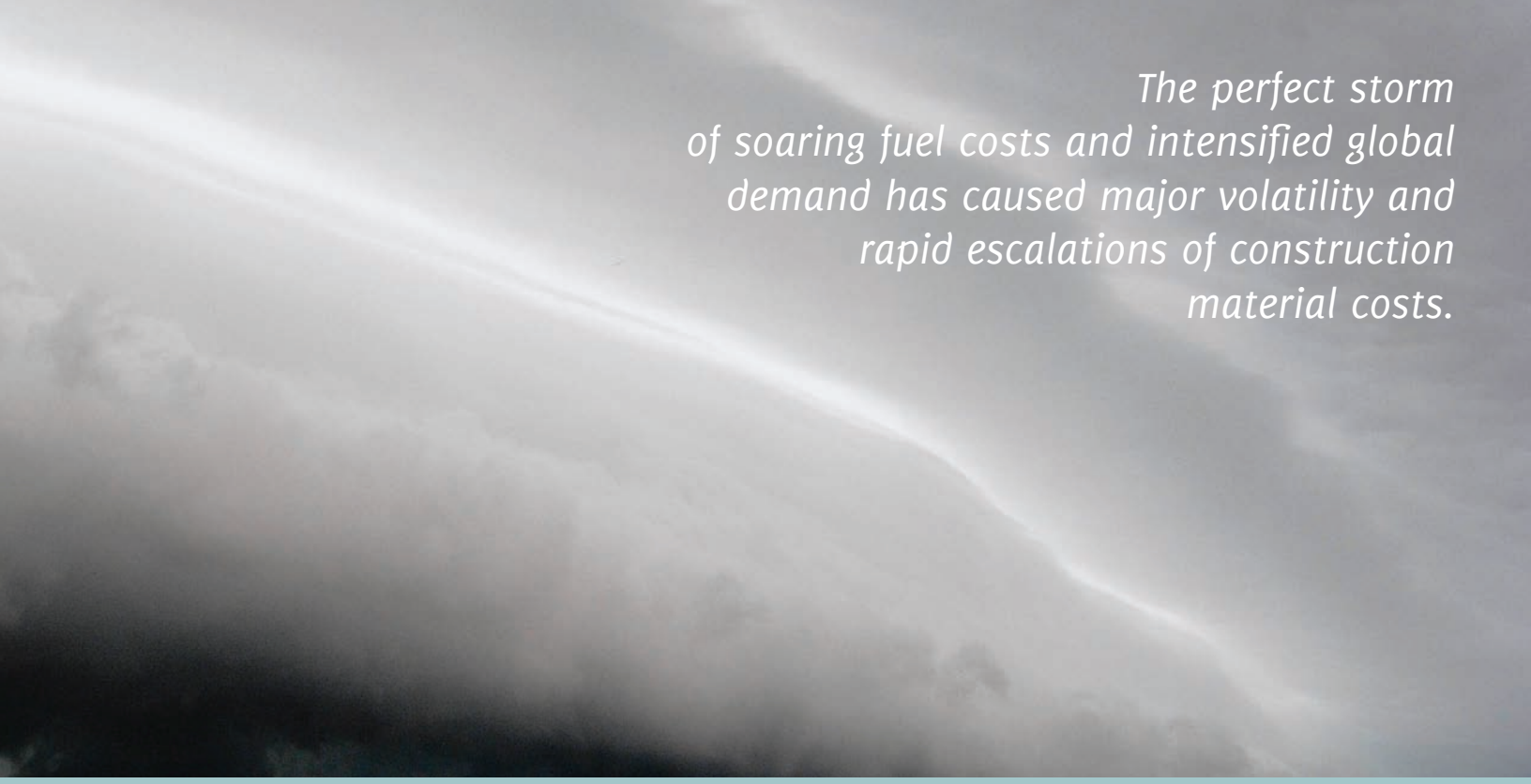
Smart Construction:

Economical Building Solutions to Offset Soaring Material Prices

Despite major escalations in construction material prices, smart contractors have a tool belt of tactics to offset the soaring costs. This paper will give you 10 insider's tips for building smarter, saving money and getting the most out of a contractor in today's economy.

Leopardo Construction



The perfect storm of soaring fuel costs and intensified global demand has caused major volatility and rapid escalations of construction material costs.

Smart Construction:

Economical Building Solutions to Offset Soaring Material Prices

The perfect storm of soaring fuel costs and intensified global demand has caused major volatility and rapid escalations of construction material costs. Now more than ever, it's critical for developers and architects to partner with sophisticated builders who know how to navigate material inflation and fast track deliveries for the most economical construction. In the end, smart construction will save potentially millions of dollars.

