



**CALIFORNIA STATE UNIVERSITY, NORTHRIDGE
CENTRAL PLANT AND UTILITIES INFRASTRUCTURE**

Final Report

November 2, 1999

**California State University
Northridge, California
CALIFORNIA STATE UNIVERSITY - NORTHRIDGE
CENTRAL PLANT AND UTILITIES INFRASTRUCTURE I
NO - 496R**

GOAL

The goal of KPMG, LLP's review of the California State University - Northridge - Central Plant and Utilities Infrastructure I Project was to evaluate the following areas of project delivery:

**CHANGE ORDERS
PROJECT MANAGEMENT SERVICES
CONTRACTOR BILLINGS
CONTRACTING COMPLIANCE
LIQUIDATED DAMAGES
PROJECT ADMINISTRATION PROCESS COMPLIANCE
VERIFICATION OF MAJOR EQUIPMENT AND COMPONENTS
CLOSEOUT DOCUMENTS**

INTRODUCTION

The purpose of this review is to provide the Trustees of California State University with assurance that appropriate procedures and controls are applied to the construction process as identified in the contract documents issued for the Central Plant and Utilities Infrastructure I Project at the Northridge campus. Based on our 1998 work on the University's behalf, the Office of the University Auditor revised the scope of the 1999 engagement to include, among other changes, submittal compliance verification for a sampling of major equipment items and building components.

KPMG's work was conducted by reviewing project construction documents between May 18, 1999, and July 30, 1999. The review included:

- Interviews with personnel from the Office of the Chancellor, Division of Capital Planning, Design and Construction (CPD&C), in Los Alamitos and Long Beach
- Discussions with members of the Northridge campus facility management (CFM)
- Reviews of project files at CPD&C's office
- Interview with personnel from CSU Project Management firm (Technical Resources, Inc.)
- Reviews of project files at CSU Project Management office on campus

- Reviews of project files at ARB, Inc. (Contractor) office in Lake Forest, California
- Sample auditing of documents for cost and process compliance

This review is based on the information contained within the project files at both the Owner's (for the purposes of this report, Owner shall mean both CSUN and CPD&C) and Contractor's offices. Physical inspections and field verifications were not conducted as a part of this review and were specifically excluded from KPMG's work.

CONSTRUCTION PROJECT DESCRIPTION

The project included the replacement of an existing central steam plant and individual campus building chillers with a new central plant of approximately 26,000 square feet and approximately 2.5 miles of trenching for an underground chilled and hot water distribution piping. Also included was an electrical distribution system infrastructure upgrade that will increase the installed capacity from 15,000 kVA to 29,000 kVA to serve buildings and the new central heating and cooling plant. The project provided two new 34.5 kV service substations, additional 4,160 volt feeders, switch gear and other electrical distribution components. The communication infrastructure upgrade provided new ductbanks and vaults for future cabling improvements. Fire water piping infrastructure upgrade consisted of trenching, new piping and fire hydrants. The project also included:

- A two-story central plant structure
- A 2.3 million gallon chilled water storage tank
- Concrete cooling towers
- Large mechanical systems
- Direct digital controls
- Medium voltage electrical systems
- Extensive underground distribution system
- Utility relocation
- Hardscape and landscape repairs
- Associated asbestos abatement

The administrative processes for the project remained the responsibility of CPD&C.

Plans and specifications were prepared by PSI Engineers, Inc. The pre-bid construction estimate was \$22,000,000. Original bids were submitted on December 14, 1995, all exceeding the pre-bid estimate. A notice issued on December 20, 1995, by CPD&C stated that the engineers were actively pursuing a review of the documents with the intent to value engineer certain areas to bring the project within budget and would re-bid the project. The bid proposal provided \$3,000 per day for liquidated damages for the overall project. Work in existing buildings carried an additional \$1,000 per day for liquidated damages for each day chilled or hot water was not operational by a separate pre-determined completion schedule. Additional liquidated damages

of \$2,000 per day were included for delays of new work specifically identified in the contract documents.

