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Associate Vice Chancellor
Facilities Design & Construction
0916

***Subject: Major Construction Projects
Audit Project 2012-20***

The final audit report for Major Construction Projects, Audit Report 2012-20, is attached. We would like to thank all members of the department for their cooperation and assistance during the audit.

The findings included in this report will be added to our follow-up system. We will contact you at the appropriate time to evaluate the status of the corrective actions. At that time, we may need to perform additional audit procedures to validate that actions have been taken prior to closing the audit findings.

UC wide policy requires that all draft audit reports, both printed (copied on tan paper for ease of identification) and electronic, be destroyed after the final report is issued. Because draft reports can contain sensitive information, please either return these documents to AMAS personnel, or destroy them, at the conclusion of the audit exit conference. AMAS also requests that draft reports not be photocopied or otherwise redistributed.

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Attachment

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AUDIT & MANAGEMENT ADVISORY SERVICES



University of California
San Diego

**Major Construction Projects
March 2012**

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Project Number: 2012-20

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Audit & Management Advisory Services Project 2012-20***

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ATTACHMENT A – Calculation of Neal Electric Change Order Overcharges

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I. Background

Audit & Management Advisory Services (AMAS) completed a review of Major Construction Projects as part of the UC system-wide audit included on the approved audit plan for Fiscal Year 2011-12. This report summarizes the results of our review, which was completed using a standard audit program and approach shared by all ten University of California (UC) campuses and the Lawrence Berkeley National Laboratory.

University of California major constructions projects are subject to requirements set forth in the UC Facilities Manual (FM). The FM is organized into six volumes, each focused on a different aspect of facilities management and operation:

Volume 1: Executive Summary and University Administration

Volume 2: Planning

Volume 3: Part I: Design, Part II: Design Documents - Models and Instructions

Volume 4: Part I: Construction Contracting and Construction Documents, Part II:
Construction Documents - Models and Instruction

Volume 5: Part I: Bidding, Part II: Construction Administration

Volume 6: Operation and Maintenance of Plant

Two significant risk areas for contracting and managing construction projects are contractor bidding and administration of change orders, both of which are addressed in the FM. FM Volume 5, Part I, contains bidding and construction administration policies, procedures, and guidelines designed to ensure that an adequate number of companies participate in the bidding process, and that the contract is ultimately awarded to the lowest responsible bidder. FM Volume 5, Part II, Chapter 3, Contract Modifications, discusses the means of accomplishing changes in the work (via change orders) that are required during construction. The construction contract between the University and contractor also contain specific restrictions for change order pricing.

In addition to the requirements set forth in the FM, individual projects could be subject to additional restrictions or requirements depending on the source of the construction funding. The sources of funding that tend to be more restrictive are Federal and State grants.

Major Construction Projects at UCSD

Major construction projects at the UCSD campus and medical centers are managed by Facility Design & Construction (FD&C). This office is comprised of approximately 70 staff members that provide functional support including project management, contract administration, and fiscal management. Contract administration is the responsibility of the FD&C Contracts Office. Each major construction project at UCSD is assigned to an FD&C Project Manager. Project Manager responsibilities include: ensuring that the project adheres to the scope of work; monitoring the project budget and schedule; serving

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as the primary Campus liaison with contractors and design professionals; ensuring the project is built according to applicable building codes and is appropriately inspected; and issuing paperwork such as the “Notice to Proceed,” change orders, and the “Notice of Substantial Completion.”

Since late in the calendar year 2009, FD&C has been in the process of implementing a construction project management software application called e-Builder. The objective of this implementation was to improve controls over construction contract management processes, and to facilitate improved construction data analysis and reporting capabilities. As of the date of this report, FD&C had implemented modules relating primarily to contract pricing, budgeting, contract approval, fees and change orders. An FD&C tiger team continues to assess additional e-Builder modules, and expects that the scheduling module will be implemented in the near future.

During the past three years UCSD has been engaged in 85 active major construction projects funded from a variety of different funding sources, with most projects funded by more than one funding source. The following table provides a general breakdown of how many projects were funded by each major funding source.

