance (QA) personnel are not required to attend the contractor's weekly QC meeting, their presence is highly encouraged as it is a key opportunity to foster the CQC/QA partnership. Attending provides the single most efficient way for the entire project team to gain a shared understanding of project status. By reviewing past performance (deficiencies), current roadblocks (submittals, RFIs), and future plans (the three-week look-ahead) together, both the QC and QA teams can align their efforts. Most importantly, it provides a forum for proactive problem-solving. By listening to the contractor's plans, a QA representative can identify potential misunderstandings or non-compliant procedures before they become deficiencies in the field, helping the contractor succeed by preventing problems rather than just documenting them after the fact.

EXERCISE 6.3

1. What are the two primary purposes of maintaining thorough and accurate daily documentation?

2. When writing the "Work Performed" section of the daily report, what key piece of information must be included to link the work to the project schedule, according to UFGS 01 45 00?

3. If a QC Specialist performs an inspection, what document must they prepare, and what must the QC Manager do with it?

4. What is the purpose of the "Verification Statement" that the QC Manager must sign at the end of every CQC Daily Report?

5. A QC inspector finds that a subcontractor has installed the wrong type of anchor bolts. The subcontractor's foreman immediately corrects the work before the end of the shift. According to UFGS 01 45 00, does this deficiency need to be added to the formal 'Rework Items List'?

6. During construction, who is responsible for leading the required weekly QC meetings?

7. When reviewing the three-week look-ahead schedule during the weekly QC meeting, what is the most important prerequisite the QC Manager should verify for an upcoming Definable Feature of Work (DFOW)?

CLASSROOM DISCUSSION EXERCISES 6.3

8. Scenario: During a Follow-up inspection, the QC Manager notices that a subcontractor has installed a small section of drywall incorrectly. The subcontractor foreman agrees to fix it, and they correct the work within an hour, right before the end of the shift. The next morning, the QC Manager is writing the CQC Daily Report for the previous day. How should this deficiency be documented? Does it need to go on the formal "Rework Items List"?

9. Scenario: The Government's QA representative is reviewing the CQC Daily Reports from the previous week. On Monday's report, the QC Manager wrote: "Performed Initial Phase for DFOW C-04, Foundation Waterproofing. Workmanship is acceptable." On Thursday's report, the QA rep finds an attached lab report showing that the adhesion test for the waterproofing failed. There is no other mention of this failed test in any of the daily reports. Why is this a serious failure of the CQC system, and what should the QA representative do?

10. Scenario: During a Weekly QC Meeting, the Site Superintendent announces that he has decided to start the roofing installation (a high-risk DFOW) next week to take advantage of a good weather forecast. This is one week earlier than shown on the three-week look-ahead schedule. The QC Manager checks the submittal register and sees that the submittal for the roofing membrane is still under review with the Government. What should the QC Manager say, and what does this situation demonstrate about the purpose of the Weekly QC Meeting?

MODULE 6.4

TESTING

Submodule 6.4 Objectives: After completing this submodule, you will be able to:

- Differentiate between Contractor Quality Control (QC) testing and Government Quality Assurance (QA) testing.
- Describe the contractor's responsibilities for managing the testing process.
- Explain the requirements for testing laboratories and personnel credentials.
- Describe the formal requirements for documenting and submitting daily test reports.

6.4.1 The Importance of Testing

For many critical construction materials and systems, visual observation is not enough to confirm compliance. Testing provides the objective, measurable proof that materials and workmanship meet the contract's technical requirements. It is an indispensable part of the CQM system.

6.4.2 Two Systems of Testing: QC and QA

Contractor Quality Control (QC) Testing: As required by UFGS 01 45 00, the contractor performs test to verify that the materials and workmanship conforms to contract requirements. This is the contractor's primary method for verifying that their own materials and procedures are producing the desired result. QC tests can be performed by properly certified technicians employed by the prime contractor or by a qualified, independent third-party testing laboratory hired by the contractor.

Government Quality Assurance (QA) Testing: The Government performs QA testing to verify the contractors QC testing procedures are adequate. This is the "Trust, but Verify" part of the process. QA tests are unannounced, randomly performed tests that often repeat a QC test to ensure the contractor's results are accurate and their process is reliable. These QA tests can be accomplished by:

- The Government QA personnel observing the contractor's technician perform the QC test again in their presence.
- The Government hiring its own, separate third-party testing agency (other than the one used by the contractor).
- Using a validated Government testing laboratory

It is critical to remember that QA tests never replace the need for the contractor to perform their own contractually required QC tests.

6.4.3 The Contractor's Responsibility: Executing the Testing Plan

As part of the accepted CQC Plan, the Quality Control Manager have a detailed Testing Plan and Log. The QC Manager is responsible for executing this plan. Per UFGS 01 45 00, this includes several key responsibilities:

- Scheduling and Notification: The Quality Control Manager must schedule all tests and provide advance notification to the Government of when and where they will occur.
- Presence during Testing: The QC Manager or their designated and qualified alternate must be present when any field quality control testing is being performed. The Quality Control Manager are there to witness their own QC process.
- Managing the Testing Agency and verifying their credentials.

6.4.4 Laboratory and Personnel Requirements

UFGS 01 45 00 requires that any commercial laboratory used must be properly accredited (e.g., validated by the USACE Materials Testing Center - MTC). It is the QC Manager’s responsibility to verify the lab's credentials.

6.4.5 A Practical Example: Concrete Testing

Using UFGS 03 30 00 Cast-in-Place Concrete as an example, the specification dictates the requirement (a slump test), the standard (ASTM C143/C143M), and the frequency. The Quality Control Manager is required to be on-site to witness the certified technician perform that test as required.

6.4.6 Factory Testing

Some specifications require tests to be performed at the factory before an item ships (e.g., performance tests on a custom window). The Quality Control Manager’s responsibilities include ensuring these tests are done and reviewing the factory test reports before authorizing shipment to the site.

6.4.7 Documentation and Submitting Test Reports

A test without a report is a test that didn't happen. The documentation process is formal.

- Daily Reporting: The Quality Control Manager must document all tests performed each day in their CQC Daily Report, including the type of test, location, and the results (pass/fail).

- Formal Report Submission: The official signed report from the laboratory must be formally submitted to the Government, typically attached to the daily report.
- The Stamp of Compliance: Per UFGS 01 45 00, the Quality Control Manager must review every single test report and then conspicuously stamp the cover sheet in large red letters with either "CONFORMS" or "DOES NOT CONFORM", then sign and date it.

6.4.8 Handling Failing Tests

A failing test is a deficiency and must be handled accordingly.

- Report Immediately: The Quality Control Manager must immediately report any failing test to the Government.
- Document and Track: The failed test must be documented on the Quality Control Manager’s Deficiency/Rework Items List.
- Investigate and Correct: Determine the scope of the non-compliant work and propose a corrective action.
- Retest: After correction, a retest must be performed to verify compliance and documented.

EXERCISE 6.4

1. What is the primary purpose of Contractor QC testing?

2. What is the primary purpose of Government QA testing?

3. You are the QC Manager. Before hiring a testing lab, what is the Quality Control Manager's responsibility regarding their qualifications?

4. The Quality Control Manager receives a concrete test report from the Approved QC Testing Laboratory. According to UFGS 01 45 00, what two things must the Quality Control Manager do to the report before submitting it to the Government?

5. According to UFGS 01 45 00, who must be present to witness a third-party technician perform a required field test?

CLASSROOM DISCUSSION EXERCISES 6.4

6. Scenario:

   A critical elevated concrete slab, designed for 4000 psi, was placed last week. Today, the QC Manager receives the 7-day compressive strength test report. The results are low, averaging 2400 psi where the typical target is 2800 psi. While not an official failure, this is a significant warning sign.

   The Site Superintendent, aware of a tight project schedule, wants to begin framing walls on the slab tomorrow. He tells the QC Manager, "This is a critical path activity. We can't afford to wait three weeks for the 28-day breaks. It's a business risk I'm willing to take."

   Question:

   As the QC Manager, you are faced with a conflict: the objective data indicates a potential quality issue, while the production team is pushing to move forward to meet the schedule. How do you lead your team and partner with the Government to manage this risk and find a win-win solution?

7. Scenario: Your project requires a factory witness test for a custom air handling unit. Your project is behind schedule, and your subcontractor wants to skip the test to save time. As the QC Manager, how do you respond and what is your justification?

