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ABSTRACT

This publication provides answers to basic questions to help school board members more fully address the complexities of the planning, design, and construction process in order to maximize the goal of student success. The 101 questions and answers are in the areas of: facility planning; learning environment; information technology; safe schools; life cycle costing; facility standards; facility costs; maintenance; bond issues; site issues; accessibility; building codes; asbestos; working with architects; construction delivery options; and sustainability issues. (SM)

# Keys to Success

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## School Facilities Primer

### Questions & Answers 101

*by Jim Brady, ALA, REFP*

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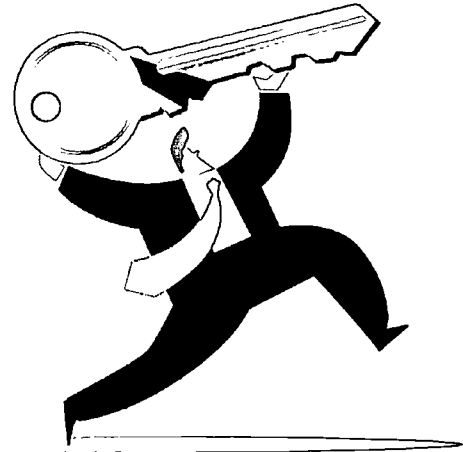
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# Foreword

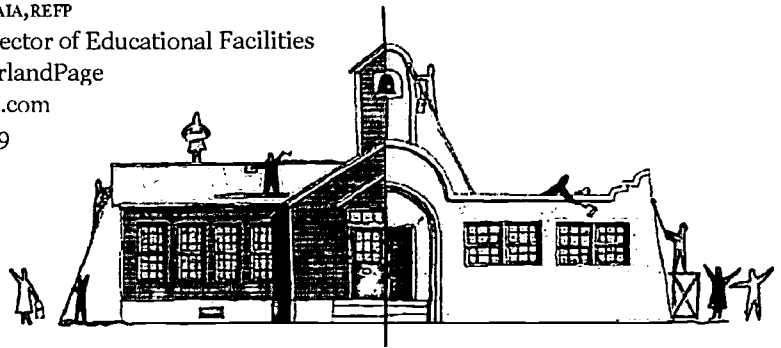
**S**chool learning environments that are **safe, nurturing, flexible and engaging** enhance student success. **Maximizing facility value** for taxpayers is an equally important consideration. As a school district endeavors to meet these goals, it must address many issues and questions related to its school facilities.

This publication has been developed for the Texas Association of School Boards' Summer Leadership Institute in the hope that by providing some basic questions, answers and vocabularies, we can help school board members more fully address the complexities of the planning, design and construction process to maximize our common goal: **student success**.

If you have additional questions or suggestions, we welcome your feedback.

*Jim Brady*

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Keys to Success Series  
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# Facility Planning

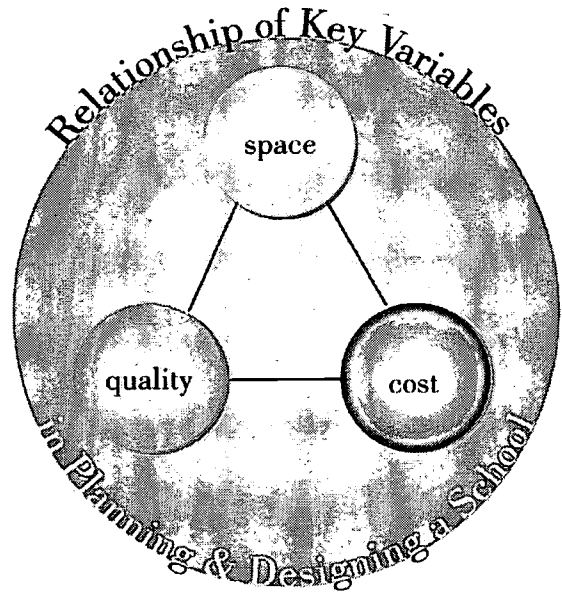
1. *In planning and designing a school, what are the key variables or determinants of any school?*

- Quality
- Size/program requirements (Space)
- Cost/Time (Budget / Schedule)
- Any two dictate the third

Source: CEFPI's Educational Facility Planner

2. *What are the key components of the facilities planning process?*

- Establish Vision
- Develop Guidelines
- Determine Needs
  - Supply
    - real estate holdings
    - student capacity
  - Demand
    - demographics
    - program requirements
- Develop Options
- Assess Options
- Develop Plan
  - projects
  - timeline
  - funding



3. *What are some online resources for addressing facility issues?*

Council of Educational Facilities Planning International | [www.cefpi.org](http://www.cefpi.org)

Design Share | [www.designshare.com](http://www.designshare.com)

National Clearinghouse for Educational Facilities | [www.edfacilities.org](http://www.edfacilities.org)

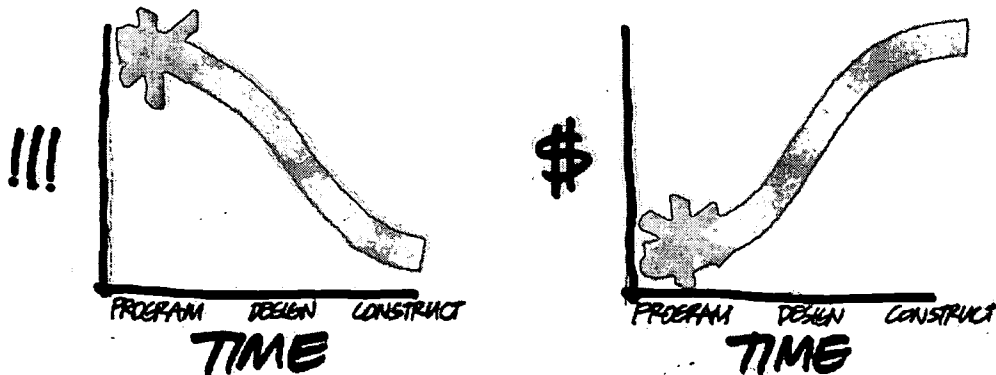
School Construction News | [www.schoolconstructionnews.com](http://www.schoolconstructionnews.com)