This paper outlines 10 construction strategies for offsetting the dramatic increases in material prices to provide considerable savings and help realign budgets with original expectations. The knowledge gained from reading this paper will hopefully empower building owners, developers, investors, architects and brokers to become better consumers of construction services.

The 10 economical building solutions to offset soaring material prices include:

1. Avoid scope creep and build lighter
2. Purchase materials smarter and in bulk
3. Know where the dollars are spent
4. Change the palette of materials
5. Build green and reap the benefits
6. Integrate more revenue-generating space and features
7. Leverage the contractor as a development partner
8. Bring the builder onboard early or explore the design-build delivery method
9. Fast track the project
10. Build smart, energy producing or self-powered projects

In Dubai, the construction crane is jokingly called the national bird.

The Causes: *Soaring Fuel Prices and Intensified Global Demand*

Before we cover the construction solutions to offset rising material prices, it's important to understand the causes of the increases.

Whether it's the front page article in the *Wall Street Journal*, the cover story of *Time* magazine or the headline report on CNN, the world is being bombarded by economic news updates about the rising costs of fuel. Since January 2004, the price per gallon of gasoline at the pump has risen 177 percent and diesel fuel has skyrocketed by 270 percent. In the last 12 months alone, diesel prices have increased by 73 percent.

The cost of fuel touches everything. Certainly, it affects petroleum-based materials such as asphalt, plastic, rubber, PVC, insulation and roofing shingles, but every single construction material requires manufacturing and transportation – sometimes across thousands of miles – which consume fuel.

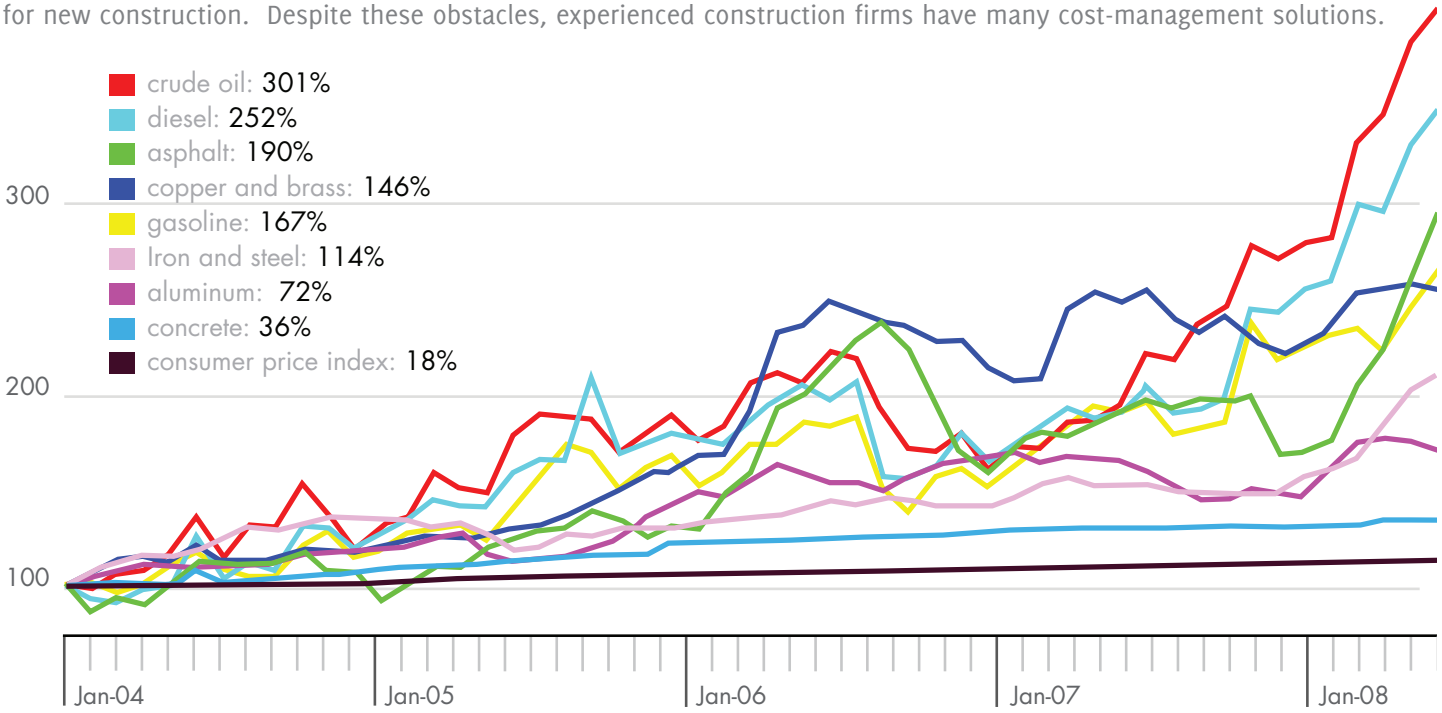
While fuel prices may eventually come back down, any signs of price stabilization are in question for the foreseeable future thanks to the plummeting value of the U.S. dollar and massive global demand. China and India, which together account for more than one-third of the world's population, are now building at unprecedented paces and consuming massive amounts of energy.

