REPORT TO THE

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A Performance Audit
of
School Building Construction

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Digest of A Performance Audit of School Building Construction

Chapter I: Introduction

Well-designed, functional school buildings are an essential part of an effective educational program. School buildings are also an integral part of a community. Coordinated efforts between school districts and communities, along with thorough planning, can result in cost-effective school buildings that facilitate and promote educational programs.

From 2006 to 2008, Utah's total new school building construction costs have increased 40 percent on a per-square-foot basis. Total new school building construction costs from 2006 to 2008 are about $661 million. As the population of the state continues to grow, the need for educational facilities also increases and the distribution changes. Some school districts are experiencing accelerated growth, others have regular steady growth, and a few are experiencing a slight decline. Even those school districts with declining growth may need new schools to address changing student distributions.

Chapter II: Several School Districts Lack Competition in the Bidding Process

Utah Code* Requires Competitive Procurement.** Competitive procurement is the contractual acquisition by an organization of any asset, good, product, or service that enables all responsible parties to compete in a fair and open environment. According to ***Utah Code 53A-20-101(2)(a), school districts should use competitive procurement for new construction projects "if the total estimated accumulative building project cost exceeds $80,000." This helps to:

- ensure the fair and equitable treatment of all persons involved,
- provide increased economy,
- foster effective broad-based competition, and
- simplify and clarify the law governing procurement.

Competitive Bidding Can Benefit School Districts. Nine of 21 school districts surveyed (43 percent) have not adequately fostered competition in procuring architectural services for large purchases costing over $80,000. The lack of competition can be attributed to the following practices: not bidding each new project, maintaining the same

architectural firm for multiple years, accepting dated prequalified firms, and bundling dissimilar projects.

Most school districts competitively bid construction services. Twenty of the 21 surveyed school districts appear to competitively bid construction managers/general contractors for new school buildings. We did, however, find one school district where competition in the procurement process may not have been adequate.

School Districts Should Continue to Monitor the Procurement of Subcontractors. Four school districts should have greater involvement and oversight for the procurement of subcontractors. Even though the procurement of subcontractors is handled by the construction manager or general contractor, school districts should review and approve selected subcontractors.

1. We recommend that school districts competitively bid the procurement of architectural and construction services for each new design or construction project.

2. We recommend that school districts provide oversight for the procurement of subcontractors.

Chapter III: Some School Districts Should Improve Their Evaluation Process

Consistent Evaluation of Proposals Is Needed. School districts commonly use a decision-matrix process to evaluate proposals from competing firms for architect or construction contracts. While a decision matrix is a useful tool, it is only effective if used appropriately. It is clear that some school districts have used the qualitative (technical) evaluation inconsistently to evaluate fee proposals. We found several situations where the criteria developed for a decision matrix have not been well defined or equally applied.

A Few Selection Committees Should Be Strengthened. Most selection committees for architect and construction manager or general contractor procurement consist of individuals with relevant backgrounds and skills. We found three school districts' selection committees are small or mostly consist of school board members. When school districts form selection committees, they should ensure that committee members have the necessary skills to evaluate proposals. Four school districts' selection committees did not have a committee member qualified in either architecture or engineering as required by *Administrative Rule* R33-5-540.

1. We recommend that school districts implement the following:

    - Evaluation criteria be weighted to reflect the priority of the information asked for in an RFP or a statement of interest and qualifications (SOIQ), following the Division of Purchasing guidelines.
    - Evaluation criteria, including the criteria weighting, be clearly stated in RFPs and SOIQs.
    - Fee proposals be evaluated objectively and independently from the qualitative proposal.
    - Criteria be evaluated consistently by selection committee members based upon a predetermined definition.

2. We recommend that, pertaining to selection committees, school districts ensure:

    - Architect selection committees have one member who is well qualified in the profession of architecture or engineering.
    - Selection committees have the necessary expertise and skills to evaluate proposals.
    - Selection committee members read and sign a confidentiality and conflict-of-interest statement.

Chapter IV: Utah's Rising School Construction Costs Less than Other States

Building Material Inflation Contributes to School Construction Costs. The cost per square foot for new elementary schools, middle/junior high schools, and high schools has increased every year since 2006, while the total square feet of new school buildings has remained fairly constant.

Utah School Construction Costs Compare Well Nationally and Regionally. Utah tends to build less expensive schools when compared with neighboring states. Both elementary schools and middle/junior high schools are, on average, $35 less expensive on a cost-per-square-foot basis. However, looking at total square feet, Utah school districts build bigger elementary and middle/junior high schools, on average, when compared with neighboring states.

Chapter V: Overall New School Buildings Have Not Substantially Increased in Size

Space per Student in New Schools Is Higher than the USOE Recommends. The Utah State Office of Education (USOE) has provided recommended guidelines for the square feet per student that should exist in a school building. A majority of new elementary schools and high schools exceed those guidelines. Only two new middle/junior high schools exceeded those guidelines. However, the space per student has not increased in new school buildings in the past two years. The square feet per student has remained fairly consistent since 2006.

The average square footage for new elementary school buildings has increased slightly since 2006, but the average square footage for middle/junior high schools and high schools has decreased. New middle/junior high schools have decreased, on average, 17,600 square feet the last two years. New high schools completed in 2008 or being completed for 2009 are not as large as the one high school built in 2007.

Space Utilization Is Similar Among School Districts. When looking at how school building space is utilized, building designs completed by three different architectural firms for different school districts show that space utilization is very consistent. The largest percentage of total space for all school buildings, except one, is dedicated to classrooms/programs.

Material Selection Can Affect the Initial Cost and Expected Life of a Building. Several building and finishing materials are available with a wide range of pricing. The preference of one building material above another can affect initial construction costs. However, it is important to note that school districts select materials not only based on cost, but also on other factors such as quality and durability. Some materials may cost more initially but may require less maintenance later in the life of the building.

1. We recommend that school districts take steps to control construction costs by considering the following:
   - Apply the USOE-recommended guidelines for square feet per student.
   - Select building and finishing materials considering cost as well as quality and durability.

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Chapter I
Introduction

Well-designed, functional school buildings are an essential part of an effective educational program. School buildings are also an integral part of a community. Coordinated efforts between school districts and communities, along with thorough planning, can result in cost-effective school buildings that facilitate and promote educational programs. School building construction is a complex process.

School districts planning to build new schools must deal with a variety of challenges and issues. These can include anticipating construction costs, developing and managing an appropriate procurement process, and having adequate controls for construction operations. The Utah State Office of Education provides guidance and has published the *School Construction and Inspection Resource Manual* to assist school districts in meeting the challenges of constructing new school buildings.

Construction Costs Continue to Increase

During the years 2006 to 2008, new school building construction costs have increased 40 percent per square foot.

From 2006 to 2008, Utah's total new school building construction costs have increased 40 percent per square foot. This increase represents an additional cost of $112,975,000 since 2006. As the population of the state continues to grow, the need for educational facilities also increases and the distribution changes. Some school districts are experiencing accelerated growth, others have regular steady growth, and a few are experiencing a slight decline. Even those school districts with declining growth may need new schools to address changing student distributions.

Figure 1.1 shows the number of new school buildings that have been built since 2006, the cost per square foot, and the total costs for each year.

From 2006 to 2008, there were 51 new schools constructed at a total cost of $661 million.

Figure 1.1 New School Building Construction, 2006-2008. The average cost per square foot has increased 40 percent.

	Elementary School	Middle/Jr. High School	High School	Total Schools	Cost per Square Foot	Total Cost
2006	16	3	0	19	$118.00	$ 188,317,000
2007	11	2	1	14	141.00	177,920,000
2008	14	2	2	18	165.00	294,727,000
Total	**41**	**7**	**3**	**51**		**$ 660,964,000**

In three years, 51 new school buildings have been constructed. Utah has built over 4.8 million square feet of new school buildings and spent approximately $661 million. While the total cost for a new school is based on a variety of components such as site preparation, architect fees, contractor fees, and building materials, the dramatic increased cost of building materials has, in large part, been a significant factor affecting construction costs.

School Districts Can Utilize One Of Two Construction Methods

School districts use either of two methods to procure construction services: Design Bid Build (DBB) or Construction Manager/General Contractor (CM/GC). The DBB procurement method allows the school districts to contract with separate entities for each of the design and construction phases of the project. The CM/GC method allows a contracted construction manager to be a part of the process from the beginning of the project. Recently, school districts became eligible to use another construction method, the Design Build (DB) method; however, no school districts used the DB method during the scope of this audit.

The Design Bid Build Construction Method Is a Step-by-Step Process

The process starts when a school district selects an architect to design a school. Upon completion of the design and specifications for the school, the school district then advertises and asks general contractors to make bids to construct the new school. The bid process helps the school

district obtain a competitive price to construct a new school. A majority of school districts use criteria such as experience and qualifications, along with cost, when considering the proposed cost of constructing the school.

The advantages (according to the American Institute of Architects (AIA)) to the DBB procurement method include the following:

Under the DBB method the lowest price is generally accepted.

- This method is an easy process to manage.
- The lowest price is generally accepted, but criteria can be used to help prevent the selection of an unproven or unreliable GC.
- There is a single point of accountability when dealing with any problems that may arise during the process (GC is responsible for the work done by subcontractors).
- This method is good for projects that are budget sensitive but are not schedule sensitive and not scheduled to change (using a redesign of a school, for example).

The DBB procurement method also has some disadvantages. In order to meet the budget, a redesign or rebid after the initial bid may be required. Generally, the school district has no control over subcontractor selection. This method is not suited for projects that are sequence, schedule, or change sensitive.

Eleven out of 21 school districts used the DBB for new school construction.

Eleven of the 21 school districts we looked at have recently utilized the DBB construction method (however, 3 of 11 school districts used both the DBB and CM/GC method for different construction projects). Of the 11 school districts that utilize the DBB method, only 4 school districts have used low-bid for selecting a general contractor for new school construction projects. But no school district uses low-bid method exclusively. A majority of the school districts surveyed use criteria such as experience and qualifications, along with cost, for selecting a general contractor.

CM/GC Method Creates Partnership At the Beginning of a Project

The CM/GC method creates a partnership with the school district, architect, and construction manager from the design stage. The CM/GC method lets school districts select a construction manager based on a fee (generally a percentage of the total construction cost) and other criteria prior to the completion of a school building design. The construction

manager (CM) and the architect work together to develop and estimate the cost of a new school building. Upon completion of the design, the CM provides a guaranteed maximum price (GMP) for the construction of the building and then receives proposals and awards contracts to subcontractors. The school districts will not pay above the GMP and will retain any savings as a result. The CM will then become the general contractor once construction begins on the new school.

Under the CM/GC, a guaranteed maximum price is established to prevent cost overruns.

Some of the advantages provided by the AIA to the CM/GC procurement method are:

- Construction firm selected by criteria such as experience and qualifications, not just fee.
- Construction manager is involved early in the design and building process.
- Owner (school districts) selects architect and CM separately and may be involved in selecting the subcontractors.
- All work except the CM fee is bid out to subcontractors (self-performed work is usually acceptable, but CM/GC must also place a bid).
- Guaranteed maximum price helps protect the school district from cost overruns.

The main disadvantage of the CM/GC is that it is not suited for small projects. Thirteen of 21 school districts have utilized the CM/GC method (as mentioned above, three school districts have used both the CM/GC and the DBB methods for recent projects).