The George Lucas Educational Foundation | [www.glef.org](http://www.glef.org)

4. *What are common pitfalls to successful planning?*

- Lack of focus or clear objectives
- Lack of agreement on next steps
- Lack of or inadequate planning for implementation
- True decision-makers not identified or involved
- "Scope creep" – project scope grows over time
- Lack of communication
- The project didn't solve the right problem
- The schedule or budget set unrealistically low
- Lack of coordination, control or follow up
- Lack of influential leadership
- Goals too vague

5. *When is the greatest opportunity for influence in a project that is cost effective?*



6. *What is an educational specification?*

A written document for a proposed new school facility or major space renovation that includes a description of the proposed project, expressing the range of issues and alternatives.

Source: 19 Texas Administrative Code (TAC) §61.1033

7. *Who is to develop educational specifications?*

School districts with personnel on staff with experience in developing specifications, or, if school districts have no qualified personnel, they "shall utilize the services of a design professional or consultant experienced in

school planning and design to assist in the development of the educational specifications.”

Source: 19 Texas Administrative Code (TAC) §61.1033

8. *What should be included in an educational specification?*

- Instructional programs
- Grade configuration
- Type of facility
- Spatial relationships
- Number of students
- Specialized classrooms and support areas
- Estimated budget
- School administrative organization
- Hours of operation
- Safety of students
- Overall security of facility

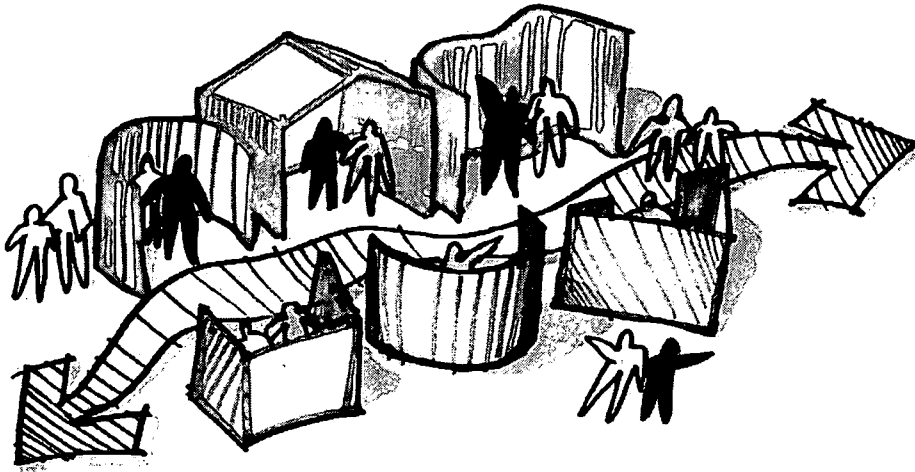
Source: 19 Texas Administrative Code (TAC) §61.1033

9. *School districts should consider developing a long-range facility plan prior to committing capital expenditures. What should a long-range school facility plan address?*

- A description of the current and future instructional program and delivery issues
- The age, condition and educational appropriateness of all buildings on campus
- Verification of the suitability of school site(s) for intended use
- A timeline and recommendations to modify or supplement existing facilities

Source: 19 Texas Administrative Code (TAC) §61.1033

## Learning Environment



10. *What are some of the facility concepts which support school reform and contribute to educational achievement?*

- Smaller schools
- Schools as community hubs
- Team suites and clusters
- Smaller classrooms
- Supervisable circulation paths
- Portfolio process studios
- Cluster of teacher offices
- Daylighting

Source: *Designing Places for Learning* by ASCD and CEFPI

11. *What effect does color have on learning?*

- Color impacts alertness and creativity and can affect IQ test results as much as 12 points. Those stimulating colors are: yellow, yellow-green, orange
- Red raises blood pressure, pulse rate, respiration, skin response. It excites brain waves.
- Blue lowers blood pressure and pulse rate. Skin response slows, brain waves decline.

Source: *Munich Institute of Rational Psychology*

12. *What are the color perceptions on the effect of room temperature?*

Tests document that people estimate the temperature of a room with cool colors such as blues and greens to be 6-10 degrees Fahrenheit cooler than the actual temperature and for warm colors, such as reds and oranges, 6-10 degrees warmer.

Source: *CEFPI-Safe and Secure Learning Environments-Effect of Color and Light 1999*

13. *Is there a difference in the effects of artificial light on students and student achievement?*

Full spectrum light has all the characteristics of daylight, including Vitamin D. Study results show students under full spectrum lights attended 3.2 to 3.8 more days per year, had nine times less tooth decay, grew an average of 3/4" taller over a two-year period and had improved academic performance.

Source: *Alberta Department of Education*

14. *Does natural light in classrooms affect student performance?*

The "Re-Analysis Report: Daylighting in Schools, Additional Analysis" study expands and validates previous research by the Hescong Mahone Group that found a statistical correlation between the amount of daylight in elementary school classrooms and the performance of students on standardized math and reading tests. This



research was performed under the California Energy Commission's Public Interest Energy Research Program and was managed by New Buildings Institute. The reanalysis findings revealed, overall, elementary students in classrooms with the most daylight showed a 21 percent improvement in learning rates compared to students in classrooms with the least daylight.

