

Fire Station Budgeting and Cost Control

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Throughout the course of your project many decisions will be made that affect your budget. From the quality of cabinets to the size of the App Bay, every decision has a cost – first a cost to construct, and then a long term cost to heat, clean, maintain, and repair. While some decisions may seem small individually, collectively they will add up to a lot of money. As Everett Dirksen’s famous quote goes, “A billion here, a billion there, and pretty soon you’re talking about real money.”

Today’s High Cost of Construction

The concern for costs and maintaining a project budget has never been greater. The unprecedented rise in construction costs since 2002 have made many projects unaffordable, or in other cases required significant scaling back in what a district had thought they could afford. According to Turner Construction, a national general contracting firm that has been tracking construction cost data since 1967, reports that construction inflation over the years 2004 through 2007 has averaged 8.3% per year. This is in contrast to the previous 8 years where the average was under 3%. So what does this mean?

		Escalation at 3%		Escalation at 6%		Escalation at 9%			
5 Years	2008	\$	3,000,000	2008	\$	3,000,000	2008	\$	3,000,000
	2009	\$	3,090,000	2009	\$	3,180,000	2009	\$	3,270,000
	2010	\$	3,182,700	2010	\$	3,370,800	2010	\$	3,564,300
	2011	\$	3,278,181	2011	\$	3,573,048	2011	\$	3,885,087
	2012	\$	3,376,526	2012	\$	3,787,431	2012	\$	4,234,745
	2013	\$	3,477,822	2013	\$	4,014,677	2013	\$	4,615,872
	2014	\$	3,582,157	2014	\$	4,255,557	2014	\$	5,031,300
	2015	\$	3,689,622	2015	\$	4,510,891	2015	\$	5,484,117
	2016	\$	3,800,310	2016	\$	4,781,544	2016	\$	5,977,688
	2017	\$	3,914,320	2017	\$	5,068,437	2017	\$	6,515,680
10 Years	2018	\$	4,031,749	2018	\$	5,372,543	2018	\$	7,102,091
			+ 34%			+ 79%			+ 136%
		<i>Add 1.0 Million!</i>		<i>Add 2.4 Million!</i>		<i>Add 4.1 Million!</i>			

Not only are capital improvement projects expensive today, but on-going inflation will cause these projects to continue to become considerably more expensive over time. If your project is several years away, budget for construction escalation appropriately.

Establish the Budget Early

It’s imperative to establish a budget prior to purchasing land – so you know you can afford to build on it. It’s essential to have a budget in place prior to announcing to your citizens that their district intends to build a new station, as there’s usually no going back to the well. It’s crucial to establish a budget before you sell bonds or obtain financing to ensure you obtain an amount large enough. Bottom line: It is never too early for minding the budget. Important to recognize, managing a budget effectively reflects directly on the way the community perceives how the district manages the rest of its operations. The lasting impressions a district leaves on their community cannot be understated.

One of the greatest values in establishing your budget early is that it builds confidence that the project has a plan and can be built for a certain dollar amount. If a project is not budgeted correctly the district may later discover that the project is under-funded. If that's the case, additional money may need to be redistributed from the district's operating budget. In severe cases additional money may need to be borrowed. This could impact the districts future operations. Similarly, an over budgeted project can be equally detrimental. If budgeted too high, a project may never be funded. An accurate cost estimate, early in the process will go a long way in getting your project off on the right foot, keeping your governing board satisfied, and your membership excited to move forward.

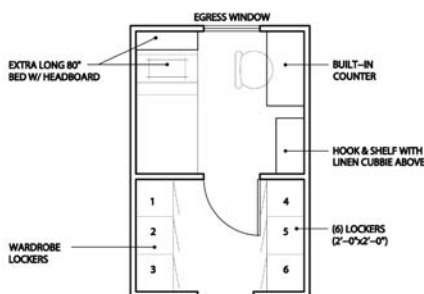
The Budgeting Process

There are two ways to arrive at a budget – from the top down and from the bottom up. We suggest employing both methods.

