



The Quantum Quote

Issue 7, February 2012

Very little in the way of preamble this issue, just a mention for the Sea Venture Scouts Crew 4081. They are hosting the [Pacific Challenge](#), a sailing, rowing and seamanship conference and competition that brings teams from all over the state to Skagit County. For our [SICBA Home and Garden Show 3rd Annual Playhouse Challenge](#) this year (wow, that was a mouthful), we've chosen to work with Crew '81 to build a pirate ship playhouse in support of these youth.

I invite all of you to contact me if you are interested in tickets, or better yet, visit the Home and Garden Show on March 16, 17, or 18 to buy tickets and vote for our pirate ship in the People's Choice Award. Until then!



Construction photo of our "playhouse"

Safety Corner

Warming Up

There are very few physical activities in life that don't pose some threat of injury without proper warming up. One of the strongest men I've ever known once hurt himself picking up a garden hose. Most of us have a story about how we hurt ourselves *<fill in the embarrassingly easy task>*.

The science behind strained or pulled muscles is simple in layman's terms. Our muscles are thermo-elastic, meaning they stretch better when warm. Strains (and sprains, their ligament counterparts) basically occur when muscles are overstretched, something much easier to do when they haven't been properly warmed up. It's important to note that strains can result from either a single stressful incident or prolonged repetitive motions.

Many of us learned how to stretch our muscles in elementary school; unfortunately most of us learned wrong. We bend at the waist to stretch out our hamstrings, pull our foot up behind us to stretch our quads, then hit the ground running. Back up a paragraph to the part where our muscles were defined as thermo-elastic. Before stretching, you should warm those muscles up. Five minutes of a light aerobic activity (such as brisk walking) fits the bill perfectly. Next, dynamic stretching is also preferable to the static stretches we learned in elementary. Dynamic stretching involves slow moving, controlled stretches. Yoga is a great example of dynamic stretching. Save your static stretching for after your workout to work on flexibility.

Following these simple steps will not only reduce your risk of injury, but will also increase your productivity. The next time you're putting up a fence or weeding the garden, give warming up a try!

Charity Choice & Last Month's Winner

We're mixing up the Charity Choice for February. All of us know someone who has been affected by cancer. This month our Charity Choice will go towards those who have no choice, sponsoring the American Cancer Society through the Anacortes Relay for Life and the Anacortes Rotary Club. Please keep cancer victims and survivors in your thoughts and prayers. If you'd like to contribute to the Anacortes Relay for Life, you can do so [here](#) or by replying to this email.

Our winner from the December issue likely needs no introduction; the **Anacortes Salvation Army** garnered the votes to win the Charity Choice. The Salvation Army supports our communities in a variety of ways, including food, shelter, toys for underprivileged children, counseling and so much more! You can learn more about the Salvation Army at <http://www.salvationarmyusa.org>.

Sustainable and Efficient

Life Cycle Cost Analysis

One foundational pillar of sustainable and efficient construction is Life Cycle Cost Analysis. Simply put, Life Cycle Cost Analysis (LCCA) looks at the installation or construction cost, the removal and replacement cost at the end of its life, and everything in between. We could also include added value (such as comfort), but for our purposes, we'll limit it to the financial picture.

Buying a car happens to be my favorite analogy for life cycle cost analysis, since most of us subconsciously use it already. The first question I ask when buying a car is *does this car meet my needs?* If not, move on. A new electric [Volt from Blade Chevrolet](#) is perfect for a commuter vehicle (*full disclosure: shameless plug for a*

current client and long time supplier of our vehicles). However, the Volt may be impractical if you're a contractor who picks up lumber daily (my fingers are crossed for a [Silverado Hybrid](#) the next time we buy a truck). Applied to LCCA, our first criteria should be that the item in question meets our needs.

Next in our car example, I look at five costs: the initial purchase cost, the projected magnitude and frequency of maintenance costs, fuel efficiency, insurance rates, and the car's resale value down the road. Say I get a small imported sports car, cherry red, for a great deal. It gets 15 miles to the gallon, my insurance premiums skyrocket, and within five years, I have \$5,000 in repair costs. My great deal suddenly doesn't sound so great.

Let's apply this to a new office building. Imagine for a moment that you'd like to build a new mixed-use building in Mount Vernon as an investment. Your ground level will have retail storefront, your second floor will hold several office suites and you plan to rent out the top floor as a pair of condos. First, your design will be significantly dictated by the use of the different floors. No cobb buildings here. Second, you'll look at factors within your control for LCCA. For brevity, let's single out the HVAC system.

When we apply our cost metric, we end up with something like this: a) A single HVAC system for the building with different climate zones throughout the building is a cost effective approach; b) You plan to own and lease this building out for 30+ years. Since utility bills related to HVAC will be absorbed into your operating costs, you're looking for an efficient system. The return on investment (ROI) for the added cost of a high efficiency system will pay itself off after a few years, then you're basically putting money in your pocket. You may also qualify for energy incentives offered by utility companies; c) You'll want to select a system with a proven track record so you're not always calling a repairman. That will quickly erode your ROI, not to mention the headache to you and tenants; d) Finally, you'll want to select a system with a long life so you don't have to replace it anytime soon. In this scenario, you'll probably spend a little more upfront, but the cost savings over the life of your investment significantly overshadow that.

Let's sum it up: life cycle cost analysis is a comparative process that takes a look at the anticipated costs over the entire usage period of the products to determine which is most cost effective overall. It's a simple, but often overlooked analysis in construction.

