

## The low-cost answer: a 10-step approach

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There are endless ways to design a sitecast concrete building. Since few designers are accorded the luxury of unlimited time, an acceptable solution must often be found under severe time constraints.

Getting started—when the paper is blank—is the most difficult stage. And, at this point, it is the designer's challenge to reconcile all structural, economic, aesthetic and functional considerations.

Value Engineering is a practical, 10-step process that helps integrate all these considerations, particularly the economic, right from the start:

1. Envision the structure as a whole.
2. With freehand sketches, compare all likely structural alternatives.
3. Make rough sketches of typical bays across the building.
4. Establish uniform column locations, with orientation and size constant where possible. Consult the "CRSI Design Handbook" or other design aids shown on page 25 to establish preliminary sizes.
5. Evaluate the sketches and make rough cost comparisons. Consider consulting a Ceco office about economic variables relating to formwork, which in turn may influence the basic structural system. Ceco will assist in developing preliminary unit costs, even to the extent of providing a total per-square-foot estimate for the entire building frame.
6. Select the framing scheme which best seems to balance structural and aesthetic objectives with economic constraints.
7. Distribute prints of the selected framing scheme to all design and building team members to solicit suggestions that may reduce future changes.
8. Refine the design, placing emphasis on aspects with the greatest economic impact on structural frame cost.
9. Visualize the construction process and the resultant impact on cost.
10. Establish specifications that minimize construction cost and time by including items such as early stripping time and acceptable finish tolerance.