Funding Source	Number of Projects	Total Funding Provided
State Funds	7	\$231,422,000
External Financing	23	\$1,603,967,000
Hospital Reserves	41	\$224,617,000
Gifts	8	\$217,905,000
Campus Funds	34	\$109,604,000
Grants	4	\$97,284,000
Auxiliary Reserves	14	\$35,672,000
Registration Fees	1	\$2,373,000
University Funds	2	\$1,950,000

II. Audit Objective, Scope, and Procedures

The objective of our review was to assess the effectiveness of construction management policies and procedures and internal controls related to the administration of construction activities, with specific emphasis on project bidding, change order administration and compliance with funding specific requirements.

In order to achieve our objectives we completed the following:

- Reviewed the UC FM Volume 5, Part I and Volume 5, Part II, Chapter 3;

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- Interviewed the following FD&C personnel:
 - Associate Vice Chancellor (Campus Architect);
 - Senior Director for Construction Services;
 - Senior Director for Campus Project Management; and
 - Contracts Manager;

- Reviewed e-Builder workflows over the change order and contract administration processes, and obtained a walkthrough of the e-Builder module relating to change orders;

- Interviewed the Manager for UCSD Capital Planning to obtain an understanding of the various funding sources used for constructions projects, and specific funding restrictions and requirements;

- Obtained and reviewed the listing of major constructions projects that were active during Fiscal Years 2008-2009 through 2010-2011 to determine the most commonly utilized delivery method, and to evaluate if it appeared that any contractors were awarded a disproportionate number of construction contracts;

- Selected the Management School Phase II project for compliance with the bidding requirements set forth in FM Volume 5, Part I. In order to evaluate compliance with the bidding requirements we reviewed and evaluated prequalification level I, II and contract bidding documentation;

- In consultation with FD&C Management, selected the Telemedicine & Prime-HED Education Facility project for change order testing. In order to test project change orders, we completed the following:
 - Reviewed the construction contract provisions relating to changes in the work;
 - Obtained a listing of all project change orders, as well as the field order/cost proposals (CP/FO) that comprised each change order, and judgmentally selected change orders Z005, Z011, Z014, Z017, Z022, Z030 and Z034 for detailed testing based on the dollar amount. For change orders that contained several CP/FO's, a judgmental sample of CPFO's were selected for testing based on dollar amount;
 - Reviewed supporting documentation for the above listed change orders and CP/FO's to determine if costs were adequately supported and in accordance with the change order provisions;
 - Reviewed a small sample of certified payroll records for a subcontractor (Neal Electric) that performed a substantial amount of change order work; and

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- For CP/FO's exceeding \$100,000, determined if change order documentation included sufficient justification as to why the work was not independently bid (as required by FM Volume 5, Part II, Chapter 3.2.7);
- Interviewed the FD&C Contract Manager to obtain an understanding of the controls in place to ensure that UCSD construction projects are in compliance with grant specific requirements; and
- Reviewed the National Institutes of Health (NIH) Notice of Award for the American Recovery and Reinvestment Act (ARRA) funded Central Research Services Facility project, identified grant specific requirements, and validated that the contract documents incorporated the project specific requirements included in the award letter.

III. Conclusion

Based on the work performed above, we concluded that the FD&C policies, procedures and internal controls were generally effective to ensure that project bidding complied with the requirements of UC FM, Part I; that change orders were reasonable, supportable, and complied with the project contract and FM Volume 5, Part II, Chapter 3; and that funding specific requirements were identified and communicated to project managers and contractors via meetings, advertisements to contractors and subcontractors, and modifications to contract documents. Based on our analytical review of construction contracts awarded during the past three years, we concluded that no single contractor was awarded an inordinate number of construction contracts.

However, we noted a few instances in which it appears that subcontractors overcharged the University for costs included in contract change orders. We also identified two substantial change orders (in excess of \$100,000) for which a justification to not solicit for bids was not included in the construction documents. Further, the process for documenting approval of construction costs representing an exception to the construction contract could be improved.

IV. Observations and Management Corrective Actions

A. Change Order Pricing

We identified a few instances in which subcontractors appear to have overcharged the University for costs included in change orders amounting to \$24,857.

During the review of the change order documentation that was provided by the general contractor (Swinterton) and subcontractors, AMAS noted a few instances

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in which it appeared that subcontractors had overcharged the University for extra work that was completed on the project.

