

Construction

**CONSTRUCTION
QUALITY
MANAGEMENT
PROGRAM**

Headquarters
U.S. Army South
Fort Buchanan, Puerto Rico
June 2001

SUMMARY of CHANGE

USARSO Regulation 415-2

Construction Quality Management Program

This revision–

- ?? Deletes references and procedures that were applicable when USARSO was based in Panama.
- ?? Replaces non-applicable/outdated Quality Assurance (QA)/Quality Control (QC) policies and procedures with current USARSO policy.

Construction

Construction Quality Management Program

FOR THE COMMANDER:

OFFICIAL:



ROBERT J. FRUSHA
COL, GS
Chief of Staff

RAYMOND C. REMBISH
LTC, GS
*Assistant Deputy Chief of Staff,
Information Management*

History Statement. This printing publishes a revision of United States (U.S.) Army South (USARSO) Regulation 415-2.

Summary. This regulation describes policies and procedures regarding the construction quality management program for U.S. military engineer exercises conducted in Latin America and the Caribbean.

Applicability. This regulation applies to all U.S. Army active and reserve component troop construction in Latin America and the Caribbean.

Proponent and Exception Authority. The proponent for this regulation is the USARSO Deputy Chief of Staff for Engineers (DCSENG). The proponent has the authority to approve exceptions to this publication that are consistent with controlling law and regulations.

Supplementation. Supplementation of this regulation is prohibited unless specifically approved by the proponent.

Suggested Improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, ATTN: SOEN-ED, PO Box 34000, Ft. Buchanan, PR 00934-3400.

Distribution. Distribution of this publication is made in accordance with USARSO Pam 25-50, Command Distribution Scheme, and is intended for USARSO A1; B1; C1; D1; SOEN-ED – 5; SOIM-IT-RP – 2; AFSA-PS-HHD (MDC) – 5; AFSA-PS-HHD (PUBS) – 5; and the USARSO Intranet.

*This regulation supercedes USARSO Regulation 415-2, February 1994

Contents (Listed by paragraph number):

Chapter 1

Introduction

Purpose	1-1
References	1-2
Explanation of terms	1-3
Responsibilities	1-4

Chapter 2

Quality Assurance Program

Policy	2-1
Procedures	2-2
Noncompliance	2-3
Post construction assessments	2-4

Chapter 3

Quality Control

Policy	3-1
Development	3-2
Implementation	3-3
Three phase inspection system	3-4
Quality Control testing	3-5
Quality Control plan	3-6
Quality Control plan approval	3-7

Chapter 4

Training and Documentation

Training	4-1
Documentation	4-2

Appendices

A. References, page 5

Glossary

Chapter 1 Introduction

1-1. Purpose

This regulation establishes policy and procedures to develop and implement the USARSO Construction Quality Management Program (CQMP), which consists of troop construction Quality Control (QC) and USARSO QA programs.

1-2. References

Required and related publications are listed in appendix A.

1-3. Explanations of abbreviations and terms

Abbreviations, acronyms, and terms used in this regulation are explained in the glossary.

1-4. Responsibilities

a. The USARSO DCSENG has overall responsibility for setting policies, goals, and objectives emphasizing and ensuring construction quality management and will:

- (1) Provide guidance for preparing QC plans.
- (2) Review and approve all project submittals to include construction schedules, designs, and management documents.
- (3) Approve all engineering plans, designs, specifications, and bill of materials.
- (4) Review and approve the Task Force (TF) QC plan.
- (5) Review QC reports and procedures. Report findings to TF QC personnel, TF Commander, and appropriate higher headquarters.
- (6) Coordinate resources to ensure adequate manning for QA inspections.
- (7) Provide TF Commander a copy of the QA assessment.
- (8) Serve as point of contact for all engineering and technical matters.
- (9) Maintain and update this regulation.

b. The USARSO Deputy Chief of Staff for Operations (DCSOPS) will:

- (1) Plan engineer exercises where USARSO is designated as United States Southern Command's (USSOUTHCOM's) executive agent.
- (2) Ensure QA is adequately addressed at planning conferences.
- (3) Assist the DCSENG to obtain construction plans, Quality Control Plans, Safety Plans, Construction Work Schedules (CWSs) and the Critical Path Method network diagram.
- (4) Review engineer submittals (designs, Critical Path Method, CWSs, etc.) and provide comments.
- (5) Provide early planning guidance to deploying units for QC plans, safety plans, construction management, engineering designs and Bill of Materials (BOMs).

c. The TF Higher Headquarters (Engineer Commands, Groups, Brigades, Joint Task Force-Bravo (JTF-B) etc.) will:

- (1) Assist the USARSO DCSENG to coordinate QA visits with the TF to include transportation and life support.
- (2) Assist the USARSO DCSENG with QA inspections when requested.
- (3) Conduct constructability and technical reviews of plans, designs, and specifications.
- (4) Review the TF Critical Path Method and CWS.
- (5) Review the TF QC plan.
- (6) Ensure all QA/QC project documentation is forwarded to the USARSO DCSENG as per USARSO Engineer Exercise standing operating procedure (SOP) and operation order (OPORD).
- (7) Ensure the TF is adequately staffed to execute its QC mission.

d. The TF Commander will:

- (1) Submit required project engineering documents for review and approval in accordance with established exercise milestones as per USARSO Engineer Exercise SOP and OPORD.
- (2) Develop a Quality Control plan tailored to the mission.
- (3) Appoint a TF QC Officer (full time position) with appropriate authority and personnel to implement the TF QC Plan.
- (4) Perform continuous management overview of QC reporting.
- (5) Ensure duration QC supervisory personnel plan and conduct transition meetings with rotational QC personnel for exercises involving reserve units. Personnel should interface to discuss quality control plans, current and repetitive deficiencies, and inspection schedules.
- (6) Review QA team findings and implement corrections.

Chapter 2 Quality Assurance (QA) Program

2-1. Policy

The USARSO DCSENG is responsible for ensuring troop construction that results in a quality product to standards, constructed on time, and within budget. USARSO satisfies this requirement by implementing an effective QA program.

2-2. Procedures

USARSO QA plans will consist of three major activities: QA orientation, constructability/technical reviews, and QA inspections.

a. QA Orientation. The TF Commander will meet with the USARSO engineer representative to discuss QA/QC requirements during the Initial Planning Conference (IPC) for the exercise. The USARSO engineer representative will provide QA guidance to include an overview of QA relationships between USARSO, the TF, and other agencies (TF higher headquarters, Joint Task Force – Bravo (JTF-B), etc.). The following documents will also be provided at the Initial Planning Conference (IPC): USARSO Reg. 415-1, Construction in Latin America and the Caribbean; USARSO Reg. 415-2, Construction Quality Management Program; USARSO Reg. 415-3, Base Camp Guidance for Latin America and the Caribbean; USARSO Reg. 415-4, Design Criteria and General Construction Specifications; and sample QC plans.

b. Design Reviews. Design reviews are an integral aspect of the USARSO Construction Quality Management Program. QA must be included early in the planning phase to ensure a quality end product. The design review involves evaluation of each project for technical merit, constructability, and cost. Each design will be reviewed to ensure adherence to the USARSO standard designs (if applicable), design regulations and codes, and acceptable engineering practices. All BOM will be reviewed at this time to ensure conformance to plans and specifications, adequate quantities and quality, and costs.

(1) Constructability is defined as the feasibility with which a designed project can be built. Constructability reviews are performed on all designs. Early determination of constructability must be emphasized during the planning and design process.

(2) Technical reviews are performed on all designs to ensure compliance with design criteria, construction specifications, and appropriate technical manuals.

(3) Frequency: The USARSO DCSENG will conduct design reviews on each design submitted at concept (35%) and pre-final (95%). Specific dates will be established at the IPC. Comments will be forwarded to the TF and appropriate higher headquarters.

c. QA Inspections

(1) Quality Assurance Representatives (QARs) will monitor the overall effectiveness, execution, and enforcement of the TF QC plan. This will be accomplished through site visits, QC project folder reviews, and by randomly verifying QC test results. QAR team members may consist of representatives from USARSO, the TF higher headquarters (Engineering Commands (ENCOMS), Engineer Group/Brigade, etc.) and JTF-B (for Central America). The USARSO DCSENG will coordinate actual team composition and dates for QA visits.

(2) The QARs will:

(a) Participate in the three-phase inspection process with emphasis on preparatory and initial inspections.

(b) Place special emphasis on monitoring QC test results that indicate immediate corrective action is required. This will serve as a check to ensure compliance before proceeding with the next phase of construction.

(c) Attempt to verify calibration of test equipment, application of specified test standards, and computation of test results in accordance with the published TF QC Plan.

(d) Conduct job site QA meetings at least once a month to evaluate overall TF QC management. A copy of all QC coordination meeting minutes will be forwarded to the USARSO DCSENG and the appropriate TF higher headquarters.

(e) Prepare daily and weekly QA reports spanning the period of their visit. The original QA report (TF copy) along with original QC reports will be filed in the TF official project file.

(f) Out-brief the TF Commander or designated representative(s) before departing. The TF commander is expected to make necessary adjustments, if the QC program is not functioning effectively or the specified level of quality is not being achieved.

d. USARSO Forms 25-R-E; 25-1-R-E; 25-2-R-E; and 25-3-R-E

USARSO Forms 25-R-E; 25-1-R-E; 25-2-R-E; and 25-3-R-E are available electronically from within the "Forms" folder on the USARSO Local Area Network (LAN) "P" storage drive and upon request at the IPC.

