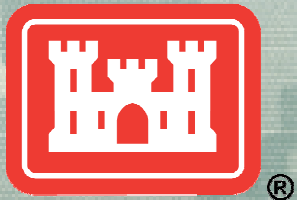


# Tulane Engineering Forum

## QA Role in Levee Construction

April 15, 2011

Bruce A. Terrell, P.E., PMP



US Army Corps of Engineers  
**BUILDING STRONG®**



# Construction Compliance, Design Verification and Deviations

## ■ Construction Compliance and Design Verification

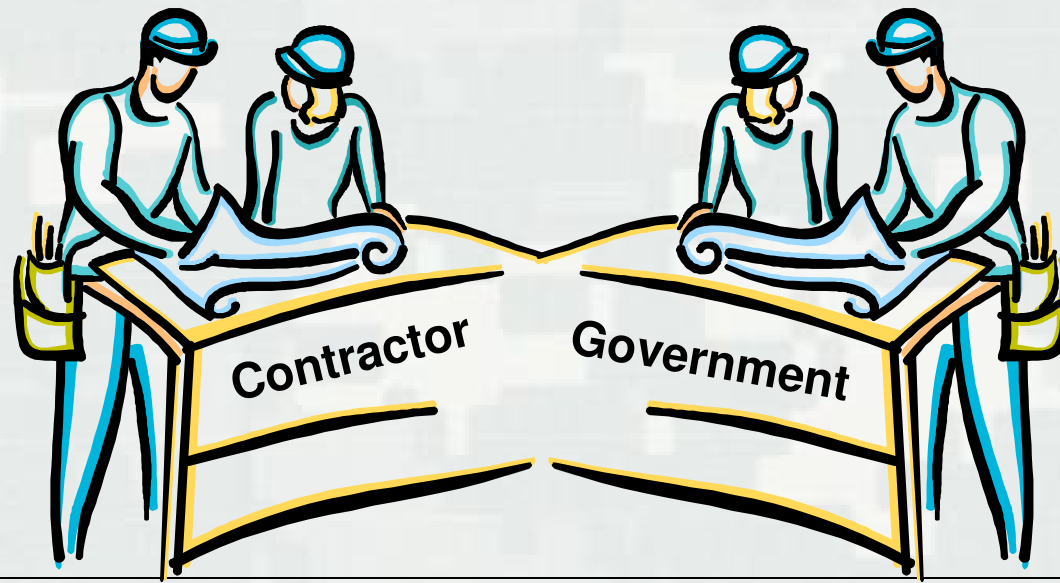
- ▶ Construction Quality Management
- ▶ Professional Engineer Contract Managers
- ▶ On-site Quality Assurance Representatives
- ▶ Submittal Review and Approval Process
- ▶ Engineering Considerations and Instructions
- ▶ Engineering During Construction
- ▶ Testing Documentation



# Construction Compliance, Design Verification and Deviations

- **Construction Quality Management**

- ▶ The contractor is responsible for performing Quality Control (QC)
- ▶ The Government is responsible for performing Quality Assurance (QA)



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ► Quality Control

- The Construction Contract defines the quality standards and the QC testing requirements
- By reference, the MVN/HPO CONSTRUCTION CONTROL MANUAL provides consistency of QC testing requirements for Soils, Concrete and Welding among contracts
- The contractor must prepare a detailed quality control plan for each definable feature of work detailing how the quality standards will be achieved. The plan must be approved before work can begin.
- The contract requires that the QC testing lab be validated by the Corps' Engineering Research and Development Center (ERDC)



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ▶ Quality Control

- Employs Three-Phase Inspection System

- ▷ Preparatory

- ▷ Initial

- ▷ Follow-up

- Document QC activities in the Resident Management System (RMS) Contractor Module



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ► Quality Assurance

- Performed to ensure the contractor's QC system is functioning properly
- QA testing at least 5% frequency of QC testing
- QA surveys spot check TBMs, baselines and grade shots
- Annual general QA Plans developed by Construction Division
- Specific QA Plan developed for each contract
- ER requires QA independent testing labs be validated by ERDC





# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ► Professional Engineer Contract Managers

- Resident Engineers are generally Registered Professional Engineers and generally have Administrative Contracting Officer Authority
- Area Engineers Oversee Resident Engineers and have the Same Credentials and Authority
- Construction Project Engineers Deal Directly with Contractors and Oversee On-Site QA Personnel
- District Support Staff of Construction Engineers



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ► On-site Quality Assurance Representatives

- Provide daily observations of construction-in-progress and QC/QA surveys
- Document QA activities in the Resident Management System (RMS)
- Document deficiencies and corrective actions





# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ▶ Engineering Considerations and Instructions

- A Means of Conveying Important Design Information to QA Staff

- ▷ Designer's intent
- ▷ Rationale for imposed limitations
- ▷ Environmental issues
- ▷ Other concerns



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ▶ Engineering During Construction

- Defines Role in Supporting to The Quality Assurance Effort
  - ▷ Submittal Reviews
  - ▷ Contractor Requests for Information
  - ▷ Modifications to Correct Designs Deficiencies
- Provides for Designer's Periodic Inspection of Construction-In-Progress
- Supports Meeting Designer's Intent



# Construction Compliance, Design Verification and Deviations

## ■ Construction Quality Management

### ► Testing Documentation

- Testing results are electronically reported immediately upon availability and stored in the QAQCS Database
- Facilitates quick and ready access by designers
- Tracking mechanism for failed tests to subsequent passing re-test or corrective action
- Written documentation of test results



# Construction Compliance, Design Verification and Deviations

## ■ Deviations

### ► Deviations may arise from

- Designer/ field initiated Modifications
- Value Engineering Change Proposals
- Contractor requested change/ deviation
- Requests for information/clarification

### ► Credit May be Sought for Non-Compliant Work That is Otherwise Determined to Meet the Designer's Intent

## ■ Formal Modifications are Required



# QUESTIONS?

