



John Keel, CPA
State Auditor

An Audit Report on

Construction Management at the Texas Tech University System

August 2006
Report No. 06-050



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Overall Conclusion

The Texas Tech University System (System) has project management controls that are sufficient to ensure that state laws and System requirements are met in the award of construction-related contracts. However, there are opportunities to strengthen these controls to ensure that all requirements are met consistently. For example:

- The System should improve documentation that supports the award of contracts for construction-related services. It did not have complete documentation for three of eight design services contracts auditors reviewed.
- The System should ensure that it executes contracts for design services with contractors before projects begin. For one design services contract auditors reviewed, the System paid the design professional \$137,726 before the contract was executed.

A total of 26 construction projects were completed at Texas Tech University and the Texas Tech University Health Sciences Center between September 1, 2003, and April 10, 2006 (see text box for additional details regarding trends in construction project costs).

The System also should improve controls to ensure that construction projects are completed within budget and on time. For example:

- All eight contracts for design services that auditors reviewed exceeded their original contracted amounts. Original, negotiated contract amounts were exceeded by an average of 24 percent. In one case, the original contract amount of \$1,978,000 was increased by \$1,478,627.

Background Information

According to the System's annual financial reports, construction-in-progress increased more than 40 percent between fiscal years 2004 and 2005:

- Construction-in-progress totaled more than \$111 million (\$80 million for Texas Tech University and \$31 million for the Texas Tech University Health Sciences Center) as of August 31, 2004.
- Construction-in-progress totaled more than \$155 million (\$110 million for Texas Tech University and \$45 million for the Texas Tech University Health Sciences Center) as of August 31, 2005.

According to the System, in fiscal year 2006 its construction and related professional service contracts totaled \$286 million. The System's Board Summary of Master Plans for fiscal years 2003-2007 specified that planned construction for Texas Tech University totaled more than \$796 million and planned construction for the Texas Tech University Health Sciences Center totaled more than \$181 million.

- The System should document its change order process for construction projects. Although a process exists, the System should document it formally. Not documenting this process increases the risk that change orders could be handled in an inconsistent manner.
- The System should improve its review process to report and correct errors in contractor payments. For one design services contract that auditors reviewed, the System overpaid the design professional \$30,393 because it did not identify an error on the invoice.
- The System should document agreements that create changes to construction-related contracts. Auditors noted changes to contract duration, warranty periods, and payment releases that the System and contractors agreed upon but did not formally document.

Summary of Management's Response

The System agrees with the recommendations in this report.

Summary of Information Technology Review

The System uses an automated Project Management Application to assist in managing projects on the various campuses. The application provides for:

- Storage and tracking of project details
- Storage of invoice data to ensure compliance with prompt payment laws
- Budget tracking
- Reporting

The System can strengthen this application by improving access controls to enhance security, creating a "read-only" user option, and establishing a formal application change management policy.

Summary of Objective, Scope, and Methodology

The objective of this audit was to determine whether the System has construction project management controls that are sufficient to ensure that state laws and System requirements are met in the award of contracts and that projects are completed on time and within budget.

The scope of this audit included an evaluation of the construction management process and an examination of selected construction projects of Texas Tech

University and the Texas Tech University Health Sciences Center that were completed between September 1, 2003, and April 10, 2006.

The audit methodology included interviewing System construction management personnel; reviewing the System's construction management process and its controls; and examining selected project files to determine compliance with state laws, System rules, and contract terms.

Recent SAO Work		
Number	Product Name	Release Date
05-038	An Audit Report on Controls Over Construction Project Management at Stephen F. Austin State University	July 2005
05-042	An Audit Report on Construction Management at the Texas State University System, Sam Houston State University, and Texas State University-San Marcos	July 2005

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Detailed Results

Chapter 1

The System Should Strengthen Certain Controls to Ensure That It Consistently Meets All Construction-Related Contract Award Requirements

Results of audit testing on 8 of 26 completed construction projects¹ at the Texas Tech University System (System) showed that the System has adequate controls over the management of construction projects to ensure that state laws and System requirements are met in the award of construction-related contracts. As Table 1 shows, the eight projects tested had combined approved budgets of approximately \$189,724,000.