Top down budgeting is the traditional way of doing business. With 'x' number of dollars at our disposal, let's build the best fire station we can. This is not an unreasonable approach since, like all public agencies, there is a limit to the financial resources, what the taxpaying citizens are willing to fund, and the fiduciary responsibility in spending their money. No question. However, we sometimes jump to conclusions in setting a maximum budget before we truly understand our long term needs. By being comprehensive and systematic in identifying, assessing, and confirming what those long term needs are, we can be considerably more accurate in establishing how much money it will take to fulfill those needs. If we are conscientious in both of these methods – budgeting up and budgeting down – we will be better prepared to find the right balance for our district and community, and will have the facts and figures to defend those decisions.

The process for budgeting from the bottom up begins with a comprehensive understanding of the project needs. This begins with a detailed program. Fire station programming is described in detail elsewhere in this book, but generally follows these sequential steps:

- 1) Preparing a list of rooms or spaces,
- 2) Describing the operational needs associated with each room or space,
- 3) Preparing a quick sketch for each room or space to further confirm the operational needs,
- 4) Assigning a reasonable square foot allowance to each room or space,
- 5) Tallying up the square footage



FF. Firefighter Bunk Room (Single) and Locker Room Alcove	
Area:	Bunk Room: 72 square feet Locker Alcove: 54 square feet
Function:	Single occupancy sleeping facilities for firefighters and medics.
Adjacencies:	Toilet/Shower Rooms. Direct and efficient access to Apparatus Bay.
Design Issues:	
Security:	No requirements.
Furnishings:	Sleep Room: Built-in Work Counter for study activities. 80" long bed. Locker Alcove: (6) 24" wide, full height wardrobe lockers with vent holes, locks, and tackable pin-up surface on inside face of door. Provide adjustable shelves, hanging bar, and a 12"+ drawer for boots. Provide cubbies on top of lockers for personal sleeping bags, pillows, USAR and wildland go-bags. Softfill in all open spaces above wardrobe lockers to avoid catch-all surfaces.
Finishes:	*
Doors:	Provided at bunk room; door must swing in direction of travel. No door required at alcove.
Plumbing:	None required.
HVAC:	*
Lighting:	Provide dimmable ceiling lights used in conjunction with alerting system. Provide reading light over bed.
Power:	Provide outlets at work counter and adjacent head of bed
Communications:	Station Intercom. No cable TV. No phone or data connections.
Equipment:	No requirements.
Other:	<ul style="list-style-type: none"> • Provide towel bar and hanging space in sleep rooms for towel drying. • Provide operable windows for ventilation and code egress. • Room is sized for one occupant per shift. • Provide acoustic insulation in walls between sleep rooms. • Provide changeable name/ID at each wardrobe locker. • Provide hard ceilings in sleep rooms to increase acoustical isolation from adjacent rooms and/or spaces.

With a reasonable total square footage, one can apply a reasonable cost-per-square-foot, and poof, we have a budget! Well, not so fast. This is a great start, but the landmines are plentiful.

Costs-per-Square Foot – CAUTION!

When estimating the cost of a project at an early stage, there is not a more common measuring stick than cost-per-square-foot. Fire Chief Magazine is a great resource for researching trends in fire station costs from across the country. Their annual edition highlighting notable fire stations in their Station Style Awards competition include cost information. With a picture to match the stated costs one can reasonable judge the quality of materials used and the complexity of the project. A quick perusing, however, will show that costs-per-square-foot can easily range from \$100/sf to over \$500/sf. Why such a fluctuation? Some can be attributed to regional differences. Fire stations in California are generally more expensive than those built in the Midwest. Differences in regional labor costs, material availability and trucking expenses, stricter building codes, and matching community expectations can greatly affect building costs. But just as great of fluctuation can simply come from what is included in the cost-per-square-foot, and what's not.

Problem #1: What's included in the cost-per-square foot?

Does the cost-per-square-foot include land acquisition? It's usually not, but a finance director who wants the total cost for a project might include it. By way of example, a recent station built in a Seattle suburb was built on a property that cost the district \$1,000,000. In terms of cost-per-square foot, land acquisition equaled \$62/sf.

Example 1:

Site Acquisition	=	\$ 1,000,000
Station Size	=	16,000 sf
Cost-per-Square Foot	=	\$ 62.00 / sf
		<i>(\$1,000,000 / 16,000 sf)</i>

For the same project, furnishings and equipment totaled \$180,000. These costs spread over the 16,000 square feet had a contributory burden of \$11/sf.

