

ACRP Problem No. 12-08-01

Guidebook to Airport Construction Project Quality Assurance and Quality Control (QA/QC)

ACRP Staff Comments: The proposed research appears to overlap with Problem Statement 12-08-02, Improvement of Construction Quality at Airports Grant Projects. It will need to consider the ongoing research for ACRP Project 01-10, Handbook for Developing, Implementing and Overseeing Airport Capital Plans. The proposed budget may be high; suggest lowering to \$300,000.

TRB Aviation Group Committees Comments: AIRCRAFT/AIRPORT COMPATIBILITY CMTE - There is a need for QA/QC guidance that could be met with a literature search. ISO 9000 and related standards may already address this issue sufficiently, but issues specific to airports may make additional research valuable.

AIRPORT TERMINALS AND GROUND ACCESS CMTE - Not recommended. The statement identifies what would seem to be a serious problem requiring an urgent response. Our question is whether this research should more appropriately be initiated by the FAA, perhaps in collaboration with the GAO.

Review Panel Comments: Not recommended — The focus of effort should be on improving design specifications, not on improving the QA/QC process.

AOC Disposition: No funds allocated. No discussion.

**AIRPORT COOPERATIVE RESEARCH PROGRAM
PROBLEM STATEMENT**

ACRP *Problem Number:* 12-08-01

I. PROBLEM TITLE

Guidebook to Airport Construction Project Quality Assurance and Quality Control (QA/QC).

II. RESEARCH PROBLEM STATEMENT

The recently released report by the Federal Aviation Administration regarding improper payments on FAA Airport Improvement Program projects is a clear sign of lacking quality assurance and control practices. Either the required testing was not performed, was performed but failing results ignored or received passing results but not properly documented. This study categorized over 51% of payments made on the sampled airport construction projects was improper due to insufficient /procedures / documentation. Using statistical sampling techniques, this is estimated to have resulted in nearly \$160.7 million in improper reimbursements. By following clearly provided QA/QC practices, a significant portion of the potentially inappropriate disbursements could have been prevented by having appropriate project documentation. FAA Advisory Circular 150/5370-10E includes guidance on QA/QC, however, the Section 100 of this Advisory Circular only covers QA/QC references regarding only one type of pavement construction and does not address a comprehensive approach to QA/QC for all types of airport projects.

III. OBJECTIVE

The objective of this research is to: (1) evaluate the effectiveness of guidance for airport construction project quality assurance and quality control currently being implemented nationally by airports across the county, and: (2) prepare a comprehensive Guidebook for the implementation of effective QA/QC on airport construction projects.

The primary suggested lines of inquiry and related products anticipated to be derived from this research effort will include: (1) Are expanded QA/QC guidelines needed for additional types of airport construction projects, (2) Are currently documented QA/QC practices adequately implemented, (3) If expectations are not being met, what are the deficiencies, and are there any national/regional patterns or issues, (4) If deficiencies are found, what are the remedies, (5) How can QA/QC practices be made more timely and effective, (6) Are grant assurances being met with the current QA/QC practices, and if not, what can be done to address these concerns, (7) Are QA/QC requirements not adequately documented or easily found to ensure that the appropriate process are being followed, and (8) What guidance can be developed to clear state the expectations of all parties involved in airport construction projects.

IV. RESEARCH PROPOSED

This research will objectively evaluate the effectiveness and performance of airport construction quality assurance and control practices. This research will answer the question to what degree are appropriate QA/QC practices actually being followed and what are the current QA/QC Best Practices. Both good and bad practices will be identified and used to develop a guidebook that will clear identify

the roles of the sponsor, engineers, consultants, and contractors should be during the construction of airport infrastructure.

The research approach tasks will, at a minimum, include;

- (a) An evaluation of airport construction QA/QC processes using a case study approach in no less than 8 different states of differing character or geography.
- (b) Confidential and non-confidential interviews and surveys with state and national experts with expertise in airport engineering and construction management,
- (c) Confidential and non-confidential interviews and surveys with airport officials,
- (d) Confidential and non-confidential interviews and surveys with state and federal officials,
- (e) A literature review.

V. ESTIMATE OF PROBLEM FUNDING AND RESEARCH PERIOD

- **Recommended Funding:** It is estimated that the funding required to execute this research is on the order of \$500,000.
- **Research Period:** It is estimated that the amount of time required to execute this research is on the order of 18 months.

VI. URGENCY AND PAYOFF POTENTIAL

As is evident in the recent FAA report, significant guidance is needed immediately to ensure that the Airport Improvement Project funds are being appropriately disbursed, but even more importantly, that the quality of the actual infrastructure is meeting a national recognized standard for safety. The QA/QC efforts conducting on airport projects should provide this level of safety assurance and the outcome of this research should assist in this effort.

From the funding perspective, the inappropriate use of these AIP funds only cause additional expenditures by the airport sponsor to address issues after-the-fact. By developing a systematic approach for ensuring the quality and the level of effort by not only the sponsor, engineers, consultants, and contractors, confidence can be ensured in the final product safety and funding eligibility.

With the level of political interest in the reduction of government waste, addressing this topic immediately following the disturbing findings may provide some level of political comfort that this issue is being addressed; thus possibly reducing the level of political concern with this funding program and potential assisting in securing a long-term federal airport funding program.

VII. RELATED RESEARCH

While there is general guidance available through various FAA Advisory Circulars, the Problem Statement development team is not aware of any recent “on-point” research into the comprehensive Guidebook for Airport Sponsors on QA/QC practices.

VIII. PERSON (S) DEVELOPING THE PROBLEM

This Problem Statement was developed by the following staff of the firm of Robert Kimball & Associates, Inc. (L.R. Kimball) and The Robert B. Balter Company (Balter Company):

Lead: Fran Strouse, Director, Aviation Technical Services
Thomas P. Thatcher, Senior Research and Planning Manager

Supported By: Richard E. Genday, Senior Vice President, Transportation Services; Joe Felix, Senior Construction Manager; Edward Balter, President; Joseph F. Whittle, Jr., Chief Engineer.

IX. PROCESS USED TO DEVELOP PROBLEM STATEMENT

This Problem Statement was developed and written by the firm of L.R. Kimball and is a result of many years of field and technical observations made by L.R. Kimball professional staff, several of whom have years of direct experience and expertise in all aspects of airport construction. Additionally, the expertise of professional staff at the Balter Company was drawn upon to further develop the Problem Statement. The process used to develop this Problem Statement started with a managerial commitment at L.R. Kimball and Balter Company to take a constructive but critical look at the effectiveness and performance of quality assurance and control processes during airport construction projects. To develop this line of inquiry, L.R. Kimball and Balter Company convened several managerial staff meetings to identify, discuss, vet and prepare this Problem Statement and prepare it for submission to ACRP. After final review and editing of the draft Problem Statement, the final Problem Statement was put into form and executed and submitted to ACRP.

X. DATE AND SUBMITTED BY

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Date: March 4, 2011