Table 1

Texas Tech University System List of Construction Projects Tested During This Audit				
Project Name	Total Project Budget (in thousands)	Construction Contract Amount (in thousands)	Design Services Contract Amount (in thousands)	Project Substantial Completion Date
Animal and Food Sciences Building	\$17,000	\$13,139	\$1,279	December 22, 2004
Texas Tech Parkway	9,237	8,193	740	August 31, 2005 (Contract completion)
Experimental Sciences Research Building	37,330	28,443	3,457	October 31, 2005
Health Sciences Center Academic Classroom Building	15,400	11,795	1,093	November 3, 2003
Student Union Building Expansion and Renovation	38,086	28,634	4,170	February 14, 2005
Grover E. Murray Residence Hall	24,000	20,815	1,237	August 20, 2005
Health Sciences Center El Paso Clinic Expansion and Renovation	9,780	7,506	1,260	January 28, 2005
El Paso Medical Science Building	38,891	29,511	3,733	January 4, 2006
Totals^a	\$189,724	\$148,036	\$16,969	

^a Contract costs for construction and design services do not sum to total project budget amounts because there are other cost categories that do not appear in this table.

Source: Texas Tech University System

¹ A total of 26 construction projects were completed at Texas Tech University and the Texas Tech University Health Sciences Center between September 1, 2003, and April 10, 2006.

Appendix 2 contains additional information on the System's construction project management process.

Although the System has project management controls to ensure that state laws and System requirements are met in the award of construction-related contracts, there are opportunities to strengthen these controls to ensure that all requirements are consistently met. Improvement can be made in the documentation of design professional and contractor selection processes. In addition, a formal written contract should be developed, negotiated and signed before the System receives any construction-related services.

The System should improve documentation related to contract awards. Documentation of the contract award process is critical to demonstrating that contracts are awarded in a fair and impartial manner and that the award process complies with state law. Not adequately documenting contract awards could subject the System and the State to allegations of favoritism or other improprieties. The following examples demonstrate that the System should improve documentation of contract awards:

- The System was unable to locate complete documentation related to responses to requests for qualifications for three of eight design services contract awards reviewed.
- The System was unable to locate all individual evaluation sheets supporting one "construction-manager-at-risk" contract award and one design contract award.

The System should execute a formal, written contract prior to receiving design services. State law establishes a process through which the System is required to select, negotiate, and contract for design services. Following this process protects state and System resources. However, for one project, the System paid \$137,726 for design services it received before it developed, negotiated, and signed a formal, written contract with the design professional. Although the System recognized the work was performed without a formal written contract and took steps to develop a contract, it placed itself in a weak negotiating position and potentially obligated itself to services outside the scope of the project.

Recommendations

The System should:

- Document all steps in the construction management process (including proposals and awards) and retain this documentation in accordance with state and System record retention requirements.

- Develop, negotiate, and sign formal, written contracts before it receives services.

Management's Response

Texas Tech agrees that copies of all qualifications, proposals, and evaluations should be retained. A large majority of the examples cited occurred in a prior administration of the Office of Facilities Planning and Construction. We now have a checklist in place to ensure all required documents are retained.

Texas Tech agrees that contracts should be executed before any work is done. The example cited occurred in a prior administration of the Office of Facilities Planning and Construction. Our project management process now ensures that no work is done without a contract.

The System Should Improve Controls to Ensure That Construction Projects Are Completed Within Budget and on Time

While the System has project management controls that should help ensure that construction projects are completed within budget and on time, it can improve these controls. Specifically, there are opportunities for the System to improve the planning of projects, the change order process, and its process for reviewing payments to contractors. Additionally, the System should perform routine formal evaluations after projects are completed and continue to specify the contract duration within its contracts.

The System should improve planning of projects. Proper project planning includes preparing a budget or a detailed estimate of project costs. The budget is developed to ensure that the project can meet the System's needs, to control expenditures, and to judge performance. Auditors noted that the System exceeded the amount budgeted for seven of eight contracts, and it exceeded the original contracted amounts for all eight design services contracts tested (see Table 2). On average, design services contracts exceeded the original, negotiated contract amounts by 24 percent. On one case, the original contract amount of \$1,978,000 was increased by \$1,478,627.