Example 2:

Emergency Generator	=	\$ 45,000
Diesel Exhaust System	=	\$ 60,000
Interior Furnishings	=	\$ 75,000
Station Size	=	16,000 sf
Cost-per-Square Foot	=	\$ 11.00 / sf
		<i>(\$180,000 / 16,000 sf)</i>

In Washington State, fire districts are obligated under state law to pay state sales tax on the full construction amount. For this \$3,000,000 fire station, the district paid an additional 8.9% in Washington State Sales Tax, which totaled \$267,000. Spread over the station square footage, this amount was equivalent to \$17/sf.

Example 3:

Wash State Sales Tax	=	\$ 267,000
Station Size	=	16,000 sf
Cost-per-Square Foot	=	\$ 17.00 / sf
		<i>(\$267,000 / 16,000 sf)</i>

These three items for this particular project tallied \$90/sf. Needless to say, the difference in cost for a station at \$200/sf verses \$290/sf would be significant. What is important is identifying everything that needs to be included in your project budget, and whether the costs you're using for comparison include those items, or not.

Tally:

Land Acquisition	=	\$ 62.00/sf
Furniture & Equipment	=	\$ 11.00/sf
Wash State Sales Tax	=	\$ 17.00/sf
Grand Total	=	\$ 90.00 / sf !!!!!

Problem #2: Building Costs verses Site Costs

Equally important when using cost-per-square foot data is recognizing that square footage costs most commonly combine building construction and site improvements into the same dollar amount. However, **'Building'** costs are heavily influenced by the quality of material used while **'Site'** costs are heavily influenced by issues like poor soil (requiring heavier foundations), traffic signalization (to safely egress the

site), below grade detention (as opposed to above ground ponds), required sidewalks and/or street trees, disposing of hazardous materials, and the like. Two identical stations – same plan, same materials – will likely cost the same as far as the station goes, but could have considerably different site costs. This lesson is demonstrated by a district in Western Washington who built two identical ‘prototype’ stations. One had a premium of \$275,000 strictly due to differing site conditions. Although identical in every other way, their cost-per-square-foot was not.

<u>Station 8</u>	<u>Station 5</u>
Poor Soil Large Detention Pond Demolish existing Station Phased Construction 8% grade across site Found Buried Tank	Good Soil Small Detention Pond No Demolition No Phasing Flat site Clean Site
\$275,000 Premium!	

Problem #3: When was that station built?

In the same way that it is important to include adequate inflation in your fire station budget, it is equally important to recognize when the stations were built that you are using as comparables. Many fire stations take a year to build, so even with a brand new station the cost basis will be at least a year out of date, and possibly more. With inflation at 8.3% per year, this can have a significant affect on your project budget if your comparables are not adequately adjusted for inflation.

Caution. Caution. Caution.

Your estimate is only as good as the data used to establish it, and cost-per-square foot amounts are often misunderstood, misinterpreted, or misrepresented. Be skeptical with any numbers you receive. Remember that every project is unique. Look for the peculiarities in the numbers you use and the peculiarities in your own project. Above all, be comprehensive.

Budget Parts & Pieces

The three part harmony of a good project budget includes Hard Costs, Soft Costs, and Contingencies. Each represents a different type of project expense, and all three are needed for a comprehensive, total project budget.

Hard Costs

Hard costs are what you get on bid day. These costs are quantifiable materials and labor to carry out the work described in the construction plans and specifications. Hard costs include building and site costs, the contractor’s overhead and profit, and their expenses managing the project, also known as General Conditions.

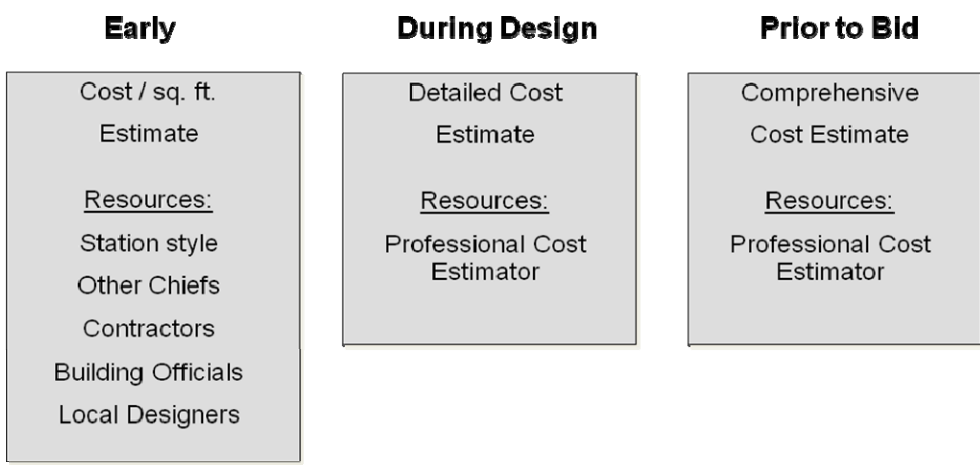
Where do budgets for Hard Costs come from? At the early stage, the only alternative is cost-per-square foot. As noted above, caution is warranted, but this is unfortunately the only alternative with a limited understanding of the scope of the project. Resources can include Station Style, other Fire Chiefs, building contractors, building officials, plan reviewers, and local design professionals. Touring recently built stations in your area is an opportunity worth taking. Seeing these new stations first hand, and knowing what they cost to build, gives a good idea on quality of materials, station size, and how to compare their costs to yours.

					DETAILED ESTIMATE BREAKDOWN
UNIT CODE	DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL
PROJECT: CASCADIA FIRE STATION - BASE ESTIMATE					
LOCATION: CASCADIA, WA					
BLDG SF: 20,510					
ESTIMATE: 2005060					
EST TYPE: PRE-DESIGN					
A10	FOUNDATIONS				
02310	FINE GRADE	20,510	SF	0.45	9,230
02315	FINISH EXCUTE/BACKFILL	20,510	SFA	0.05	17,434
02820	FOOTING DRAINS W/GRAVEL	975	LF	6.15	5,996
02720	GRAVEL/SAND/VAPOUR BARRIER @ S.O.G	20,510	SF	1	20,510
03010	PREMIUM STAIRS ON GRADE	80	SF	22	1,760
03310	S.O.G.-COMPLETE	20,510	SF	4	82,040
03310	STANDARD FOUNDATIONS	20,510	SFA	3.5	71,785
07210	RIGID INSULATION @ SLAB PERIMETER	2,925	SF	1.5	4,388
A10	FOUNDATIONS				213,142
B10	SUPERSTRUCTURE				
05120	HONSTING	87	TON	150	13,050
05120	MEZZANINE	1,970	SFA	13	25,610
05120	MISC STEEL-5 PSF	10,255	LBS	1.48	15,177
05120	STRUCTURAL STEEL-ASSUME 8 PSF	164,060	LBS	1.48	242,838
B10	SUPERSTRUCTURE				296,676
B20	EXTERIOR CLOSURE				
04210	BRICK VENERICUM TUFED STONE-ASSUME 2"	4,875	SF	25	121,875
06110	EXT. WALL FRAME/SHEATH/INSUL/CWB	19,500	SF	9	175,500
06110	EXTERIOR SOFFIT	1,026	SF	10	10,260
07450	FIBER PANELS	5,889	SF	25	147,225
07820	FLASHING	19,500	SFA	0.75	14,625
07900	CAULKING	19,500	SFA	0.25	4,875
09100	AUTO OPENERS	2	EA	2500	5,000
08110	EXT. H.M. DOOR/FRM/HWRE-PAIR	2	EA	3000	6,000
08110	EXT. H.M. DOOR/FRM/HWRE-SGL	9	EA	1650	14,850
08360	SECTIONAL OH DOOR-14X14	9	EA	5700	51,300
08410	ALUM STOREFRONT DOOR	7	EA	1500	10,500
08410	ALUMINUM STOREFRONT	2,097	SF	44	92,268
08520	ALUM WINDOWS-OPERABLE-25%	1,200	SF	58	69,600
08920	STUCCO-ASSUME 25%	4,875	SF	14	68,250
09000	EXT. PAINTING/SEALING	19,500	SF	0.75	14,625
B20	EXTERIOR CLOSURE				806,753
B30	ROOFING				
06100	ROOF SHEATHING	21,536	SF	1.3	27,997

During the detailed design phase of your project, there is no substitute for a professional cost estimator. These individuals live and breathe the construction market on a daily basis, updating their own internal cost data to reflect the latest contractor and subcontractor market fluctuations. Partly science and partly intuition, professional cost estimators provide an educated opinion for what your project will cost based on programming to date and plan sketches, escalated to the anticipated bid opening date. They're not always exactly right, but their involvement and expertise substantially increases the odds of having a bid on bid day that meets or beats your budget.