All across Asia thousands of cranes are transforming skylines and building cities overnight. Many industry experts estimate that 15 to 25 percent of the world's 125,000 cranes in operation are being used in Dubai where the construction crane is jokingly called the national bird.

The net result of all these worldwide economic trends is an extremely challenging environment for new construction, exacerbated by the long lead times of development compared to the volatility and soaring prices of construction materials. Despite these obstacles, U.S. companies can still find ways to develop new facilities for growth and expansion. Experienced construction firms can offer many strategies for offsetting soaring material costs. The following pages highlight 10 of these strategies.

Construction Material and Fuel Costs

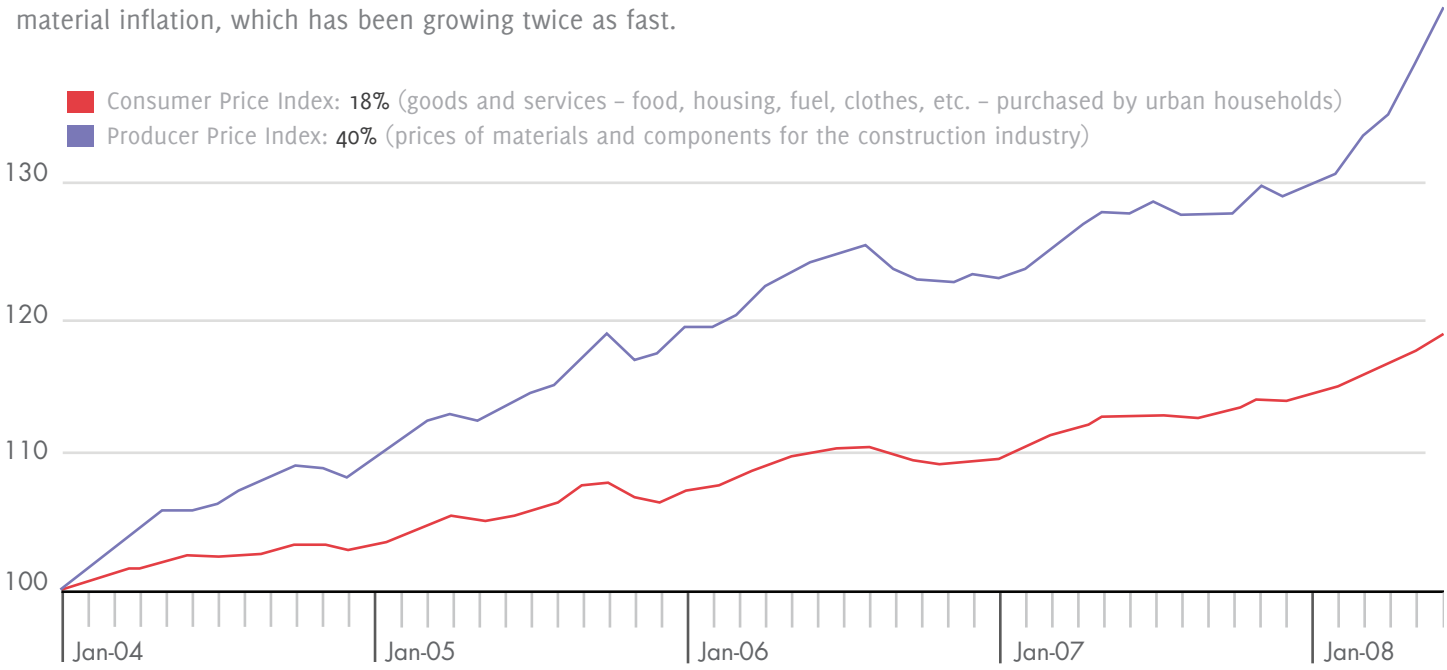
Historically high fuel prices and volatile construction material costs have caused an extremely challenging environment for new construction. Despite these obstacles, experienced construction firms have many cost-management solutions.



Source: Bureau of Labor Statistics

Construction Material Prices vs. Consumer Prices

When budgeting for construction, some will mistakenly account for consumer inflation rather than construction material inflation, which has been growing twice as fast.