SUBMODULE 6.5

FINISHING STRONG: A GUIDE TO SPECIAL INSPECTIONS, COMMISSIONING, AND THE RED ZONE

Submodule 6.5 Objectives: After completing this submodule, you will be able to:

- Describe the purpose of Special Inspections and the QC Manager's role as coordinator.
- Explain the formal process for the acceptance testing of critical building systems.
- Differentiate between Building Commissioning (Cx) and Contractor Quality Control (CQC).
- Define the "Red Zone" and identify the key activities required to successfully close out a project.

6.5.1 Special Inspections

What Are Special Inspections? (And Why Are They "Special"?)

As defined in UFGS 01 45 35 SPECIAL INSPECTIONS, this is a higher level of scrutiny required by the International Building Code (IBC) for specific, critical components of the building that are essential to life safety and structural integrity.

The key difference is *who* performs the inspection. It is not the QC Manager or the QA Representative. It is an independent, certified Special Inspector—a third-party expert hired by either the Contractor or the Government. They must have specific, nationally recognized certifications for the work they are inspecting.

What a Special Inspector Covers

Special Inspector’s focus on materials and assemblies that are critical to the building's structural stability and fire resistance. The final list is documented in the contract's Statement of Special Inspections, but typical items include:

- Structural Steel: Verifying the proper installation and tensioning of high-strength bolts and inspecting critical structural welds.
- Reinforced Concrete: Verifying the size, grade, and placement of reinforcing steel before concrete is placed.

- Structural Masonry: Inspecting the placement of reinforcing steel and ensuring cells are properly grouted in CMU walls.
- Spray-Applied Fireproofing: Measuring the thickness and density of fireproofing applied to structural steel members.

The QC Manager's Role: The Coordinator

The QC Manager does not perform the Special Inspection, they make sure the Special Inspection gets done correctly. The QC Manager's role is to be the manager and coordinator. This means they must:

- Plan: Identify all Special Inspection requirements in the CQC Plan and name the certified agency you will use.
- Coordinate: Schedule the Special Inspector's site visits to align with the construction schedule.
- Facilitate: Ensure the Special Inspector has safe access to the work when it is ready for them.
- Document: Collect the signed Special Inspection reports and submit them to the Government as part of the official project record.

A Practical Example: High-Strength Bolting

- Let's say the project involves a structural steel frame. The CQC Plan identifies "High-Strength Bolting" as requiring Special Inspection and names "ABC Inspection Services" as the certified agency.
- The steel erector is scheduled to bolt up the connections on the second floor next Tuesday. The QC Manager is responsible for calling ABC Inspection Services and scheduling their certified bolting inspector to be on-site Tuesday afternoon.
- On Tuesday, the Special Inspector arrives. The QC Manager escorts them to the work area. They observe the crew performing the work and then use a calibrated torque wrench to test a representative sample of the installed bolts to verify they have been properly tensioned.
- At the end of the day, the Special Inspector gives the QC Manager a signed report stating that the bolting they observed on the second floor conforms to the contract requirements. The QC Manager then attaches this formal report to the CQC Daily Report for that day.

6.5.2 Acceptance Testing of Critical Systems

What Makes a System "Critical"?

As a project nears completion, the focus shifts from inspecting individual components (like a single pipe or wire) to testing entire systems. Certain systems are so essential to the building's mission and the safety of its occupants that they are deemed "critical."

Think of it like building a car. You can inspect the tires, the engine block, and the seats individually. That's standard quality control. But the most important test is when you turn the key, put it in gear, and take it for a test drive. That "test drive" for a building is called Functional Performance Testing (FPT), and it is applied to critical systems. These critical systems typically include:

- HVAC Systems: Heating, Ventilation, and Air Conditioning.
- Fire Alarm and Fire Protection Systems: Including sprinklers and suppression systems.
- Electrical Systems: Power distribution, emergency generators, and backup power (UPS).
- Security Systems: Access control, intrusion detection, and CCTV systems.

For these systems, the final acceptance process involves a much higher level of technical oversight from both the contractor and the Government.

The Contractor's Responsibility

The QC Manager’s role during the acceptance testing of critical systems is that of a manager, planner, and coordinator.

QC Manager’s responsibilities include:

- Planning: The requirement for these tests, including the specific test procedures, must be identified in the CQC Plan from the very beginning.
- Scheduling: Must work with subcontractors and the Government to schedule these complex tests. This often involves multiple trades and can require after-hours work.
- Coordinating: Responsible for ensuring that all necessary personnel are present for the test. This includes the subcontractor's certified technicians, any required manufacturer's representatives, the independent Commissioning Agent, the QC Staff, and the Government QA team.
- Documenting: Responsible for gathering all test documentation, which includes not just a pass/fail result, but the detailed, signed test procedures and checklists. The QC Manager will then review, certify, and formally submit this package to the Government.

The Government's Responsibility: Subject Matter Expert / Technical Oversight

During the testing of critical systems, the Government QA Representative's role evolves from a random spot-checker to a Subject Matter Expert witness providing technical oversight. Their philosophy is still "Trust, but Verify," but the verification is much more intense. Their responsibilities include:

- Reviewing the Test Procedure: Before the test, the QA representative will review the contractor's submitted Functional Performance Test procedure to ensure it is comprehensive and will actually verify the contract requirements.
- Witnessing the Test: The QA representative will witness the entire test alongside the QC Manager. They will observe the procedures and the results firsthand.
- Providing Technical Oversight: The QA representative, often a Subject Matter Expert with specialized engineering and/or technician knowledge will ask probing questions to verify the system's performance under various conditions. For example, during a fire alarm test, they might ask, "Now show me what happens when the backup power is activated."
- Formal Acceptance: Final acceptance of a critical system is a formal process. The QA representative's concurrence on the final, certified test report signifies that the Government has formally accepted the system as complete and compliant.

A Practical Example: A Fire Alarm System Test

- Plan: The requirement for a 100% functional test of the fire alarm system is in the CQC Plan.
- Schedule: The QC Manager schedules the test for a Saturday to minimize disruption to the base.
- Notify: The QC Manager formally notifies all parties: their electrical subcontractor, the fire alarm manufacturer's representative, the Commissioning Agent, and the Government QA team, including the base Fire Marshal.
- Perform: On the scheduled day, the subcontractor's technician, following the approved test procedure, goes to every single device (every smoke detector, every pull station) and manually activates it.
- Witness: The QC Manager, the QA representative, and the Fire Marshal walk the site with the technician, watching the control panel to ensure each device reports correctly.
- Document: The technician completes and signs the detailed test report checklist.

- Certify: The QC Manager reviews the signed report, stamps it "CONFORMS," and formally submits it to the Government.
- Accept: The Government QA representative, having witnessed the successful test, provides their formal concurrence, and the system is accepted.

This formal, coordinated process ensures that the most important systems in the building are proven to work exactly as designed before the keys are handed over.

6.5.3 Examples of Critical Systems for Acceptance Testing

While every part of a building is important, certain systems are considered "critical" because they are essential for the facility's primary mission, life safety, or operational integrity. These systems require a formal, documented acceptance test before the project can be considered complete. Here are common examples:

- Life Safety Systems: These are the most critical systems of all, as they are directly responsible for protecting the lives of the building's occupants.
    - Fire Alarm System: This includes a 100% functional test of every single device. The test must prove that when any smoke detector, heat detector, or manual pull station is activated, the main fire alarm control panel receives the correct signal and activates the appropriate alarms (horns and strobes).
    - Fire Sprinkler / Suppression Systems: This includes testing the water flow alarms (tamper switches) and, if applicable, a full-flow test of the fire pump to ensure it delivers the required water pressure and volume. For specialized systems like those in a data center, it would involve a discharge test of the clean agent suppression system.
    - Mass Notification System: A test to ensure that pre-recorded or live voice messages are broadcast clearly and audibly throughout the entire facility as required.
- HVAC and Mechanical Systems: These systems are critical to making the building habitable and functional for its intended purpose.
    - Heating, Ventilation, and Air Conditioning (HVAC) System: This involves a full functional performance test, often managed by the Commissioning Agent (CxA). The test verifies that the system can properly heat and cool all zones of the building under various load conditions and that all controls and safeties function correctly.
    - Building Automation System (BAS) / Energy Management Control System (EMCS): This test proves that the "brain" of the building can properly monitor and control all connected equipment (chillers, boilers, air handlers, etc.), including testing alarm conditions and trend logging.
    - Medical Gas Systems (in Hospitals): A rigorous test to verify the pressure, purity, and proper function of all medical-grade oxygen, vacuum, and air outlets.