(1) USARSO Form 25-R-E (Quality Control Inspection Checklist). The QARs will use USARSO Form 25 to record the status of measures required of the TF to ensure it's prepared to perform its QC mission.

(2) USARSO Form 25-1-R-E (Quality Assurance Inspection Checklist). The QARs will use USARSO Form 25-1 to report TF construction management techniques and to ensure compliance with plans and specifications.

(3) USARSO Form 25-2-R-E (Preparatory Phase Checklist). The QARs will use USARSO Form 25-2 to record preparations made by the TF prior to starting work on the job site.

(4) USARSO Form 25-3-R-E (Initial Phase Checklist). The QARs will use USARSO Form 25-3 to check unit construction procedures during actual work performance.

2–3. Noncompliance

Noncompliance is defined as failure to fulfill specified QC requirements as outlined in the TF QC plan; unauthorized deviations from approved designs; or failure to revise the QC plan as directed. The TF Commander will be notified immediately of a noncompliance situation (verbally and in writing) and provided reasonable time to initiate corrections. Failure to correct a noncompliance situation will result in the issuance of a Notification of Noncompliance. A copy of the Notification of Noncompliance will be forwarded to the USARSO Commander for action.

2–4. Post construction assessments

Post construction assessments will be made to construction sites by USARSO to:

- (a) Gauge effectiveness of the Construction Management Program.
- (b) Check finished projects for structural deficiencies that have become apparent due to time, weather or use.
- (c) Gather other information (i.e., maintenance requirements) to assist in future updates to standard designs.

Chapter 3

Quality Control

3–1. Policy

The TF Commander is responsible to ensure quality construction practices are adhered to. The TF Commander satisfies this obligation through the development and implementation of a sound QC plan.

3–2. Development

A TF Quality Control cell should be established to include an Officer in Charge (OIC), an NCO with extensive construction background, and technical inspectors (numbers and ranks will vary depending on exercise scope and duration). The TF QC officer develops the QC plan based on guidance from the TF Commander, input from USARSO engineer exercise representatives, and established engineering practice.

3–3. Implementation

The TF QC officer implements the TF QC plan. The TF QC officer will ensure that:

- (a) The QC section has technically qualified and trained personnel assigned to all phases of inspection.
- (b) QC personnel have QC inspection and reporting written as critical elements in their performance standards and that established standards ensure successful QC performance.
- (c) QC personnel receive specific assignment detailing authority and responsibility.
- (d) QC personnel receive training in and thoroughly understand the three-phase inspection system.
- (e) QC personnel have a clear understanding of actions to be taken in handling and correcting deficiencies.
- (f) QC personnel are adequately trained in both construction and quality control techniques.
- (g) QC testing equipment, meeting established QC testing requirements, is available to QC personnel.
- (h) QC test procedures and results are verified.
- (i) Each work site has a QC plan and a safety plan.
- (j) QC plans are current, being followed, and are correctly documented.
- (k) All construction deficiencies are noted and corrected.

3–4. Three phase inspection system

a. Preparatory. This phase will be performed before the start of each definable feature of work. It involves conducting a review of plans and specifications to ensure that materials, samples, equipment, and construction procedures conform to project requirements. The QC testing plan for the scheduled segment of work will have been finalized prior to this inspection. The preparatory inspection will include an examination of the new work area to verify that work already accomplished, conforms to project requirements. The inspection will also determine whether required materials have been approved, are on hand, and are properly stored.

b. Initial. This phase will be done at the time troops arrive on site to accomplish each definable feature of work and at any time new workers or crews arrive for work assignments. Initial inspections are designed to ensure strict compliance with procedures, use of materials, and testing outlined in preparatory inspections. The QC staff must approve materials and planned construction techniques before the next increment of work can be started. During this phase, control testing will be initiated and the results verified.

c. Follow-up. Follow-up inspections are controlled procedures used to verify the product being constructed is in compliance with plans and specifications. This phase will be performed continually on each activity until completed. Adjustments to procedures used may be required as a result of findings and tests.

3-5. Quality control testing

- a. Quality control testing will be performed in accordance with Field Manual (FM) 5-530, Materials Testing.
- b. The QARs have the authority to use TF test equipment to conduct tests and to direct, if necessary, that additional tests be conducted at the job site to verify QC procedures.