Source: Bureau of Labor Statistics

10 Construction Solutions to Offset Soaring Material Costs

1 Avoid Scope Creep and Build Lighter

Often throughout the planning and design phase, a project will suffer from what the industry calls "scope creep," or the gradual expansion of project parameters to accommodate new ideas, perceived needs and enhancements. Increased square footage has the greatest impact on initial building cost. Working together, owners, architects and contractors can help offset rising material prices by identifying wasted space and making the facility as functionally efficient as possible.

Typically, owners will purposely build unused space because they are planning for growth and assuming that space will later be occupied. As an alternative, instead of building for growth today, consider building a smaller, more flexible facility that can quickly and easily expand to fit the company's needs when they change.

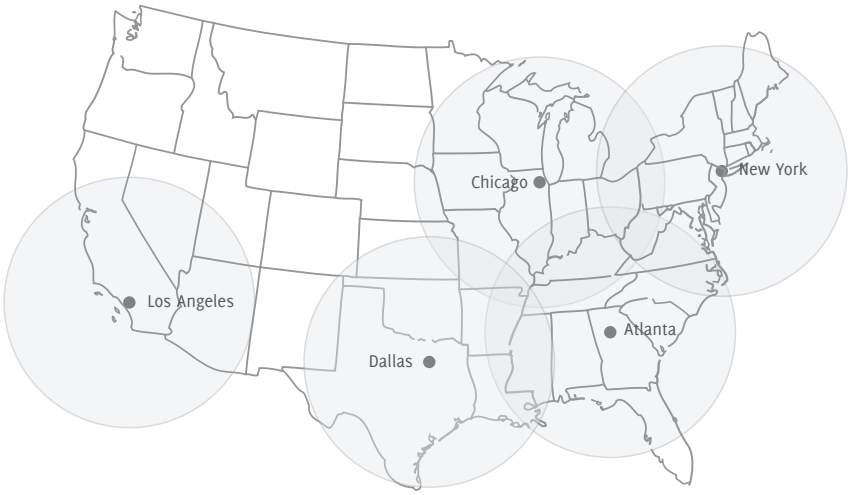
While the scope of a project can shrink by constructing a physically smaller structure, it can also be reduced by building lighter. On nearly every construction project, a menu of options and alternatives exist for foundations, framing, enclosures and MEP (mechanical, electrical and plumbing) systems.

An early peer review or independent second opinion of drawings and documents may uncover several areas where leaner foundations, framing or enclosure systems may be used without compromising the building's safety, integrity, durability and functionality. For example, building with six-inch concrete slabs instead of eight-inch slabs will reduce the weight and thickness of the structure and therefore make the construction more affordable. While soil conditions will affect your options, even a slightly lighter skeleton can influence the foundation system, which may eliminate costly materials and time. A lighter superstructure, or the portion of a building above the ground, will allow for a lighter foundation and free up money that can be put back in the pocket of the client or used elsewhere on the project.

A trained eye can look at building drawings and identify wasted space and analyze all factors to determine whether lighter materials and systems can be used to build a more cost-efficient structure. When smart contractors and smart architects collaborate from the start, the result is a much more efficient design that is built quicker and often with a considerable savings.

2 Purchase Materials Smarter and in Bulk

The strategies employed in the procurement of materials can lead to significant cost savings. For instance, similar products can sometimes be purchased within a 500 mile radius, which may result in transportation and fuel surcharge savings. Just as "locavores" are people committed to eating foods grown locally because of cost and nutritional savings, the same term can be applied to those who are committed to purchasing and using materials from local manufacturers.



The green building rating system, Leadership in Energy and Environmental Design (LEED), offers a credit to projects that can procure 50 percent of their materials within a 500-mile radius. While there is no guarantee that producers will pass transportation savings onto the purchaser, it makes sense to identify common products that can be purchased locally and run quick cost comparisons for any potential savings. Even if the costs are identical, using local materials significantly decreases fuel consumption, delivery time and the carbon footprint, which makes the decision an environmental savings.

Veteran construction companies also have well-established purchasing channels. Centralized buying and discounted bulk purchasing is music to any client's ears… and wallet. Larger contractors with preconstruction experts on staff can assemble material and equipment packages that are much more attractive to suppliers and increase their ability to negotiate the best prices and delivery dates. The economies of scale can provide sizeable pro forma savings.