Addendum #3 issued on March 15, 1996, set the re-bid date as March 21, 1996. On March 21, 1996, six contractors submitted pricing for the base bid and five bid alternates. The low bid was withdrawn and the next lowest bidder, ARB, Inc., was awarded the project. A construction Agreement was executed on April 8, 1996, for the base bid amount of \$21,690,000. Notice of Completion (Construction Mgmt. Form 702.02) was recorded on June 29, 1998, indicating a completion date of June 23, 1998.

CHANGE ORDERS

Findings:

The original agreement entered into by the Owner and Contractor was based on a lump sum amount. KPMG's review included reconciling change orders issued by the Owner to the change orders issued to subcontractors by the Contractor. The Owner had methods to track requests for, causes of, associated costs, and final dispositions of change orders. At project completion, the Central Plant and Utilities Infrastructure project had approved Change Orders through Number 45 totaling \$2,581,292. This represents an additional 11.9% in project costs beyond the original construction contract amount of \$21,690,000.

CPD&C provided a report reflecting total change orders issued and approved, although this information was not recapped on the actual Change Order form. KPMG confirmed the accuracy of this report and verified that the Contractor's last submitted pay request (No. 29) accurately reflected the Owner's record of approved change orders.

The Owner's project management firm, Technical Resources, Inc. provided a "Contingency Status Report" dated June 19, 1998. The report included the description of the change, originating document for each Change Order, the Change Proposal/Estimate Numbers, Owner's Change Order Number and the Final Change Order Amount. It included the reason code for the change but did not contain a cost recap by reason. KPMG found this report inadequate as an effective means to track project change orders as it was not entirely computerized, totaled correctly and was not inclusive of all changes.

Technical Resources, Inc.'s report reflected over 500 change order proposals incorporated into 43 Owner Change Orders.

Using the incomplete report provided, KPMG calculated the total changes by reason for the change. The following is a recap of total changes by reason:

Type of Change	C.O. Totals	% of CO	% of Contract
4.1 Errors/Omissions from the Contract Documents	\$540,815	21.0%	2.5%
4.2 Unforeseeable job site conditions	820,505	31.8%	3.8%
4.3 Regulatory agency, bldg. code, safety, health	32,154	1.2%	.1%
4.4 Originated by the University	637,114	24.7%	2.9%
4.5 Unavailability of specified materials	2,019	0.0%	0.0%
4.6 Other	418,909	16.2%	1.9%
Not Coded	5,136	.2%	0.0%
Amount to balance to final CO's/math errors	124,640	4.9%	.7%
Total Change Orders	\$2,581,292	100.0%	11.9%
Original Contract Amount	\$21,690,000		

KPMG sampled approximately 80 Change Proposals (CP's) representing \$684,772 (27% of total change orders). In our review of the CP's sampled, we found the majority of subcontract proposals were traceable to actual subcontract change orders.

The Contractor's records cross-referenced the Owner's change order on each subcontract change order. KPMG found the Contractor's records standard in the industry and adequate for Owner review purposes.

Recommendations:

1. We recommend the following:
 - a. A standardized change order log or summary be prepared by Owner which includes a sequential, running total of changes issued to the construction contract. Alternatively, a running total of previously approved changes should be identified on the change order form. Both of these methods of change order tracking are standard industry practices utilized to provide information necessary to verify the accuracy of contractor's billings. Guidelines and standard forms should be developed for system-wide use.
 - b. Owner should develop standardized change order logs to be utilized by all project management firms wherever feasible. We have found that these essential management tools vary from project to project, depending on the consultants employed. Additionally, these reports should be updated/reconciled, either by the project management firm or the Owner, to reflect the final construction contract status.
 - c. Owner and Project Management records should be reconciled and kept in balance throughout project construction.