Table 2

Texas Tech University System Comparison of Budget, Original Contract Amount, and Final Contract Amount For Eight Contracts Tested			
Project	Design Services Budgeted Amount (in thousands)	Design Services Original Contract Amount (in thousands)	Design Services Final Contract Amount (in thousands)
Animal and Food Sciences Building	\$1,112	\$1,251	\$1,279
Texas Tech Parkway	722	661	740
Experimental Sciences Research Building	3,024	1,978	3,457
Health Sciences Center Academic Classroom Building	909	909	1,093
Student Union Building Expansion and Renovation	2,500	3,203	4,170
Grover E. Murray Residence Hall	1,300	1,216	1,237
Health Sciences Center El Paso Clinic Expansion and Renovation	767	971	1,260
El Paso Medical Science Building	2,673	3,087	3,733
Totals	\$13,007	\$13,276	\$16,969

Source: Texas Tech University System

The System should document its change order process. The System has begun documenting operating procedures for construction contracting; however, it does not have a documented change order process. Auditors identified one change order that was not appropriately approved and three instances in which work was performed prior to the approval of change orders. Additionally, the System's review of the pricing of a change order for one project did not prevent an item from being priced at \$1,220 per hour when the maximum rate for that item was \$111 per hour. Inadequate documentation of change orders can result in unauthorized and undesirable changes to contract agreements.

The System should improve its process for reviewing payments to contractors. The System's review process did not prevent the following errors in the approval and processing of contractor payments:

- System staff did not identify an error that allowed one design services contractor to collect and hold an advance payment of \$30,393 when it had not yet performed the service.
- On one contract, retainage (which is a percentage of the contract withheld from the contractor to help ensure that the project will be finished) exceeded the amount specified in the contract. This error was apparent on the contractor's application for payment but was not detected during the System's review.

The System should improve collection, retention, and retrieval of contract-related documentation. Documentation of contract progress helps to ensure there is evidence that construction projects are completed within budget and on time. The following examples demonstrate that the System should improve collection, retention and, retrieval of required contract related documentation:

- For one contract, the System did not document mutual agreements to extend the contract period beyond the term established in the contract and its related amendments. Changes to contract terms, including terms that establish time constraints, should be formally documented and reviewed to ensure that all parties understand the terms and scope of the agreement.
- For one contract, the System did not document agreements to provide a separate warranty period for items that were installed after substantial completion. The lack of a documented warranty period creates the risk of potential legal consequences and increased costs.
- For one contract, the System released retainage before final completion without the required documentation or written consent from the surety, as contractually required. Obtaining written consent from the surety for the early release of retainage mitigates the risk of future conflicts and ensures completion of the work.

The System should continue to specify the duration of the contract within the contract itself. Six of eight contracts auditors reviewed did not contain definite begin and end dates for the various project phases or for the project as a whole. However, auditors noted that, for current projects, the System has corrected this issue and is now including definite project duration terms in its contracts.

The System should routinely perform formal post-completion evaluations. The System does not routinely perform formal evaluations of construction projects, such as post-project meetings or reports, after projects are completed. Auditors noted that “lessons-learned” discussions were held in two instances: once for a project for which errors were evident and another time for a project that was performed using the “design-build” delivery method. However, performing post-completion evaluations for all projects would help to determine whether design objectives were achieved and whether the facility is functioning as intended and would help to identify useful information for future projects.

Recommendations

The System should:

- Improve the planning of projects to develop a more accurate budget before the start of construction.
- Document a formal process to ensure that all construction change orders are managed uniformly.
- Strengthen its review of contractor billings to identify errors before payment is made.
- Improve documentation to ensure (1) that all construction change orders and agreements are reviewed and approved prior to work being performed and (2) that such documentation is maintained in the project files.
- Continue to specify within its contracts the begin and end dates for the various project phases and for the project as a whole.
- Routinely perform formal post-completion evaluations for all construction projects.