- Electrical Systems: These systems are critical for providing reliable power for the facility's mission.
    - Emergency Power System: This is a comprehensive test involving the Emergency Generator and Automatic Transfer Switches (ATS). The test simulates a loss of normal utility power and must prove that the generator starts automatically, the ATS transfers the load, and the building's emergency circuits are successfully powered within the time specified (often within 10 seconds).
    - Uninterruptible Power Supply (UPS) System: For critical spaces like data centers or command centers, this test simulates a power flicker and verifies that the UPS batteries seamlessly carry the load with no interruption to the protected equipment.
- Security and Communication Systems: These systems are critical for protecting the facility's assets and personnel.
    - Access Control System: A test to verify that every single card reader works and that a card swipe correctly grants or denies access at the central server as programmed.
    - Intrusion Detection System (IDS): A test of all door contacts and motion sensors to ensure they properly report an alarm condition.

6.5.4 Building Commissioning (Cx)

What is Commissioning? (And Why Is It Different From CQC?)

Standard Quality Control focuses on ensuring individual components of a project are installed correctly. For example, CQC verifies that a specific pump is the correct model, is bolted down properly, and is wired according to the plans.

Commissioning (Cx) takes the next step. As defined in UFGS 01 91 00.15 TOTAL BUILDING COMMISSIONING, commissioning is a systematic process of ensuring, verifying, and documenting that all of the building's energy-using systems and assemblies perform interactively according to the design intent. It's not about inspecting a single pump; it's about performing a Functional Performance Test (FPT) on the *entire* chilled water system—pumps, chillers, controls, and air handlers—to prove they work together as an integrated whole to deliver the required cooling.

When is a Commissioning Agent Needed?

While basic start-up and testing are required on most projects, a formal, dedicated Commissioning process led by a Commissioning Agent (CxA) is typically required for projects that have:

- Complex HVAC Systems: Buildings with central plants, variable air volume (VAV) systems, or sophisticated building automation systems (BAS).
- LEED or Sustainability Goals: Commissioning is a prerequisite for achieving most LEED certifications and for ensuring energy efficiency goals are met.
- Mission-Critical Facilities: Data centers, hospitals, laboratories, and command centers where the correct environmental conditions and system reliability are absolutely non-negotiable.
- Renewable Energy Systems: Projects incorporating solar arrays, geothermal systems, or other complex energy sources.

The Roles and Responsibilities in the Commissioning Process

- The Contractor's QC Manager as a Facilitator and Manager: The QC Manager is not the Commissioning Agent, but a key manager of the process. The QC Manager's responsibilities include planning, coordination, documentation management, and issue resolution. This pivotal role requires the QC Manager to proactively schedule and lead coordination meetings between the Commissioning Agent, subcontractors, and Government personnel to ensure complex Functional Performance Tests. Furthermore, as outlined in UFGS 01 91 00.15, *Total Building Commissioning*, the QC Manager serves as the central hub for project records, responsible for collecting, managing, and formally submitting all commissioning reports, from pre-functional checklists to the final certified Commissioning Report to the Government. Crucially, this management function extends to the Cx Issues Log, where the QC Manager ensures every deficiency identified by the is assigned, corrected, and successfully re-tested. Ultimately, the diligent management of these meetings and reports provides the final, verifiable proof that all building systems are fully integrated and ready for formal acceptance.
- The Commissioning Agent: The Expert Tester: This is the independent, third-party expert responsible for leading the hands-on commissioning process. Their role is to develop the Cx Plan, verify installation, lead Functional Performance Testing (FPT), identify and log issues, and compile the final report.
- The Government's QA Representative: The Oversight Witness: The Government QA representative's role is to provide technical oversight and to witness key commissioning

activities. They review and accept the Cx Plan, witness FPTs, verify issue resolution, and provide final acceptance.

6.5.5 The Red Zone

The "Red Zone" Analogy

Think of a construction project like a football game. The first 80 yards of the drive gets your team into scoring position, but the final 20 yards—the "red zone"—require intense focus, a specific plan, and perfect execution to get the ball into the end zone. The Red Zone process is the playbook to prevent projects from getting stuck in this final phase with open punch lists and missing paperwork.

The Purpose of the Red Zone

As detailed in UFGS 01 30 00, Administrative Requirements, the Red Zone is the final, critical phase of a project. While the intensive effort typically begins when the work is around 75% complete, the list of required closeout activities—the "Red Zone checklist"—should be introduced and discussed at the Preconstruction Conference so all parties are aware of the end-game requirements from the very beginning. A formal, actionable plan for completing these items should then be developed when the project reaches approximately 75% completion. The primary purpose of this final phase is to apply intense, coordinated management focus from all stakeholders to drive the project over the finish line, completing all remaining construction work and, just as importantly, all contractually required documentation for a smooth and efficient turnover.

Key Activities during the Red Zone Period

The Red Zone is a period of intense activity focused on completing all closeout requirements. During this phase, the QC Manager must ensure the final completion of:

- The Contractor Punch-Out, where all deficiencies are identified and corrected.
- The Pre-Final Inspection and the correction of the official Government punch list.
- All final system testing and Building Commissioning (Cx) activities.
- The assembly and submission of all Closeout Submittals (SD-11), including final Record Drawings ("As-Builts").
- The submission and acceptance of all Operation and Maintenance (O&M) Manuals.
- The scheduling and completion of all required User Training.
- The inventory and turnover of all spare parts and keys.

The Red Zone Meeting

The Red Zone Meeting is the capstone event of this process. It is a formal meeting that brings together all stakeholders—including the End User Representatives, Government's Quality Assurance personnel and Contracting Officer, and the contractor's Project Manager and QC Manager—to formally verify that all closeout requirements have been met. The agenda is a final check of all the activities listed above. This meeting confirms that all punch list items are complete and all turnover documents have been submitted and accepted, paving the way for the Final Acceptance Inspection and official project turnover.

EXERCISE QUESTIONS MODULE 6.5

1. What is the main difference between a regular QC inspection and a Special Inspection?

2. As the QC Manager, what is the most important job during a Special Inspection?

3. Name two examples of "critical systems" and explain in one sentence why each is considered critical.

4. What is the difference between Construction Quality Control (CQC) and Building Commissioning (Cx)?

5. In your own words, what is the main goal of the "Red Zone" phase of a project?

6. List three important activities that must be completed during the Red Zone.

CLASSROOM DISCUSSION EXERCISE MODULE 6.5

7. Scenario: The Uncoordinated Inspection

   The steel erection crew is installing high-strength bolts on the third floor—a task that requires a Special Inspection per the contract. The Government QA representative, performing their scheduled daily site walk, observes the work in progress.

   A few minutes later, the QA representative meets the QC Manager at the site trailer for a pre-planned discussion about an upcoming submittal. During their conversation, the certified Special Inspector for bolting arrives and informs the QC Manager that he is there to perform the inspection on the first-floor connections, which were completed yesterday. He states that he was never notified about the active work on the third floor.

   The Government QA representative, now aware of a procedural disconnect, turns to you as the QC Manager and asks, "I just saw your crew actively bolting on the third floor. Can you help me understand why that work is proceeding without the required Special Inspector being scheduled and present?"

Discussion Questions:

- As the QC Manager, what is the very first thing you should do?
- What went wrong here? Who is responsible for this breakdown in the process?
- What are the next steps to get this situation under control professionally?

8. Scenario: Fire Alarm Acceptance Testing.
   It is Saturday, and you are the QC Manager leading the final acceptance test of the building's fire alarm system. The test is going well, and you have a large team witnessing, including your subcontractor, the government QA representative, and the base Fire Marshal. On the very last circuit, one smoke detector in a small janitor's closet fails to report to the main panel. Your subcontractor says, *"No big deal, it's probably just a loose wire. We tested 200 devices today. Let's sign the 'Passed' test report, and I promise I'll fix that one device first thing Monday."*

   Discussion Questions:

   - As the QC Manager, what is your immediate response to your subcontractor?
   - Why is this a big deal? Why not just take his word for it to save time and effort?
   - What is the correct and professional process for properly finishing this acceptance test?

