

RIVERSIDE: AUDIT & ADVISORY SERVICES

October 21, 2014

To: Robert Gayle, Associate Vice Chancellor
Architects & Engineers

Subject: Internal Audit of Capital Programs, Architects & Engineers

Ref: Audit Report Number R2014-02

We have completed an audit of Capital Programs, Architects & Engineers in accordance with the University of California, Riverside Audit Plan. Our report is attached for your review. We will perform audit follow-up procedures in the future to review the status of management action. This follow-up may take the form of a discussion or perhaps a limited review. Audit R2014-02 will remain open until we have evaluated the actions taken.

We appreciate the cooperation and assistance provided by your division. Should you have any questions concerning the report, please do not hesitate to contact me.

Gregory Moore
Director

xc: Audit Committee
Associate Vice Chancellor Carlson
Capital Programs, A&E Director of Finance Koenig

UNIVERSITY OF CALIFORNIA AT RIVERSIDE
AUDIT & ADVISORY SERVICES
MEMBER OF ASSOCIATION OF COLLEGE & UNIVERSITY AUDITORS

INTERNAL AUDIT REPORT R2014-02

INTERNAL AUDIT OF
CAPITAL PROGRAMS, ARCHITECTS & ENGINEERS

OCTOBER 2014

Approved by:

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**UC RIVERSIDE
INTERNAL AUDIT OF
CAPITAL PROGRAMS, ARCHITECTS & ENGINEERS
INTERNAL AUDIT REPORT R2014-02
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I. MANAGEMENT SUMMARY

Based upon the results of work performed within the purpose and scope of the audit, it is our opinion that, overall, Capital Programs, Architects & Engineers (A&E) practices, policies, and procedures to manage construction project post-completion activities are operating satisfactorily and generally in compliance with applicable University policies and procedures.

We observed some areas that need improvement to strengthen internal controls and/or effect compliance with University policy.

- 1) A&E does not conduct post project reviews on completed construction projects. (Section III.A.)
- 2) A&E does not conduct post occupancy evaluations of newly built or renovated facilities. (Section III.B.)

Minor items that were not of a magnitude to warrant inclusion in the report were discussed verbally with management.

II. INTRODUCTION

A. PURPOSE

University of California, Riverside (UCR) Audit & Advisory Services (A&AS), as part of its Audit Plan, performed an audit of A&E construction project post-completion activities to evaluate compliance with certain University policies and procedures, efficiency and effectiveness of selected operations, and adequacy of certain internal controls.

The primary objective of the audit was to evaluate selected post-completion activities for adequacy and effectiveness, compliance with policy and procedures, and adherence to generally accepted capital project controls and best practices.

Secondary objectives of the audit were to analyze strengths, weaknesses, opportunities, and threats in A&E operations as well as to study recurring issues and potential problems with project delivery, customer satisfaction, communication, and departmental service / quality management.

B. BACKGROUND

The University operates an extensive design, construction, and renovation program. The University makes a substantial investment in each capital project and has instituted policies and procedures to guide project construction.

The UC Facilities Manual (FM) is intended to allow easy access to important policies, procedures, and guidelines for facilities management and operation, including construction contracting, construction documents, bidding, and construction administration. Each Campus within the UC System is encouraged to develop its own procedures manual that expands on and complements FM content.

In August 2011, the UCR Capital Programs division was organized to foster administrative efficiencies and maximize the operational effectiveness of the planning, design, and construction enterprise on campus. The division consists of four major units: Capital Resource Management, Capital Finance & Real Estate, A&E (Architects & Engineers, formerly known as the Office of Design & Construction), and Sustainability.

A&E is responsible for the design and construction of new buildings, renovation of existing buildings, renewal of building systems and facilities and deferred maintenance, and seismic retrofit projects on campus. A&E has professionals in the fields of architecture, engineering, inspection services, design, environmental planning, construction contracts, and finance. Project Managers oversee schematic design, design development, construction drawings, and construction of capital projects through construction delivery and post-occupancy assessment.

More recently, there have been many changes and vacancies in key management positions within the Capital Programs division and A&E. Various reorganizations and management restructuring decisions have been made and are expected to be made as personnel changes continue in the immediate and near future. The consequences of these critical changes, on campus operations in general, and on A&E operations in particular, remain to be seen.

C. SCOPE

Audit procedures were performed to evaluate the adequacy and effectiveness of A&E practices, policies, and procedures to manage construction project post-completion activities, specifically: inspection and quality assurance / quality control, post-project review, post-occupancy evaluation, and required maintenance.

The scope of the audit was principally limited to analyzing the current A&E organization, management practices, policies, and procedures, and included interviewing selected personnel as well as reviewing reports, records, and documents related to certain post-completion activities.

D. INTERNAL CONTROLS AND COMPLIANCE

As part of the review, internal controls were examined within the scope of the audit.