Given the increase in global demand, skyrocketing fuel costs and the spikes resulting from natural disasters and material shortages, costs are even more volatile today. As a result, lead times, comprehensive costs and usage figures are more important than ever for determining and securing bulk and wholesale pricing. By studying market trends and cost data, contractors can forecast prices and conclude the most cost-effective purchasing solutions. Plus, seasoned general contractors have developed close familiarity with all construction products and their suppliers, and know how to navigate cost spikes and material inflation, which saves money and time. For instance, in retail rollout construction, where multiple stores are built simultaneously or in succession, contractors can speculatively purchase key volatile components knowing that the material cost savings far offset any potential storage fees. A general contractor's intimate knowledge of today's construction marketplace will optimize material line items and practically eliminate usual delivery delays.

For example, steel may be cheaper than concrete at the time of budgeting and planning. However, if the contractor's steel suppliers are forecasting double-digit increases every month for the next quarter or two while concrete is expected to be relatively flat, the builder should wisely suggest concrete. Material purchasing is often a complex chess game, especially for larger projects that are constructed over the span of a year or two. For instance, steel mills only run certain shapes during specific times of the year. To avoid or reduce storage fees and prevent purchasing steel shapes from warehouses that are often 20 percent higher than the mills, contractors can examine the steel shape fabrication schedules, cross-reference it with the project schedule and anticipated cost escalations, and ultimately make the most cost- and time-effective advance bulk purchases.

3 Know Where the Dollars Are Spent to Gain the Biggest Savings

Some contractors are so intensely involved in the day-to-day management of a project that they forget to look at the big picture. By taking a step back to look at trends and expenditures, construction firms can truly understand where the most construction dollars are spent and dedicate the appropriate resources in order to deliver substantial cost savings for the client. Nowhere is this more evident than interior construction where almost half of the entire interior building budget can be tied up behind the walls or above the ceiling, leaving only half the budget for the design and aesthetics of the space.

Leopardo recently analyzed every interiors project completed over the course of 12 months. Eliminating the top and bottom 10 percent to account for any statistical anomalies, some interesting discoveries were made regarding where the most interior budget dollars were spent. On average, this is what we found:

- **24 to 26 percent** of the total interior construction cost was spent on electrical
- **9 to 11 percent** was spent on heating, ventilation and air condition (HVAC)
- **4 to 6 percent** on plumbing and fire protection
- **3 to 5 percent** on communication and security

These four above-mentioned line items total 40 to 48 percent of the interiors budget and are all construction elements found behind the walls or above the ceiling. That leaves about 52 to 60 percent of an entire interior construction budget for the design and aesthetics of the space. Considering that interior design sets the image for the space and tenants will indeed judge books by their covers (i.e., lobbies and reception areas), it's critical to make the most with your interior investment.

Another key finding of Leopardo's research was with the variance from low bid to high bid. While many components, such as ceiling tile and carpet, had an average swing of five percent, electrical bid swings pushed as high as 20 percent. In a $1 million electrical job, that may mean a low bid of $800,000 and a high bid of $1.2 million. In this case, an experienced contractor with meticulous estimating experience, coupled with knowledge of the market and the ever-changing subcontractor community, can save the client $400,000, which can be spent on the interior design or go back in the client's pocket.

Half of the entire interior building budget can be tied up behind the walls or above the ceiling.

4 Change the Palette of Materials

Using substitute materials that are lower priced, less volatile, more sustainable or more labor-efficient will result in significant project cost savings.

Copper, steel, asphalt and aluminum are some of the materials with soaring prices. A project using a substantial amount of these materials that is delayed just two months could tally $100,000 in added, unbudgeted costs. Pervious paving material is a relatively new and environmentally-friendly alternative to concrete and asphalt, which is less volatile and more economically sound for some projects.

Pre-assembled or pre-fabricated materials such as pre-cast concrete panels used for a structure's enclosure system can help trim a construction schedule and produce considerable savings. The reason for this is two-fold. First, quicker assembly on-site eliminates some of the man-hours needed for installation. Second, pre-engineered walls and floors are produced in a controlled indoor environment where workers can increase their overall rate of production by avoiding extreme weather conditions on site, wearing comfortable clothing, not walking through mud, etc.

In one Chicago suburb, a police station project had been talked about, planned and over-budgeted for five years. Leopardo stepped in as the design-builder and changed the enclosure system from all masonry to masonry and pre-cast concrete. As a result, the construction was completed in seven months and $200,000 under budget.

By changing the palette of materials, Leopardo expedited a project that was stalled for five years and saved the client $200,000.

Building pre-engineered walls and floors in a controlled indoor environment will also likely increase quality and safety levels too. For instance, rather than welding metals while wearing harnesses and being suspended at awkward angles from tall buildings, welding can now be done more safely while assuring the weld is of the highest quality.

At a more micro level, there are joints, fittings and connectors that are less labor intensive to help offset the higher costs of materials. Considering that building construction hovers around a 50-50 material-to-labor ratio, any reductions in labor costs will quickly add up.

