DELANO
ARCHITECTURE

DESIGN CONSIDERATIONS: cost and energy

Buildings cost money to build and money to operate. I have included some information to help us focus in on how money will affect our decisions during the design process.

In addition to the design features you would like included in the project, such as the number of bedrooms and types of materials, there are other aspects we will consider which affect the performance of the building once construction is complete. Because money is at the heart of many of these decisions, I will begin with how design choices will affect your bottom line.

BUDGET- the cost of any project is a result of three things: size, complexity, and materials.

Size

square footage(SF) = cost. Construction costs for New England begin at $300/SF as a minimum for custom design projects and go up in cost from there depending on project scope, complexity, and finish selections. Unfinished and unheated garages begin at $75/sf. This does not include land acquisition, complex or extensive site preparations, landscaping, permit fees, or Design Fees.

Complexity

As a general rule, a simpler building will cost less money. Complexity also has other effects, which are desirable, or may even lead to a *decrease* in building cost. For instance, complexity is often more visually appealing (many beloved architectural styles are some of the most complex to build), or complexity may even allow two or more design requirements to be solved with one solution. That single solution may save square footage (which will save money), but may add cost by it being more complicated to build.

Because complexity affects many aspects of the design--both positive and negative--we will strive to balance each decision by weighing its effects on the design with those of cost.

Materials

Often, the least expensive materials to buy and install, cost the most to maintain: they have low durability, do not age gracefully, or need replacing more often. For example, stone costs more than wood to install, but costs almost nothing to maintain once it is in place. Pine siding costs less than cedar siding, but will need more regular maintenance, may not age as gracefully, and/or may need to be replaced sooner.

VALUE-DRIVEN DESIGN- life-cycle cost

The simplest way to judge the cost of a decision is to look at the price tag: how much does it cost for the material, and how much for the labor to install it? If you were to sell your house

immediately after the renovation is complete, that would be a logical way to judge the price.

However, if you are planning to live in the house for longer than 10 years, we should think about it differently- in terms of its life-cycle cost. The life-cycle cost is where we judge the cost of building materials over your *ownership period* rather than just the cost during construction-- factoring in over time, maintenance costs, finishing costs, and/or replacement intervals. When we do this, the decisions involve a few more factors for consideration, but are more realistic to the value of your time, energy consumption, comfort and enjoyment of your property.

We think of this as **value-driven design** and should be the leading unit of measure for making decisions during design and ultimately, for judging the success of your project.

ENERGY

The recipe for low heating costs is high Insulation values and complete air sealing for the entire building envelope. When we think about the building being "well insulated" we should consider the insulation type, its thickness, and the detailing of the cavity into which the insulation is placed. For instance, when we install R-21 insulation into a 2x6 stud wall, the overall R-value of that wall is somewhere between 8 and 21-- 8 at the studs, and 21 in between. The more studs we have, the lower the insulation value of the entire wall- generally it is somewhere around R-12-15. There are many different insulation types and methods for installing them which will yield a higher, overall R-value, closer to 25-- or even much higher—for the entire wall.

Even more important to insulation, however is proper air sealing of the perimeter of your building. New building assemblies and materials make air sealing easier and more integrated into the building process, but it takes care during construction to get it right. The best method for air sealing your project will be developed during the design development phase, and must be carried out effectively during construction.

With all the benefits of tighter, well-insulated buildings, there is concern of stale air and a potential for condensation causing rot in wall and roof assemblies. The best and simplest method to eliminate this problem is to install an ERV (Energy Recovery Ventilator). This is a ducted, mechanical device that replaces stale, interior air with preheated fresh air from the outside.

Let us work together to create beautiful, long lasting buildings that effortlessly keep us warm in the winter, cool in summer and rich in spirit every single day. It is a challenge to do so, but the rewards are great.