

Introduction

For many years, transportation departments (DOTs) performed testing and inspection to verify the quality of materials used in highway construction. During those years, DOTs were the sole testing and inspection authority. Later, as some of the testing duties were shifted to the contractor, the DOTs continued performing tests for acceptance or verification. The contractor testing was then referred to as quality control, while the DOT testing and inspection were termed quality assurance.

In the past two decades, the use of alternative project delivery methods challenged the traditional quality management approach where the contractor performed quality control while the owner conducted quality assurance. This caused a shift in perspective about quality assurance. As Figure 1 illustrates, in today's work environment quality assurance is viewed as an umbrella under which all quality management activities take place and the owner's primary quality assurance role is one of acceptance. Use of the term quality assurance is now favored over the previously used abbreviation QAQC or QCQA.



Figure 1. FHWA Concept of Quality Assurance

Quality construction is fundamental to meeting the mission of the California Department of Transportation (Caltrans), and quality assurance is the primary means by which Caltrans ensures the quality of constructed highway projects.

Quality assurance encompasses all materials and construction activities on a project and directly impacts the service life of a transportation facility. The elements of an acceptable quality assurance program include quality control by the contractor, acceptance testing and inspection by Caltrans,

independent assurance, qualified personnel, accredited laboratories, and a dispute resolution process. These elements work together to ensure an effective quality assurance program. Any elements missing from the program increase the risk of a reduced service life.

The Construction Quality Assurance Program (QAP), developed by Caltrans for highway construction projects, adheres to the quality assurance requirements outlined by the Federal Highway Administration (FHWA) in 23CFR 637, Construction Inspection and Approval, Subpart B – Quality Assurance Procedures for Construction, Section 637.205, “Policy,” and Section 637.207, “Quality Assurance Program.”

The role of the QAP is to provide confidence that the quality of the materials and workmanship incorporated into all highway construction projects is in conformity with the requirements of the plans and specifications.

Quality Assurance Program Manual Overview

Purpose

Completed projects represent tangible products by which Caltrans is measured in the delivery of its programs. The public ultimately defines the success of Caltrans’ performance based on these projects.

The role of the QAP is to provide confidence that the quality of the materials and workmanship incorporated into all highway construction projects is in conformity with the requirements of the plans and specifications.

Caltrans makes every effort to achieve quality construction in all its projects. As a result, over the years, Caltrans has developed many procedures and methods to ensure that every construction project achieves the desired level of quality for both materials and workmanship. The responsibility for ensuring quality construction has been shared by various functional groups in the department. This has resulted in distribution of quality-related policies, procedures, and guidelines throughout the department, with no single, consolidated document available as a guide for all quality-related requirements.

Scope

This manual documents the QAP by identifying existing requirements from all applicable department policies, procedures, and guidance documents (see Appendix B, Caltrans Quality Assurance Documents) and references them in one document. This manual also demonstrates compliance with 23 CFR 637 referenced above.

The provisions of this manual do not apply to projects for which Caltrans has entered into a public-private partnership or a design-build agreement, but they do apply when the project is under a construction manager/general contractor (CM/GC) agreement. The Caltrans document, “Design-Build Demonstration Program Quality Manual Outline,” provides guidance to designers-builders regarding quality assurance. For alternate project delivery methods, Caltrans retains responsibility for acceptance. The implementing agency may use its own program when authorized by Caltrans; however, Caltrans retains authority for the project and performs independent quality assurance to ensure that the implementing agency’s quality assurance activities result in projects being developed in accordance with Caltrans standards, policies and practices and the quality control plan provided by the project sponsor.

The manual does not repeat information contained in other manuals but references where the inspection, acceptance testing and independent assurance requirements are found for materials used in highway construction.

Organization

- Chapter 1, Construction Quality Assurance Program, describes the QAP activities performed by Caltrans to achieve the specified quality for constructed highway facilities. These activities include control of documents and records, management responsibilities, resource management, process control, inspection and testing, control of nonconforming work, control of testing and measuring equipment, and project materials certification.
- Chapter 2, Construction Quality Assurance Roadmap, describes the six major components of the QAP; presents the route to developing quality assurance specifications for materials, workmanship, products, and services; summarizes the various quality assurance methods used by Caltrans; and provides guidance in determining which of those quality assurance methods are needed to achieve a level of quality assurance commensurate with the application of an item and severity of the consequences of its failure.
- Chapter 3, Construction Quality Assurance Long-Range Plan, recommends and describes a potential long-range plan for improvements to the QAP. The long-range plan includes establishing a construction quality assurance database, adopting a system-based acceptance process, implementing performance specifications, and adopting risk-based acceptance criteria based on use of performance-related specifications, risk-based acceptance, and system-based acceptance. Development and implementation of a materials management system construction quality assurance database is the primary recommendation to improve the efficiency and quality of the QAP.

Process for Updating

The Division of Construction issues Quality Assurance Program Bulletins (QAPBs) (Appendix A) to improve this manual and to respond to procedure and policy changes. As needed, subsequent revisions will be made to the manual to incorporate QAPBs. QAPBs supersede any conflicting information, guideline, or instruction in the manual. If a policy contained in this manual is unclear or has been superseded and a QAPB has not been issued covering the changed policy, notify the Division of Construction manual coordinator.

The Division of Construction will routinely revise the manual to make improvements and to incorporate issued QAPBs.