School Districts Select Architects Based on Qualifications

All 21 school districts used a qualification-based procurement method for architectural services for projects over $80,000.

For the selection of the architectural firm for new school construction projects, all school districts surveyed that have procured architectural services appear to use a qualification-based procurement method for projects costing over $80,000. None of the surveyed school districts selected an architect based solely on lowest bid; qualifications are an important part of the procurement process.

Sixty-three percent of the school districts surveyed use a request for proposal (RFP) to procure architectural services; the RFP asks for both

qualifications and a proposed fee. The remaining 37 percent ask architectural firms to provide a statement of qualifications and interest.

Statements of qualifications describe the basic requirements for a school district and set forth the architect-engineer evaluation criteria. An RFP is more in-depth and clearly and completely defines all the obligations of the parties with respect to the scope of work to be performed. The RFP includes a detailed description of the essential and technical requirements of the project and sets forth the terms and conditions of a contract. A statement of qualifications and RFP are both acceptable procurement methods.

School Districts Appear to Have Adequate Controls for Construction Operations

School districts appear to employ cost-control methods, such as monitoring costs, employing separation of duties, and establishing contingency amounts for change orders. All of the school districts with new school construction over the last three years have used some form of administrative controls throughout the construction process.

School Districts Appear to Monitor Costs Throughout the Construction Process

School districts seemed to perform cost-inspecting methods throughout the construction process.

Monitoring costs throughout the school building process is accomplished by different types of reviews. The review process generally consists of:

- On-site construction visits
- Matching pay request with amount of work claimed to be completed
- Review of costs, performed by an architect, business administrator, and usually another district worker

School districts surveyed seem to carry out these cost-inspecting methods. Weekly on-site visits assist in controlling costs. These are some examples where school districts benefitted in this respect:

- One school district found that the mortar was the wrong color during a walk-through of a construction project and had it

corrected. Additionally, during another walk-through the school district found that some cinder block had major chips and required it to be repaired or replaced.

- When a school is complete, it is a standard practice for one school district to perform a walk-through and create a punch list of any final work needed. This process helps ensure all specifications are met and all work is done properly; generally, schools hold a percentage of the contractor's fee (a retainer) until the job is satisfactorily completed.

The on-site inspections conducted by school district officials also assist in matching pay requests with the amount of work claimed to be completed by the contractor and subcontractors.

School Districts Appear to Have Adequate Separation of Duties in Place

Separation of duties helps prevent financial errors and fraud.

Separation of duties aids in the prevention of errors and fraud by requiring more than one person to complete a task. In the case of school districts, the task is processing a check for payment requests. An inadequate separation of duties increases the risk of fraud. One of the key concepts of internal control is that no single individual should have control over multiple phases of a transaction or operation. School districts surveyed displayed a separation of duties.

School districts appear to have a separation of duties in place for payment requests.

The process for a payment request is generally the same for all school districts surveyed. A general contractor submits a payment request to either the construction manager or the architect; that individual then reviews the payment request for accuracy and then forwards the payment request to a district official (usually a facilities manager). The district official reviews and then submits the request to an accounts payable department that, in turn, creates a check that will be signed by a business administrator or the president of the school board and then paid to the general contractor.

Contingency Amounts Are Established To Anticipate Unpredicted Change Orders

School districts surveyed had a built-in contingency (financial provision made against future unforeseen events) budgeted prior to

A contingency amount of 2-5 percent of total construction costs is set aside for unpredicted change orders.

construction. The contingency, if used, was generally for change orders. The built-in contingency allowed schools to have funds (generally 2 to 5 percent of total construction costs) set aside in the unforeseen case that a change (or change order) in the construction needed to occur.

School districts used their contingency amounts appropriately and within the amounts prescribed in the contract. Change orders can potentially increase the price of a project. School districts that had new school construction had built-in contingencies for change orders; none of the surveyed school districts overspent their designated contingency amount.

Audit Scope and Objectives

Three legislators requested a performance audit of the construction of school buildings. They asked for an analysis of school districts' building costs, factors that affect school building costs, and the type of school buildings being constructed in Utah. Specifically, the audit scope considered the following:

- Determine the trend of school building construction costs for elementary schools, middle/junior high schools, and high schools.
- Determine how school districts' construction costs compare to other states' school building construction costs.
- Determine what factors may affect construction costs, such as construction inflation, choice of building materials, the use of repeat designs, etc.
- Determine the size and space utilization of school buildings.
- Determine if school districts are competitively procuring architects and construction managers/general contractors.
- Determine if school districts have controls in place to appropriately process construction payments.

For this audit, we surveyed all school districts that have constructed new school buildings since 2006.

To address these objectives, we asked all school districts that have constructed new school buildings since 2006 to provide us with information for each new school building. We gathered information from 21 school districts concerning specific construction costs, site costs as well as total costs, the size of the school buildings, student capacity, and other pertinent information. For comparison, we gathered construction cost and size information for school buildings from surrounding states.

We visited all 21 school districts to gain an understanding of the type of school buildings being constructed. We gathered bidding and evaluation information regarding the procurement of architects and construction managers/general contractors for each new school constructed since 2006. We also collected and reviewed the schedule of payments to contractors and interviewed school district personnel to determine what financial controls exist for managing construction operations.

Chapter II
Several School Districts Lack Competition in the Bidding Process

Our review of 21 school districts found that 9 need to foster more competition in their bidding process for architectural and construction services. Additionally, school districts should continue their involvement with primary contractors and be more involved and monitor the procurement of subcontractors by construction managers and general contractors. This review included all Utah school districts, 21 of 40, that have completed new school buildings since 2006 or are in the process of constructing new school buildings.

Competition in the bidding process helps control costs and promotes efficiency.

The bidding process is an important step in the construction of a new school building. If done properly, the process fosters competition and reduces legal and ethical problems. Competition, as required by statute, helps to control costs and promotes efficiency, innovation, and transparency.

Utah Code Requires Competitive Procurement

Competitive procurement is the contractual acquisition by an organization of any asset, good, product, or service that enables all responsible parties to compete in a fair and open environment. According to ***Utah Code*** 53A-20-101(2)(a) school districts should use competitive procurement for new construction projects "if the total estimated accumulative building project cost exceeds $80,000." This helps to:

- ensure the fair and equitable treatment of all persons involved,
- provide increased economy,
- foster effective broad-based competition, and
- simplify and clarify the law governing procurement.

Local boards of education are charged with ensuring that school building construction, both permanent and temporary, is conducted in accordance with the procurement code and antitrust laws. The goal of

antitrust laws is to foster and protect competition. Figure 2.1 explains why the Legislature has enacted antitrust laws.

Figure 2.1 Antitrust Laws Help to Protect Competition. ***Utah Code*** 76-10-912 identifies the purpose of antitrust laws.

Antitrust laws foster and protect competition for economic welfare.

1. The Legislature finds and determines that competition is fundamental to the free market system and that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress, while at the same time providing an environment conducive to the preservation of our democratic, political, and social institutions.

2. The purpose of this act is, therefore, to encourage free and open competition in the interest of the general welfare and economy of this state by prohibiting monopolistic and unfair trade practices, combinations and conspiracies in restraint of trade or commerce and by providing adequate penalties for the enforcement of its provisions.

School districts can develop and adopt their own procurement policies, but in doing so, they must, at a minimum, meet state requirements. The Utah State Office of Education (USOE) has developed a resource manual that includes topics such as the bidding process, legal requirements, building inspections, and resource information provided by the Division of Purchasing to aid school districts in developing and following proper procurement practices.

The USOE allows several types of competitive bidding, including low bid and negotiated procurement.

Acceptable competitive bidding encompasses several methods, including: low bid, negotiated procurement, two-step sealed bidding (a combination of bidding and negotiating) and value-based procurement. If a method other than low bid is selected, it is acceptable for the school districts to prequalify bidders based on criteria such as experience and ability.

Competitive Bidding Can Benefit School Districts

Nine of the 21 school districts surveyed need to increase competition when procuring architectural and construction services. (We found eight school districts need to increase competition when procuring architectural

services, and one school district needs to increase competition when procuring both architectural and construction services.)

Competitive bidding for architectural services usually results in a lower architect fee.

School districts that competitively bid for architectural services, on average, negotiate a lower architect fee than school districts that do not competitively bid for these services. For the recent construction projects that were not competitively bid, the construction manager fees appear reasonable. However, school districts should still implement competitive bidding practices as required by statute to ensure fairness and obtain a possible financial benefit.

Several Architect Services Were Not Competitively Bid

Forty-three percent of school districts surveyed have not competitively bid architectural services.

Nine of 21 school districts surveyed (43 percent) have not adequately fostered competition in procuring architectural services for construction projects costing over $80,000. The lack of competition can be attributed to the following practices: not bidding each new project, maintaining the same architectural firm for multiple years, accepting dated prequalified firms, and bundling dissimilar projects. Seven of the nine school districts are located in rural areas of the state, and two school districts are in urban areas.

Four School Districts Did Not Competitively Bid Architectural Services to Create New School Building Designs. Four school districts used architectural firms previously procured for earlier construction projects to design new school buildings completed between 2006 and 2008. Those individual architectural firms provided architectural services for those four school districts for many years. As an example, one school district's business administrator asked the school board to consider competitively procuring an architectural firm. The school board said they liked the working relationship with the current architectural firm and did not want to change.

One of the four school districts used their preferred architectural firm to design a new elementary school. The architect fee was $639,860, or 6 percent of the total construction costs for the school. The average fee for other new elementary school designs was 5.8 percent. In our opinion, if the school district had negotiated an architect fee of 5.8 percent, the school district may have saved about $21,000.

A second school district hired their preferred architectural firm to design a new junior high school. The fee was $946,972, or 6 percent of the total construction costs. The average architect fee for other competitively bid new middle/junior high school designs was 5.4 percent. If the school district had negotiated the architect fee at 5.4 percent, this school district may have saved about $90,000.

A third school district hired their preferred architectural firm to design a new high school. The architect fees were 6 percent, $2,729,149 of the total construction costs. This fee is concerning because it is one of the highest architect fee of all procurement projects reviewed during this audit. The average architect fee to design other new high schools was 5.2 percent. Only a small number of high schools have been built recently, but if the negotiated architect fee would have been similar to other high schools, the school district may have been able to save about $350,000.

The fourth school district hired their architectural firm to design a small 10,000 square foot alternative high school. The architect fee was 6 percent, $116,400. Other small alternative high schools have not been built between 2006 and 2008 for a comparison.

Some school districts have used the same architects for multiple projects instead of competitively bidding each new project.

Three Other School Districts Have Employed Their Architectural Firms for Multiple Years. Three school districts hired their architects to modify existing school designs for the construction of new elementary school buildings between 2006 and 2008. While it is appropriate to hire the same architect to modify a design that is created and owned by the architect, the audit team noticed that those three school districts have utilized or are utilizing the same architectural firms for multiple years. If a new design project is needed, each project should be competitively bid to foster competition, rather than using the same architectural firm.

One school district has exclusively used the same architect for over 10 years. The second school district has a five-year agreement with an architectural firm that began in 2005. The third school district has hired a new building official and has developed and implemented a competitive bidding process to procure architectural services. However, this school district's previous building official used the same architectural firm for all architectural needs, including the school building project included in the scope of this audit.