Building, Start to Finish: Part 3

If you're joining us for the first time, we're at the third installment of "Building: Start to Finish," an abbreviated, reader-friendly look at a typical construction or remodel process. At the end of our last article, readers were left with a finished foundation. In this article, we'll explore the building as it begins to stand up and be noticed.

Framing

No doubt you've driven by a building lot before and did a double take. Where did that house come from?! The house was probably in the framing stage, where the contractor begins to erect the skeleton of the house. There are four basic types you might see: stick framing, structurally insulated panels (SIPs), masonry or block buildings, and insulated concrete forms (ICFs). Stick framing, the most common technique, uses wooden or steel studs to literally build the house piece by piece, covering it with wooden sheathing to enclose it. It's a fast, affordable technique, allowing most houses to be framed in two to four weeks. Advanced framing is when larger studs are spaced at wider intervals, typically 2x6 studs spaced at 24 inches. Its goal is to increase the thermal properties of the wall by replacing heat conducting studs with insulation.

Structurally insulated panels are prefabricated walls of foam insulation sandwiched between sheets of OSB. Common in high efficiency homes, SIPs typically cost more than stick framing materials but are erected faster, saving labor, with a net result of being equal or slightly more expensive than stick framing. Locally, masonry structures are more common for commercial structures and include brick and concrete bricks (CMU). Finally, insulated concrete forms are another building

technique favored by high efficiency structures. When using ICFs, panels made of an insulating material are used to pour concrete walls for the height of the structure. The result is a highly insulated, air tight building, similar to those constructed with SIPs. It should be noted that each of these framing techniques refer to exterior walls. In most cases, stick framing will be used to build interior walls.

Tips for Savings

During your design phase, work with your architect to make your plans more buildable. For example, reducing the number of wall corners and using standard dimension can each save small amounts, as well as reduce construction waste.

In terms of construction costs, advanced (stick) framing is most likely to save you money. You can also ask the contractor to look for incremental savings, such as eliminating or substituting unnecessary or expensive hangers or connectors. Structurally engineered products, such as glulams or I-joists, may also save money over conventional wood beams in some applications.

Tips for Success

Framing provides a great opportunity for life cycle cost analysis. SIPs and ICF construction may cost more for installation, but realize savings in furnace size and monthly heating or cooling costs. Discuss the benefits and drawbacks of these with your builder or architect to determine which is right for you. If pursuing SIPs or ICF construction, it is important to work closely with your plumber and electrician prior to beginning construction, as it limits their work.

Windows and Doors

The next step after framing is external windows and doors. There are five basic types of window frames: vinyl, fiberglass, wood, aluminum, and composite. Vinyl frames are the most common, as they are affordable, low maintenance and offer good thermal properties (reducing heating bills). Fiberglass windows are similar to vinyl, and can also be painted and shaped with more architectural freedom. Wood windows look great and can be painted or stained, but require regular maintenance and are more expensive than vinyl. Aluminum windows' strength grants them greater architectural flexibility and low maintenance, but cost and thermal properties can also suffer. Composite windows are a combination of two frame materials, which vary by manufacturer. Manufacturers also provide coatings to glass that improve and optimize performance. Windows also come in different styles and operations, from bay and double hung to casement and pictures windows.

Doors come in many of the same materials as windows, with the same benefits and drawbacks to each. Also customizable in doors are "lite kits," which are the glass sections of your door. Typical options include full-lites (whole door glass), half-lites (half door glass) and divided-lites (which use smaller pieces to make up a pattern). Side-lites, the windows directly adjacent to a door, are also available. Doors often come prehung in the frame, allowing streamlined installation by the contractor.

Tips for Savings

Windows and doors also benefit from life cycle cost analysis, weighing the benefits of low maintenance and insulating values to construction costs. There's often an economic and performance sweet spot between cheap windows and ultra-high end windows. Vinyl windows are perhaps the best value for the money, offering great performance and low prices. As a quick comparison, aluminum windows can cost roughly double the price of similar vinyl windows. Assess how often you will open the window, as opening windows cost more than picture windows and a difficult-to-reach window is unlikely to be opened regularly. For both windows and doors, find a reputable manufacturer, but don't get stuck on brands.

Tips for Success

It's important to work with your builder and architect to find the right windows and doors for the right job, looking at the whole package. There's no point in buying an expensive solid wood front entry door and pairing it with a cheap handle or frame. Also consider the typical traffic through a door when selecting sizes. Sizes are described in width by height terms, so a 3068 door is 3 feet, 0 inches wide by 6 feet, 8 inches tall. When discussing doors or windows, use pictures to communicate exactly what you would like; many people use different door terminology and mix-ups are common.

You'll notice during this issue that we mentioned life cycle costs a few times. It's easy to cut construction costs with disastrous ongoing results. For example, skimping on insulation might save a few hundred bucks upfront, and cost you hundreds a year in heating costs. Make sure you keep a good balance between cost and quality throughout your project, and plan ahead to ensure you have the funds to finish it as intended. Next issue we'll continue on to discuss electrical, plumbing, mechanical and our building envelope.

[Quantum Construction, Inc.](#) is a family-owned general contractor based in Anacortes, WA. Quantum has been building high quality commercial, custom residential and industrial projects since 1984. For information on how we can give you the best building experience, please contact us by [email](#) or by phone at (360) 293-0656.



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