Source: *New Buildings Institute*

15. *What is the effect of improving learning environments through renovation and remodeling?*

In a Rochester NY study, after renovation of all district elementary facilities, there was an increase in standardized math scores of over 5%.

Source: *CEFPI - Northwest Region 1997*

16. *What impact does the condition of the facility have on student achievement?*

A study in Washington, DC shows a range of 11% difference in standardized student test scores between poor and good facilities.

Source: *School House in the Red*

17. *What emerging educational issue has facility implications?*

Spaces designed to foster and support individual learning styles/ multiple intelligences including:

- verbal-linguistic
- logical-mathematical
- visual-spatial
- bodily-kinesthetic
- musical-rhythmical
- interpersonal
- intra-personal
- naturalist
- existential

Source: *Transforming the Learning Environment- AIA*

18. *What are the six themes of Breaking Ranks: Changing an American Institution and their related facility / teaching implications?*

1. *Personalization*

School units of no more than 600

Variety of instructional strategies (learning styles)

2. *Coherency*

Interdisciplinary instruction

Real world application

3. *Time and Organization*

Teacher/Student Contact: 1:90

12 month operation

Abandon Carnegie unit

4. *Technology*

Access

Instructional and learning activities

5. *Professional Development*

Large group learning areas for adults

6. *Leadership*

Shared leadership in nurturing environment

Source: *National Association of Secondary Principals on the High School of the 21<sup>st</sup> Century*

19. *What are some of the facility implications of lecture vs project-based learning?*

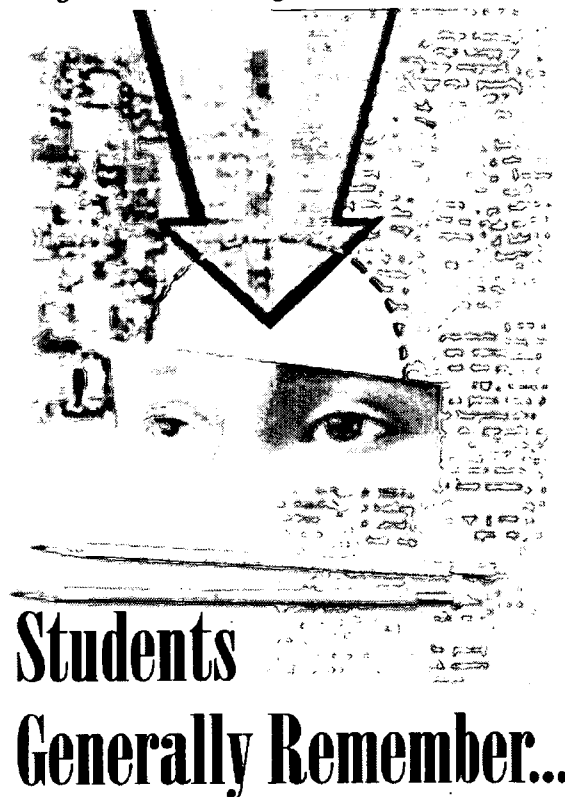
- Passive vs. active
- Smaller vs. larger spaces
- Structured vs. flexible
- Fixed seating vs. flexible lab tables
- Carpet vs. hard surface
- Front of room vs. centers of learning
- Teacher-centered vs. student-centered

20. *What is the current trend regarding carpet in schools?*

The amount of space in schools that is carpeted has decreased. During 2002, the percentage of space carpeted in new K-12 schools was 24%.

Source: *American School & University* May 2003

21. For each of the different teaching strategies, there should be a correlating facility response. What are the effects of teaching strategies on learning?



## Students Generally Remember...

Read	10% of what they read
Hear words	20% of what they hear
Watch still pictures	30% of what they see
Watch exhibit Watch demonstration	50% of what they hear and see
Do a site visit Do a dramatic presentation	70% of what they say and write
Simulate a real experience Do the "real thing"	90% of what they say and do

Source: Edgar Dale's  
"Cone of Experience"

# Information Technology

22. *How does the State of Texas compare with overall US statistics regarding access to technology in schools?*

	TEXAS	US
Students per instructional computer	3.3	3.8
Students per instructional computer in classrooms	8.1	9.2

Source: "Technology Counts 2003," Education Week on the Web

# Safe Schools

23. *What is the description of a safe school?*

A safe school refers not only to the physical safety of the students, but the emotional safety of the students as well.

24. *What are the significant safety problem areas in a school environment?*

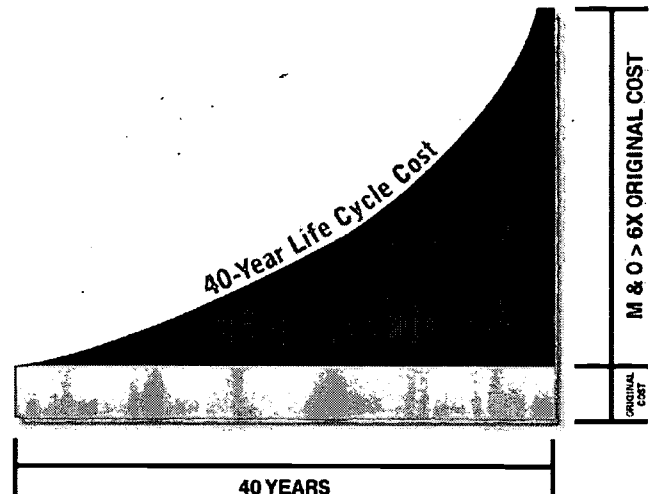
- School grounds
- Parking lots
- Cafeterias
- Corridors
- Classrooms
- Locker rooms
- Restrooms
- School buses
- Labs and preparation rooms

# Life Cycle Costing

25. *What is life cycle costing?*

Building cost, maintenance and operating costs (M&O), inflation and financing over a building's life.

