FEATURE

GREEN IS GOOD, GREEN WITH PREFAB IS BETTER

By Dr. Perry Daneshgari & Dr. Heather Moore
with contributions from John Armitage

As an increasing number of owners and jurisdictions adopt or specify local, state, or international codes or standards in support of green building options, strategies to cost effectively conform become increasingly vital for your organization.

From the standpoint of a building's or facility's total life-cycle cost and impact, sustainable, green, or living building design and construction can prove to be a viable option for lower total cost of ownership.

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The question becomes, do these methods necessarily imply greater cost of delivery? Yes and no. While materials, methods, and regulations may incur some higher costs, each phase of the project will have opportunities to better manage costs through skillful use of design, planning, and improved processes of project and resource management. When limits exist, innovation will provide success.

Understanding "Green"

What does green construction mean to you? The intent, requirements, understanding, and implementation vary widely by region and jurisdiction. Perhaps these standards are not required or enforced, but the owner wishes to honor the intent of green building practices. As a contractor, understanding these standards will be crucial to putting the green in your pocket versus being left feeling green.

When you refer to standards such as the ICC's International Green Building Code or California's CALGreen, it's obvious that new or different means, methods, and procedures must be put in place. What may not be so obvious is that the standards for sustainable construction provide a pathway to improved practices and can actually encourage a 'systems thinking' approach to the entire project.

Taking this facility-as-a-single-system view encourages collaborative and innovative decision-making. Starting with the early concepts through the design phase, cost control and value-adding decisions can be engineered into the design. Diligent scheduling and sequencing of work flow across all trades will encourage cooperation, shorten durations, and root out conflicts and gaps in design info that the coordination efforts missed.

With more detailed planning, options and opportunities become apparent.

Prefabrication Benefits in Support of Green

Prefabrication has provided cost savings and waste reduction as a matter of practice for decades. