

Designing to a Construction Budget Without Sacrificing Features

By establishing your budget and staying vigilant, you'll be able to meet your priorities without giving up features.

By Catherine Cruickshank and Kevin Duffy



their dimensions and an allowance for support spaces. Using those limited data, estimators provide a square-foot price on the basis of historical data from similar projects.

Adjustments for inflation, allowances for unique site conditions, and typical construction costs for the specific region must all be factored in. A contingency allowance should also be established to absorb minor changes in the scope of the project because of items that were overlooked in the initial planning, as well as unforeseen conditions.

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Inevitably, after determining the total cost for all of the desired features, you must prioritize the needs. It's common for the needs and wants to far exceed the desired referendum amount. Clearly defined, self-contained "wants," such as a swimming pool or an auditorium, may be put into a separate referendum question, with the aim that the primary referendum will pass even if the secondary portion does not.

2. Try to avoid establishing a target budget for a referendum and then trying to fit as many of the needs as possible into

You wouldn't try to take a weeklong family vacation with only \$50 in your pocket. You wouldn't try to buy a new car with just \$1,000 in the bank.

If you are considering a construction project, whether to remodel an existing school or to build a new one, the first step is to ensure that your budget is realistic. Then, you take the steps to stay within it—without sacrificing your priorities or goals.

Developing a Construction Budget

A referendum budget is a vital aspect of any public education facility

project and can make or break its success. The financial plan for the referendum can be established using a variety of methods:

1. Identify all the needs (and perhaps a few wants), and establish the dollar value for each item as accurately as possible. The cost of the known necessary features, such as a new roof, can be confirmed by obtaining quotes from appropriate contractors. However, if you can't identify all the features yet, estimators must work with what they have. Typically, that information is nothing more than a list that identifies the rooms with

that budget. The target is often determined by speculating what might be the highest tax increase that voters would likely support or by matching the amount of debt that is due to be retired. Since this approach leads to a somewhat arbitrary budget, after the referendum is passed, the school district will still want to squeeze in lower-priority needs that may have previously been eliminated, making it a challenge to keep the project within budget.

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3. Budget according to life cycle. It is important to clearly understand life-cycle costs and the goals of the district. Typical priorities include such items as enhancing safety and security, bringing technology up to date, addressing accessibility concerns, promoting sustainability and improving energy efficiency, providing better learning environments, and upgrading athletic facilities.

The budget should reflect the higher initial costs of some low-maintenance items. For example, fluorescent light fixtures versus LEDs, synthetic turf versus natural grass, and various options of flooring can raise initial costs but may be wise choices in the long run. It is important to verify the life-cycle costs of all items to ensure that the return on investment justifies a higher first cost.

Staying Within the Budget

Establishing the budget is just part of the equation. The next challenge is to stay within it. Clearly defining and documenting the scope of work for each item as early as possible will help keep the school district's building committee in check and the design professionals on track. Here are 10 tips as you undertake the design process:

The Benefits of Value Trading

Value trading enhances the design and performance of a building while keeping it within budget. An example of value trading involved the heating, ventilating, and air-conditioning system at Northland Pines High School in Eagle River, Wisconsin.

Energy modeling suggested that the recommended chiller might be larger than necessary. After system simulations and conversations with the school district, it was determined that the larger chiller would be necessary only in extremely infrequent and unlikely circumstances. Furthermore, it was determined that the temperature might drift up a negligible 2 degrees above an optimum temperature of 75 degrees in those rare situations.

The choice was made to use a smaller chiller that would provide initial cost savings and limit future demand charges from the utility provider. In eight years, the full capability of even the smaller chiller has yet to be tried. The school district used the savings for further items of major value that it could not have otherwise afforded.

1. Monitor costs. Constantly monitor costs, comparing them with the original budget. Include site design, selection of materials and systems, and constructability. The initial cost-per-square-foot estimates in the conceptual and schematic design phases are replaced by more detailed quantity estimates of materials and systems as the building design becomes more defined. Obtaining current pricing on the design from major subcontractors is essential before construction begins.

2. Track and discuss. It's important to track variations to the scope of the design and discuss the cost implications with the building committee. Then, the committee can determine what adjustments should be made to accommodate the cost increases. The building committee's input and guidance at this point in the process can truly be invaluable.