SUBMODULE 6.6

THE FINISH LINE - PROJECT COMPLETION AND TURNOVER

Submodule 6.6 Objectives: After completing this submodule, you will be able to:

- Describe the inspection process for project completion as defined by UFGS 01 45 00.
- Explain the contractor's responsibility for creating and managing the punch list.
- List the key components of the final closeout and turnover package.
- Explain the contractor's warranty responsibilities under the contract.

6.6.1 A Phased Approach to the Finish Line

Finishing a project is a formal, multi-step process designed to ensure all work is 100% complete and compliant before the facility is turned over. As detailed in UFGS 01 45 00 this process involves a sequence of three distinct inspections.

The Contractor Punch-Out Inspection

The QC Manager must lead their own team on a thorough inspection to create a "punch list" of deficiencies. Only after the Quality Control Manager has corrected and verified every item on the list do they formally notify the Government that the facility is ready for the "Pre-Final Inspection."

The Pre-Final Inspection

This is the joint review where the Government QA Representatives and the QC Manager inspect the project together. The QC Manager documents any additional items found by the Government, creating the official "Pre-Final Punch List." They must correct every item on this list before the Quality Control Manager can request the final acceptance inspection.

The Final Acceptance Inspection

This is the final verification and official turnover meeting, attended by the contractor, the Government QA team, and the end-user. The Quality Control Manager must provide at least 14 days' notice and certify that all work is complete. Failure to be 100% ready for this inspection can result in the contractor being billed for the Government's additional inspection costs.

6.6.2 The Final Turnover Package:

In parallel with the final inspections, the QC Manager is responsible for assembling and submitting the complete turnover package. Per various UFGS sections, this is a comprehensive set of documents and actions that are prerequisites for final acceptance. Failure to complete any of these can prevent project closeout.

Component	UFGS Reference	Description
Closeout Submittals	01 78 00	This is the master category for all final documentation. Its key component is the Record Drawings ("As-Builts"), which must be a clean, consolidated set of drawings showing the final, as-constructed condition of the project, incorporating all changes and RFIs.
Operation and Maintenance (O&M) Data	01 78 23	The Quality Control Manager must submit a comprehensive collection of O&M Manuals for all new equipment. This includes manufacturer's product data, operating instructions, maintenance procedures, and parts lists. As a QC Manager, the Quality Control Manager are responsible for collecting, organizing, and submitting this data.
User Training	01 78 23	If required, the Quality Control Manager must schedule and conduct training for the facility staff on how to operate the new systems. This training must not be scheduled until after the O&M Manuals have been submitted and accepted by the Government.
Building Commissioning (Cx) Reports	01 91 00.15	For projects with commissioning, all functional performance tests must be complete. The final Commissioning Report, showing that all systems have been tested and are operating correctly as an integrated whole, must be submitted. The Cx Issues Log must be fully resolved.
Special Inspection Reports	01 45 35	A final, consolidated report from the independent Special Inspector must be submitted, certifying that all required special inspections (e.g., for structural welding, high-strength bolting, fireproofing) were performed and passed.

Warranty Management Plan	01 78 00	The Quality Control Manager must submit a consolidated package of all manufacturer and contractor warranties and a plan that outlines the points of contact and procedures for the Government to use when making a warranty claim.
Spare Parts & Materials	01 78 00	All required attic stock, spare parts, and special tools must be inventoried, properly labeled, and formally turned over to the Government.

6.6.3 The Warranty Period

As defined by FAR Clause 52.246-21, Warranty of Construction, the contractor warrants the completed work against all defects.

- Standard Period: Typically one year from the date of final Government acceptance.
- Manufacturer Warranties: If a manufacturer provides a warranty longer than one year (e.g., a 20-year roof warranty), that longer warranty accrues to the Government's benefit.
- Repaired Work: If the Contractor has to repair or replace any work during the warranty period, that specific item receives a new one-year warranty starting from the date the repair is completed.

EXERCISE MODULE 6.6

1. What is the primary purpose of the Contractor Punch-Out inspection, and who is responsible for creating the initial punch list?

2. What is the correct chronological sequence of the three final inspections?

3. A contract requires the Contractor to train the facility staff on the new HVAC system. According to UFGS 01 78 23, what key deliverable must be submitted and accepted *before* this training can take place?

4. A project has a 20-year manufacturer's roof warranty. The project is accepted on June 1, 2024. When does the roof warranty expire?

CLASSROOM DISCUSSION EXERCISES MODULE 6.6

5. Scenario: Punch-Out
   The Quality Control Manager has completed their Contractor Punch-Out and has scheduled the Pre-Final Inspection. The superintendent says one punch list item—repainting a scuffed wall—can't be done until after the inspection. What is the correct professional action to take, and why?

6. Scenario: Final Acceptance
   It is two weeks before the scheduled Final Acceptance Inspection. The QC Manager realizes that the final Commissioning Report is not yet complete because the Commissioning Agent found an issue with the HVAC controls.

MODULE 7

THE DIGITAL JOB SITE: MASTERING ELECTRONIC MANAGEMENT SYSTEMS

Module 7 Objectives: After completing this module, you will be able to:

- Understand the purpose of an Electronic Construction Management System as required by the contract.
- Recognize that while software applications may change (RMS, eCMS, Procore, Kahua), their core functions remain consistent.
- Identify key CQC tasks that are managed through these digital platforms.
- Appreciate the importance of timely and accurate data entry as a primary communication tool.

7.1 The Evolution of Construction Management

For decades, project management was handled with paper files, faxes, and mail. Today, our projects are managed through powerful software platforms. The Quality Control Manager may be familiar with the terms RMS (Resident Management System) used by USACE or eCMS used by NAVFAC.

It is essential for the Quality Control Manager to understand that the name on the software is not what's important. The principles and the required functions are what matter. Regardless of platform, these systems are the contractually required method for managing project information. Think of it like a building's foundation: the specific depth and rebar schedule may differ between a small office, a warehouse, or a barracks, but they all require proper excavation, formwork, and concrete placement to support the structure. The core principles the Quality Control Manager learns on one system are directly transferable to the next.

7.2 The Purpose of a Centralized Digital System

The requirement to use electronic system like this is outlined in the specifications. These systems are not optional; they are the official communication and documentation tool for the project. Their purpose is to:

- Create a Single Source of facts: All official project documentation—submittals, RFIs, daily reports, deficiencies—lives in one central place. This eliminates disputes over "he said, she said" or lost paperwork.

- Standardize Processes: The software enables everyone to follow the same workflow. An RFI must be submitted through the proper digital channel, ensuring it goes to the right people and gets a formal response. This prevents informal answers.
- Provide Real-Time Visibility: Both the contractor and the Government can see the status of any item at any time. The Quality Control Manager can see exactly when a submittal was submitted, who is currently reviewing it, and when a response is due.
- Create a Permanent, Auditable Record: The system automatically creates a complete historical record of the project, which is invaluable for project closeout, performance evaluations, and resolving any potential claims.

7.3 The Quality Control Manager's Daily Job in the Digital System

The QC Manager lives in a digital system every day. It is where they will perform many of the core tasks we've discussed in this course.

7.3.1 Submittal Management**:** The Quality Control Manager will use the system to manage their Submittal Register. The Quality Control Manager will upload submittal documents, apply their digital certification stamp, and formally transmit them to the Government. The Quality Control Manager will then be able to track the Government's review and receive the official response ("Approved," "Approved as Noted," etc.) directly through the system.

7.3.2 Daily Reporting**:** The Quality Control Manager will prepare and submit the Quality Control Manager's CQC Daily Report directly into the system. As we learned in Module 6.3, this report must be submitted daily. The system creates the official record and time-stamps their submission.

7.3.3 Deficiency Management: The system will host the Deficiency/Rework Items List. When the Quality Control Manager or the Government identifies a deficiency, it will be logged in the system. The Quality Control Manager will then use the system to track the status of the correction, from "Open" to "Corrected" to "Verified and Closed."

7.3.4 Three-Phase Control**:** The Quality Control Manager will use the system to manage the documentation for the Contractor's Three Phases of Control. The Preparatory and Initial Phase Meeting minutes will be uploaded and attached to the CQC Daily Report for the day the meeting was held.

7.3.5 Requests for Information (RFIs): The QC Manager will initiate and track all Requests for Information within the system. This process involves clearly writing the question, attaching any relevant drawings or photos to support the query, and formally submitting it to the Government. The system provides a clear channel for this communication and creates a time-stamped record, allowing the QC Manager to track the official response and ensure questions are answered formally.

7.3.6 Communications / Meeting Minutes: The system serves as the official repository for all formal communications, including meeting minutes. After key meetings such as the Preparatory Phase meeting or weekly progress meetings, the QC Manager will upload the official minutes. This ensures that all stakeholders have access to a single, official record of what was discussed and what decisions were made, preventing miscommunication.

7.4 Conclusion: The Quality Control Manager’s Responsibility as a User

The most sophisticated software in the world is useless if the information put into it is inaccurate or late. As a QC Manager, the commitment to quality includes a commitment to timely and accurate data entry. A CQC Daily Report submitted three days late or an RFI submitted without the required details creates delays and undermines the CQC/QA partnership. Mastering the project's required electronic management system is not an administrative burden; it is a fundamental requirement of being an effective Construction Quality Manager in the 21st century.

MODULE 8

MAKING THE SYSTEM WORK

Module 8 Objectives: After completing this module, you will be able to:

- Identify common categories of construction problems.
- Describe the importance of resolving issues at the lowest possible level.
- List the formal contract actions the Government can take to enforce compliance, citing the specific FAR Clause authority for each.
- Explain the role of the QC Manager as a proactive problem-solver.

8.1 The Inevitability of Problems

On any construction project, problems are inevitable. A successful project is not one with zero problems; it is one where problems are identified early and resolved effectively. Most issues fall into common categories:

- Delays: Late submittals, slow correction of deficiencies, or a general failure to adhere to the CQC process.
- Lack of Planning: A failure to properly execute the Three Phases of Control, which almost always leads to rework.
- Testing Failures: Improper, inadequate, or untimely testing that compromises material verification.
- Poor Documentation: Late, incomplete, missing, or inaccurate reports.
- Misunderstanding of CQC Responsibilities: A lack of clarity on CQC roles and requirements.

8.2 The First Line of Defense: Solving Problems at the Field Level

The goal of a successful CQC/QA partnership is to solve problems at the lowest possible level before they escalate. This is achieved through professional, daily, one-on-one communication between the contractor's QC Manager and the Government's QA representative. The process is simple: a potential issue is identified, it is communicated immediately, and the QC Manager takes the lead to investigate and act.

This is the most efficient and least adversarial path. The roles of the QC Manager and QA Representatives are to be proactive problem-solvers.

8.3 When Field-Level Resolution Fails: Government Enforcement Options

Proper and effective CQC can prevent most adverse Government actions. However, if informal communication does not resolve a recurring or serious issue, the Government has a range of formal contractual remedies to enforce compliance. These actions are progressive, starting with formal warnings and escalating only as necessary.

Action	Description	Authority (FAR Clause)
Formal Written Notice	A formal letter or Non-Compliance Notice (NCN) is issued, officially documenting the deficiency and demanding correction.	General Contract Administration
Require Removal and Replacement	The Government can direct the contractor to remove and replace any work that does not conform to the contract, at the contractor's expense.	52.246-12, Inspection of Construction
Withhold Payment	The Government can withhold progress payments for work that is deficient or for a systemic failure of the CQC system. The Government has no obligation to pay for non-compliant work.	Contract Payment Clause
Require Removal of Personnel	If a contractor's employee is found to be incompetent, careless, or otherwise objectionable, the Government can demand their removal from the project.	52.236-5, Material and Workmanship
Stop Work	The Contracting Officer can issue a formal order to halt a specific feature of work until a deficiency is corrected, particularly if subsequent work would cover it up.	General Contracting Authority
Issue Unsatisfactory Performance Appraisal	A poor performance rating (CPARS) can be issued at any time. Even a single unsatisfactory rating can severely impact a contractor's ability to win future government contracts.	CPARS Regulations

Issue Cure Notice	A formal notice giving the contractor a specific timeframe (typically 10 days) to "cure" a performance failure before more drastic action is taken.	Contract Disputes Act
Terminate the Contract	The most drastic measure, taken only when all other remedies have failed. The Government can terminate the contract for default.	52.249-10, Default (Fixed-Price Construction)

These actions are not taken lightly and are almost always preventable. A contractor with a robust and proactive CQC system will rarely, if ever, face these formal measures.

EXERCISE MODULE 8

1. What is the most effective and efficient way to solve the majority of problems on a construction site?

2. A contractor consistently fails to submit daily CQC reports on time. This is an example of which common problem category?

CLASSROOM DISCUSSION EXERCISES MODULE 8

(**Questions 3, 4, 5, and 6 are classroom discussion exercises to be led by the facilitator.**)

3. Scenario: The Leaking Windows
   A contract is for a large barracks complex with 4,200 windows. The project is 75% complete, and some buildings are occupied when the end-user complains that the factory-glazed window panels are leaking during driving rain. Investigation reveals an improper glazing seal was used.
   - Identify the steps within the CQC system that failed.
   - Identify the steps within the Government's QA system that failed.
   - What is the first corrective measure the Resident Engineer should employ?
   - What action should be taken on the remaining buildings?
   - If the contractor refuses to comply, what powerful tools can the Resident Engineer resort to?

4. Scenario: The Wrong Carpet
   The contract is for classrooms that are scheduled to be turned over before the start of classes. Carpet, which was color-coordinated with room furnishings, was scheduled for delivery on August 1, allowing only 3 weeks for installation. On August 1, the carpet arrives, and it is immediately discovered that the color does not adequately match the approved sample submittal.

   - Could the CQC system have prevented this? How?
   - Did the Government fail in its QA role by not inquiring about the status of the carpet manufacture?
   - What steps should the Government take now?

5. Scenario: The Missing Sealant Test
   An airfield project requires a special jet fuel-resistant joint sealant for the concrete apron. The specifications require this sealant to be Government tested and approved *before* use. As the contractor starts placing the concrete apron, it is discovered that the sealant was never submitted for the required testing.

   - In what meeting should the overall testing requirements of the contract have been discussed?
   - At what specific CQC phase should this specific sealant testing requirement have been discussed?
   - Within the Government's QA role, where should this deficiency have been detected?
   - What corrective measure should the Resident Engineer use now?

6. Scenario: The Wrong Masonry Reinforcement
   A project includes several masonry buildings. The contractor provides a mock up wall panel without an approved submittal for the joint reinforcement. The Government QA representative objects verbally, but the contractor proceeds anyway. Ten days later, with one building's walls complete, the QA rep discovers the contractor is using the wrong type of joint reinforcement.

- What questions immediately come to mind regarding the effectiveness of the CQC system?
- Where did the Government's QA role first break down?
- What Contract Clauses should the QA Representatives employ *now*?

PAGE LEFT BLANK

PREPARATORY PHASE CHECKLIST

SPEC SECTION	DATE

CONTRACT NO	DEFINABLE FEATURE OF WORK (DFOW)	SCHEDULE ACT NO.	INDEX #

PERSONNEL PRESENT | GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: ◯ YES ◯ NO | Add | Del

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN SUBMITTED AND APPROVED? (IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED OR APPROVED) ◯ YES ◯ NO

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

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

OTHER ITEMS OR REMARKS.

QC MANAGER _____ DATE _____

4256/2C (9/98)

INITIAL PHASE CHECKLIST

SPEC SECTION	DATE

CONTRACT NO	DEFINABLE FEATURE OF WORK (DFOW)	SCHEDULE ACT NO.	INDEX #

PERSONNEL PRESENT — GOVERNMENT REP NOTIFIED ____ HOURS IN ADVANCE: ◯ YES ◯ NO — Add / Del

NAME	POSITION	COMPANY/GOVERNMENT

PROCEDURE COMPLIANCE — IDENTIFY 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 INITIAL WORK BE CONSIDERED A SAMPLE? ◯ YES ◯ NO
(IF YES, PROVIDE THE LOCATION WHERE THE INITIAL WORK CONSIDERED AS A SAMPLE IS LOCATED AND THE PRECAUTIONS TAKEN TO PRESERVE THE SAMPLE

RESOLUTION — RESOLVE ANY DIFFERENCES.

COMMENTS:

CHECK SAFETY — REVIEW JOB CONDITIONS USING EM 385-1-1, ACTIVITY HAZARD ANALYSIS AND MSDS

COMMENTS:

OTHER — OTHER ITEMS OR REMARKS

QC MANAGER _____ DATE _____

4296/2C (9/98)

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

REPORT NO

PHASE	CONTRACT NO		CONTRACT TITLE	

PREPARATORY WAS PREPARATORY PHASE WORK PREFORMED TODAY? ◯ YES ◯ NO — Add / Del

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

Schedule Activity No	Definable Feature of Work (DFOW)	Index #

INITIAL WAS INITIAL PHASE WORK PREFORMED TODAY? ◯ YES ◯ NO — Add / Del

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

Schedule Activity No	Definable Feature of Work (DFOW)	Index #

FOLLOW-UP WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? ◯ YES ◯ NO

WORK COMPLIES WITH SAFETY REQUIREMENTS AND INSPECTION COMPLIES WITH EM385-1-1? ◯ YES ◯ NO — Add / Del

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) — REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST) — Add / Del

Schedule Activity No	Description	Schedule Activity No	Description

REMARKS (Also Explain Any Follow-Up Phase checklist Item From Above That Was Answered "NO"; Work Deficiency, Safety Deficiency.) Manuf. Rep On-Site, etc. — Add / Del

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.

[TYPE NAME]

AUTHORIZED QC MANAGER AT SITE — DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT: FOR GOVERNMENT USE ONLY. — Add / Del

Schedule Activity No	Description

[TYPE NAME]

GOVERNMENT QUALITY ASSURANCE MANAGER — DATE

4296/2C (9/98)

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

CONTRACT NO	TITLE AND LOCATION	REPORT NO

CONTRACTOR	SUPERINTENDENT

AM WEATHER	PM WEATHER	MAX TEMP (F)	MIN TEMP (F)

WORK PERFORMED TODAY

Add | Del

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 actions.)	◯ YES	◯ NO	

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

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

Add | Del

Schedule Activity No	Submittal #	Description of Equipment/Material Received

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

Add | Del

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

Add | Del

Schedule Activity No	REMARKS

CONTRACTOR/SUPERINTENDENT

DATE

4296/2C (9/98)

GOVERNMENT QUALITY ASSURANCE (QA) REPORT

DATE

REPORT NO

CONTRACT NO

TITLE AND LOCATION

STATUS

WORKING? ◯ YES ◯ NO
IF NO, WHY NOT:

WEATHER CONDITIONS:

CHECK POINTS

SUPERINTENDENT ON SITE ◯ YES ◯ NO
REMARKS:

QC MANAGER ON SITE ◯ YES ◯ NO
REMARKS:

QC REPORTS CURRENT ◯ YES ◯ NO
REMARKS:

AS-BUILTS CURRENT ◯ YES ◯ NO
REMARKS:

SUBMITTALS APPROVED FOR ONGOING WORK ◯ YES ◯ NO
REMARKS:

DEFICIENCY LIST REVIEWED ◯ YES ◯ NO
REMARKS:

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

Schedule Activity No	DESCRIBE OBSERVATIONS

MEETING/CONFERENCE NOTES (INCLUDING PARTICIPANTS): Add Del

Schedule Activity No	NOTES

INSTRUCTIONS GIVEN OR RECEIVED/CONTROVERSIES PENDING: Add Del

Schedule Activity No	INSTRUCTIONS/CONTROVERSIES

QA REPRESENTATIVE DATE

SUPV INITIALS DATE

4296/5 (9/98)

DEFICIENCY / REWORK ITEMS LIST

Project: P-987, Consolidated Communications Center **List Updated:** June 5, 2026
Contract No: W91234-25-C-0001

Item No.	Date Discovered	Discovered By	NAS Activity	Location	Description of Deficiency	Responsible Subcontractor	Date to be Corrected	Date Corrected	QC Verification (Date & Initials)
001	15-MAY-25	J. Miller (QC)	1040	Foundation, Grid A-B	Honeycombing observed on west face of wall after form removal. Approx. 2 sq ft area.	SQC	18-MAY-25	17-MAY-25	17-MAY-25 JM
002	22-MAY-25	F. Reynolds (QA)	1090	2nd Floor, Grid C-4	Anchor bolt #3 was installed 2" out of tolerance to the east. Prevents steel column placement.	SQC	24-MAY-25	23-MAY-25	24-MAY-25 JM
003	28-MAY-25	S. White (Elec. QC)	2050	Elec. Room 101	Panelboard 'LP-1' was delivered with a dent on the front cover.	Salcha Electric	04-JUN-25		
004	02-JUN-25	J. Miller (QC)	1070	East Elevation	CMU wall has non-uniform mortar joints between course 5 and 6. Varies from 1/4" to 3/4".	Masonry Supply	06-JUN-25	05-JUN-25	05-JUN-25 JM
005	04-JUN-25	Test Report #S-005	1080	Area C Backfill	Soil compaction test #S-005 failed. Achieved 91% compaction where 95% is required.	Earth Movers Inc.	07-JUN-25		

Explanation for Students: How to Read and Use This Log

- **Item No.:** A unique, sequential number for tracking. Never reuse a number.
- **Date Discovered:** The date the problem was first identified.
- **Discovered By:** Who found the issue? It could be your QC staff, a Government QA representative, or it could be a failed Test Report. This promotes accountability.
- **NAS Activity:** Linking the deficiency to the schedule activity helps in assessing potential schedule impacts.
- **Description of Deficiency:** A clear, factual, and specific description of the problem. **"Honeycombing on west face"** is good. **"Concrete looks bad"** is bad.
- **Responsible Subcontractor:** Identifies who is responsible for performing the corrective work.
- **Date to be Corrected:** The date the contractor commits to having the correction completed. This is reviewed at the weekly QC meeting.
- **Date Corrected:** The actual date the work was finished.
- **QC Verification:** The QC Manager inspects the corrected work and, if it is acceptable, signs and dates it. This is a critical step. The item is not closed until QC verifies it.
- **Status:**
    - **Open:** The problem has been identified but not yet fixed. *(See Item #003 and #005)*
    - **QC Verified:** The contractor has fixed the item and their own QC Manager has verified the fix, but they are waiting for Government concurrence. *(See Item #004)*

- **Closed:** The item has been fixed, verified by QC, and concurred with by the Government. It is 100% complete. *(See Item #001 and #002)*

SAMPLE QUALITY CONTROL (QC) MEETING MINUTES

Project: P-205, Aircraft Maintenance Hangar
Contract Number: N62473-23-C-0001
Meeting Date: October 26, 2025
Time: 9:00 AM – 10:15 AM
Location: Project Site Trailer

1.0 Attendees

Name	Title	Organization
John Smith	QC Manager	ABC Construction
Jane Doe	Project Superintendent	ABC Construction
Mike Guarino	Electrical QC Specialist	ABC Construction
Sarah Wilson	Commissioning Provider (CxC)	Cx Solutions Inc.
Gary Allen	Project Manager	ABC Construction
Bill Miller	Contracting Officer (Rep)	NAVFAC

2.0 Meeting Agenda and Discussion

The meeting was led by the QC Manager, John Smith.

- **2.1 Review Minutes of Previous Meeting (10/19/2025):**
    - Minutes from the previous week's meeting were reviewed. No corrections were noted. Minutes were approved as final.
- **2.2 Review of Schedule, Work Status, and Deficiencies:**
    - Schedule: The project is currently 3 days behind schedule due to a delay in steel delivery. A recovery schedule has been submitted.

    - Work Status: Concrete slab for Bay 1 (Activity #1010) is 100% complete. Structural steel erection (Activity #1020) is 50% complete.
    - Deficiencies: Rework Item #014 (incorrect anchor bolt placement) was corrected and approved on 10/25. One new deficiency was noted: #015 - minor cracking on a section of the slab; investigation is in progress.
- **2.3 Review Status of Submittals and RFIs:**
    - Submittals: Submittal 05 12 00-01 (Structural Steel) was approved. Submittal 26 24 16-01 (Panelboards) is pending government review.
    - RFIs: RFI-008 regarding conduit routing was answered and closed. RFI-009 regarding fire-stopping material is awaiting a response from the A/E.
- **2.4 Three-Week Look-Ahead:**
    - Week 1: Complete steel erection for Bay 1 (Activity #1020). Begin metal decking installation (Activity #1030).
    - Week 2: Begin roofing installation over Bay 1 (Activity #1040). Start interior CMU wall construction (Activity #2010).
    - Week 3: Continue roofing (Activity #1040). Begin rough-in for electrical and mechanical systems in Bay 1 (Activity #3010 & #4010).
- **2.5 Review Testing Plan and Log:**
    - Concrete cylinder break tests for Bay 1 slab passed the 7-day and 14-day requirements. 28-day break is scheduled for next week.
    - Soil compaction tests for the new parking area were completed and passed. Reports are attached to the daily report.
- **2.6 Resolve QC and Production Problems:**
    - Production: The issue of crane access being blocked by material laydown was resolved by reorganizing the laydown yard.
    - Change Orders: PC-002 (additional power outlets) is awaiting final pricing before submission.
- **2.7 Items Requiring QC Plan Revision:**
    - No items were identified that would require a revision to the QC Plan.
- **2.8 Review Accident Prevention Plan (APP) and Safety:**
    - No incidents or near misses were reported this week.