5 Build Green and Reap the Benefits

The myth is that sustainable construction costs more, which is not always the case. While seeking Leadership in Energy and Environmental Design (LEED) status carries a variety of consultant and registration fees, using green building practices, materials and systems can actually cost less than their non-green counterparts, and provide immediate and long-term savings.

For example, a green roof, which started as the poster child of the green building movement, is commonly associated with high costs. However, a building can achieve many environmental benefits by using white thermoplastic polyolefin (TPO) roofing membranes that cost one-third of what a standard intensive vegetative green roof typically runs. And it still benefits a LEED-seeking building.

LEED is the national certification program by the United States Green Building Council (USGBC). Four levels of LEED certification exist – Certified, Silver, Gold and Platinum – which require 26, 33, 39 and 52 points, respectively, to achieve them. In order to achieve any certification, a project must comply with seven prerequisite points.

Rumors in the industry have long circulated about the added cost of achieving LEED certification with numerous professionals suggesting it falls in the five to 10 percent range of the total budget. While many studies will suggest otherwise, the answer is it depends. The cost of LEED construction depends heavily on the level of certification being pursued. According to construction consultancy Davis Langdon, which studies the cost of green building, many projects are achieving LEED with little or no added cost and with budgets well within the cost range of non-green buildings with similar programs.

Plus, the project itself may have natural or built-in LEED points, like construction on a brownfield site, that can reduce any added costs of seeking a LEED ranking.

When considering LEED, it's also important to consider the lifetime costs of the building, which will always point to sustainable construction for savings. A green contractor is familiar with calculating payback periods for measuring the break-even points of various green systems and materials. For instance, a developer that spends more on a geothermal HVAC system with a 4.2-year payback period will start profiting from the system after 4.2 years. In some cases, like the construction of new hospitals, that could mean $1 million or more saved from the operating budget, which can later be spent on modernizing or expanding. Experienced green builders can also identify how long equipment will last, replacement costs, savings over time and true lifetime costs of building systems.

According to the USGBC, green buildings typically save 30 percent in energy, reduce waste costs by 50 to 90 percent, reduce water usage by 30 to 50 percent, have higher rents and resale values, and reduce carbon emissions by about 35 percent. According to Doug Widener, executive director of the USGBC-Chicago Chapter, "most green building innovations will pay for themselves in the first two years and after that it's all return on investment."

Pursuing LEED certification can also provide other financial and time savings that help offset the additional costs associated with the certification process. In Chicago, LEED-seeking projects benefit from a fast-track permitting incentive, which can save months on the schedule and may serve as a blank check of savings when faced with explosive material escalations or an aggressive schedule.

6 Integrate More Revenue-generating Space and Features

Often times, the solution for offsetting the rising costs of construction materials is not the size of the building, but how you use it. Working closely together, the owner, architect and contractor team can maximize a building's rentable square footage. Adding more rentable square feet or converting a non-rent producing space, such as a rooftop terrace, into a rent-producing area will earn the owner additional revenues to justify upfront costs.

Other revenue-generating considerations include incorporating cellular or communication technology on the building's roof, or moving the mechanical systems to the roof to free up valuable floor space. If the building is in a high-profile location, like a central business district, with great viewership by foot, train, car or boat, then there are marketing and advertising professionals who will pay big money for signage rights. Hanging promotional signage on the side or top of your building can generate as much as $50,000 per month. Plus, with new electronic media and changing messages, you may be able to multiply that figure by three or four.

7 Leverage the Contractor as a Development Partner

Seasoned construction firms like Leopardo have the resources, relationships and know-how to be a trusted development partner on most projects. With decades of local and regional experience, some contractors are development savvy enough to counsel or collaborate with clients on sale-leasebacks for freeing up precious capital, tax-engineering strategies for depreciating property quicker and lowering the net tax base, alternative financing methods, municipal grants, and economic development zones.

When dealing with local economic development incentives – such as enterprise zones, empowerment zones, TIF districts, etc. – having experience of navigating the process with the appropriate government agencies will also greatly benefit the client from a time saving standpoint.

When working with a building owner who has tenant leases up for renewal, a qualified contractor can work with the landlord to help them offer more attractive renewal deals by supporting them with cost estimates to define the tenant's wish list. In a competitive market, a good contractor is a building owner's best friend.

Bottom line, the domain of the real estate professional often expands into construction and a smart contractor working in concert with the developer has a variety of money trees to shake for incentives and savings. As the contractor in the partnership, they can also provide completion guarantees to the bank as well as performance and payment bonds, which may prove priceless.