Source: *Space, Inc.*



26. *What is the life cycle cost of a 40-year facility?*  
 For a building constructed with quality materials and craftsmanship, the M&O costs over a 40-year life cycle of a typical school building exceeds the original construction cost by more than six times.  
 Source: *Space, Inc.*
27. *What has been the history of the life cycle of schools?*  
 Schools built in the early years of the 1900s were frequently built for a life span of 50 to 100 years. Buildings built after 1970 were designed to have a life span of only 20 to 30 years.  
 Source: *U. S. Government Accounting Office*
28. *How many buildings are currently reaching their predicted life cycle in the U.S.?*  
 More than 60% of America's schools are reaching the end of their predicted life span.  
 Source: *U. S. Government Accounting Office*

## Facility Standards

29. *What is the range of square footage per student for an elementary school?*
- |                   |                        |
|-------------------|------------------------|
| 400-600 students  | 130-140/SF per student |
| 600-800 students  | 110-130/SF per student |
| 800-1000 students | 100-110/SF per student |
- Source: *CEFPI Southern Region Annual Conference, 1997*
30. *What is the range of square footage per student for a middle school /intermediate school?*
- |                    |                        |
|--------------------|------------------------|
| 600-800 students   | 160-175/SF per student |
| 800-1000 students  | 155-160/SF per student |
| 1000-1200 students | 150-155/SF per student |
| 1200-1500 students | 125-150/SF per student |
- Source: *CEFPI Southern Region Annual Conference, 1997*
31. *What is the range of square footage per student for a high school?*
- |                    |                        |
|--------------------|------------------------|
| 1500-2000 students | 150-180/SF per student |
| 2000-3000 students | 140-170/SF per student |
- Source: *CEFPI Southern Region Annual Conference, 1997*

Questions 32-40: The Commissioner of Education has adopted amendments to 19 TAC Chapter 61, School Districts, Subchapter CC, Commissioner's Rules Concerning School Facilities, effective June 9, 2003.

32. *What does a district do to show compliance with Texas state facility standards?*

To ensure that facilities have been designed and constructed according to state standards, the school district, architect and contractor must each execute the Certification of Project Compliance developed by the Texas Education Agency. The school district retains this form indefinitely until review and/or submittal is required by representatives of TEA.

For a copy of the document: [www.tea.state.tx.us/school.finance/facilities/rnd7rfa.doc](http://www.tea.state.tx.us/school.finance/facilities/rnd7rfa.doc)

33. *When is the implementation date for the **new** school facility standards outlined in the June 6, 2003, Texas Register?*

The new standards (19 TAC §61.1036) will apply to projects for new construction or major space renovations for which construction documents have been approved on or after January 1, 2004. For projects funded from bond elections prior to October 1, 2003, and for which a contract for construction has been awarded no later than 31 December 2005, school districts may use the current square footage standards (19 TAC §61.1033) required for science lecture/labs and libraries.

34. *What are the new State of Texas minimum square footage standards for general classrooms?*

PK-1	800 SF/room or 36 SF/ student for districts with small class sizes
Elementary	700 SF/room or 32 SF/student for districts with small class sizes
Secondary	700 SF/ room or 28 SF/student for districts with small class sizes

35. *What are the new State of Texas minimum square footage standards for computer classrooms that are used for the teaching of computer skills ?*

900 SF/room for 25 students; 36 SF/student will be added for each student in excess of 25.  
36 SF/student for districts with small class sizes

36. *What are the new State of Texas minimum square footage standards for computer labs that are used to support other instructional areas?*

25 SF/computer station; 20 SF/computer station when portable computers will be used

37. *What are the new State of Texas minimum square footage standards for combination science lab/classrooms, where each student has a lab station?*

Elementary	900 SF/room for 22 students plus 41 SF/each student in excess of 22 students
Middle School	1,200 SF/room for 24 students plus 50 SF/each student in excess of 24 students
High School	1,400 SF/room for 24 students plus 58 SF/each student in excess of 24 student

*Exception: For school districts with small class sizes,*

Elementary	41 SF/student, but not less than 700 SF
Middle School	50 SF/student, but not less than 950 SF
High School	58 SF/student, but not less than 1,100 SF

38. *What are the new State of Texas minimum square footage standards when separate science classrooms and science labs are used?*

A science classroom shall be a minimum of 700 SF, regardless of grade level. School districts with small class sizes may provide a minimum of 32 SF/student.

