

Designing a concrete building frame: can less cost more?

During the value engineering process for concrete frames, the common approach— both in theory and in practice—is to search for ways to cut back on materials. In the pursuit of economy, each structural element is carefully examined to make sure that it is no heavier, wider or deeper than its load requires. Yet, for all the time and effort spent on reducing materials, total frame costs don't go down, but up.

To concentrate solely on permanent material reduction is to overlook the most important influence on concrete structural frame cost— formwork. While formwork is not even a tangible part of the finished structure, it can account for over 50 percent of the cost of a site-cast concrete frame. It follows then, that any realistic effort to economize must integrate the construction process in its entirety: materials, plus time, labor and equipment.

Concrete frame economy begins in the design development stage. Often, two or more structural solutions will meet the design objective equally well. One may be significantly less expensive to build. To arrive at that optimal solution at the initial design stage—not later—requires a basic sense of formwork logic.

Ceco Concrete Construction has been constructing concrete frame buildings since 1912. This text is a product of that experience. The following recommendations and practical suggestions are intended to help both designers and builders capitalize on the economic advantages of site-cast concrete.