8 Bring the Builder Onboard Early or Explore the Design-Build Delivery Method

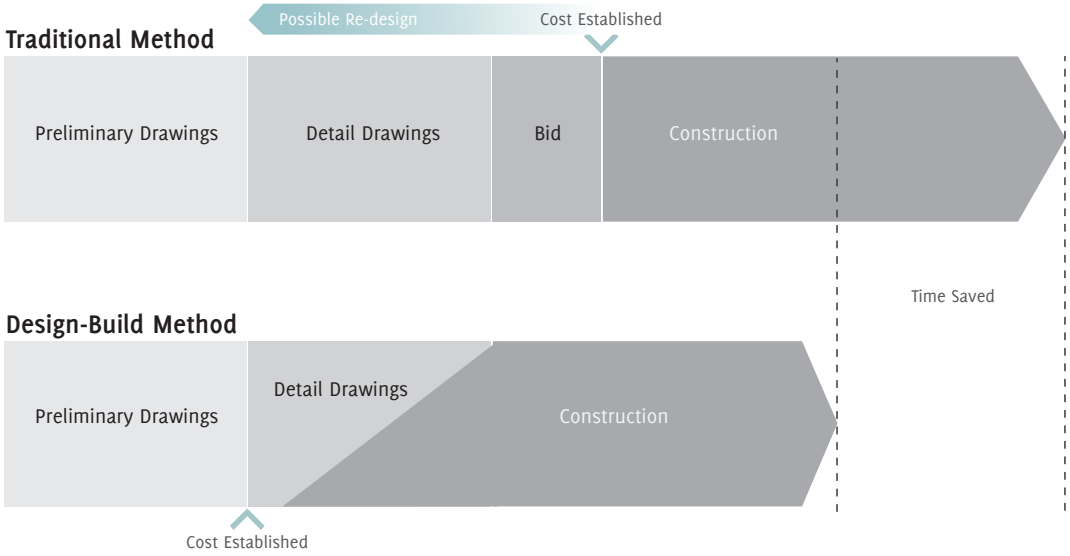
The majority of the other solutions presented in this paper can be realized by simply bringing the right builder onboard during the project's early planning stages when decisions are not set in stone.

Some may argue that bringing the contractor in early will add unnecessary fees to the project but the amount of money saved on material price escalations will outweigh the contractor's fee. Holding out and delaying the project, even just a couple months, could mean future material costs of several million dollars.

In addition to avoiding costly escalations an earlier partnership between the architect and contractor makes for more efficient value designing, addresses critical MEP system considerations and helps prevent re-design. Plus, by having the contractor onboard early, the firm can build permitting packages to start the job earlier, build quicker and deliver faster. A proactive solution to bringing the builder on early is to use the design-build method of construction delivery.

The traditional design-bid-build delivery method is when the owner hires an architect, who designs the project and then goes out to three or four contractors for bids on the drawings. This delivery method has high potential for going over budget and over schedule because it often leads to re-designing and change-orders.

Sophisticated architects are reaching out to partner with savvy contactors earlier on large projects because they appreciate and understand the process benefits and because it reduces the amount of requests for information (RFIs) that subcontractors issue to designers while constructing the facility because something was missing from the original drawings. Ultimately, a reduction in RFIs equates to considerable time and financial savings.



The design-build method is a way to economize and streamline a project by overlapping the design and construction phases with the contractor assuming the majority of risk. If the project doesn't budget out as anticipated, the general contractor operating as the design-builder can redesign the facility in a way that creates value in multiple ways and gives the owner a turnkey price to still do the whole deal on budget. The design-build method commonly produces substantial profitability and is popular for turning seemingly unworkable projects into legitimate opportunities.

9 Fast Track the Project

In 1931, it took only 410 days – or just under 14 months – to complete the Empire State Building, which at 102 floors remained the world's tallest building for 41 years. Today, the amount of construction in cities like Dubai is equivalent to New York City's skyscraper boom of the early 20th century. Dubai is practically being built over night with three, around-the-clock work shifts and thousands of construction workers from all over the world.

Never before in construction has the platitude of "time is money" been more true than it is right now. With construction materials realizing eight percent annual inflation, a project that costs $10 million today will cost $12.6 million in three years. Even shrinking a 24-month schedule to 18 months will generate considerable savings.

Never in construction has time been money more than it is right now.

One way to achieve such speed is through fast tracking construction, which moves away from the traditional linear building process and overlaps the design and construction to enable portions of the project to begin before the design is completed. For example, once the civil engineer finishes the mass grading drawings, the contractor can usually get permits to start work immediately while the rest of the drawings and documents are being finished.

In fast-track construction, the contractor typically orchestrates the process and coaches the design team and owner as to when it needs the documents to keep moving forward without hesitation. This creative sequencing will allow the project to start much earlier in the design phase and save both time and money, especially on big projects.