Management’s Response

The System agrees that project planning can always be improved. A majority of the examples cited are as a result of significant external influences such as:

- *the approval of a four-year medical school in El Paso;*

- *receipt of Tuition Revenue Bond (TRB) funding that allowed expansion of a research building in design;*
- *termination of an unsatisfactory contractor;*
- *rapid growth in enrollment from 24,000 to 28,000 students.*

The remaining amendments are normal adjustments to design contracts for multi-year, multi-million dollar construction projects on a 75-year old campus. To strengthen the planning process, all project managers have been instructed, and all design professional will be instructed to emphasize global, big picture thinking during the programming phase to ensure all possibilities are explored.

The System agrees that the process should be documented. This will be accomplished by September 30, 2006.

The System agrees the review process to report and correct errors in contractor payments should be improved. All project managers have been shown the types of errors the auditors found and instructed on the proper review process.

The System agrees that all change orders and agreements should be documented and retained. All project managers have been shown the types of errors the auditors found and have been instructed on proper procedures for approving and documenting change orders.

The System agrees to continue including dates in all contracts.

The System agrees to establish an evaluation process for all construction projects. A draft form has been developed and will be finalized by September 30, 2006.

The System Should Strengthen Certain Aspects of Its Automated Project Management Application

The System's automated Project Management Application is designed to provide assurance that state laws and System requirements are met in the management of construction projects. However, there are opportunities to strengthen this system. Specifically:

- The System does not have documented procedures to grant, remove, or modify access to the Project Management Application and does not periodically review user access to this application. User access controls typically should be designed to prevent unauthorized access or alteration of information systems.
- The Project Management Application does not include a "read-only" user option. The lack of a "read-only" user option could allow individuals to make unauthorized changes and result in unreliable project management data, data integrity issues, and inefficient use of resources.
- The System has not established a formal change management policy for the Project Management Application. Change requests for this application are communicated informally to the Information Technology Department. Lack of a formal change management policy can result in unauthorized changes that could hinder the application's intended functionalities.

Recommendations

The System should:

- Document formal procedures that outline the process of authorizing, removing, and/or modifying user access to the Project Management Application.
- Periodically review user access to the Project Management Application to ensure that user IDs for all terminated employees have been disabled or deleted from the Project Management Application.
- Create a separate "read-only" user option for the Project Management Application.
- Create a formal change management policy to prevent unauthorized changes from being made to the Project Management Application.

Management's Response

The System agrees and has documented the process through the use of an Employee In/Out Process checklist.

The System agrees and will review and document the review of user access to the Project Management Application on a quarterly basis.

The System agrees and will develop a separate "read-only" user option for the Project Management Application in Fiscal Year 2007.

The System agrees and we now use the TTU Prism Work Order System to manage all changes to the Project Management Application.

Appendices

Appendix 1

Objective, Scope, and Methodology

Objective

The objective of this audit was to determine whether the Texas Tech University System (System) has construction project management controls that are sufficient to ensure that state laws and System requirements are met in the award of contracts and that projects are completed on time and within budget.

Scope

The scope of this audit included an evaluation of the construction management process and an examination of selected construction projects of Texas Tech University and the Texas Tech University Health Sciences Center that were completed between September 1, 2003, and April 10, 2006.

Methodology

The audit methodology included interviewing System construction management personnel; reviewing the System's construction management process and its controls; and examining selected project files to determine compliance with state laws, System rules, and contract terms.

Information collected and reviewed included the following:

- Policies and procedures for the System's construction process.
- *2006 Texas Tech University System Strategic Plan.*
- *The System's Master Plan for Texas Tech University and Texas Tech University Health Sciences Center.*
- The master plan the System's submitted to the Texas Higher Education Coordinating Board and approval letters for selected construction projects.
- Selected construction project files containing minutes of meetings for planning, approval of the project, and selection of contractors; initial summary package presented to the System's Board of Regents; documentation of the contract award process; contract documents; progress reports; payment applications; and close-out documentation.

Procedures and tests conducted included the following:

- Conducted interviews with System construction management personnel.
- Reviewed System policies and procedures.
- Compared System construction management processes with best practices, industry standards, requirements in relevant laws, and System Board of Regents rules and regulations.
- Tested controls for selected construction projects to determine whether they were sufficient to ensure compliance with contract terms and selected statutes, System Board of Regents rules and regulations, and System policies and procedures designed to ensure projects are completed on time and within budget.