The architect fees for these repeat elementary school design projects were higher than fees in other school districts that competitively bid for architectural services. The architect fees were 4.5 percent, 4.6 percent, and 5.5 percent of the total construction costs for three new elementary schools, one school in each of the three school districts. The average negotiated architect fee for a repeat design was 4.3 percent for other school districts. It appears that these three school districts may have saved the following, based on the total construction costs for each project, if the architect fee was 4.3 percent:

- $10,000 for the school building with 4.5 percent architect fee
- $43,000 for the school building with 4.6 percent architect fee
- $79,000 for the school building with 5.5 percent architect fee

One School District Prequalified Four Architectural Firms 10 Years Ago. Since 1998, the school district has used the services of their prequalified architectural firms on a rotational basis. While the pre-qualification method is an appropriate competitive procurement process, the school district should have conducted additional competitive prequalification processes since 1998 to procure architectural services. The architect fees for repeat designs for two elementary schools in this school district are 5.7 percent of the total construction costs, 1.4 percent higher than the average fee. This school district may have been able to save about $117,000 in architect fees for each school if the architect fee had been the average, 4.3 percent.

Prequalifying architectural firms can be an effective procurement method when done on a regular basis.

Conversely, another school district that uses the prequalification process re-creates their prequalified lists every three years. This gives additional architectural firms an opportunity to prequalify. Regularly repeating the prequalification process should foster innovation, ensure quality work, and control prices.

One School District Inappropriately Bundled Nine Design Projects. This school district procured one architectural firm to be the master architect for nine different construction projects: two new school buildings and seven renovations and/or additions. A second architect firm was procured to design the renovations and additions for one of the nine school construction projects, but the master architect still has oversight over that project. The cost for designs for each of these projects ranged from $297,000 to $1,948,000. In bundling the projects, it appears the

school district did get a reasonable rate for at least one of the design projects.

Each project costing more than $80,000 should be bid separately.

According to ***Utah Code*** 53A-20-101(2)(a) school districts should use competitive procurement for new construction projects "if the total estimated accumulative building project cost exceeds $80,000." Each large architect project costing over $80,000 should be bid separately to better foster competition. Bundling projects limits competition for architectural firms.

Most School Districts Competitively Bid Construction Services

Most school districts surveyed competitively bid for construction managers/general contractors.

Twenty of the 21 surveyed school districts appear to competitively bid construction managers/general contractors for new school buildings. We did, however, find one school district where competition in the procurement process may not have been adequate.

One school district bundled multiple construction projects together. The school district that bundled nine architect projects, discussed above, also combined the same nine construction projects into two separate bid packages. The first bid package was requesting a construction manager for two renovations/additions for two high schools. The costs for these two projects are about $21 million and $37 million, or a combined cost about $58 million. The second bid package was a request for a construction manager for seven construction projects that included the construction of two new elementary schools and five renovation and/or addition projects for existing schools. The cost for each of these projects ranged from about $3 million to $13 million, or a combined cost of about $45 million. Each bundled bid package was awarded to a different construction manager.

Another school district needed to build three new elementary schools at about the same time. When the school district competitively bid for a construction manager for the projects, the school district selected three different construction managers, one for each project. Each project cost about $9 million. The three firms that scored the highest total points on the RFP evaluation were awarded the contracts. All three large construction projects costing over $80,000 were competitively bid.

School Districts Should Continue to Monitor The Procurement of Subcontractors

School districts should review and approve selected subcontractors.

Four school districts should have greater involvement and oversight for the procurement of subcontractors. Even though the procurement of subcontractors is handled by the construction manager or general contractor, school districts should review and approve selected subcontractors.

School districts choose between two procurement methods: (1) a Construction Manager (CM/GC) or (2) a General Contractor (GC) who procures subcontractor services. Forty-eight percent of school districts only utilized the CM/GC procurement method, 38 percent solely used the GC procurement method, and 14 percent used both CM/GC and GC procurement methods. A third method, the Design Build (DB) method is now available, but was not used during the scope of this audit.

Using the Construction Manager/General Contractor (CM/GC) procurement method allows school districts more control during the procurement process.

School Districts Have More Oversight when the Construction Manager Procurement Method Is Utilized. According to the school districts that utilize the CM/GC procurement method, they monitor the subcontractor selection process, attend bid openings, and approve of selected subcontractors. Sometimes, school districts help the CM/GC advertise for subcontractors and ask subcontractors to submit a bid.

Seventy-four percent of school districts using the CM/GC procurement method went with the lowest subcontractor bid.

Since school districts using the CM/GC procurement method have a degree of oversight when selecting subcontractors, the following results were found in the survey of school districts with new school construction:

- 74 percent of school districts went with the lowest responsible subcontractor bid.
- 26 percent of school districts did not go with the lowest bid; reasons cited were scheduling problems, not enough experience, or bid was too low in comparison with other bids.

A common practice when procuring subcontractors is to obtain multiple bids for each subcontracted area to help control costs. According to our survey, school districts need to be more involved with the CM/GCs to obtain multiple subcontractor bids for each subcontracted area:

- 77 percent of school districts using the CM/GC procurement method required multiple bids (generally three bids).

- 23 percent of school districts did not require a minimum number of bids.

One school district requires three bids for all subcontracted areas. If they do not receive three bids for each area from the first procurement, then the school district rebids for subcontractors until there are at least three bids for all subcontracted areas.

General contractors wanting to self-perform work must submit bids with other subcontractors.

School districts surveyed also allow self-performed work to be performed by the general contractor, regardless of the procurement method, but school districts require that the general contractor submit a bid along with other subcontractors. Some rural school districts find it difficult to get three bids for all subcontracted areas, but school districts should continue to try and get at least three bids for each subcontracted area to obtain quality service for a reasonable cost.

School Districts Have Limited Oversight when the General Contractor Procurement Method Is Utilized. Under the General Contractor procurement method the GC usually submits the selected subcontractors as part of their bid for the construction project, or shortly after being awarded the contract. School districts that used the GC procurement method don't have control over the subcontractor selection, such as monitoring the selection process or attending bid openings. However, most school districts surveyed review and approve selected subcontractors. Getting competitive bids from subcontractors aids in obtaining an economical price for a new school. The school districts that use the GC procurement method stated the following:

Sixty percent of school districts using the General Contractor procurement method were able to use the lowest subcontractor bids.

- 60 percent of school districts using the GC delivery method reviewed the subcontractor selection and approved that the GC was able to go with the lowest bid for subcontractors.
- 10 percent of school districts asked the GC to not go with the subcontractor that submitted the lowest bid because school districts had a bad prior work experience.
- 30 percent of school districts did not provide oversight or review of the selected subcontractors by the GC.

School districts choose either the CM/GC or GC procurement method for a variety of reasons; the advantages and disadvantages of both methods are given in Chapter I.

Recommendations

1. We recommend that school districts competitively bid the procurement of architectural and construction services for each new design or construction project.

2. We recommend that school districts provide oversight for the procurement of subcontractors.

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Chapter III
Some School Districts Should Improve Their Evaluation Process

Of the 21 school districts surveyed, 10 could improve their evaluation process.

School districts need to provide guidance to their procurement officers, school building officials, and selection committees to ensure that the procurement evaluation process reflects consistency, impartiality, and the appropriate priority of the information used. We found 10 of 21 schools districts that can improve their evaluation process. One school district's evaluation lacked consistency, and they could have better managed other aspects of the procurement process. In the case of selection committees, members should be well qualified and have the expertise necessary to adequately evaluate proposals and/or qualifications to obtain the best service for the lowest cost.

Consistent Evaluation of Proposals Is Needed

School districts commonly use a decision-matrix process to evaluate proposals from competing firms for architectural or construction contracts. While a decision matrix is a useful tool, it is only effective if used appropriately. It is clear that some school districts have used the qualitative (technical) evaluation inappropriately to evaluate fee proposals. We found several situations where the criteria developed for a decision matrix have not been well defined or applied consistently.

Decision Matrix Is Generally The Utilized Methodology

A decision matrix can be an effective tool for evaluating information.

School districts routinely use some form of a decision matrix in awarding contracts. A decision matrix, also called a scoring matrix, is an appropriate tool for evaluating both quantitative and qualitative information. A decision matrix allows decision makers to structure information and determine the relative value of bids and proposals by:

- Specifying and prioritizing their needs with a list of appropriate criteria
- Evaluating, rating, and comparing the different proposals

- Selecting the best matching proposal to the criteria

A decision matrix is used to evaluate different proposals against various criteria.

A decision matrix evaluates different proposals against various criteria, which are weighted independently of their respective importance to the final decision. A selection committee rates each proposal based on the selected criteria. The ratings are then multiplied by the weight assigned to each criterion to compute the score. The scores of each proposal are added together to determine the final score.

The decision matrix is not error proof. The ratings are subject to interpretation, since much of the information used is qualitative. Decision makers can adjust criteria weights and/or ratings to favor a given proposal, reducing the impartiality of the evaluation. A well-defined and clear understanding of the criteria helps to remove some of the subjectivity from the process.

Since weighting of criteria is important to the final outcome, school districts should carefully consider the weight for each criteria. The USOE resource manual directs school districts, as local public procurement units, to consider guidance provided in the Request for Proposal (RFP) manual developed by the State Division of Purchasing.

Strong Evaluation Criteria Is the Foundation of the Process

The weighting of the criteria must reflect the priority of the information asked for in the RFP.

Construction costs should be appropriately weighted in the evaluation process. The RFP manual states that the weighting of the criteria must reflect the priority of the information asked for in the RFP. The manual lists both examples of criteria and their weighting:

Weight	Criteria
40	Proposed cost of the project
20	Demonstrated ability to meet the scope of work
15	Demonstrated technical capability
15	Qualification and expertise of staff
10	Performance references for similar projects

The manual recommends that cost be weighted between 30 and 50 percent. A weight of less than 30 percent requires approval by the director of purchasing. We found three instances, out of 21, from three

different school districts where cost was weighted less than 30 percent in procuring construction services without the required approval.

The audit team noticed that architect fees were weighted less than 30 percent in several school districts in procuring architectural services; these school districts commented that they believe cost should not be given the highest weighting. They believe that both experience and design ability—the firm's capacity for innovation in all aspects of the design—should be weighted higher to help control construction costs. In our opinion, their position is acceptable as long as the school district officials approve of the weighting.

Evaluation criteria should be clearly stated and adhered to by the selection committee.

Evaluation Criteria Should Be Accurate and Consistent. When soliciting construction service bids, the advertising document (an RFP or request for qualifications) should clearly state each area of the evaluation criteria in detail, according to the RFP manual. We found four separate instances where school districts did not state the weight of the criteria in their RFPs.

School districts should ensure transparency exists throughout the procurement process.

School districts should ensure transparency exists throughout the procurement process. One of the four school districts that did not state the weight of the criteria also did not state in the RFP that construction manager costs was a criterion used to select a construction manager.

We found one example where a selection committee member added criteria to the decision matrix that were not listed in the RFP. The same criteria listed in the RFP should also be used in the decision matrix. This committee member added "local" criteria and rated each proposal by giving up to 10 additional points to a local firm. This additional criteria did not change the outcome in this selection process, but such independent actions create the appearance of an unfair evaluation that could change evaluation outcomes.