It is advisable to have your cost estimate updated when the construction plans and specifications are between 80% and 90% complete. This update incorporates any changes since the last estimate, changes in the bid climate, and confirms whether there has been any scope creep. If there is any doubt about whether the project may bid on budget or not, this updated cost estimate can be used to identify possible bid alternates.

The level of detail and potential resources for assisting you in developing the Hard Costs portion of your overall project budget are as follows:



Soft Costs

Soft costs encompass every other out-of-pocket expense the district will incur over the course of the project. For projects that include land acquisition, the soft costs would include the property purchase cost, plus real estate fees, escrow, title insurance, and possibly demolition, hazardous material testing, and abatement. In addition to architectural and engineering services, you may need additional professional services from a land surveyor, geotechnical (soils) engineer, a wetlands biologist, a wildlife consultant, or a traffic engineer. You'll have permit fees for land-use and building permits, utility connections, tap fees and special inspections during construction. You may be required to undertake certain off-site improvements outside of your contractor's scope of work for such things as sidewalks, road improvements, traffic signalization, utility extensions, or street trees. Soft costs also include furniture, fixtures, and equipment, also known as FF&E. If it's a new station, FF&E would include desks, chairs, mattresses, and kitchen appliances, as well as stocking the kitchen with pots and pans. Your equipment list may include a diesel exhaust collection system, air compressors, telephones, data, and alerting equipment. If sales tax is due on construction costs in your location, it too is a 'soft cost' and needs to be accounted for in your overall budget. All of these items carry costs that, if not accounted for early in the process, could adversely impact your budget down the road.

Where do budgets for Soft Costs come from? The process starts with brainstorming a list of all the possible items that you may have to purchase out-of-pocket. That may sound daunting, but the items noted above could be used for a starting point. Talk with other Chiefs in your area who may have recently built a station and are willing to share an itemized expense summary from their project.

In general, soft costs will fall into these categories:

- ✓ Professional Services
- ✓ Permits and Approvals
- ✓ Utility Fees (connections, extensions, meters, and the like)
- ✓ Off-site Improvements (sidewalks, traffic signals, street lights, etc.)
- ✓ Furniture
- ✓ Equipment
- ✓ State or local taxes

At the early stage of a project, expect a lot of legwork to develop a reasonable budget for your soft costs. Soft costs vary substantially from project to project and represent an area of high risk in under-budgeting your project. As a ratio to hard costs, soft costs can easily total 25% of your hard costs, and can sometimes be as high as 50%, or higher. In other words, if the hard costs have been estimated at \$3.0 million, soft costs could be anywhere between \$750,000 (25% of \$3.0M) and \$1.5 million (50% of \$3.0M). There isn't a reliable rule-of-thumb that can be substituted for a thorough and conscientious effort in estimating your potential soft costs.

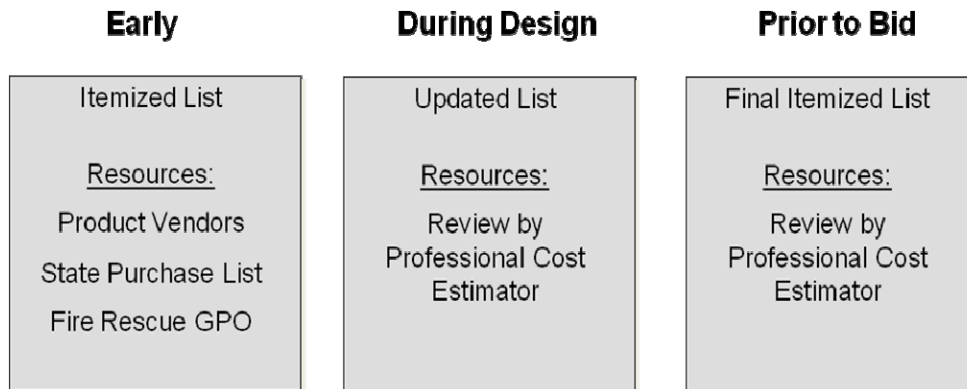
For furniture and equipment, product vendors are often helpful with early pricing. State contracts for purchasing are also a source, as is the Fire Rescue GPO. GPO stands for Group Purchasing Organization. GPO's negotiate purchase agreements with product manufacturers on a national basis. With the power of purchasing at a group rate, Fire Rescue GPO is able to negotiate a manufacturer's lowest price and pass those savings on to fire districts, large and small.