Criteria used included the following:

- Texas Government Code, Chapter 2254
- Texas Education Code, Sections 51.775 through 51.784
- Title 1, Texas Administrative Code, Chapter 202, Subchapter C
- Texas State Record Retention Schedule (3rd Edition), Section 5.2
- Texas Higher Education Coordinating Board rules
- The Rules and Regulations of the Board of Regents of the Texas Tech University System
- Policies and Procedures of Texas Tech University System
- Texas Tech University System's Uniform General Conditions/Supplemental General Conditions (2001 Edition)

Project Information

Audit fieldwork was conducted from April 2006 through June 2006. This audit was conducted in accordance with generally accepted government auditing standards.

The following members of the State Auditor's staff performed the audit:

- Jules Hunter, CPA (Project Manager)
- Joe K. Fralin, MBA (Assistant Project Manager)
- Jennifer Logston, MBA

- Shahpar McIntyre, CPA, JD
- Fabienne Robin, MBA
- Priscilla Garza (Information Systems Audit Team)
- Charles P. Dunlap, Jr., CPA (Quality Control Reviewer)
- Dave Gerber, MBA, CISA (Audit Manager)

Overview of Construction Management Process

Table 3 lists the stages of the basic construction management process at the System.

Table 3

Stages of the System's Basic Construction Management Process			
Conceptual Phase	Planning and Design Phase	Construction Phase	Wrap-up/Closeout Phase
<ul style="list-style-type: none"> ▪ Determine the need for a construction project ▪ Define project objectives ▪ Approve planning budget 	<ul style="list-style-type: none"> ▪ Select contract delivery method ▪ Select design team ▪ Draw up design ▪ Obtain approvals ▪ Collect and evaluate proposals ▪ Award contract 	<ul style="list-style-type: none"> ▪ Document communication between contractor and management ▪ Oversee construction process through: <ul style="list-style-type: none"> ♦ Regular inspections ♦ Approval of change orders, and pay applications 	<ul style="list-style-type: none"> ▪ Establish documented and reasonable warranty period ▪ Perform walk-throughs ▪ Perform final inspections ▪ Review closeout documents ▪ Perform final acceptance ▪ Make final payment

Descriptions of Construction Project Delivery Methods

Five of eight projects tested during this audit were contracted using the construction-manager-at-risk delivery method. The System used the design-build delivery method for one project and the competitive sealed proposals method for another project. The remaining project tested during this audit was performed through an interagency agreement that required another state agency to manage construction. These first three construction delivery methods are described below.

Lowest competitive bid and competitive sealed proposal methods. For both of these methods, the architect/engineer is selected before the request for proposals is issued. However, under the competitive sealed proposals method, the contractor is selected based on best value rather than on price alone, and the negotiation process may lead to contract terms and prices that are different from those originally submitted. Under the lowest competitive bid method, the selected contractor is generally the lowest responsible bidder, and the contract award is based on that lowest bid.

Construction-manager-at-risk method. Under this method, the System contracts with the construction manager and the architect/engineer at the same time. The construction manager at risk is selected based on qualifications and best overall value to the System. The construction manager manages the entire construction process and provides a single point of accountability for all subcontractors.

Design-build method. When using this method, the System contracts with a single design-build contractor. There is a single point of contact for all construction and design-related work. Because the architect and builder are part of the same team, construction can start before the design phase is finished, enabling fast delivery of the project. The System may designate an independent architect to act as its representative.

Copies of this report have been distributed to the following:

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The Honorable Tom Craddick, Speaker of the House, Joint Chair
The Honorable Steve Ogden, Senate Finance Committee
The Honorable Thomas “Tommy” Williams, Member, Texas Senate
The Honorable Jim Pitts, House Appropriations Committee
The Honorable Jim Keffer, House Ways and Means Committee

Office of the Governor

The Honorable Rick Perry, Governor

Texas Tech University System

Members of the Texas Tech University System Board of Regents
Dr. Donald R. Haragan, Chancellor



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