*Science Laboratory*

Elementary	800 SF/room for 22 students plus 36 SF/each student in excess of 22 students
Middle School	900 SF/room for 24 students plus 38 SF/each student in excess of 24 students
High School	1,000 SF/room for 24 students plus 42 SF/each student in excess of 24 student

*Exception: For school districts with small class sizes,*

Elementary	36 SF/student, but not less than 600 SF
Middle School	38 SF/student, but not less than 700 SF
High School	42 SF/student, but not less than 800 SF

39. *What are the new State of Texas minimum square footage standards for gymnasiums?*

Primary gymnasiums or PE space if required by district's educational program

Elementary	3,000 SF
Middle School	4,800 SF
High School	7,500 SF

40. *What are the new State of Texas minimum square footage standards for libraries based on planned student capacity?*

Based on the School Library Standards and Guidelines adopted under TEC §33.021

Up to 100 students	1,400 SF
101-500 students	1,400 SF plus 4 SF/each student in excess of 100 students
501-2,000 students	3,000 SF plus 3 SF/each student in excess of 500 students
2,001 or more students	7,500 SF plus 2 SF/each student in excess of 2,000 students

41. *What are the nationally recommended classroom sizes for traditional delivery of instruction?*

Kindergarten	1200 SF
Elementary	900 SF
Middle School	850 SF
High School	800 SF

Source: CEFPI -Guide for School Facility Appraisal

42. *How do square footages per student for special learning areas at the secondary level compare to standard classrooms? (national statistics)*

Classrooms	25-30 SF per student
Art	45-50 SF per student
Band	40-50 SF per student
Choir	30-35 SF per student
Special Ed	35-45 SF per student
Industrial Arts	100-110 SF per student

43. *What is the median elementary school size and square footage per/student in the US?*

650 students @ 146 SF/ student

Source: American School & University - 29th Annual Education Construction Report, 2003

44. *What is the median middle school size and square footage per/student in the US?*

850 students @ 159 SF / student

Source: American School & University - 29th Annual Education Construction Report, 2003

45. *What is the median high school size and square footage / student in the US?*

765 students @ 134 SF / student

Source: American School & University - 29th Annual Education Construction Report, 2003



# Facility Costs

46. *What is the comparable cost of a portable versus a permanent building for the life of the building?*

Portable building life-cycle cost will be 166% more than permanent construction due to the costs of energy efficiency, maintenance and refurbishing.

Source: Texas Association of School Administrators "Temporary Education"

47. *What is Value Engineering?*

Value Engineering is a process to evaluate all parts of a product or process with the objective of arriving at the best value commensurate with lowest cost in context of the design criteria. This is typically done at the conclusion of schematic design. Value engineering should address life cycle cost and design criteria as well as the initial capital costs.

48. *What have been the annual increases in school construction costs?*

Example: Greater Houston Area for the last ten school years:

1994	5.5%	1999	9%
1995	6.2%	2000	7.5%
1996	7.4%	2001	5.5%
1997	7.5%	2002	4.5%
1998	9%	2003	4.5% (projected)

49. *What are the effects of escalation (compounded) on a project budget?*

Example using Greater Houston Area inflation rate:

A school constructed for \$5 million in 1993 would cost \$9.51 million in 2003

50. *What is the average elementary school square footage cost in the Southern Region (Texas, Oklahoma, Louisiana and Arkansas)?*

Low	Medium	High
\$85.00	\$92.00	\$100.00

Source: CEFPI Southern Region Annual Conference, 2002

51. *What is the average middle school/junior high school square footage cost in the Southern Region?*

Low	Medium	High
\$89.00	\$97.00	\$106.00

Source: CEFPI Southern Region Annual Conference, 2002

52. *What is the average high school square footage cost in the Southern Region?*

Low	Medium	High
\$95.00	\$105.00	\$115.00

Source: CEFPI Southern Region Annual Conference, 1997

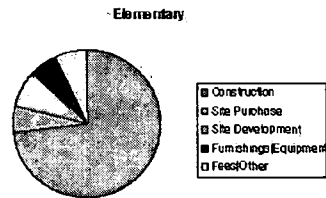
53. *What should be considered in a total project cost/budget?*

- Construction cost
- Technology infrastructure
- FFE (furniture, fixtures/equipment)
- Site purchase/site development
- Off-site improvements
- Testing/balancing
- Program management
- A/E design fees
- Planning and programming fees
- Legal fees

54. *What is the average project cost allocation for elementary schools?*

Construction	73%
Site Purchase	6%
Site Development	8%
Furnishings/Equipment	6%
Fees/Other	7%
	100%

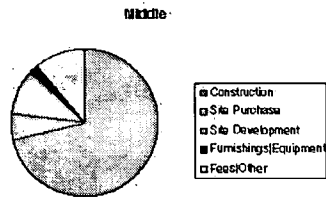
Source: *American School & University* May 2003



55. *What is the average project cost allocation for middle schools?*

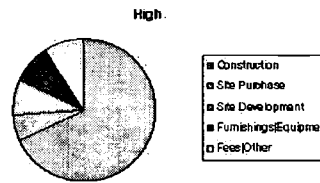
Construction	71%
Site Purchase	6%
Site Development	10%
Furnishings/Equipment	2%
Fees/Other	11%
	100%

Source: *American School & University* May 2003



56. *What is the average project cost allocation for high schools?*

Construction	68%
Site Purchase	6%
Site Development	8%
Furnishings/Equipment	9%
Fees/Other	9%
	100%



Source: *American School & University May 2003*

57. *What are some of the implications of limited funds on building programs?*

- Schools open near design capacity
- Late arrival of funding can lead to both design and construction shortcomings
- Requires on-going school design modifications
- Unmet community expectations

Source: *CEFPI-Pacific Northwest Region*

58. *What % of a school construction project is Heating, Ventilation and Air Conditioning (HVAC)?*

Upwards to 25-35% of the cost of the project

## Maintenance

59. *What is the percent of net current expenditures that school districts have spent annually on maintenance and operations over the last decade?*

1994	9.21%	1999	9.09%
1995	9.05%	2000	9.03%
1996	9.55%	2001	8.50%
1997	9.59%	2002	7.78%
1998	9.40%	2003	7.43%