3-6. Quality control plan

- a. As a minimum, the TF QC plan will include the following:
 - (1) The inspection organization:
 - (a) Names and qualifications of all inspection personnel
 - (b) Authority and responsibilities of inspection personnel
 - (2) Definable features of work with specifications; the technical clauses of the specification should address:
 - (a) Technical construction requirements
 - (b) Submittals required
 - (c) Required tests with success parameters identified
 - (d) Specific requirements for sampling and control testing
 - (e) Schedule for inspection personnel showing types and phases of work.
 - (f) Test methods, including the name of the test laboratory to be used, if appropriate.
 - (g) Schedule indicating the use of non-unit technical personnel and facilities, such as manufacturers' representatives and approved testing laboratories.
 - (h) Procedures and required forms for documenting inspections and testing results.
 - (i) Tests and inspection responsibilities retained by the controlling headquarters engineer.
 - (j) Unit contingencies for corrective action resulting from test failures, and approval authority for corrective actions.
 - (k) Procedures for the three phase inspection system.
- b. The QC inspection and test activities will be shown on the unit's Critical Path Method for major construction activities.

3-7. Quality control plan approval

The TF QC plan should be given the highest priority for processing by the reviewing headquarters and forwarded to the USARSO DCSENG for final approval. Submittal dates can be found in the USARSO exercise OPORD.

Chapter 4

Training and Documentation

4-1. Training

- a. Training to standard is critical to a successful QC/QA program. Adequate training should be provided to military personnel who lack basic QC training, or require refresher training to perform QC tasks to standard.
- b. The TF Commander must assess the status of QC training and develop training plans to correct deficiencies.
- c. The training program should focus on inspections and testing procedures that will be required for critical activities in upcoming construction.
- d. The U.S. Army Engineer School is an excellent training resource and is available to assist with QC/QA training.

4-2. Documentation

- a. Standards. Documentation of the QC effort is an integral part of construction Quality Management. It must be accomplished with the highest standards and be rigorously enforced by the entire chain of command. Failure to document critical activities may result in the construction of a specific portion of work not in compliance with standards. Documentation helps ensure that appropriate corrective action will be taken.
- b. Monitoring. The USARSO DCSENG will inspect all project QC documents to ensure adequacy of both QC tests and test records. Checks will be made to ensure TF compliance is consistent with established guidelines. Results will be reported on USARSO Form 25-2 for preparatory inspections and USARSO Form 25-3 for initial inspections.
- c. Documents. A quality control file will be kept for each work site or major segment of work. As a minimum, the file will contain the following:
 - (1) Clear identification of the specific feature of work to be accomplished in the segment.
 - (2) Preparatory and initial inspection documents.
 - (3) Testing results and documented corrective action taken upon test failures.
 - (4) The QC and QA daily and weekly inspection documents.
 - (5) The CWS, Critical Path Method, and Project Safety Plan with assessment.

Appendix A References

Section I Required Publications

FM 5-530

Materials Testing (Cited in para 3-5.)

USARSO REG 415-1

Construction in Latin America and the Caribbean (Cited in para 2-2.)

USARSO REG 415-3

Base Camp Standardization (Cited in para 2-2.)

USARSO REG 415-4

Design Criteria and General Construction Specifications (Cited in para 2-2.)

Section II

Related Publications

A related publication is a source of additional information. The user doesn't have to read it to understand this publication.

FM 5-541

Military Soils Engineering

ENGINEER ARTEPs

Army Training and Evaluation Program (ARTEP)

Corps of Engineer Regulations (ERs):

ER 415-1-11

Biddability, Constructability and Operability

ER 415-1-302

Construction Inspection and Work Records

ER 1180-1-6

Contract, Construction Quality Management

ER 1110-2-1200

Engineering and Design, Plans and Specifications

Section III Prescribed Forms

USARSO Form 25-R-E

Quality Control Inspection Checklist

USARSO Form 25-1-R-E

Quality Assurance Representative Checklist

USARSO Form 25-2-R-E

Preparatory Phase Checklist

USARSO Form 25-3-R-E

Initial Phase Checklist

Section IV

Referenced Forms

DA Form 2028

Recommended Changes to Publications and Blank Forms

Glossary

Section I

Abbreviations

DCSOPS

Deputy Chief of Staff for Operations

OPORD

operation order

QA

quality assurance

QC

Quality Control

SOP

Standard Operating Procedure

U.S.

United States

USSOUTHCOM

United States Southern Command

Section II

Terms

Joint Task Force Bravo

A USSOUTHCOM Task Force in Honduras

LATAM

Latin America, used to refer to Central and South America

Section III

Special Abbreviations, Brevity Codes, and Acronyms

This publication uses the following abbreviations, brevity codes, and acronyms not contained in AR 310-50.

BOM

bill of materials

CQMP

Construction Quality Management Program

CWS

construction work schedule

ENCOMS

engineering commands

ER

engineer regulation

IPC

initial planning conference

JTF-B

Joint Task Force Bravo

QAR

quality assurance representative

QCR

quality control representative

USARSO

United States Army South