    - A safety observation noted two workers not wearing safety glasses; a toolbox talk on PPE was conducted immediately. The effectiveness of the overall safety program remains satisfactory.

- **2.9 Review Environmental Requirements:**
    - The silt fence near the south gate requires minor repair. This will be addressed today. All other erosion control measures are effective.
- **2.10 Review Environmental Management & Waste Management Plans:**
    - Waste dumpsters were emptied on 10/24. All dumpster to remain covered when not in use.
- **2.11 Review Status of Training Completion:**
    - Training schedule for HVAC controls and maintenance scheduled for November 17, 2025. Awaiting Government to provide final roster.
- **2.12 Review Commissioning (Cx) Plan and Issues Log:**
    - Cx Provider reviewed the pre-functional checklist for the HVAC system.
    - Cx Issues Log: One new issue was added regarding sensor placement for the AHU-1. The issue has been assigned to the mechanical subcontractor for review.

3.0 New Action Items

Item #	Action	Responsible	Due Date
1	Repair silt fence at the south gate.	Jane Doe	10/26/2025
2	Follow up on RFI-009 with the A/E.	John Smith	10/27/2025
3	Submit final pricing for PC-002.	David Chen	11/02/2025

Prepared by: John Smith, QC Manager

Distribution: A copy of these minutes was provided to all attendees and submitted to the Contracting Officer on October 26, 2025

Sample Quality Control (QC) Testing Plan and Log

Project: P-205, Aircraft Maintenance Hangar
Contract Number: N62473-23-C-0001
Date: July 26, 2025

Test Required	Associated Feature of Work	Specification Paragraph	Frequency	Responsible Person
Soil Compaction Test	Earthwork & Site Grading	31 20 00 - 3.4	One test per 2,000 sq. ft. of each lift.	QC Manager / ABC Testing
Concrete Slump Test	Cast-in-Place Concrete	03 30 00 - 2.1.B	First truck and every 50 cubic yards thereafter.	QC Manager / ABC Testing Lab
Concrete Compressive Strength	Cast-in-Place Concrete	03 30 00 - 3.8.A	One set of cylinders per 50 cubic yards poured.	ABC Testing Lab
Structural Bolt Torque Verification	Structural Steel Erection	05 12 00 - 3.3.C	10% of installed bolts, per RCSC requirements.	QC Manager
Weld Inspection (Visual & UT)	Structural Steel Welding	05 12 00 - 3.4.A	25% of all moment connection field welds.	XYZ Party Inspector
Masonry Mortar Compression Test	CMU Walls	04 22 00 - 3.5.B	One set of cubes for every 500 sq. ft. of wall.	QC Manager / ABC Testing Lab
HVAC Duct Leakage Test	Mechanical Ductwork	23 31 00 - 3.6	Per SMACNA standards, prior to insulation.	Mechanical QC Specialist (Phill Payne)
Electrical Circuit Continuity	Electrical Branch Wiring	26 05 19 - 3.2.A	100% of all circuits prior to energization.	Electrical QC Specialist (Mike Guarino)
Paint Dry Film Thickness (DFT)	Interior/Exterior Painting	09 90 00 - 3.9	5 random spot checks per 1,000 sq. ft.	QC Manager

SAMPLE PREPARATORY PHASE MEETING MINUTES

Project Name: P-385, Unaccompanied Enlisted Personnel Housing (UEPH)
Contract Number: N62473-25-C-1025
Date: 19 March 2026
Time: 13:30

Definable Feature of Work (DFOW):
DFOW-12: Exterior Window Installation, First Floor (48 EA, Type W-1)

---

1. Purpose of Meeting

To conduct the Preparatory Phase meeting in accordance with UFGS 01 45 00, Paragraph 3.6.2.1, prior to the start of window installation on the first floor. The purpose is to perform a comprehensive review of all contract requirements with the full team to ensure a mutual understanding of the work, verify readiness, and establish the standard of quality.

---

2. Attendees

Name	Title / Company	Signature
Frank Castle	QC Manager, ABC Construction	*(signature)*
Billy Russo	Superintendent, ABC Construction	*(signature)*
Marco Inaros	Certified Window Installer Foreman, ABC Const.	*(signature)*
Karen Page	QA Representative, NAVFAC SW	*(signature)*
Curtis Hoyle	Safety Officer, ABC Construction	*(signature)*

---

3. Review of Contract Requirements (Per UFGS 01 45 00, Para 3.6.2.1)

The QC Manager (Frank Castle) led the team through a detailed review of all requirements for this DFOW:

a. Review Applicable Specifications, Codes, and Standards:

- [✓] Section 08 51 13, Aluminum Windows and Section 07 92 00, Joint Sealants were reviewed paragraph by paragraph.
- [✓] Referenced Standard: AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) was discussed. A copy of the standard is on-site and available for review.
- [✓] All required documents are present in the field office.

b. Review Contract Drawings:

- [✓] Sheet A-201, Exterior Elevations, and Sheet A-501, Window Details, were reviewed.
- [✓] Installation details, including flashing integration, sealant joints, and fastener locations were confirmed by the Installer Foreman (Marco Inaros).

c. Verify Field Measurements:

- [✓] Superintendent (Billy Russo) confirmed that 100% of first-floor rough openings (48 total) were field-measured on 15 Feb 2026.
- [✓] These measurements were cross-referenced against the approved shop drawings before the window order was finalized, confirming no discrepancies.

d. Verify Approved Submittals and Factory Test Results:

- [✓] The following submittals are approved and filed on site:
    - 085113-001A: Window Shop Drawings & Product Data.
    - 085113-002A: Installer Qualifications (Marco Inaros's crew meets the 5-year experience requirement).
    - 079200-001A: Joint Sealant Product Data.
- [✓] Factory Test Results: Submittal 085113-003A, containing certified factory test reports for air infiltration (ASTM E283), water penetration (ASTM E331), and structural performance (ASTM E330) per the approved AAMA/WDMA ratings, was verified as received and approved.

e. Review Testing Plan:

- [✓] The CQC Plan's testing requirements were reviewed.
- [✓] Field Testing: Per spec section 08 51 13, a third-party agency (A2LA Accredited Testing) will be contracted to perform field water penetration testing (ASTM E1105) on 3% of the installed windows (2 windows, selected by the Government QA).
- [✓] QC Manager is responsible for scheduling the test after the first 10 windows are installed and fully sealed.

f. Examine Work Area and Preliminary Work:

- [✓] The Superintendent and QC Manager confirmed a joint inspection of all 48 rough openings was completed on 18 Mar 2026.
- [✓] Weather barriers and primary flashing are installed per manufacturer's instructions and contract drawings. No deficiencies were noted. The work area is clean and ready.

g. Review Coordination of Product/Material Delivery:

- [✓] Windows are stored in the designated laydown yard on dunnage, covered with original factory packaging.
- [✓] A plan is in place to move windows to their respective installation points on a daily basis to minimize on-site clutter and risk of damage.

h. Examine Required Materials, Equipment, and Samples:

- [✓] Materials: All 48 Type W-1 windows have been inspected on-site. No damage (scratches, broken seals, etc.) was found. All required fasteners and sealants are on-hand and properly stored.
- [✓] Equipment: All necessary tools and installation equipment are on site.
- [✓] Sample Work: A sample mock-up of the window installation, including flashing and sealant, was approved on 28 Feb 2026 and is being used as the standard of quality for this work.

i. Check All Materials and Equipment are Tested, Submitted, and Approved:

- [✓] This item was confirmed as complete via the submittal review in step (d) and material examination in step (h).

j. Discuss Construction Methods, Tolerances, and Controls:

- [✓] Method: Marco Inaros (Foreman) described the installation sequence: window placement, shimming plumb/level/square to a 1/8" tolerance, fastening, and sealant application.
- [✓] Workmanship: Emphasis was placed on ensuring a continuous, tool-finished sealant bead with no gaps.
- [✓] Potential Problems: The team discussed the importance of protecting installed windows from damage by other trades. Superintendent will enforce a "no-touch" zone around newly installed units.

k. Review APP and Activity Hazard Analysis (AHA):

- [✓] The project APP and the specific AHA for "Exterior Window Installation" were reviewed by the Safety Officer (Curtis Hoyle).
- [✓] Key topics covered: manual lifting techniques, use of ladders/scaffolding, and potential for falling objects.
- [✓] Safety Data Sheets (SDS) for the sealant are on site and have been reviewed by the crew.

