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RESEARCH SUMMARY

Material Quality Assurance Risk Assessment

Problem

With the shift from quality control (QC) of materials and placement techniques to quality assurance (QA) and acceptance over the years, the role of the Office of Materials Technology (OMT) has been shifting towards assurance of material quality and oversight of contractor quality control operations. Thus, there was a need to examine such quality control procedures and identify risks and potential improvements.

Objectives

The objectives of this study were to identify typical material QC/QA procedures and: a) examine their conformance in relation to the federal requirements for defining QA plans, Independent Assurance (IA) procedures, and material certification; b) identify potential improvements to existing SHA QA plans; c) assess product variability based on production QC data; and d) evaluate risks based on material acceptance data.

Description

The existing quality assurance procedures for graded aggregate base (GAB), precast concrete for drainage elements, structural steel, rebars, coatings, and neoprene strip seals were reviewed and potential improvements to existing SHA QA plans were identified. In some cases this assessment included site visits and review of contractor QC manuals and QC production data for assessing production quality and conformance to SHA requirements. Compliance of such procedures to the federal requirements was also examined. The risks to the contractor and the agency were assessed using SHA's acceptance data.

Results

The review of the existing quality assurance procedures for graded aggregate base, precast concrete for drainage elements, structural steel, rebars, coatings, and neoprene strip seals indicated that the overall Code of Federal Regulations (CFR) Title 23 requirements have been incorporated. Improvements for each QA process were identified for potential implementation into the existing QA procedures. Production variability analysis and the development of QC curves and quantification of agency and contractor risks, carried out in this study, provide the means to SHA for adjusting sample size and/or eventually adjusting specification limits so as to select acceptable levels of risks.

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