Fees Should Be Scored Objectively

Four districts allowed committee members to score fee proposals subjectively.

Of the 21 school districts surveyed, 5 (24 percent) of these need to improve their scoring methodology to rate fee proposals. Four districts allow individual committee members to subjectively score fee proposals rather than maintaining a consistent, objective process. The fifth school district was unable to show how the scoring was calculated for procuring a construction manager.

In one of the five school districts where selection committee members rate fee proposals, the committee reviewed proposals for an architectural project. The proposal that submitted the lowest fee was given the highest rating by three of seven committee members. Two committee members gave the same rating as other proposals, and two committee members scored the proposal with the lowest fee as least favorable. Two other procurement processes in this school district also exhibited the same inconsistent, subjective scoring of fees.

Fee proposals should be evaluated independently from the qualitative proposal.

Fee proposals should be evaluated independently from the qualitative proposal. The RFP manual states costs and fees should be objectively scored. The evaluation committee should not be involved in the cost evaluation. The procurement officer, or other qualified employees, should calculate the score for each fee proposal using a mathematical formula. The RFP Manual provides a formula that pro-rates the score for each fee proposal based on the lowest proposed fee. Once a score is calculated for each proposal, these scores should be included in the compilation of the final scores. Figure 3.1 below shows an example of a appropriately scored fee proposal.

Figure 3.1 Appropriate Fee Rating. This school district had the business administrator objectively rate fee proposals.

Proposal	Fee	Fee Rating (40 Points)	Qualitative Score (60 Points)	Total Score
A	$ 458,070	24.84	46.97	71.81
B	453,013	25.12	54.77	79.89
C	374,645	30.37	57.79	88.16
D	327,600	34.73	57.30	92.03
E	316,100	36.00	58.90	94.90
F	290,000	39.24	**59.00**	**98.24**
G	284,460	**40.00**	54.79	94.79

Note: Fee Rating + Qualitative Score = Total Score

The separate fee rating is combined with the qualitative evaluation to get the total score for the proposals.

After the fee proposals have been scored, fee scores are combined with the qualitative scores that have been rated by the selection committee. (In

this case fees were weighted at 40 points, and Proposal G submitted the lowest fee and received the most points. The qualitative score was weighted at 60 points, and Proposal F received the most points.) In the qualitative section, proposals were rated on general experience, references, past performance, and adequate personnel and their ability to complete the project. From this decision matrix, Proposal F received the highest total score.

One School District's Evaluation Process Lacks Consistency

A school district's evaluation of the firm experience criterion does not appear to be scored consistently.

One school district's procurement process shows inconsistency and lacked open communication during the qualitative evaluation. The school district's evaluation of the firm experience criterion for the architect selection of its new high school does not appear to be scored consistently. It appears that the school district did not clearly communicate information to competing architectural firms interested in the design project. Also, the current projected cost of the high school project increased $6.5 million above the amount authorized by public vote in a bond election in 2006.

Firm Experience Evaluation Was Scored Inconsistently

The school district's selection committee awarded its high school design contract to an architectural firm that did not have the experience in designing high schools that other architectural firms demonstrated on their proposals. Under the "firm experience" section in the selected architectural firm's proposal, the firm declared the following high school design experience:

- Science room remodel
- Commons area converted from a interior courtyard
- Gymnasium addition
- Media center addition with adjoining writing/research computer lab and 50-seat lecture hall
- Auditorium rebuild
- Wrestling facility addition
- Alternative high school

The firm had completed six addition/remodel projects, and one 62,000 square-foot facility for alternative high school students. However, the firm had not designed an entire high school. High schools currently being built in Utah range from 242,000 square feet to 375,000 square feet.

A school district rated an architectural firm higher than other firms who had more experience.

Under "firm experience," the selected architectural firm also listed other design projects for elementary schools and middle/junior high schools. The firm had designed many new buildings and designed many additions and remodels. Other architectural firms also listed design projects for elementary schools and middle/junior high schools.

The school district's ratings from the decision matrix revealed that the selected architectural firm, Proposal B, that had never designed a new high school, received higher scores for "firm experience" criterion than three other architectural firms that had experience designing new high schools as shown in Figure 3.2 below. "Firm Experience," as defined in the request for qualifications, was stated as the "scope, categories, or type of work, in which the firm considers themselves most qualified."

Figure 3.2 Firm Experience Ratings. Each committee member scored firm experience for each proposal on a scale from 1 to 10.

		Committee Member Scores					
Proposal	High Schools Designed	No. 1	No. 2	No. 3	No. 4	No. 5	Total
A	10	10	9	10	9	10	48
B	**0**	**10**	**10**	**9**	**8**	**10**	**47**
C	8	7	9	10	10	10	46
D	6	7	10	10	9	10	46
E	5	7	7	10	8	8	40
F	0		4	7	2		13

Proposal B received a higher rating than four other proposals.

The figure shows that the selection committee awarded high points to proposals that had completed projects designing entire high schools, except Proposal B. Proposal B was rated high, even though that firm had not previously designed an entire high school. The architectural firm that

submitted Proposal B was selected to develop the design. Proposal A listed 10 projects designing new high schools and 10 addition/remodel projects for high schools, and only received one additional point over proposal B. Proposal C listed eight projects designing new high schools and many high school additions/remodels. Proposal C received one point less than Proposal B.

Three members of the selection committee were asked by the audit team why the selected architectural firm, Proposal B, was rated high in firm experience. All three committee members gave a similar response—they appreciated the working experience with the architectural firm on two previous projects, and they liked their work from the site visits. The same architectural firm that was selected to design the high school was previously selected to design an elementary school and do work on another building in that school district. None of the selection committee members, who are or were school board members, were qualified in architecture or engineering as required by the USOE resource manual.

Members of the selection committee were not qualified in architecture or engineering.

It appears that committee members scored Proposal B, the selected proposal, based on their past experience with the architectural firm, while other architectural firms were scored on the information provided in their proposals. Other criteria used for this evaluation besides firm experience (10 points) included responsiveness (5 points), individual experience (15 points), fee schedule (10 points), design ability (25 points), program adaptation (10 points), energy conservation (5 points), references (10 points), and consultants (10 points).

The winning architectural firm, Proposal B, submitted a lower fee than other architectural firms. The "fee" criterion was weighted at 10 points and was scored subjectively by each committee member; it was not scored objectively, as required. We are not saying that the selected architectural firm should not have been awarded the contract; they did submit the lowest bid. In our opinion, it is also appropriate for the school district to select an architectural firm that has no experience building a high school. An architectural firm could be scored high in other criteria areas besides experience and still be awarded the contract. Our concern is that a consistent evaluation process was not followed for scoring firm experience.

Consistent scoring could have resulted in the selection of a different firm.

The "firm experience" criterion scores could have made a difference between which architectural firm was awarded the contract. Total possible points for the evaluation was 500. Proposal B received 455 points. The second-highest proposal was Proposal A with 439 points. These two proposals were separated by 16 points. If the selection committee had given Proposal B 16 fewer points out of 50 for the firm experience criterion, they may not have been awarded the contract. The other firm that did not have experience building a new high school, Proposal F, only received 13 points.

The Selected Architectural Firm Conducted a Needs Assessment

The selected architectural firm was not paid for completing the needs assessment.

The architectural firm that submitted Proposal B volunteered to conduct a needs assessment for the new high school. The architectural firm interviewed the high school's faculty and staff to determine their needs. A school district official and board members stated that the architectural firm was not paid for this assessment and that the architectural firm asked the school district for permission to do the assessment. A school district official also stated that no other architectural firms asked to do a needs assessment.

Using the needs assessment, the selected architectural firm developed new design concepts.

With the aid of the needs assessment, new design concepts were developed by the selected architectural firm for the submitted proposal. Three selection committee members stated that the winning proposal was selected due to the fact that they liked the new design concepts provided in the proposal.

A selection committee member said the architectural firm selected for the high school project had done their homework. While other proposals were based on past designs, the winning architectural firm submitted a new traditional design that would fit this area. The winning firm was rated higher than other firms for the "design ability" criterion. The "design ability" criterion was given a weight of 25 points, the highest weight of the criteria.

One competing architectural firm felt the procurement process was fair while two other firms did not.

One competing architectural firm felt the procurement process was fair, but two other competing firms felt it was unfair. These two firms felt they should have been invited to complete a needs assessment and believe the assessment may have given the selected firm an advantage in the procurement process. One firm stated that "this part of the process was

confusing and I was told by the school district that submitting a repeat design would be fine." The other firm was more negative stating that "when the firm submitted their proposal that a school board member told a firm's employee—thank you, but we like the design of another proposal better—even though the design contract had not yet been awarded."

Even though it was not inappropriate for an architectural firm to conduct a needs assessment, we believe the school district should have clearly communicated to competing architectural firms their vision and any pertinent information required for the project in the RFP. First, the school district should have made it clear to all competing firms whether they wanted all firms to submit new design concepts as part of their proposal and/or repeat designs.

Second, the school district should have made competing firms aware that one architectural firm had conducted a needs assessment to develop a new design and invited all competing firms to conduct their own needs assessment at their own cost. The school district could have also purchased the needs assessment from the architectural firm that did the work and provided that information to all competing firms to equalize the playing field. This lack of communication may have provided an unfair advantage, but we found no evidence to conclude that it did.

The total cost for one new high school has succeeded the originally planned price by 11 percent.

The Cost of the Construction Project Has Increased

The school district reported that the total cost of the project is estimated at $66 million for construction and land acquisition, 11 percent higher than originally planned. The November 2006 proposition to build the new high school stated that general obligation bonds would not exceed $59.5 million for the purpose of defraying all or a portion of the costs of land acquisition, equipment, acquisition, and construction of a new high school and related improvements.

When the construction manager signed the contract on March 5, 2007, to build the high school, a guaranteed maximum price was not established at that time. The contract stated:

No guaranteed maximum price was established when the contract was signed.

> The Construction Manager acknowledges that Owner's budget for this Project, including the preconstruction, construction, and post-construction phases, and the Cost of the Work and the

Construction Manager's fee during each of those phases is $46,200,000.00. [NOTE TO CONSTRUCTION MANAGER: school district wants to leave this at $46,200,000.00. However, they understand that you have told them that the price for their project as currently designed will assuredly come in at a higher number.]

A standard cost-control mechanism is to have a guaranteed maximum price stated in the contract.

A standard cost-control mechanism is to have a guaranteed maximum price stated in the contract. From the amount stated in the original contract to the current reported construction costs of $61.7 million, the construction costs have increased by $15.5 million. The current size of the high school is 320,000 square feet, with a cost of $193 per square foot.

Two other high school construction projects in the state also began in 2006:

- One high school reported construction costs of $51.5 million for a 285,000-square-foot building, with a cost of $181 per square foot.
- A second high school reported construction costs of $33.4 million for a 260,000-square-foot building, with a cost of $128 per square foot.

The average cost per square foot for all seven high schools completing construction between 2007 and 2009 in the state is $154 per square foot. The high school being reviewed, in this school district, is at $193 per square foot and 320,000 square feet—the most expensive high school being built during our review period.

The old high school will need to be sold to cover the increasing costs of the new high school.