One subcontractor, Neal Electric, performed a substantial amount of the electric work that was included in change orders that were selected for review. The change order costs included materials and labor. Labor costs were associated with three different labor classifications: inside wireman, apprentices and foremen. The labor rates for these classifications were supported by a labor breakdown form. Based on a review of a sample of certified payroll records provided by Neal Electric, it appears that the base labor rate that was used to calculate change order costs exceeded the base rate that was actually paid to workers involved in the change order work. The difference between the base payroll rate included in the change order and the rate actually paid to employees, plus the Swinerton and subcontractor markup fees, appears to have resulted in overcharges totaling \$24,185 in costs included in the change orders that AMAS reviewed (**Attachment A**).

In addition to the overcharges associated with Neal Electric payroll charges, we also identified one instance in which a subcontractor miscalculated the markup fee associated with the cost of the extra work. Baring Industries completed some of the change order work included in change order Z022. Based on the cost of the extra work (\$17,567), the markup fee of 15% should have been \$2,635. Instead, the markup fee that was billed to the University totaled \$3,275. The difference of \$640 plus the Swinerton markup fee of 5% totaled \$672.

The total overcharges identified during the review represented a small percentage of total change order costs approved for the project. The first two change orders for the project were to amend the contract in order to retain Swinerton as the construction manager, and to amend the contract for subcontractor bids, which had a combined total of \$48,879,058. In addition to these initial change orders, FD&C approved 45 change orders totaling \$2,606,128. Of these 45 additional change orders, we selected for testing 11 individual CPFOS totaling \$846,446 (32.5%). The Neal Electric overcharges represented less than three percent of total change order costs reviewed.

Management Corrective Action:

FD&C will pursue an explanation and possible restitution for the overcharges identified in the audit. Based on the results of the inquiry, FD&C will consider review of additional Neal Electric change orders.

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B. Justification for Substantial Change Orders

Change order documentation for two out of three change orders selected for review that exceeded \$100,000 did not include justification as to why the work was not competitively bid.

The UC Facilities Manual, Volume 5, Part 2, Chapter 3.2.7 states that "If the cost of a change in the scope of work to be accomplished by a change order or series of change orders exceeds \$100,000 (the dollar value for formal competitive bidding), or if the proposed changes in design are not incidental to the scope of the work as bid, the work may not be performed by change order unless it can be convincingly demonstrated that no advantage would be gained by conducting an advertised bid for the work." This section proceeds to give examples of acceptable reasons for not advertising and bidding the work.

FD&C has a very thorough change order review process in which multiple individuals review and sign-off on CP/FO's prior to them being grouped into a formal change order for final approval. Once the documentation supporting the extra work is received from the contractor, the Project Manager performs a review of the documentation to determine if it appears reasonable and complete and prepares a CP/FO. The Project Manager then sends the CP/FO to the FD&C Fiscal Office to confirm that funding is available to pay for the extra work. After the Fiscal Office confirms that funds are available, the CP/FO is sent to the FD&C Senior Director for approval. The review and approval process is repeated once CP/FO's are consolidated into a formal change order. This process is implemented via an electronic workflow process within the e-Builder contract management system in which each reviewer provides an electronic signature (each reviewer also provides a written signature on the hard copy CP/FO documentation). FD&C personnel advised that all of the individuals involved in this review process review the documentation to ensure that change order work that exceeds \$100,000 contains a written justification of why the work was not solicited for bids. However, the electric workflow in e-Builder does not currently contain any specific system controls to alert reviewers when the justification is required, or to prevent the approval if a required written justification is absent. We understand that FD&C has some flexibility in customizing e-Builder to be aligned with local procedures.

Telemedicine & PRIME HEq-Education Facility project change orders that were selected for AMAS review included three CP/FOs that exceeded \$100,000. Of these, no-bid justification had only been provided for one of the change orders. We were advised that there was a high rate of turnover of administrative staff in the time frame that these change orders were processed, and the two justifications were misplaced or misfiled.

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Management Corrective Actions:

After being notified that the two justifications were missing from the project files, the FD&C Project Manager for the Telemedicine & PRIME HEq-Education Facility project provided after-the-fact documentation explaining the circumstances which justified why the work was not competitively bid. The explanations provided appeared reasonable. This documentation will be provided to the FD&C Contract Office for inclusion in the Telemedicine & PRIME HEq-Education Facility construction contract documents.

FD&C has added a form to the e-Builder workflow that contains fields to provide written documentation justifying why the work was not competitively bid, which will be required for change orders exceeding \$100,000. System controls will not allow the change order to advance if the form is required but not completed.