---

4. Establishment of Quality Standards for Initial Phase

It was agreed by all attendees that the Initial Phase Inspection will be conducted at the first window installed (Unit 101). The inspection will verify that the unit is plumb, level, and square, that fasteners are correctly installed, and that the flashing and sealant details precisely match the approved sample mock-up. No further windows will be installed until the Initial Phase inspection is passed.

---

5. Action Items

Item	Responsible Party	Due Date	Status
1. Schedule ASTM E1105 field testing after first 10 units are installed.	Frank Castle (QCM)	TBD	Open

---

6. Conclusion

A comprehensive review has been completed. The team has a mutual understanding of the methods, standards, and safety requirements. Work on this DFOW is authorized to begin on 20 March 2026.

Meeting Adjourned: 14:15

SAMPLE PRE-CONSTRUCTION CONFERENCE AGENDA

Contract Number: N12345-26-C-0001
Contract Title: P-385, Unaccompanied Enlisted Personnel Housing (UEPH)
Location: Naval Base Orca
Date & Time: 28 March 2026 – 09:00

1. Introduction and Overview (Led by: Gov't Construction Manager)

- Purpose of Meeting: To discuss and clarify all administrative and procedural requirements for the P-385 UEPH project. This meeting does not change any contract requirements.
- Introduction of Key Personnel:
    - Government Team:
        - Contracting Officer (KO): Michael Ramirez
        - Design Manager: Mike Guarino
        - Construction Manager (CM): Chris Willner
        - Engineering Technician (ET): Gary Allen
    - Contractor Team (Alpha Construction):
        - Project Manager: Sarah Jenkins
        - Superintendent: Bob Vance
        - Quality Control Manager (QCM): Frank Castle
        - Site Safety & Health Officer (SSHO): Maria Hill
    - End User / Base Personnel:
        - Housing Manager: Bill Smith
        - UEPH Manager: Janice Williams

2. Contract & Project Overview (Led by: Contractor)

- Contractor's Presentation: An overview of the project scope, their basic approach, and the proposed construction phasing and schedule.
- Contract Details:
    - Scope: Construct a new 150-room UEPH facility.
    - Award Date: 15 March 2026
    - Contract Completion Date: 15 September 2027
    - Liquidated Damages: $1,250.00 per calendar day.

3. Administrative & Communication Protocols (Led by: Gov't CM)

- Official Correspondence: All mail must be addressed to the main office, not to individuals, and must reference the contract number.
- Working Hours & Base Access:
    - Standard Hours: 07:00-17:00, Monday-Friday.

    - Alternate Hours: Requests for night, weekend, or holiday work require 3-day advance written notice to the KO.
    - Contract requires a full time Superintendent.
    - Quality Control Manager (QCM) and Site Safety and Health Officer (SSHO) shall have no other responsibilities except to manage their program.
- Base Security (Naval Base Orca): Review of DBIDS badging, vehicle pass requirements, and the zero-tolerance drug enforcement policy.

4. Pre-Construction Submittals (SD-01) (Led by: Gov't CM)

- Discussion of Key Submittals: The following are required before starting on-site work: Contractor Quality Control (CQC) Plan, Accident Prevention Plan (APP), Project Schedule, Schedule of Prices, Performance/Payment Bonds, List of Subcontractors (SF 1413), Environmental Protection Plan and Emergency Recall List.

5. Material & Equipment Management (Led by: Gov't CM)

- Submittal Process (UFGS 01 33 00): Submittals will be managed via the electronic management system. The contractor must review, certify, and clearly identify any variations.
- Government has 21 working days to review GA/DM submittals
- Government has 10 working days to review FIO submittals
- Defense Priorities and Allocations System (DPAS):
    - This contract has a priority rating of DO-C2.
    - This rating is mandatory for use on all material orders. Failure to use it may jeopardize requests for time extensions due to material delays.

6. On-Site Operations & Supervision (Led by: Gov't CM)

- Supervision: The contractor's Superintendent must be on the job site at all times during work progress and have the authority to act for the contractor.
- Weekly QC Meetings: In accordance with UFGS 01 45 00, these meetings will be conducted by the Contractor's QCM to review past work, plan for upcoming three-phase inspections, and resolve quality deficiencies. The weekly QC meeting will be held every Tuesday at 10:00 in the government field office.
- Utility Outages: All outage requests (electrical, water, etc.) and excavation permits require 14 days advance written notice.

7. Job Site Amenities & Temporary Construction Facilities (Led by: Gov't ET)

- Submission of Temporary Facilities: The contractor shall submit their plan for temporary facilities in accordance with UFGS 01 50 01.00 requirements.

- Prior to submission, walk site with ET to predetermine best location for temporary trailers.
- Temporary Utility Services: Required.
- Job Site Telephone (Cell): Required.
- Project Sign: Required IAW UFGS 01 58 00.

8. Safety & Environmental (Led by: Gov't ET)

- Safety (EM 385-1-1):
  - Contract requires a LEVEL 1 Site Safety and Health Officer (SSHO).
  - The strictest requirements shall apply when there is a difference between the US Army Corps of Engineers Safety Manual EM 385-1-1, OSHA, or the contract documents.
  - An Activity Hazard Analysis (AHA) is required for each definable feature of work.
  - Personal Protective Equipment (PPE): Safety shoes, head protection, high visibility vest and eye protection are required at all times.
  - Accident Reporting: Notify the government immediately.
- Environmental Protection: The contractor must maintain a clean job site daily, protect existing vegetation, and maintain Safety Data Sheets (SDS) for all on-site materials.

9. Payments & Invoicing (UFGS 01 20 00) (Led by: Gov't CM/ET)

- Prior to invoice submission, contact the ET and walk site to concur with percentage of work complete.
- Invoice Processing: Invoices will be submitted monthly through Wide Area Workflow (WAWF).
- Documents required for Payment**:**
  - Contractor's Monthly Estimate for Voucher and Contractors Certification
  - Monthly Work-hour report.
  - The Contractor's invoice
  - Updated Construction Progress Schedule
  - Contractor Safety Self Evaluation Checklist.
  - Updated submittal register
  - Solid Waste Disposal Report.
  - Certified payrolls.
  - Updated testing logs.
- Retainage: Up to 10% may be withheld for lack of satisfactory progress or failure to submit required reports.

10. Project Close-Out, Red Zone, CPARS, and Warranty (Led by: Gov't CM)

- Inspection Sequence (UFGS 01 45 00): 1) Contractor Punch-Out, 2) Pre-Final Inspection, and 3) Final Acceptance Inspection.

- Draft Red Zone spreadsheet is provided. When the project reaches the 75% stage we shall begin our Red Zone Meeting.
- Draft 1354 (Transfer and Acceptance of DoD Real Property) provided. Update as necessary and provide completed 1354 IAW UFGS 01 78 00 Closeout Submittals.
- Performance Evaluation (CPARS): The contractor's performance will be formally evaluated in the Contractor Performance Assessment Reporting System (CPARS). These ratings directly impact the ability to win future government contracts.
- Warranty (FAR 52.246-21): The standard warranty period is one year from final acceptance.

11. Partnering & Concluding Remarks (Led by: All)

- Partnering Discussion: Reaffirm commitment to the project's partnering charter to resolve issues at the lowest possible level.
- Open Discussion / Questions & Answers.
- Confirmation of Next Meeting: The Coordination and Mutual Understanding Meeting is scheduled for 4 April 2026 at 10:00