A school district official stated that cost of materials has increased since the beginning of the project. The school district official stated that the current high school property will need to be sold to help cover the increase in costs. The new high school construction project is not finished yet but is expected to be completed for the 2009-2010 school year. Costs for this building may continue to increase depending on the need for change orders.

Fees were paid to the architectural firm before the new bond had passed.

The School District Paid Part of the Design Costs Before the Bond Election. The architectural firm awarded the design project was announced during the March 9, 2006, school board meeting. At the

August 17, 2006, school board meeting, the school board authorized the school district to pay the selected firm $382,500 for architect fees. Beginning August 31, 2006, the school district paid the firm three equal payments of $127,500 for three consecutive months. The bond to build the new high school did not pass until November 7, 2006, and the contract was signed November 16, 2006.

These events show that work had been completed and that the school district paid the architectural firm before the bond election. If the result of bond election had not been approved for building a high school, then the $382,500 would have been a sunk cost. It is a common practice among school districts to first hold a bond election to obtain the necessary funds, before beginning school construction projects.

A Few Selection Committees Should Be Strengthened

Having qualified members on the selection committee helps to ensure proposals are adequately evaluated.

Most selection committees for architect and construction manager or general contractor procurement consist of individuals with relevant backgrounds and skills. For example, one school district's architect selection committee consisted of the school district's building official—qualified in engineering—the purchasing director, three school district board members, the business administrator, and the building maintenance supervisor. Another school district has asked a community member to participate on their selection committee in addition to other qualified members. A third school district has the principal of the school being built participate on selection committees, in addition to other qualified committee members. School districts' selection committees for construction proposals usually carry forward the same individuals of the architect selection committees, with the addition of the project's architect.

We found three school districts' selection committees are small or consist mostly of school board members. When school districts form selection committees, they should ensure that committee members have the necessary skills to evaluate proposals. A selection committee consisting mainly of school board members may not have the needed expertise or qualifications to adequately evaluate proposals.

Architect Selection Committees Require Expertise in Architecture or Engineering

According to the USOE's resource manual and *Administrative Rule* R33-5-540, architect selection committees must consist of at least three members; at least one of them must be well qualified in the professions of architecture or engineering, as appropriate. All selection committees had at least three members, but architect selection committees in four school districts did not have a committee member qualified in either architecture or engineering. One school district is in an urban area, and three of the school districts are in rural areas.

One rural school district asked qualified persons from another school district to join their selection committees.

A school district in a rural area that does not have a qualified architect or engineer to participate on a selection committee can consider one rural school district's approach. A school district in a rural area has asked employees with expertise in architecture or engineering from another school district to participate on their selection committees. This helps to ensure that selection committee members have relevant experience to evaluate proposals. That same school district asked the administrator of facilities of a different school district, who is a licensed architect, to participate on a selection committee for the procurement of a construction manager. This helped the school district form a well-qualified selection committee.

Seventy-one percent of schools surveyed did not require committee members to sign confidentiality and conflict-of-interest statements.

Selection Committee Members Need to Sign a Confidentiality And Conflict-of-Interest Statement. Of the 21 school districts surveyed, 15 school districts (71 percent) did not require their selection committee members to sign an evaluator confidentiality and conflict-of-interest statement as recommended by the state's Division of Purchasing. The purpose of having committee members read and sign an evaluator confidentiality and conflict-of-interest statement prior to the evaluation is to help ensure that committee members understand the following:

- The information contained in the proposals and information regarding the evaluation process is proprietary and cannot be released or discussed with other offerors or individuals not involved in the evaluation process.
- They should not participate in the evaluation process if they or immediate family members have a material, personal, or financial interest in or fiduciary relationship to any offeror or to a direct competitor of any offeror under consideration.

- They should not participate in the evaluation process if they have any relationship or bias toward any offeror or any relationship or bias that may create the perception of bias of an evaluation.

Statements of confidentiality and conflict-of-interest help the evaluation process remain fair and impartial.

A statement of confidentiality and conflict-of-interest helps to ensure the evaluation process is fair and impartial. If a committee member discloses a relationship or bias, the purchasing director, along with other school district officials, will need to determine whether it is appropriate for the prospective committee member to participate on the evaluation committee.

Recommendations

1. We recommend that school districts implement the following:

   - Evaluation criteria be weighted to reflect the priority of the information asked for in an RFP or a statement of interest and qualifications (SOIQ), following the Division of Purchasing guidelines.
   - Evaluation criteria, including the criteria weighting, be clearly stated in RFPs and SOIQs.
   - Fee proposals be evaluated objectively and independently from the qualitative proposal.
   - Criteria be evaluated consistently by selection committee members based upon a predetermined definition.

2. We recommend that, pertaining to selection committees, school districts ensure:

   - Architect selection committees have one member who is well qualified in the profession of architecture or engineering.
   - Selection committees have the necessary expertise and skills to evaluate proposals.
   - Selection committee members read and sign confidentiality and conflict-of-interest statements.

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Chapter IV
Utah's Rising School Construction Costs Less than Other States

Utah's school construction prices have increased each year from 2006 through 2008 due mainly to the cost inflation of construction materials. When compared to neighboring states and the national average, Utah's new schools have more total square feet per building but are less expensive per square foot. Using a repeat school design helps manage initial construction costs.

Building Material Inflation Contributes To School Construction Costs

Construction cost data was gathered for 54 new school buildings.

An increase in total cost of construction for new school buildings has occurred every year since 2006. We obtained building cost data for 40 elementary schools, 7 middle/junior high schools and 7 high schools. We found the cost of materials has increased both nationally and within the state and has contributed to the increase in total construction prices. Also, a new school building design can be more expensive than reapplying a design already developed for a school building.

School Construction Costs Have Increased Annually Since 2006

The cost per square foot for new elementary schools, middle/junior high schools, and high schools has increased every year since 2006, while the total square footage of new school buildings has remained fairly constant. Figure 4.1 shows the annual increase in the cost per square foot for new elementary schools, middle/junior high schools completed in 2006 and 2007, and new school buildings completed or in the process of being completed in 2008. The figure also shows the new high school completed in 2007 and three other new high schools that are in the process of being completed. No new high schools were completed in 2006.

Figure 4.1 Annual Cost-per-Square-Foot Comparison. The average cost per square foot has increased each year since 2006 for each type of school.

Elementary	No. of Schools	Average
2006	16	$119
2007	10	150
2008	14	171
Middle/Jr. HS	**No. of Schools**	**Average**
2006	3	$113
2007	2	125
2008	2	137
High School	**No. of Schools**	**Average**
2007	1	$ 91
2008	2	155
2009 (projected)	4	169

The cost per square foot for each type of school increased every year from 2006 to 2008.

The average cost per square foot shown in Figure 4.1 includes costs for site preparation, architect fees, contractor fees, and materials but does not include land acquisition costs. All new school buildings showed an annual increase in cost per square foot:

- Elementary school costs increased 44 percent from 2006 to 2008.
- Middle/junior high school costs increased 21 percent from 2006 to 2008.
- High school costs are expected to increase 86 percent from 2007 to 2009.

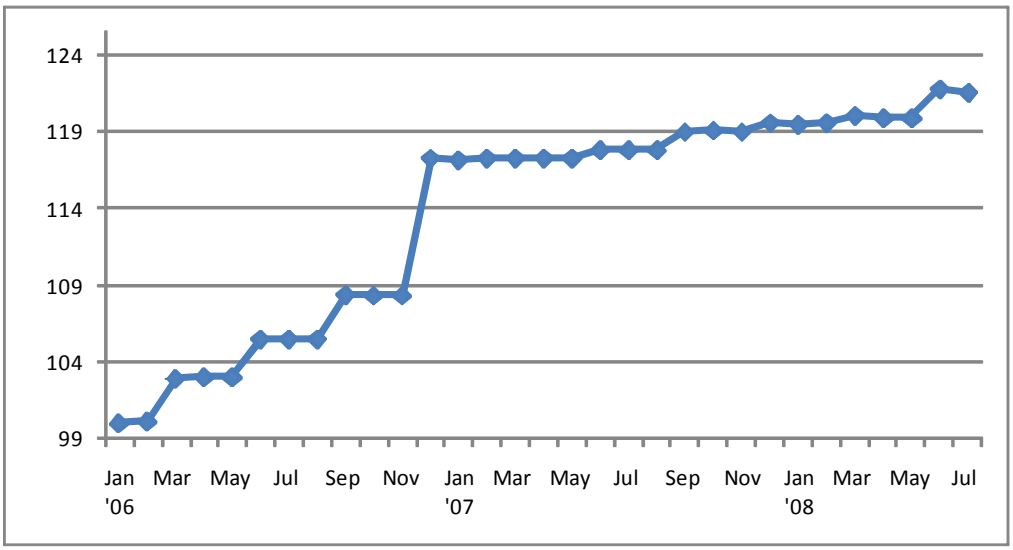
The annual increase in total cost of school building construction can be attributed to rising costs of materials, types of construction materials selected for new school buildings, the use of a new or repeat building design, and the inefficient procurement process discussed in Chapters II and III of this report.

The Cost of Construction Materials Has Continued to Increase

The cost of construction-related materials increased 21.6 percent nationally from January 2006 to July 2008 and continues to increase. The national rate of inflation for new school construction from January 2006 through July 2008 is presented in Figure 4.2.

Figure 4.2 Bureau of Labor Statistics: Inflation Rate for New School Construction, January 2006-July 2008. The inflation rate for new school construction has risen dramatically over a two-and-a-half-year period.

The cost of construction-related materials increased 21.6 percent in two-and-a-half years.

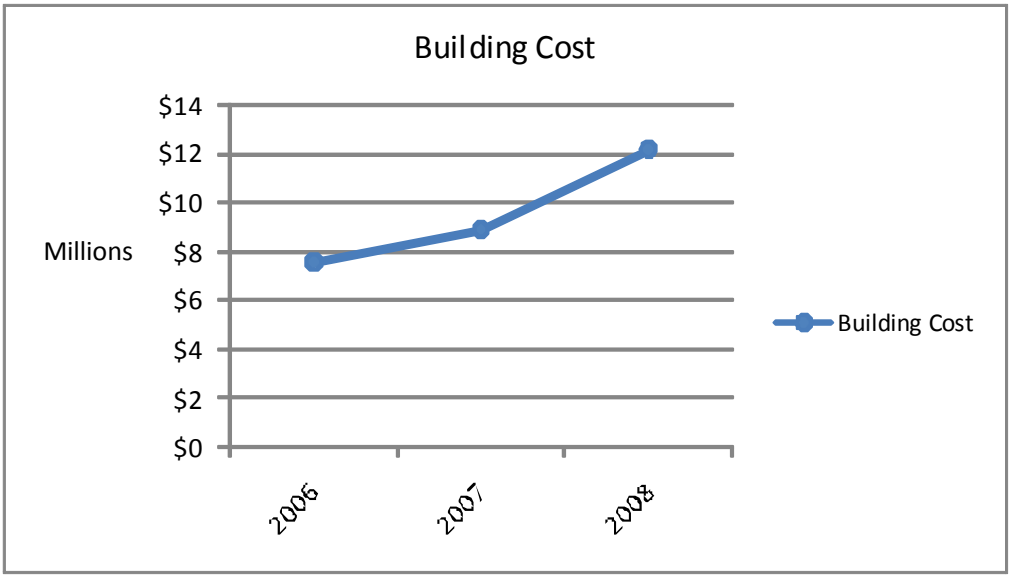


Source: Bureau of Labor Statistics (http://data.bls.gov) PPI=Producer Price Index

The rate of inflation is based on the Producer Price Index (PPI). The PPI measures the average price change over time from the seller's perspective. Construction costs have increased by 21.6 percent from January 2006 to July 2008. The 8 percent increase from November 2006 through December 2006 is, in part, the result of a corresponding increase in crude oil and copper prices over the same time period. Crude oil is used in many construction materials and can affect several different construction costs.