C. Change Orders – Exceptions to the Construction Contract

During the review we noted that the FD&C change order documentation practices could be improved by specifically documenting when change order costs that are normally prohibited by the construction contract are deemed to be acceptable.

The Telemedicine & PRIME-HEq Education Facility project construction contract article 7, Changes in the Work, contains the restrictions and requirements for project change orders. Section 7.3.2 of the article includes a listing of costs that a contractor or subcontractor could claim for change order work. Section 7.3.3 contains a listing of costs that are prohibited for inclusion in a change order. Prohibited costs include scheduling, estimating, drafting and detailing, fencing and office expenses.

Change order Z005 was initiated based on issuance of an architect's supplemental instruction (ASI), which was a change in the contract for the purpose of providing clarification. Per the FD&C Project Manager, this ASI was highly unusual in that it resulted in changes to several aspects of the project, thereby resulting in a CP/FO that included the work of several subcontractors. One of these subcontractors, McMahon Steel, claimed additional costs totaling \$27,538, \$19,460 of which was labor costs for detailing. Detailing is a cost that is specifically prohibited by the construction contract Section 7.3.3. The FD&C Project Manager has indicated that based on the nature of the ASI, additional costs for detailing were deemed to be reasonable. The change order

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documentation did not indicate that the Project Manager was aware that the costs of the extra work included prohibited costs, and that an exception to the contract was appropriate.

Currently, the e-Builder system does not contain a specific data field to document when change orders contain prohibited costs, and there is not a standardized way to explicitly document approval for contract exceptions in the e-Builder system.

Management Corrective Action:

FD&C will develop a standard method for explicitly documenting in e-Builder the approval of legitimate costs that are exceptions to contract provisions.

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 Calculation of Neal Electric Change Order Overcharges

Change Order No.	Craft	Base Hourly Rate			Hours Billed	Overcharge for Base Payroll	Subcontractor Markup (15%)	Swinerton Markup (5%)	Total Overcharge
		Billed	Actual	Difference					
Z005	Inside Wireman	\$45.82	\$36.65	\$9.17	42	\$385.14	\$57.77	\$19.26	\$462.17
Z005	Apprentice	\$31.82	\$25.66	\$6.16	15	\$92.40	\$13.86	\$4.62	\$110.88
Z011	Inside Wireman	\$45.82	\$36.65	\$9.17	81	\$742.77	\$111.42	\$37.14	\$891.32
Z011	Apprentice	\$31.82	\$25.66	\$6.16	35	\$215.60	\$32.34	\$10.78	\$258.72
Z014	Inside Wireman	\$45.82	\$36.65	\$9.17	55.38	\$507.83	\$76.18	\$25.39	\$609.40
Z014	Apprentice	\$31.82	\$25.66	\$6.16	27.69	\$170.57	\$25.59	\$8.53	\$204.68
Z017	Foreman	\$48.72	\$41.65	\$7.07	3.56	\$25.17	\$3.78	\$1.26	\$30.20
Z017	Inside Wireman	\$45.82	\$36.65	\$9.17	16.02	\$146.90	\$22.04	\$7.35	\$176.28
Z017	Apprentice	\$31.82	\$25.66	\$6.16	14.24	\$87.72	\$13.16	\$4.39	\$105.26
Z022	Inside Wireman	\$45.82	\$36.65	\$9.17	37.8	\$346.63	\$51.99	\$17.33	\$415.95
Z022	Apprentice	\$31.82	\$25.66	\$6.16	16.2	\$99.79	\$14.97	\$4.99	\$119.75
Z030	Inside Wireman	\$45.82	\$36.65	\$9.17	336.94	\$3,089.74	\$463.46	\$154.49	\$3,707.69
Z030	Apprentice	\$31.82	\$25.66	\$6.16	505.41	\$3,113.33	\$467.00	\$155.67	\$3,735.99
Z030	Inside Wireman	\$45.82	\$36.65	\$9.17	269.96	\$2,475.53	\$371.33	\$123.78	\$2,970.64
Z030	Apprentice	\$31.82	\$25.66	\$6.16	179.97	\$1,108.62	\$166.29	\$55.43	\$1,330.34
Z034	Inside Wireman	\$45.82	\$36.65	\$9.17	604.32	\$5,541.61	\$831.24	\$277.08	\$6,649.94
Z034	Apprentice	\$31.82	\$25.66	\$6.16	325.41	\$2,004.53	\$300.68	\$100.23	\$2,405.43

Total \$24,184.65