Source: *American School & University April 2003*

60. *What is the total median M&O budget per square foot?*

National Median	<1,000 students	1,000 - 3,499 students	>3,500 students
\$3.30	\$3.03	\$3.15	\$4.13

Source: *American School & University April 2003*

## Bond Issues

61. *What are key strategies of success for Bond Issue passage?*
- Focus on Kids (not dollars)
  - “Where voters see value”
- Source: *Design School Facilities for Learning*
62. *What are the favorable voter characteristics?*
- New resident to the community
  - Parent of a school-age child
  - Eighteen-year old student
  - Employed in skilled, clerical, or sales work
63. *What are favorable facts affecting the success of bond packages?*
- Current demographic and enrollment trends
  - Required renovations/additions/new facilities
  - Improvement plan alternatives
    - (educational effectiveness and cost-efficiency)
  - Community benefits

## Site Issues

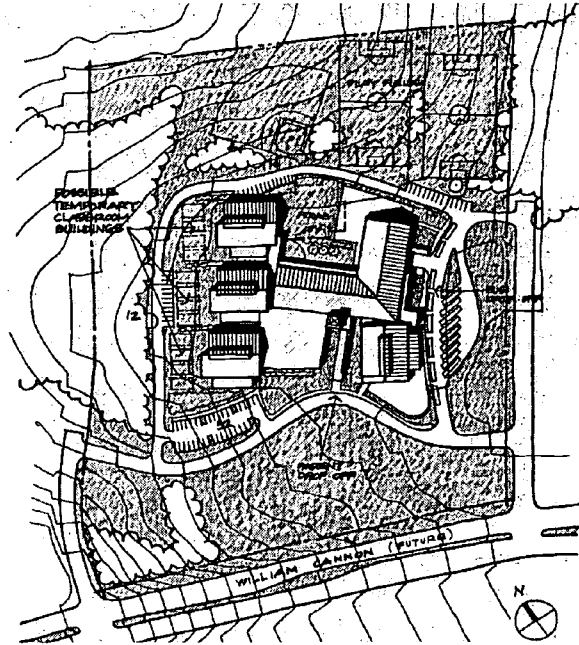
64. *What is a general rule of thumb for size of school sites?*
- Elementary: 10 acres + 1 acre per 100 students  
Middle school: 20 acres + 1 acre per 100 students  
High school: 30 acres + 1 acre per 100 students.
- Source: *TEA, Council of Educational Facility Planners, International*
65. *In a site selection process, what criteria should be included in the analysis and ranking of the proposed sites?*
- Safety
  - Soil conditions
  - Topography

- Environment
- Location
- Accessibility
- Configuration
- Utilities
- Public services
- Cost
- Availability
- Political implications

Source: TEA-Division of State Funding and School Facilities

66. *What are some site safety issues?*

- Poorly-defined borders
- Poor building layouts with isolated areas
- No vehicular separation of buses, drop-off and parking areas
- Surrounding neighborhoods
- Inadequate signage
- Unsafe play equipment – ground surfacing



## Accessibility

67. *Are there different height requirements for elementary, middle and high school accessibility?*

Yes, there is an extensive chart in Section 2.1.1 of the Texas Accessibility Standards (TAS), "Mounting Heights for Adults and Children," that dictates the minimum requirements for these age group divisions

68. *What are some examples of the differences in ADA requirements for students to adults?*

	<u>Grades Pre-K - 5/6</u>	<u>Grades 6-8/9</u>	<u>Adult</u>
Water Coolers	32"	34"	36"
Grab bars	28"-30"	30"-32"	33"-36"
Sink rim	30" max	32" max	34" max

69. *Are historic school buildings exempt from complying with the ADA standards?*  
No, governmental programs located in historic properties are not excused from the requirement for program access
70. *What if it is not feasible to comply on existing structures or the site?*  
Formal variances to areas that are technically and financially infeasible are options to explore.
71. *In addition to the building's primary function areas, what other facility requirements does ADA require?*  
Alterations trigger "path of travel" from the entrance to the altered area and telephones, rest rooms and drinking fountains serving the altered area. A school district is required to spend up to 20% per year of the total cost of the original alteration in making the "path of travel" accessible.  
Source: *Compliance Guide for Public Schools Boards & Administrators, Disability Access Consultants, Inc.*

## Building Codes

72. *What building code does a district need to follow when the site or the district is outside of an area with a locally-adopted building code?*  
A school district located in an area that has not adopted local building codes shall adopt and use the building code and related fire, plumbing, mechanical, fuel, gas and energy conservation codes from the latest edition of the family of International Codes published by the ICC, and the National Electric Code published by the NFPA. As an alternative, a school district may adopt the building code and related fire, plumbing, mechanical, fuel, gas and energy conservation codes as adopted by a nearby municipality or county.  
Source: §61.1036(f)(2)(A) of the Texas Administrative Code (TAC)

## Asbestos

73. *What buildings need to be inspected for asbestos prior to renovation?*  
All buildings must be inspected prior to any renovation or demolition regardless of their completion date. Previously buildings completed after October 1988 did not have to be inspected for asbestos.  
Source: TASB's Environmental Programs reference to the December 1998 revision of the Texas Asbestos Health Protection Rules.