School districts have also observed the increasing cost of materials. One school district has used the same school building design to build 10 new elementary schools since 1998 and has seen an increase in total costs of construction each year. Figure 4.3 shows 2006 through 2008, the period represented in the audit.

Figure 4.3 An Example of an Increase in School Building Costs. The total building costs for new elementary school buildings in one school district have increased by two-thirds from 2006 through 2008.



In one school district, the cost to construct an elementary school rose 69 percent.

Figure 4.3 represents the average costs for five new schools in three years: two in 2006, one in 2007, and two in 2008. The costs in Figure 4.3 only show the total construction costs; site preparation costs are not included. From 2006 through 2008, construction costs rose from $7.5 million to $12.7 million, an increase of 69 percent. When building costs are compared to the PPI growth shown in Figure 4.2, both show a sharp increase that continues through 2007.

For this review, school districts itemized cost data into specific divisions set by the Construction Specifications Institute (CSI). The 16 divisions of construction are shown in the appendix. The 16 CSI divisions are a commonly used standard for organizing specifications and other written information for commercial and institutional building projects in the U.S. and Canada. It provides a master list of divisions to follow in organizing information about a facility's construction requirements and associated activities.

Mechanical, electrical, masonry and site preparation are the most expensive portions of school construction.

A review of the construction data revealed that some materials are consistently higher in cost; the most expensive was mechanical, which includes plumbing, heating, air conditioning, etc. About 15 percent of total construction costs fall into this category. The data also showed high costs for electrical, masonry, and site preparation divisions of

construction. Each of these divisions comprises about 10 percent of total construction costs.

Use of Repeat Designs Has Reduced Costs

New school designs are usually more expensive than a repeat design.

New designs are usually more expensive than repeat designs and can increase the total cost of the construction project. A majority of the new school buildings were constructed using a repeat design. Looking at all new school buildings in the scope of this audit, we made the following observations:

- Of the 40 new elementary schools, 31 (78 percent) were constructed using a repeat design.
- Of the seven middle/junior high schools, three (43 percent) were constructed using a repeat design.
- Of the seven new high schools, four (57 percent) are being constructed using a repeat design.

The majority of new schools were built using repeat school designs.

School districts not only reuse designs that have been developed for school buildings within their districts, but several school districts also use designs developed in other school districts. Using an existing design can reduce costs. Figure 4.4 shows that architect fees are lower for repeat designs. The figure also shows the potential savings that school districts can realize by using a repeat design.

Figure 4.4 Average Potential Savings Using Repeat School Designs. The fee for a repeat design is about one percentage point less than a new design fee.

	New		Repeat		
	Fee	Design Cost	Fee	Design Cost	Potential Savings
Elementary	5.82%	$ 570,300	4.25%	$ 459,200	$ 111,100
Middle/Junior	5.55	947,700	3.83	582,100	365,600
High School	4.55	2,543,500	4.00	1,350,400	1,193,100

Figure 4.4 shows the average architect fee for all 40 elementary, 7 middle/junior high, and 7 high schools included in the scope of this audit,

both as a percentage and dollar amount, for new and repeat school designs. The dollar amount is higher for new designs than a repeat school design for each type of school. Using a repeat school design could result in an average potential savings of $111,100 for elementary schools, $365,600 for middle/junior high schools, and over $1 million saved for a repeat high school design.

Using an existing design can result in cost savings for school districts.

Another analysis comparing just the architect fees for four new elementary school designs and 10 repeat designs completed for new school buildings being constructed only in 2008 shows that the average architect fee for a new design was about $764,000, or 5.88 percent of total construction costs. The architect fee for repeat designs, on average, was about $574,000, or 4.11 percent of total construction costs. The elementary schools constructed using a repeat design in 2008 saved about $200,000. Architect fees, in terms of the fee percentage, have not significantly changed from year to year, but the dollar amount being paid to architectural firms has increased every year because the fees are based on total construction costs, and construction costs are increasing every year.

While school districts recognize that savings can occur using a repeat design, school districts also report that using new school building designs is important. School districts and the USOE report it is through new designs that changes can be made to fix problems in old designs, such as poor management of student traffic flow. It is also through new designs that educational programs can become more effective and efficient. For example, one school district believes that students learn better if they are in the same physical environment with other students their own age. This school district designs its school buildings into "pods," so each grade is in a separate area.

Utah School Construction Costs Compare Well Nationally and Regionally

Utah school construction costs are less than the national average.

Utah school districts, when compared nationally and with seven neighboring states, are comparable in both size and cost. Utah school districts, on average, tend to build bigger elementary schools, in terms of square feet, but the schools are less expensive looking at cost per square foot when compared nationally. Utah's middle schools and junior high schools appear reasonable in terms of size and cost when compared

nationally. When Utah school districts are evaluated against surrounding states, Utah school districts tend to build larger school buildings, but the buildings are less expensive on a cost-per-square-foot basis. Only one high school was constructed in Utah between 2006 and 2007 when recent national and other states' data is available, so we were unable to make a comparison with other states for high schools.

Utah Schools Compare Well with National Average

New school construction costs for Utah school districts are below the national median average. Utilizing the *Official Education Construction Report* (American School & University), which is an annual report for "construction spending by education institutions," one can compare Utah's new school construction costs with the national average. The figure below is data compiled during the years of 2006 and 2007 for both Utah school districts and school districts nationally (provided by American School & University). Figure 4.5 compares school districts nationally with Utah school districts using square foot per building and the cost per square foot of elementary and middle/junior high schools.

Construction costs increased from 2006 to 2007 both locally and nationally.

Figure 4.5 Building and Cost Comparison. Comparison of Utah school construction costs and building size with national data.

2006				
	Elementary		Middle/Jr. High	
	Square Foot/ Building	Cost/ Square Foot	Square Foot/ Building	Cost/ Square Foot
National	70,000	$ 137	157,380	$ 110
Utah	72,374	119	151,493	113
2007				
	Elementary		Middle/Jr. High	
	Square Foot/ Building	Cost/ Square Foot	Square Foot/ Building	Cost/ Square Foot
National	62,000	$ 188	135,000	$ 211
Utah	71,128	150	128,762	125

National Data Source: American School & University, 33rd and 34th Annual Official Education Construction Reports.

In terms of cost per square feet (averaged for years 2006 and 2007), Utah is well below the national average for both elementary and middle/junior high schools—21 percent and 35 percent lower, respectively. Utah elementary schools have more square feet when compared to the national average by 9 percent while middle/junior high schools are roughly 4 percent smaller than the national average. Figure 4.5 does not include high schools because Utah only had one high school built between 2006 and 2007, which is not enough to provide a meaningful comparison.

Utah school districts may be building larger elementary schools for less than the national average due to economies of scale (per-unit costs decrease as output increases). However, when comparing Utah school districts with school districts nationally, geography and construction materials play sizeable factors and make comparisons difficult and somewhat unequal. A regional comparison allows for a more meaningful evaluation.

Utah Schools Generally Cost Less Than Neighboring States' Schools

Utah's school construction costs compare favorably with those of the surrounding states. Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Wyoming were chosen because they have similar types of weather and terrain.

Utah builds larger schools than neighboring states at a lower cost per square foot.

To compare Utah with neighboring states, Figure 4.6 utilizes the total square feet per building (this number only represents the building itself, not the parking lot, playing fields, etc.) and the cost per square foot. The numbers are broken down by type of school (elementary and middle/junior high) and by state.

Figure 4.6 Building and Cost Comparison. Utah's elementary and middle/junior high schools' cost and building size were compared to seven neighboring states for the years 2006 and 2007.

	Elementary		Middle/Junior High	
	Sq Foot/ Bldg	Cost/ Sq Foot	Sq Foot/ Bldg	Cost/ Sq Foot
Arizona	60,329	$ 114	127,000	$ 141
Colorado	63,731	159	141,092	148
Idaho	63,187	152	138,938	138
Montana	n/a	n/a	130,000	146
Nevada	62,568	204	119,285	186
New Mexico	71,580	168	109,091	173
Wyoming	46,964	187	83,432	147
Avg. Other States	**61,393**	**$164**	**121,263**	**$154**
Utah	**71,895**	**$131**	**142,400**	**$118**

Other state values were gathered as a result of requests to various school districts in these neighboring states; not all school districts that were sent a request replied.

The data in Figure 4.6 represent a composite average from the years 2006 and 2007. Utah school districts build bigger elementary and middle/junior high schools on average when compared with neighboring states. Utah also tends to build less expensive schools when compared with neighboring states. Elementary schools and middle/junior high schools are, on average, about $35 less expensive on a cost-per-square-foot basis. Again, high schools were not included because there was only one high school built in Utah during 2006 and 2007, which would not allow for a meaningful comparison with the seven neighboring states.

Several states have a procurement process similar to Utah.

Some School Districts in Neighboring States Utilize Procurement Methods That Are Similar to Utah's. Some of the processes that neighboring states use for new school construction are as follows:

- In Colorado, school districts are able to choose which procurement method works best for their needs. One school district utilizes the CM/GC (Construction Manager/General Contractor) procurement method.

- Idaho school districts procure individually. One school district uses a CM/GC; however, instead of placing the general contractor and all of the subcontractors under one contract, the school district has separate contracts for each subcontractor. This means there could be anywhere from 30 to 40 contracts during a new school construction project. The school district had increasing construction costs throughout construction and attributed these increases to inflation.

- Nevada school districts are able to procure independently. One school district utilized the Design Bid Build procurement method when procuring new school construction. The final cost was within 5 percent of the estimated cost for new school buildings.

- Wyoming school districts procure individually and have had problems with rising construction costs caused by inflation and an increasing demand of work and an under supply of contractors. Eighty percent of school districts in Wyoming utilize a CM/GC procurement method.

Utah has a procurement process similar to neighboring states, except for Arizona.

- All Arizona school districts use the CM/GC procurement method. School districts have to conform to preestablished measurements set forth by the Arizona School Facilities Board. Construction may not occur until a GMP is established; this holds for all school districts. This helps keep cost per square feet down.

While Utah has a similar procurement process as some neighboring states, the cost per square foot has been lower for new school construction. One way Utah has managed costs is by using existing designs, rather than new building designs.

Chapter V
Overall New School Buildings Have Not Substantially Increased in Size

Most Utah schools have more square feet per student than the USOE guidelines recommend. The size of elementary schools has increased slightly, and the size of secondary school buildings has actually decreased since 2006. New school building space utilization is very similar among different schools, with most of the space being utilized by classrooms. Also, the selection of building and finishing materials by school districts can affect the initial cost of the school building, but school districts select materials based on quality, durability, and cost.