Management's Response:

- a. We agree to develop a standard form and guidelines for systemwide use. Form 703.04L, Change Order Log, was included in the Project Administrative Reference Manual, revised September, 1999.

- b. We agree. The duties of the Project Manager or Construction Administrator shall include reconciling change order logs and payment requests. These duties were added to the Project Administrative Reference Manual, revised September, 1999.
- c. We agree, as stated above in Item 1-b.

PROJECT MANAGEMENT SERVICES

Findings:

Technical Resources, Inc. was selected to provide project management services. A service agreement formalizing this decision was executed on April 3, 1996.

Project Management services were to be provided from April 22, 1996, through April 21, 1998. The agreement identified a specific rate schedule which was adjusted each calendar year. The beginning rate schedule included a Project Manager (\$57.12/hr), Inspector of Record (\$52.86/hr), Assistant Inspector (\$35.70/hr), Project Scheduler (\$48.36/hr), Project Estimator (\$37.21/hr) and a Student Intern (\$8.40/hr) at a total cost of \$530,000 or \$22,083 per month over a 24-month period. The agreement provided that office expenses were not to exceed \$1,500. Amendment No. 1 approved classification change for the intern position to Field Office Assistant with a billing rate of \$18.00 per hour. However, there was no increase in the overall commitment. Amendment No. 2 added 197 days to the management term which was completed with in the original agreement amount of \$530,000.

KPMG found that although the overall agreement was not exceeded, the reimbursable expenses exceeded the original allowance of \$1,500. We found that all invoices were properly approved. The total project management services represent 2.4% of the original construction contract amount of \$21,690,000, and 2.18% of the final construction contract amount of \$24,271,292. The fees are reasonable and within industry averages.

CPD&C procedures include minimum desired qualifications for construction inspectors. These include certification by either ICBO (in general building, structural steel and concrete), or OSHPD, or DSA, or an equivalent level of certification. There was no reference in the service agreement requiring Technical Resources to provide evidence of their personnel's certification.

Recommendations:

- 2. We recommend:
 - a. CPD&C develop Project Management cost guidelines for future projects.
 - b. Standard language be included in Project Management Service Agreements requiring Inspectors of Record to be certified by ICBO, OSHPD, DSA, or to hold an equivalent

certification. Additional language should be incorporated requiring that proof of certification for key personnel be filed with CPD&C upon execution of the service agreement.

Management's Response:

- a. We agree to develop project management and inspector cost guidelines for systemwide use. This will be done by December 31, 1999, and will be included in SUAM.
- b. We agree, but we have also successfully used engineers and architects as inspectors. Therefore, we would add to the credential requirements "... architect, engineer, or equivalent qualification." This clarification was included in the Project Administration Reference Manual, revised September, 1999. Requiring proof of certification to be included in service agreements will be done by December 31, 1999, and will be included in SUAM.

CONTRACTOR BILLINGS

Findings:

The A/E Consultant is required under the Contract General Conditions (Article 8.02 and 8.05) to review and approve each "Contractor's Pay Request." We found ARB, Inc.'s pay requests to be appropriately approved by the A/E Consultant, Project Manager, and CPD&C.

Recommendations:

None

CONTRACTING COMPLIANCE

Findings:

KPMG sampled the most significant statutory compliance requirements identified in the contract specifications. The following requirements were tested:

- Bonding: KPMG examined Contractor's Payment and Performance bonds in the amount of \$21,690,000 and found them to be in accordance with Owner's specifications.
- Bid Tabulation Procedures: KPMG found the bid process to be acceptable as outlined in the CSU Contract General Conditions (Article 2.00 Bidding). The Abstract of Bids (CSU Construction Management form 701.01) for the original bid identified three bidders and

pricing for the project. The Abstract of Bids for the re-bid included pricing from six contractors. KPMG reviewed the original bids and found the Abstracts of Bids were completed correctly and included the certification and signature of the person receiving and recording the bids.