Utility fees and any off-site improvements will be property and location specific. You can gain a sense for these items by talking with your local utility purveyors and building officials. Assume the worse and budget accordingly.

For professional fees, talk with others in your region to determine the going-rate in your particular location.

As the station design progresses, your design professional, and their professional cost estimator if they have one, can be a very helpful resource in reviewing and commenting on your soft cost budget. With their experience and knowledge, they can share where they believe some line items may be too high or too low.

The level of detail and potential resources for assisting you in developing the Soft Costs portion of your overall project budget are as follows:



Contingencies

Contingency is your safety net, specifically for the unknown, unexpected, and unimaginable. Despite the best planning, the most thorough of investigation, and the best of intentions, nothing ever goes completely as planned when it comes to construction. Having the concrete labor union go on strike the day after you open bids is out of your control. Discovering an abandoned buried fuel tank that no one recalled is out of your control. Finding Native American artifacts amidst your excavation is out of your control. These events have happened, and do happen, and contingencies are your protection that if they do, your overall project budget will likely be able to handle them without compromising the integrity of the project.

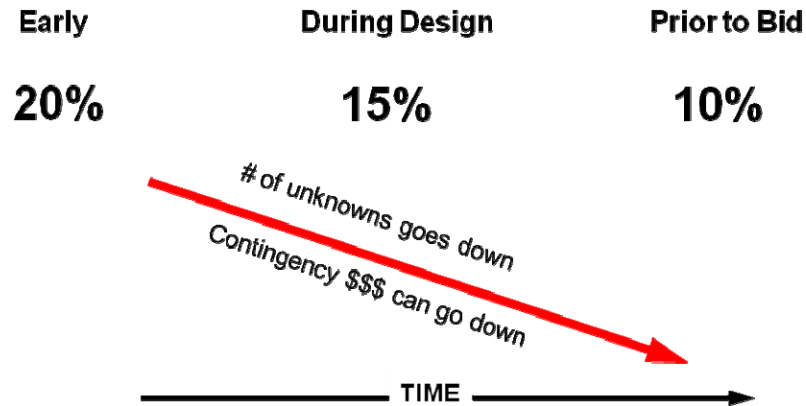
At the beginning of your project there will be the greatest number of unknowns requiring the greatest number of assumptions. As your design team investigates your property, confirms your programmatic needs, applies for permits, and works with their cost estimators, the number of unknowns' decreases. As your project progresses, assumptions made early in the process are refined and the budget adjusted appropriately. Over time, one assumes a higher confidence in the overall project budget, and contingencies are typically reduced to reflect the lower risk.

Contingency amounts are typically a percentage of the combined hard costs and soft costs. It would not be uncommon to budget 20% at the early stage of a project, gradually reducing this amount over the course of the project to 5% or 10%.

An adequate contingency on bid day is prudent to guard against unknown market conditions and bidding climate.

Contingencies continue to be important as you begin construction to guard against an unknown number of Change Orders that may be required.

A guide for assisting you in developing the contingency portion of your overall project budget would be as follows:



An important note – the amount of contingency a district sets aside should be reflective of the risk the district is taking in regards to their project scope matching their project budget. Contingency and risk go hand in hand.

The Balancing Act

The emphasis so far has been focused on establishing and confirming operational needs, quantifying them, and determining a project budget to accomplish them. But what if the cost to accomplish the needs is greater than the funds that are available? If that's your case, you're not alone. Regardless, the act of balancing your project scope with the available funding is a valuable and important step. Once accomplished, it will strengthen your appeal to those individuals who you ask to help fund those needs.