Space per Student in New Schools Is Higher than the USOE Recommends

As discussed in Chapter IV, school buildings in Utah are larger than the national average, on a square foot basis. Most new school buildings have more square feet per student than what is recommended by USOE guidelines. However, the average size of new elementary school buildings has only slightly increased since 2006. The average size of new middle/ junior high and high school buildings has decreased slightly since 2006.

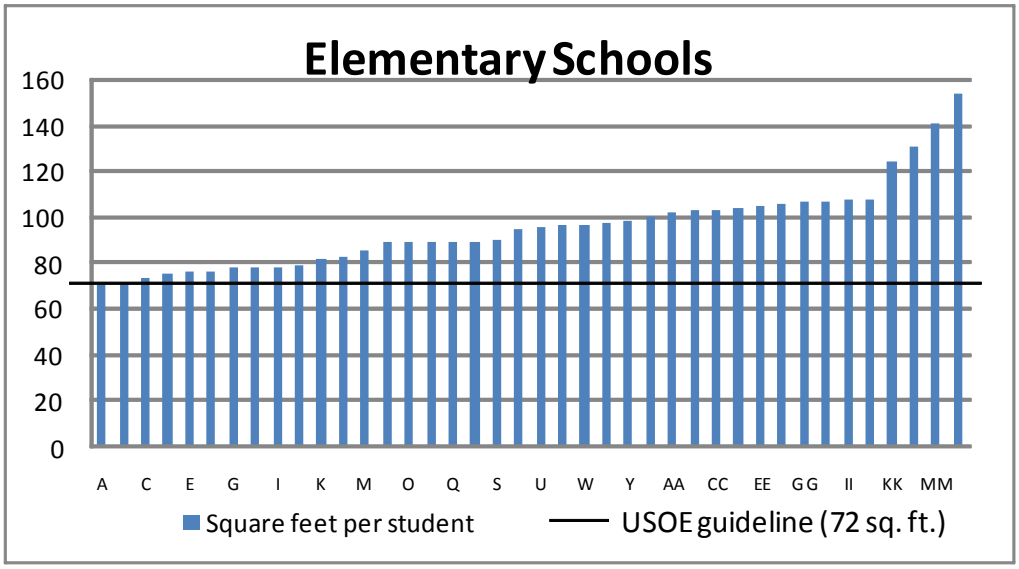
USOE Guidelines Are Not Being Followed

The USOE has provided guidelines for the space per student.

The Utah State Office of Education (USOE) has provided recommended guidelines for the space per student that should exist in a school building. A majority of new elementary schools and high schools exceed those guidelines. Only two new middle/junior high schools exceeded those guidelines.

Figure 5.1 shows the large number of new elementary school buildings that have more square feet per student than USOE guidelines recommend.

Figure 5.1 Elementary School Square-Feet-per-Student Comparison. Most elementary schools have built more square feet per student than USOE guidelines suggest.

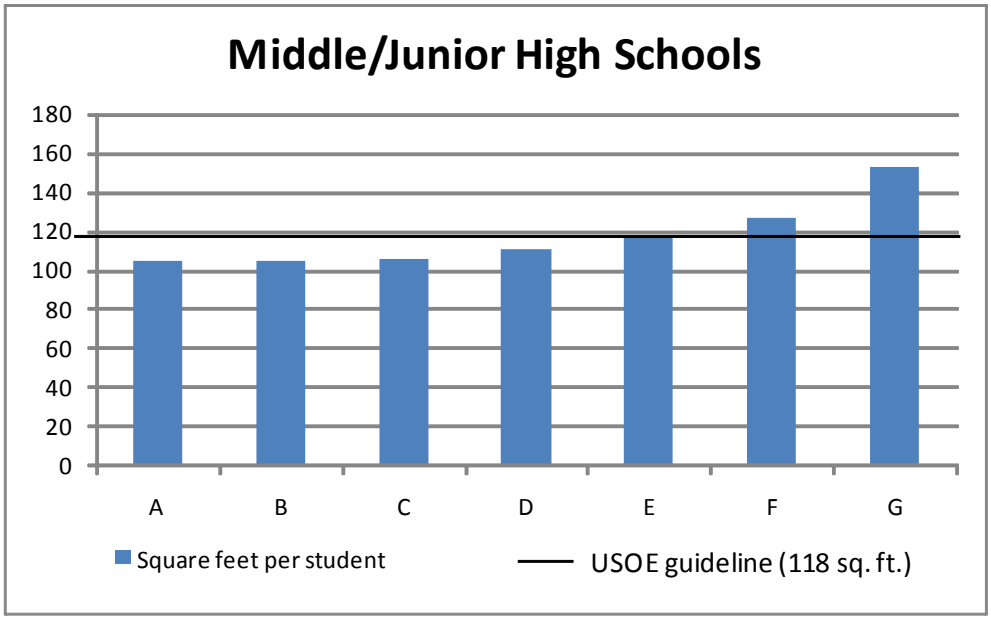


Thirty-one, or 78 percent, of new elementary schools are at least 10 percent above the USOE guideline.

USOE guidelines recommend 72 square feet per student for elementary schools. Only two of the elementary schools did not meet the suggested guideline. Thirty-one of 40 schools were at least 10 percent above the guideline, and 27 elementary schools were more than 20 percent above the recommended guideline. Surrounding states report a wide range for square feet per student for their elementary school buildings. Other states' square feet per student, on average, range from 83 to 202. In Utah, the new elementary school building with the largest square feet per student is 154.

Guidelines are also in place for middle/junior high schools. Figure 5.2 shows the square feet per student for each middle/junior high school included in the audit and their compliance with the recommendation.

Figure 5.2 Middle/Junior High School USOE Guideline Comparison. Only two middle/junior high schools exceeded the guideline suggested by USOE.

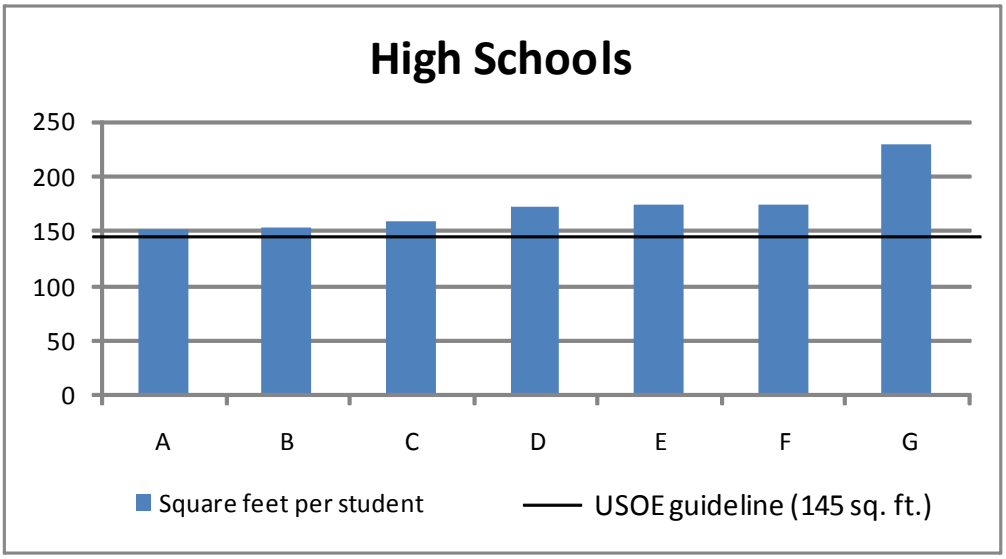


One, or 14 percent, of the middle/junior high schools exceeds the USOE recommendation by 10 percent or more.

For middle/junior high schools, USOE suggests 118 square feet per student. Only two of the seven middle/junior high schools exceeded the guideline. One of those two schools exceeded the recommendation by more than 10 percent. Surrounding states reported that square feet per student for their middle/junior high school buildings, on average, range from 126 to 261. Utah's new middle/junior high schools have fewer square feet per student than surrounding states, except for two school buildings.

Figure 5.3 shows the square feet per student in high schools compared to the USOE recommended guideline.

Figure 5.3 High School Square-Feet-per-Student Comparison. All high schools in this audit surpassed the USOE suggested guideline for square feet per student.



Five, or 71 percent, of the high school buildings surpassed the USOE guidelines by 10 percent or more.

USOE recommends 145 square feet per student for high schools. Of the seven high schools, five exceeded the guideline by more than 10 percent–this includes one high school that surpassed the guideline by more than 20 percent. Surrounding states report a wide range for square feet per student for their high school buildings. Other states' square feet per student, on average, range from 136 to 318. New Utah high schools' square feet per student are within the range reported by other states.

The three figures above show that a majority of new school buildings have exceeded the recommended square-feet-per-student guideline recommended by USOE. Looking at all the school buildings together, 37 of 54 school buildings, 69 percent, exceed USOE guidelines by at least 10 percent. Regarding the space per student by year, the square feet per student has not been increasing in new school buildings in the past two years. The average square feet per student has remained fairly consistent each year since 2006.

New Elementary School Buildings Have Slightly Increased in Size

The average square footage for new elementary school buildings has increased slightly since 2006, but the average square footage for middle/junior high schools and high schools has decreased. Figure 5.4

shows the average square footage for new elementary, middle/junior high, and high school buildings.

Figure 5.4 Total Square Feet of New School Buildings. The average total square footage of new elementary schools has not varied significantly from 2006 to 2008.

Elementary	No. of Schools	Average
2006	16	72,000
2007	9	77,000
2008	14	73,000
Middle/Jr. HS	**No. of Schools**	**Average**
2006	3	151,000
2007	2	129,000
2008	2	134,000
High School	**No. of Schools**	**Average**
2007	1	375,000
2008	2	273,000
2009	4	292,000

Note: One outlying elementary school was removed from the 2007 sample to better represent the overall trend in construction.

New middle/junior high schools and high schools, on average, have decreased in size.

The average total square footage of new elementary schools has stayed consistent over the last three years. New middle/junior high schools have decreased, on average, about 17,600 square feet. Overall, new high schools show some variation, but new high schools being built in 2008 and 2009 are not larger than the one built in 2007. No new high schools were completed in 2006.

Space Utilization Is Similar Among School Districts

When looking at how school building space is utilized, building designs completed by three different architectural firms for different school districts show that space utilization is very consistent. The largest

percentage of total space for all school buildings, except one, is dedicated to classrooms/programs. Figure 5.5 illustrates the use of building space for five new elementary schools and five new secondary schools.

Similar use of space is seen among school buildings in different school districts.

Figure 5.5 Examples of Space Utilization for Elementary and Secondary Schools. Different school districts allocate similar usage of space.

	Elementary Schools				
	Elem. A	**Elem. B**	**Elem. C**	**Elem. D**	**Elem. E**
Administration	4%	4%	6%	7%	7%
Circulation	23	28	25	15	23
Classrooms	46	38	41	45	44
Commons/Group Teaching Centers	1	2	4	5	2
Kitchen/Multipurpose	13	12	13	16	13
Media Centers	3	5	4	5	5
Support	10	11	7	7	6
Total Square Feet	**54,428**	**67,986**	**68,697**	**70,500**	**75,548**
	Secondary Schools				
	Jr. High A	**Jr. High B**	**Middle C**	**High D**	**High E**
Administration	4%	3%	7%	3%	4%
Auditorium	8	12	0	4	4
Circulation	24	21	26	23	26
Classrooms	39	22	38	37	41
Commons	4	2	3	4	2
Kitchen/Nutrition Services	3	4	5	3	3
Media Centers	3	5	5	2	3
Physical Education	13	25	13	18	15
Support	1	7	4	6	1
Total Square Feet	**124,108**	**132,494**	**148,455**	**252,242**	**380,000**

Note: Space utilization was determined by individual architectural firms. Firms may categorize space differently.