3. Trade costs. Value trading is the practice of making design choices that add greater value and "paying" for them by changing or eliminating design features and elements that will provide less benefit. This collaborative process can improve the design and performance of a building while keeping costs within budget.

4. Consider constructability. Square footage is not the only driver in determining cost; it's just the most glaring factor. Take a close look at the constructability of systems, as that offers an opportunity to save money. For example, changing the structural framing system may save a considerable amount of steel without compromising the integrity of the building.

5. Share the responsibility. Mechanical, plumbing, and electrical engineers may be unaware that the cost of specified systems and fixtures could be greatly reduced by using a different, equally effective product. Subcontractors who regularly bid, install, and service equipment can offer valuable advice on saving money.

A multidisciplinary team that includes design, engineering, and construction professionals, as well as expert consultants, working together should identify areas of concern and coordinate a unified approach to ensure that the design is cost-effective without sacrificing quality and performance.

6. Fathom the finishes. Interior and exterior finishes can have a significant influence on initial and ongoing maintenance costs and

should be thoroughly discussed and evaluated to maximize the value of each selection. During the design process for Woodland Intermediate School in Kimberly, Wisconsin, the project team determined that using a local concrete brick product (which was a sufficient alternative) instead of a conventional clay brick product would provide the school district with multiple benefits, including a 40% reduction in material costs.

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7. Be aware of alternates.

Don't eliminate important items that can't be added later. Create a base project with alternate bids to enhance space, finishes, and added scope items. Alternate bids consist of a list of items whose scope is clearly defined through drawings and specifications that are not included in the base project, but for which pricing is obtained at the time of bidding to ensure that the process is most competitive.

Should the base project come in under budget, some of the alternate bid items can be selected for inclusion in the project or added at a later date. That approach is more cost-effective than eliminating an option that will be impossible or cost prohibitive to add later. Adding two classrooms a year after construction, for example, would be expensive and impractical. It would be cheaper and wiser to "shell out" future rooms (build the walls, floor, and roof) and hold off on equipment and finishes until the rooms are actually needed or can be funded. Plan ahead to avoid additional costs down the road.

8. Contemplate seasonal scheduling. The construction schedule can have a colossal effect on construction costs. Ideally, the majority of the exterior work should be carried out and the building fully enclosed before winter in the north or a traditional rainy season in some regions. That decision allows you to avoid paying a premium for dealing with adverse weather conditions. Although, in the short run, there may be value in completing the school facility as quickly as possible, it should not be done at the expense of desired features that may need to be eliminated to pay that premium.

It is prudent to establish a time line for completing the design drawings and specifications and then work backward to decide whether a spring, fall, or special election will make it possible to break ground sufficiently early in the year to ensure enclosure by winter. Weather is not an issue if the project consists primarily of interior remodeling. Bidding a northern project in the winter months often results in lower bids as subcontractors are less busy and are trying to line up work for the coming spring and summer. Long lead times for certain items, such as heating and cooling units or custom fixtures, should also be considered to minimize costly delays to the schedule or paying a premium to have them expedited.

9. Respond to requests. A successful referendum often leads to numerous appeals that were not identified before the referendum. Because of a perception that the district now has millions of dollars at its disposal, requests from teachers, information technology managers,

coaches, and other staff can come out of the woodwork faster than Usain Bolt can sprint 100 meters. The administration should filter such requests and evaluate and manage them carefully. They often need to be challenged because they may just continue the status quo rather than connect with the vision for 21st-century education.

For example, if the district is moving to one-to-one devices, will including several computer labs really be necessary? If nearly everyone is carrying a digital device, is a highly sophisticated building-wide clock system still essential? Be certain to evaluate the requests to determine their merit, and use the opportunity to clarify the direction and vision for the school.

10. Monitor costs. Costs should be constantly monitored in a holistic manner. An experienced estimator should work closely with the entire design team and should enable adjustments to keep the design near the bull's-eye of the targeted budget. That approach will avoid the scenario where the bids come in well over budget, and features are hastily cut to keep the project within budget, possibly compromising function, aesthetics, and operations.

By establishing your budget and staying vigilant, you'll be able to live within your means and still enjoy great and needed features in your next school building project!

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