- Proposed Subcontractors: Per Article 2.06b of the CSU Contract General Conditions, each Contractor shall submit a list of each subcontractor which will perform work or labor or render services in excess of one-half of one percent of the Contractor's total bid. This information was submitted on CSU's Construction Management form 701.04, "List of Proposed Subcontractors." We found this list of proposed subcontractors corresponded with the actual subcontracts executed by ARB, Inc.

Expanded List of Subcontractors: Per Article 2.06.b of the CSU Contract General Conditions, the low bidder is required to submit and "Expanded List of Subcontractors" (CSU Construction Management form 701.04A) with detailed addresses, phone numbers and license numbers. This "Expanded List of Subcontractors" included the same eleven subcontractors as proposed.

Recommendations:

None

LIQUIDATED DAMAGES

Findings:

Liquidated damages associated with the chilled or hot water availability (\$1,000/day) and completion of new work on the site north of the Central Plant (\$2,000/day) was addressed in CSU Change Order No. 37. CSU was provided beneficial occupancy and there was no cause for assessment of damages.

Relating to overall project completion, Change Order No. 13 allowed for an additional 21 days for weather, extending the contractual completion date to May 31, 1998. Change Order Nos. 43 and 45 extended the completion date to June 24, 1998. CO #43 provided a non-compensable delay (6 days) because of 1998 commencement activities that took place the week of May 25, 1998. CO #45 provided for non-compensable delays of 18 days for Field Instruction 390, which included a number of miscellaneous items that were construction related. The Notice of Completion certified that the contract was accepted on June 23, 1998. KPMG found appropriate documentation that negated any assessment of liquidated damages to the overall project.

Recommendations:

None

PROJECT ADMINISTRATION PROCESS COMPLIANCE

Findings:

KPMG selected various areas of review to determine if CPD&C provided adequate controls to assure that construction was performed in accordance with project specifications. As part of this review, KPMG examined procedures for both geotechnical and materials testing. Per Article 2.16 of the General Conditions, the Owner, rather than the contractor, solicit at least three proposals and arrange for outside testing laboratories through a service agreement. This practice is standard industry procedure and designed to assure that firms providing testing services remain independent of the project contractor.

Universal Laboratories, Inc. was selected to perform materials inspections and testing during construction. The service agreement also stipulated that services were to include structural steel, concrete, masonry, roofing and provide written reports. Universal's original agreement, dated April 3, 1996, was in the amount of \$40,000 and covered services through April 30, 1998. An amendment dated February 4, 1997, authorized video surveying of the piping system.

Jerry Kovacs and Associates was selected to perform geotechnical services including inspections on soils, excavations, imported fill, compaction, and backfill as required by the contract documents. Kovacs's original agreement, dated April 3, 1996, was in the amount of \$25,000 and covered services through April 21, 1998. In October, Amendment No. 1 authorized an additional \$15,000 to perform additional testing.

Due to the nature of this project, a corrosion and water treatment testing agreement was issued to M. J. Schiff & Associates on May 7, 1997. The amount of the agreement, in the amount of \$15,000, covered testing and consulting from June 1, 1997, through March 31, 1998.

KPMG found all reporting thorough and invoices appropriately approved by project personnel. We further noted an appropriate separation of duties in the overall project testing procedures.

Recommendations:

None

VERIFICATION OF MAJOR EQUIPMENT AND COMPONENTS

Findings:

As part of our evaluation to verify whether equipment and construction components were provided in accordance with project specifications, KPMG reviewed the submittal procedures outlined under the General Conditions, Article 5.04. As is standard throughout the construction industry, the Contractor was responsible for submitting data and specifications for materials and

equipment, along with shop drawings if required, to the A/E Consultant. Article 3.11 of the CSU Project Administration Reference Manual states that the Project Manager/Construction Inspector shall assist in the submittal process.