Internal control is a process designed to provide reasonable, but not absolute, assurance regarding the achievement of objectives in the following categories:

- * effectiveness and efficiency of operations
- * reliability of financial reporting
- * compliance with applicable laws and regulations

Substantive audit procedures were performed during February through June 2014. Accordingly, this evaluation of internal controls is based on our knowledge as of that time and should be read with that understanding.

III. OBSERVATIONS, COMMENTS, AND RECOMMENDATIONS**A. Post Project Reviews**

A&E does not conduct post project reviews on completed construction projects.

COMMENTS

Many construction companies conduct reviews on project completion to enhance learning and to carry out a quality management program. Sometimes referred to a “post-mortems,” post project reviews are essential in capturing learning from construction projects and have the principles of continuous improvement at their core. A common misconception about post

mortems is that they should be conducted when a project fails, but in reality, as much if not more value can be derived from a review of a highly successful project. Undertaking effective post-mortems on completed projects encourages not only consideration of process improvements but also identification of best practices for future projects.

RECOMMENDATIONS

A&E should conduct post-mortem analysis on all projects. The primary purpose of the exercise would be to identify what went well, what went poorly, and what needs improvement, so that future projects are run better. The process would be a valuable tool for continuous improvement, through which the project team looks at project outcomes retrospectively, with a view to learning from both successes and failures.

MANAGEMENT RESPONSE

A&E is grateful for A&AS's highlighting of the Post-Project Review as a practice. A&E concurs that post-project reviews (PPRs) can be useful, whether project is deemed a 'success' or 'failure'. A&E intends to develop PPR as a standard available practice, to be applied selectively based on management's judgment of probable value to be derived in project-specific circumstances. A&E is considering the following time line for development, adoption and implementation of PPR practice.

- Fall 2014: Investigate good PPR practices among relevant peer organizations; complete by December 31, 2014.
- Winter 2014-15: Development template for UCR A&E PPR; complete March 31, 2015.
- Spring 2015: Deploy PPR process.

In the interim A&E will pursue conducting PPR for the just-completed Glen Mor 2 housing project, and in 2015, PPR for the Student Recreation Center project. A&E will refine its implementation strategy as we become increasingly knowledgeable about PPR practices.

The above actions are contingent on the availability of funds, either within established project budgets or operational funds.

B. Post Occupancy Evaluations

A&E does not conduct post occupancy evaluations of newly built or renovated facilities (otherwise known as building-in-use studies).

COMMENTS

Post occupancy evaluation (POE) is the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time.¹ POEs address how well a facility contributes to the productivity, satisfaction, and well-being of the occupants and the goals of the organization. Emphasis is on evaluating the functional quality and efficient use of living and working environments. In the case of new construction or renovation projects, actual functions are compared to the program objectives of the project.²

RECOMMENDATIONS

Management should conduct POEs of newly built or renovated facilities. POEs can serve many purposes, and the scope and extent of underlying studies can vary greatly. Some of the obvious benefits that can be derived from effective POEs are:

- Discovering and correcting functional concerns in buildings
- Responding to complaints of building users
- Improving space utilization based on feedback from users
- Finding new uses for facilities
- Establishing accountability for building performance
- Improving the design quality of future buildings
- Informed decision making
- Strategic insight

MANAGEMENT RESPONSE

A&E is grateful for A&AS's highlighting of the POE as a practice, and for the references provided. A&E concurs that well-executed POE can be of significant value to all project stakeholders, and of strategic value for A&E's business going forward.

A&E is considering the following time line for development, adoption and implementation of POE practice.

- Fall 2014: Investigate good POE practices among relevant peer organizations; complete by December 31, 2014.
- Winter 2014-15: Development template for UCR A&E POE; complete March 31, 2015.

¹ *Post Occupancy Evaluation*, Preiser W F E, Rabinowitz H Z, and White E T, New York: Van Nostrand Reinhold 1988

² *Postoccupancy Evaluation*, Larry Lord, AIA, and Margaret Serrato, AIA, ASID, Excerpt from The Architect's Handbook of Professional Practice, 13th edition, ©2000

- Spring 2015: Deploy POE process.

Initially this will be performed on all Major Capital Projects (>\$750,000) that are completed during the FYE 2014-15 and will be maintained in project files. In FYE 2015-16 we will expand this program to include Minor Capital Projects (>\$100,000).

As currently understood by A&E, POEs are most usefully conducted based on a duration of occupancy of duration sufficient to create a meaningful body of experience and measurement of the facility's performance in relation to its intended purposes. Thus, a POE for Glen Mor 2 student apartments might be staged, such that residents during the first academic year of use have an opportunity to provide input.

The findings of the POEs over time will inform A&E's project development and delivery processes, with the goal being increasing consistency and quality in project outcomes. A&E will refine its implementation strategy as we become increasingly knowledgeable about POE practices.

The above actions are contingent on the availability of fiscal capacity, either within established project budgets or operational funds.