## Working with Architects

74. *What is meant by A/E?*  
Architect / Engineer or Architectural / Engineering  
Registered professionals with different educational and training backgrounds, and separate state licensing boards.
75. *When is the district required to hire an architect?*  
For educational or assembly projects costing \$100,000 or more (new) or \$50,000 (if remodeling).
76. *Can A/E services be competitively bid for school projects?*  
No. Selection shall be made on the basis of demonstrated competence and qualifications. This is the first of a two-step process. The second step is to negotiate an acceptable fee with the top-ranked firm.  
Source: Section 2254.004 Government Code
77. *What is the range of basic architectural fees for new school construction?*  
6-7.5% of construction cost  
Source: CEFPI Southern Region Annual Conference, 1997

## Construction Delivery Options

78. *What are the methods available to school districts to enter into contracts (except for the purchase of produce or vehicle fuel) valued at \$25,000 or more in aggregate for each 12 month period?*
- competitive bidding
  - competitive sealed proposals
  - request for proposals
  - catalogue purchase as provided by government code
  - an inter-local contract
  - design/build contract
  - construction management contracts to construct, rehabilitate, alter or repair facilities
  - job order contracts for minor repair, rehabilitation or alteration of a facility
- Source: SB 1 and SB 583

79. *What is the determining factor as to which method of contracting the district should utilize?*

By the method which provides the best value to the district.

Source: SB 1 and SB 583

Examples of best value include:

- Cost
- Time
- District capability/staffing
- Type of project or program
- Accessibility, etc.

Source: CEFPI - Austin Chapter Meeting May '97

80. *What factors are considered in determining to whom to award a construction contract?*

- the purchase price
- the reputation of the vendor and of the vendor's goods or services
- the quality of the vendor's goods or services
- the extent to which the goods or services meet the district's needs
- the vendor's past relationship with the district
- the impact on the ability of the district to comply with laws and rules relating to historically underutilized business
- the total long-term cost to the district to acquire the vendor's goods or services
- any other relevant factor that a private business entity would consider.

Source: SB 1 and SB 583

## **Competitive Bidding**

81. *What are some advantages of competitive bidding?*

- Familiar delivery method
- Defined scope
- Single point of accountability
- Easy process to understand and manage
- Open, aggressive bid competition

Source: *Design School Facilities for Learning*

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82. *What are some disadvantages of competitive bidding?*

- Longer schedule duration
- Price not established until bidding complete
- If bid exceeds budget, more time required to re-design or rebid
- More adversarial relationship
- District or A/E receives no assistance from contractor during design phase on constructability, etc.

Source: *Design School Facilities for Learning*

## Competitive Sealed Proposal

83. *What are some advantages of competitive sealed proposals?*

- Flexibility in contractor selection
- Single point of responsibility
- Visible method of changing scope to fit budget and not have to re-bid

Source: *Design School Facilities for Learning*

84. *Where are some of the disadvantages of competitive sealed proposals?*

- Longer schedule duration
- District or A/E receives no assistance from the contractor in the design phase
- More adversarial relationships

Source: *Design School Facilities for Learning*

85. *What is CM agency?*

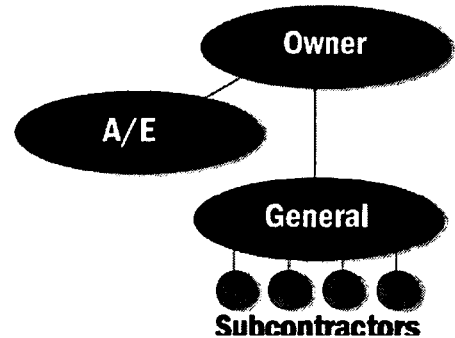
CM agency is when the Construction Manager serves as an agent for the district and provides administration and management services during construction and consultation during the design phase.

Source: *Design School Facilities for Learning*

86. *What are the advantages of Construction Management Agency?*

- Design assistance in cost, schedule and quality
- Direct control of the trade contractors
- Non-adversarial relationship
- Flexibility in packaging and enhanced opportunities for local participation
- Schedule can be reduced

Source: *Design School Facilities for Learning*



87. *What are the disadvantages of Construction Management Agency?*

- No single point of responsibility for construction
- Price is not established until all packages are bid
- District must manage more contracts
- No guaranteed price

Source: *Design School Facilities for Learning*

## **Construction Manager @ Risk**

88. *What is Construction Management@Risk?*

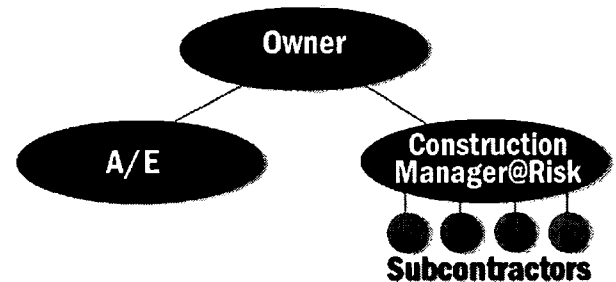
CM@Risk is when the CM serves as the general contractor providing administration and management services.

Source: *Design School Facilities for Learning*

89. *What are the advantages of CM@Risk?*

- Flexibility in selection
- Single point of construction responsibility
- Design assistance in cost, schedule and quality
- Team concept
- Open book
- Potential for faster delivery

Source: *Design School Facilities for Learning*



90. *What are the disadvantages of Construction Management@Risk?*

- Potential adversarial relationship
- Assumes CM can buy project out as effectively as GC
- Difficult for owner to evaluate validity of a guaranteed maximum price (GMP)

Source: *Design School Facilities for Learning*

## **Design/Build**

91. *What is Design/Build?*

Design/Build is a delivery method where a single entity is contracted to provide both design and construction.