KPMG found that Technical Resources, Inc. (Project Manager) did not specifically prepare a comprehensive submittal log but reviewed hard copies of the submittals and utilized submittal logs furnished by ARB, Inc. (Contractor). While in ARB, Inc.'s office, we were provided all submittal detail and sampled a number of the approved submittals and found that all included appropriate evidence of conformance with CSU specifications.

We further directed our sampling toward major equipment submittals and those indicating multiple submittals. We reviewed the following in greater detail:

Submittal 01 - Cast Coil Transformers 16461: On August 12, 1996, the engineer indicated notations and requested a re-submittal. The notes indicated a requirement that anchor calculations be signed and stamped by a structural engineer, and additional information be provided for specific seismic isolation pads, wiring diagrams, certain finish requirements and ground pads. On September 16, 1996, the engineer approved submittal 01A which met approval on all noted issues.

Submittal 001 - Air Coils 15790: The engineer received submittal and noted on the submittal to note corrections relating to pressure differential and instructed ARB, Inc. to resubmit on January 22, 1997. The air coil data was resubmitted (001A) by the subcontractor/supplier and the engineer accepted the equipment submission on March 19, 1997, and indicated met to contract compliance.

Submittal 001 - Air Handling (AHU-1, 2) & Fan Coil Units (FC-1, 2, 3) 15855: On July 10, 1996, the mechanical subcontractor submitted York International (as specified) for the AHU's and FC's which met with CSU specifications. The trade names were CurbPak (AHU) and AirPak (FC). On July 15, 1996, the engineer approved the equipment as submitted.

Submittal 001 - Underground Electrical 16402: Submittal was reviewed by the engineer on June 3, 1996, and stamped on June 6, 1996, indicating to make corrections and resubmit. On July 5, 1996, the sub-subcontractor presented a letter to the electrical subcontractor outlining compliance with the engineers notations. KPMG found no record of the actual resubmittal approved by the engineer at the time of our review.

Submittal 002 - Natural Gas Sensor System 15980: On December 16, 1996, the engineer approved the combustible gas transmitter and the four channel receiver and indicated that the contractor confirm with manufacturer compatibility prior to ordering. The subcontractor provided a data sheet prior to the engineer's final review.

Submittal 003 - Chilled Water Storage Tank 15780: The Contractor provided the subcontractor's tank, anchorage and foundation calculations for the storage tank on May 20, 1996, which was certified and stamped by a Registered Professional Engineer (State of

California). ARB, Inc. reviewed the documentation and on June 25, 1996, the engineer reviewed the submittal and approved the storage tank as submitted.

In addition to reviews by the A/E Consultant, Technical Resources, Inc., Inspector of Record and regulatory inspectors, the CSU Construction Mgmt. Form 702.19 requires that the general contractor and subcontractors guarantee that materials/systems have been installed in accordance with the Plans and Specifications.

Recommendations:

3. We recommend:

- a. Although it is the Contractor's final responsibility to construct the project in accordance with plans and specifications, we recommend that either the A&E firm, or the Project Management firm, maintain and submit a completed Submittal Log that reflects final dispositions for each submittal.

Management's Response:

- a. We agree to modify our systemwide guidelines to include this recommendation. This was included in the Project Administrative Reference Manual, revised September, 1999, and will be added to SUAM.

CLOSEOUT DOCUMENTS

Findings:

CPD&C maintains a "Stop Notice Log" that identifies all claimants and amounts claimed. The log was found to be adequately maintained.

CSU provides a form entitled "Project Closeout Checklist" which indicates the dates that closeout documents are forwarded to the Owner. We found this form to be an excellent tool for monitoring the closeout process but did not find a completed form on file. Although KPMG does not doubt that ARB forwarded all close-out documents to the Owner prior to the release of final payment, we would have found this form a useful tool in documenting such.