Before embarking on the balancing act, it is important to recognize the interrelationship of quantity, quality, and cost. With every built project, these three aspects eventually find equilibrium, but their relationship to each other is like a balloon – squeeze one side, and it will bulge somewhere else.

Example: If you establish a fixed number of square feet for your station (**quantity**), and that you want it built with materials to last 50 years (**quality**), you will lose your control over the budget it will take to build it (**costs**). This is a great strategy if your budget is unlimited.

Example: If you establish a fixed number of square feet for your station (**quantity**), and your budget has a fixed upper limit (**costs**), you will have to sacrifice the quality of materials installed (**quality**). This approach will bring your project in on budget and be appropriately sized, but will maintaining the station cost you more in the long term?

Example: If your budget has a fixed upper limit (**costs**), and you're committed to building a station with materials to



last 50 years (**quality**), you will only be able to build a station so big (**quantity**). You'll end up with a great station, but there just may not be enough of it there to meet your operational needs.

Recognizing this interrelationship of quantity, quality, and costs will help you and your building committee in the balancing effort, should that be necessary.

What can go wrong with my Budget?

There is a lot that can go wrong with the budget. However, with a thorough and conscientious effort, the opportunities for a budget bust are substantially reduced. Here are 7 of the more common budget oversights that can sideswipe a fire district:

No. 7 --- Inflation

Fire stations are expensive projects to build in the first place, but the inflation rate on construction has had an enormous impact on their costs. Know when your construction will begin and budget for inflation appropriately.

No. 6 --- Using OLD numbers

Unfortunately, not all projects begin construction when they originally thought they were going to. Did the ballot measure get voted down? Did your land acquisition get hung up in a legal dispute? Did your governing council shelve your project in favor of something else? If your project is delayed, don't use the same budget number that was established years earlier. It won't be enough!

No. 5 --- Bid Climate

America was built on supply and demand. When contractors are busy, prices are higher. When work slows down, the pencil is sharper. You can't change the bid climate, but you can control when you go out for bids. Pay attention to the market. While delaying your project a few months might add inflation, it might be offset by a more competitive bidding environment. By way of example, many contractors are less busy in the winter months. Some districts time their bidding for late winter or early spring to capitalize on a more favorable bidding season.

No. 4 --- Overlooking soft costs, like furnishings and equipment

It's tough for firefighters to spend their first night in the station without a mattress, pots and pans to cook with, or a desk to sit at. Obvious, yes, but more frequently overlooked than you might think, especially for a station where some furniture and equipment may be new and some may be reused. A room-by-room checklist of needed furniture and equipment is particularly helpful.

No. 3 --- Overlooking temporary facilities when remodeling a station

Providing emergency services during a remodel is not easy for a contractor or the station crews. Rarely does it work. Your personnel are in the way of the contractor, which drives their price higher. The contractor's personnel are in the way of the station crews with every emergency response. Alternatively, moving out of the station necessitates a 'temporary' fire station, be it a tent structure, portables, both, or leasing other space. All options are expensive and are often under budgeted or overlooked all together.

No. 2 --- Picking materials that aren't "firefighter proof"

Sometimes the 'hard choices' include downgrading the quality of materials and products that go into the station. It's often an innocent decision based on product literature that boasts the superiority of the product. Resistance to firehouse wear and tear is sometimes a different story. Switching to a different material after it has been installed can be an expensive endeavor. Equally expensive can be the ongoing maintenance and upkeep if it's not.

No. 1 --- Optimism overriding realism

If you repeatedly find yourself saying, "I can't believe it will cost that much," then it's time to check your optimism at the door. Our number one, worst enemy is ourselves and our disbelief in how much it can possibly cost to build a fire station. We sometimes talk ourselves into small cuts here and there, and voila, that looming budget deficit is back on track. A wiser approach is to have faith in the facts and figures that have come out of a thorough and comprehensive design approach.

Conclusion

To be effective, budgeting and cost control need to begin at the onset of the project. It deserves a conscientious effort and a comprehensive approach. And, it never ends. Budget and cost control is an ongoing effort to ensure that the budget established at the beginning of the project matches the amount spent on the day you cut the ribbon. Attention to costs is worth every penny.

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