Source: *Design School Facilities for Learning*

92. *What are the advantages of Design/Build?*

- Single point of responsibility and accountability for design and construction
- Team concept
- Potential for faster delivery
- Flexibility in selection

Source: *Design School Facilities for Learning*

93. *What are the disadvantages of Design/Build?*

- Potential adversarial relationship
- More difficult process to select and manage
- Quality and design not known before prices given
- Least amount of competitive bidding.

Source: *Design School Facilities for Learning*

94. *What is Bridging?*

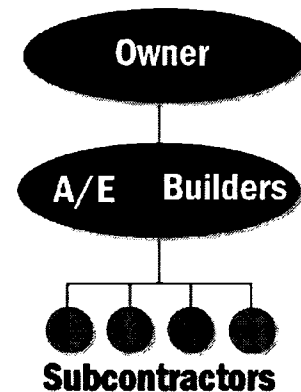
Bridging is another form of Design/Build where the district hires an A/E to prepare a more comprehensive “design criteria package.” This package represents 30%-50% complete design documents and fully delineates the design and details of the project requirements. The Design/Builder is selected on either competitive bid process or a combination of qualifications, experience and price. The Design/Builder completes the construction documents and performs the work.

Source: *Design School Facilities for Learning*

95. *What is a “design criteria package”?*

“Design criteria package” is a set of documents that provides sufficient information to permit a response to a school’s requirements. It must specify criteria the district considers necessary to describe the project and may include: site survey, interior space requirements, special material requirements, material quality standards, conceptual criteria, special equipment, cost or budget estimates, time schedule, quality assurance, site development requirements, parking, etc.

Source: *Design School Facilities for Learning*



# Sustainability Issues

96. *What is meant by “Green Design?”*

“Green Design” is characterized by design and construction practices which “significantly reduce or eliminate the negative impact of buildings on the environment and occupants.”

Source: U.S. Green Building Council

97. *What are the benefits of designing a “green” school building?*

- Environmental: Reducing the impacts of natural resource consumption
- Economic: Improving the bottom line
- Health & Safety: Enhancing occupant comfort and health
- Community: Minimizing strain on local infrastructures and improving quality of life

Source: U.S. Green Building Council

98. *What is the LEED™ Rating System?*

The LEED Green Building Rating System™ is a priority program of the US Green Building Council. It is a voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a collaborative, “whole building” perspective over a building’s life cycle, providing a definitive standard for what constitutes a “green building.” Please refer to [www.usgbc.org](http://www.usgbc.org).

Source: U.S. Green Building Council

99. *What components of a project are considered for a LEED rating?*

Virtually every aspect of a building project: Sustainable site; water efficiency; energy & atmosphere; materials & resources; and indoor environmental quality.

Source: U.S. Green Building Council

100. *Where can LEED-certified professionals be located?*

The U.S. Green Building Council maintains a membership list of architects, engineers, contractors, etc., by category, on their website: [www.usgbc.org/aboutus/index.htm](http://www.usgbc.org/aboutus/index.htm).

Source: U.S. Green Building Council

101. *What questions can we answer for you?*

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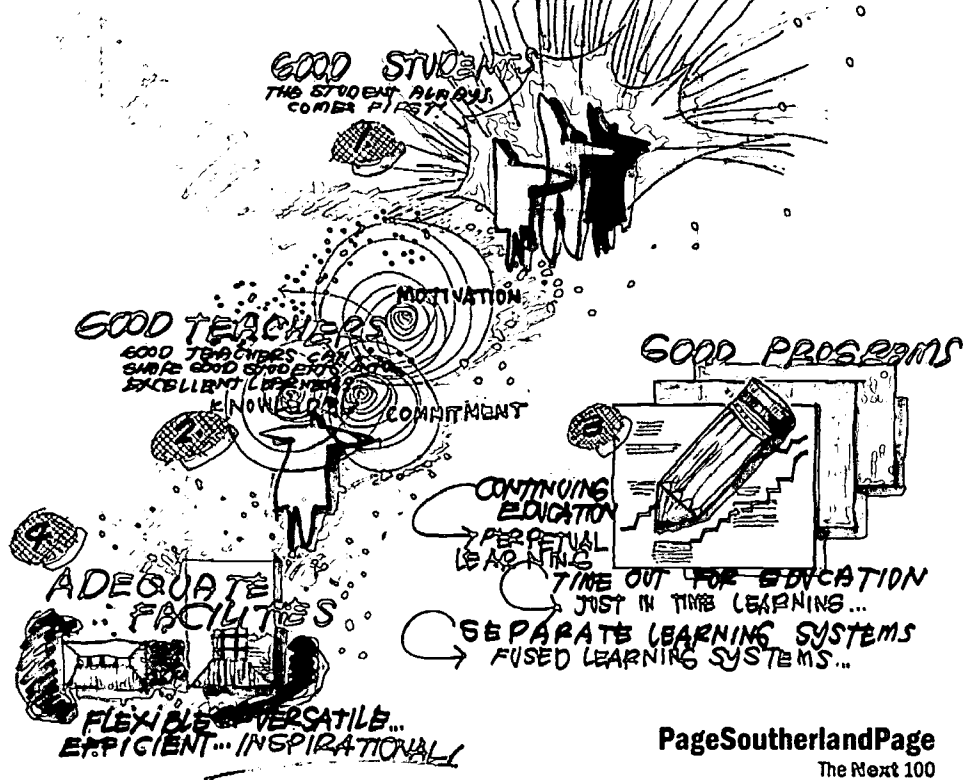


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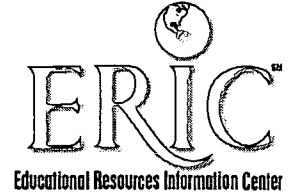
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