Based on design programs compiled by architectural firms, Figure 5.5 shows similar use of space for all types of schools despite different square footage. Elementary schools have the highest percentage of space dedicated to:

- Classrooms
- Circulation (hallways, stairways, walls, and elevators)
- Kitchen and cafeteria/multipurpose room

Classrooms and circulation have the highest percentages of space for both elementary and secondary schools.

Elementary D has less circulation space, but we believe it is due to the way the architectural firm categorized certain dedicated space. The smallest percentage of space is dedicated to group teaching areas or common areas for large-group instruction. Figure 5.11, shown later in the report, shows pictures of two examples of group teaching areas.

Secondary schools have similar use of space. The highest percentages of space are used for:

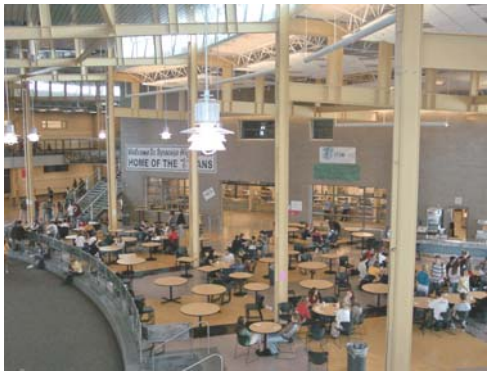
- Classrooms
- Circulation
- Physical education (gymnasiums, locker rooms, dance rooms, weight rooms, etc.)

The only exception is Junior High B, which has dedicated the largest area of the building to physical education. This area can hold multiple gym classes simultaneously and is also available for community use. In our opinion, we believe the largest use of space should be for classrooms, similar to other schools.

Some middle/junior high schools have a "cafetorium," a joint cafeteria and auditorium, to save space.

Some middle/junior high schools are designed so the cafeteria area and auditorium or assembly area are joined to form a "cafetorium." Having one common area instead of two separate, large areas can save space. New high schools can be designed so the cafeteria area is connected to a commons area to provide a multipurpose area. Figure 5.6 below shows two examples of spaces connected to cafeterias.

Figure 5.6 Examples of Connected Areas in Secondary Schools. The picture on the left is a junior high school, and the one on the right is a high school.



Some school districts partner with local governments to share spaces, such as a park or playground.

Many school districts also consider the community's needs when designing a new school. School districts often ask community members to provide input during the design process and suggest ideas for areas that fit public needs, such as large instruction rooms that also serve for community meetings. Some school districts create partnerships with local governments to share space such as a city park/school playground. One junior high has a community recreation center attached to the school building. This way, school districts and local governments share the costs for operations and maintenance.

Material Selection Can Affect the Initial Cost and Expected Life of a Building

The use of different materials can affect the up-front costs of a school.

Several building and finishing materials are available with a wide range of pricing. The preference of one building material above another can affect initial construction costs. However, it is important to note that school districts select materials based not only on cost, but also on other factors such as quality and durability. Some materials may cost more initially but may require less maintenance later in the life of the building. The purpose of this section of the report is to provide information on the basic material choices that school districts are currently selecting and their approximate costs. A number of schools in urban and rural areas of the state were visited to gain an understanding of the basic construction and finishing materials now used in school building construction.

Schools are built to have an expected life of at least 50 years.

Figure 5.7 shows some of the common construction materials used for exterior and interior walls and their cost per square foot. The audit team visited 28 different new school buildings across the state to determine school districts' wall material preferences. All school districts built schools to have an expected use of at least 50 years; different materials can extend the life of a school building to 70-100 years. Some school districts prefer certain materials based on expected or perceived durability.

Figure 5.7 Estimated Cost of Common Building Materials. Costs for wall materials have large variances and can affect the total cost of schools.

Wall Material	Cost per Square Foot	Percentage Used	
		Exterior	Interior
Atlas brick	$ 23	29%	21%
Tilt-up (prefab concrete)	10-20	18	11
Concrete masonry units (CMU)	10-18	53	54
Ceramic wall tile over drywall	12	N/A	14

The percentage used shows how many of the schools visited use the listed material. The figure shows that most school districts prefer CMU for exterior and interior walls. CMU is less expensive than atlas brick and similar to tilt-up depending on the style of the CMU, such as honed or unhoned. A few school districts use ceramic wall tile over drywall to cover the bottom two-thirds of the wall to help protect drywall. Glass is the most expensive wall material at about $35 per square foot. Glass is commonly used in classroom doors, interior walls for windows in classrooms, and exterior wall windows. Some school districts use more glass than others.

Tilt-up, or prefab concrete, is mostly used in southern areas of the state. CMU and tilt-up have a large range of prices because several options are available. Basic grey, smooth CMU and tilt-up will cost less per square foot than colored and textured CMU or tilt-up. Masonry

building materials have a wide range of prices but constitute approximately 10 percent of total construction costs for elementary schools.

The choice of building and finishing materials can affect the initial cost of a school building.

The choice of building and finishing materials used for a new school can greatly affect the initial cost. The following three figures show different materials that affect the cost of the new buildings.

Figure 5.8 Examples of Exterior Walls. The figure shows two different materials used for exterior walls.

Figure 5.8 above displays two different materials used for exterior walls on new schools. The picture on the left is unhoned CMU, and the picture on the right is honed atlas brick. There are varieties of colors and texture (smoothness) that school districts can utilize for their schools. In terms of cost, the CMU (according to Figure 5.5) tends to be less expensive than atlas brick. One school district believes atlas brick extends the life of their schools.

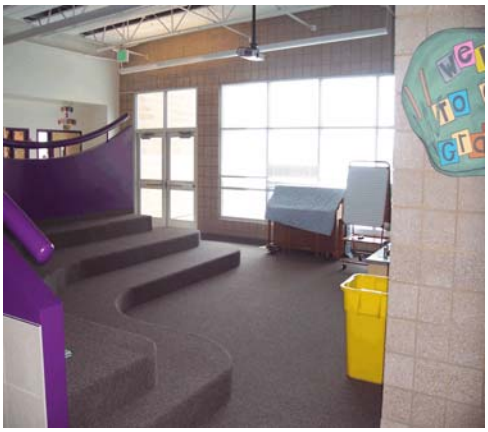
Figure 5.9 Hallways for Elementaries A and B. This figure shows a comparison between Elementary A's and Elementary B's hallway.

Elementary A **Elementary B**

Extra features such as elementary school lockers, interior windows, and pendulum lighting can increase the total cost of the building.

Figure 5.9 above illustrates the difference between elementary schools looking down a hallway. The hallway for Elementary A consists of CMU, classroom doors, and basic lighting. The hallway in Elementary B has additional features, such as: lockers, extra glass along the wall, a teaching station outside the classroom with overhanging lighting, a bench, and a computer jack along the bench. The additional features can increase the total cost of the school; the cost per square foot for Elementary A was about $105, and the cost per square foot for Elementary B was about $149.

Figure 5.10 Study Areas and Interior Glassed Areas. This figure shows two study areas (top pictures) and two areas that are heavily glassed (bottom pictures).



Group study areas are becoming more common in elementary schools.

Glass is a much more expensive option for walls than drywall or brick.

Figure 5.10, above, shows examples of added features that can increase the total cost of a new school. The top two pictures are of group study areas. The area in the top left picture is called a kiva; it is utilized by a specific grade for group activities. In this particular elementary school, each grade has its own kiva. The top right picture is of a study area situated between two classrooms. The area is generally used for art-related activities. The two rectangular glass panes (located on the wall at the back of the picture) can open to allow students to walk directly to this study area. The two bottom pictures illustrate the use of glass in school hallways. If used in large quantities, glass can greatly increase a school's total cost.

Each of these examples above shows that school districts have different approaches for the construction of new school buildings and use different

building materials. Recently there has been an increase in the use of technology in classrooms; 89 percent of new schools visited have installed audio enhancement as standard equipment. Some new schools have smart boards and built-in projectors. Several school districts told us they try to design their school buildings and install technological devices to better implement their educational programs and teaching philosophies.

Recommendation

1. We recommend that school districts take steps to control construction costs by considering the following:

    - Apply the USOE-recommended guidelines for square feet per student.
    - Select building and finishing materials considering cost as well as quality and durability.

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Appendix

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Appendix A

New School Building Construction Information
(For new buildings, constructed from 2004 to present)

General Information

School District
School Type (Elementary, Middle, Junior High, High)
Date when new building project began (month and year)
Date school was/will be completed (month and year)
Is the new building for growth or replacing an old an old building?

CSI Division	Description	Cost	Warranty Guarantee/ Expected Life
--	Architect/Consultant Fees		
--	Construction Contract		
--	Contingency		
--	Public Infrastructure (roads, sewer, public utilities, etc.)		
01	Other General Requirements		
02	Site Construction (landscaping, parking lots, etc.)		
03	Concrete		
04	Masonry		
05	Metals		
06	Wood and Plastics		
07	Thermal and Moisture Projection		
08	Doors and Windows		
09	Finishes		
10	Specialties		
11	Equipment		
12	Furnishings		
13	Special Construction		
14	Conveying Systems		
15	Mechanical		
16	Electrical		
--	Other Costs		
--	Total Building Cost		

Other Related Information		
Land acquisition cost (if applicable)		
Size of the Ground (in acres)		
Expected Life of the Building		
School Capacity (total number of students)		
Total Square Feet for the school building		
Average Square Feet per classroom		
Student per square foot		
Cost per square foot		

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Agency Response

UTAH STATE OFFICE OF EDUCATION

Leadership. . . Service. . . Accountability Patti Harrington, Ed.D. State Superintendent of Public Instruction
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250 East Cesar E. Chavez Blvd. (500 South) P.O. Box 144200 Salt Lake City, Utah 84114-4200

September 30, 2008

John Schaff
Auditor General
W315 State Capitol Complex
Salt Lake City, UT 84114

Dear Mr. Schaff:

Thank you for allowing a review of the exposure draft of *A Performance Audit of School District Construction* (Report No. 2008-10). We are pleased to note that:

- Utah's school districts appear to have adequate controls for construction operations.
- The increasing cost of school construction in Utah's school districts is commensurate with the escalating costs of building materials.
- With the exception of Arizona, Utah school districts have the lowest per square foot cost for school construction among intermountain states in the U.S.

The Utah State Office of Education (USOE) agrees with the recommendations for the audit and will work to ensure appropriate training and understanding of state guidelines and procedures among district and local board leaders in the state.

The USOE recommends that a future audit include Utah's charter schools. The construction of charter schools as a new function of government, and therefore, a new asset of the state, is worthy of careful study regarding procurement, materials, and expected life cycle. We would urge and welcome a state audit on this matter.

Thank you for the report and for the continued excellence of your office.

Sincerely,

Patti Harrington

Patti Harrington, Ed.D.
State Superintendent of Public Instruction