In cities like Chicago, fast tracking also gives more flexibility for builders to navigate the freezing winter months and keep the project on schedule.

Aside from fast tracking, construction speed can be increased by other tactics including multiple shifts, overtime and stacking of sub trades. With material and fuel prices now escalating at such a steep pace, the savings from building quicker can far outweigh the additional costs of aggressive schedules and overtime.

10 Build Smart, Energy Producing or Self-Powered Projects

Take notes from world architecture, engineering and construction, including the arrival of energy positive buildings. While some of the world examples may be notably larger than your needs, the innovative and dynamic projects in the pipeline globally should serve as motivation for working closely with your architect and builder to think outside the box and stretch the limits of your imagination.

In Dubai, The Dynamic Tower is being labeled as the world's first building in motion. Designed by David Fisher, the tower will use 360 degree rotating technology to constantly change its shape. Between the 78 floors are 77 wind turbines will be positioned horizontally to produce enough green energy for the tower itself and several other nearby buildings. The Dubai Dynamic Tower is expected to be completed in 2010 with another similar project slated for Moscow.

In Abu Dhabi, the capital of United Arab Emirates, the Masdar Headquarters building will feature a massive solar roof that will produce more power than it needs. Designed by Chicago architecture firm Adrian Smith + Gordon Gill, the solar roof will be constructed first in order to provide power for the remainder of the building construction. The building will serve as the centerpiece of Masdar City, which is a $22 billion development that broke ground on February 9, 2008. The Masdar Headquarters will be completed by the end of 2010.
France has also taken a leadership role in energy positive building by pledging all of its new housing will fit into this category by 2020.

Around the world, dozens of new and exciting eco-towers are being built that will eventually catch the eyes of all industry leaders and shepherd the next generation of design and construction. Buildings like the Urban Cactus in the Netherlands; 340 on the Park in Chicago; the CIS Tower in Manchester, England; Bank of America Tower in New York City; the Pearl River Tower in Guangzhou, China; the Bahrain World Trade Center Towers in the Kingdom of Bahrain. Go ahead, Google them.

What you may also discover is irony - Asia is the biggest consumer of construction materials and fuels, yet also the global leader in sustainable construction and energy positive building.

Conclusion

Smart contractors will add tremendous value to any project. They will help take clients and architects out of their comfort zone to discover new cost-effective solutions that will deliver considerable time and financial savings. Contractors have grown to be close relatives of economists. They truly understand that the term "saving" goes well beyond dollars and cents, and counsel clients on price escalations, material demands, supply shortages, alternative methods of construction, lifetime costs, efficiencies and impact on the environment. With a smart contractor onboard early, companies will have countless solutions for offsetting the rising material costs.

Authors

Media Contact: Todd Andrlik | Marketing Director
847.783.3950 | tandrlik@leopardo.com

Mike Behm, AIA | Vice President

847.783.3212 | mwbehm@leopardo.com

Mike has more than 25 years of experience in both architecture and construction. At Leopardo, he oversees all community-related projects, including municipal, criminal justice, parks and recreation, aviation, religious, K-12 schools and higher education facilities. He is a member of the American Institute of Architects and holds a master's of architecture with a concentration in structural engineering from University of Illinois.

Pierre Cowart, LEED AP | Vice President

847.783.3800 | pccowart@leopardo.com

Pierre has 15 years of experience in architecture and design, and construction and development. He handles a diverse range of projects that stress design-build work and fast-track scheduling. Pierre is a member of the United States Green Building Council and holds two master's degrees from University of Illinois – one in civil engineering and one in architecture.

Steve Smith | Vice President

847.783.3300 | swsmith@leopardo.com

Steve has more than 25 years of construction experience and oversees Leopardo's retail, office, industrial and hospitality projects. He has overseen numerous rollout construction projects for national brands like Apple, CVS, National City Bank, Trader Joe's and Washington Mutual. Steve graduated from Western Illinois University with a degree in construction technology.

Rory Tihinen | Project Executive

847.783.3224 | ratihinen@leopardo.com

Rory has more than 25 years of construction experience and works with clients across all of our markets during pre-construction stages to determine the most economical path to completion. He has completed a wide variety of projects including high-rise residential, hospitals, higher education, office buildings, municipal and tenant interiors. He graduated with honors from DePaul University with a degree in finance and a minor in business administration.

Interiors • Healthcare • Retail • Residential Condo • Office • Industrial • Aviation • Community • Hospitality • Building Services

Hoffman Estates, IL • Chicago, IL • Charleston, SC
with job sites across the nation

www.leopardo.com