Recommendations:

4. We recommend:

- a. Owner ensure that Project Managers and Inspectors furnish signed documentation that verifies all required closeout documentation is turned over to a campus designee familiar with closeout requirements prior to release of final payment.

Management's Response:

- a. We agree. The Project Closeout Checklist and the requirement to execute it was added to the Project Administrative Reference Manual, revised September, 1999.

CONCLUSION

During a post-construction meeting with campus facilities management personnel, KPMG found a high level of involvement and contractor satisfaction from campus administration even though the project was not delegated. Campus personnel and CPD&C also found project management and inspector supervision satisfactory and beneficial. Although, the main focus of project management services is to provide day-to-day project oversight, we found report documentation sub-standard for monitoring project costs and providing adequate control.

KPMG found the Contractor most cooperative in establishing our on-site review and additionally found ARB, Inc. very professional in participating in the post-construction review.

Memorandum

To: Mr. Larry Mandel
University Auditor
Office of University Auditor

Date: November 29, 1999

RECEIVED
University Auditor

NOV 29 1999

From: Richard P. West 
Executive Vice Chancellor and Chief Financial Officer
Business and Finance Division

**The California State
University**

Subject: Audit Report
Central Plant and Utilities Infrastructure I, Project No. NO-496R
California State University, Northridge

I am pleased that the overall theme of this audit report continues in a positive vein and that it finds general compliance with established procedures. I have reviewed the report's findings with my Capital Planning, Design and Construction (CPDC) staff and our specific comments to the auditors' findings and recommendations follow.

Change Orders

Recommendations:

- 1-a. We agree to develop a standard form and guidelines for systemwide use. Form 703.04L, Change Order Log, was included in the Project Administrative Reference Manual, revised September, 1999.
- 1-b. We agree. The duties of the Project Manager or Construction Administrator shall include reconciling change order logs and payment requests. These duties were added to the Project Administrative Reference Manual, revised September, 1999.
- 1-c. We agree, as stated above in Item 1-b.

Project Management Services

Recommendations:

- 2-a. We agree to develop project management and inspector cost guidelines for systemwide use. This will be done by December 31, 1999, and will be included in SUAM.
- 2-b. We agree, but we have also successfully used engineers and architects as inspectors. Therefore, we would add to the credential requirements "...architect, engineer, or equivalent qualification." This clarification was included in the Project Administration Reference Manual, revised

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September, 1999. Requiring proof of certification to be included in service agreements will be done by December 31, 1999, and will be included in SUAM.

Verification of Major Equipment and Components

Recommendations:

3-a. We agree to modify our systemwide guidelines to include this recommendation. This was included in the Project Administrative Reference Manual, revised September, 1999, and will be added to SUAM.

Closeout Documents

Recommendations:

4-a. We agree. The Project Closeout Checklist and the requirement to execute it was added to the Project Administrative Reference Manual, revised September, 1999.

JRC:bn

cc: Mr. J. Patrick Drohan
Mr. W. Clifford Hahn



THE CALIFORNIA STATE UNIVERSITY

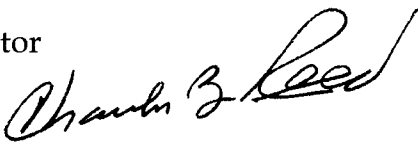
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CHARLES B. REED
CHANCELLOR

December 14, 1999

MEMORANDUM

TO: Larry Mandel
University Auditor

FROM: Charles B. Reed 
Chancellor

SUBJECT: KPMG Peat Marwick Draft Final Report on the *Central Plant and Utilities Infrastructure I Project* at California State University, Northridge

In response to your memorandum of December 13, 1999, I accept the response as submitted with the draft final report on the Central Plant and Utilities Infrastructure I Project, California State University, Northridge.

CBR/cw

Enclosure

cc: Richard P. West, Executive Vice Chancellor and Chief Financial Officer
Business and Finance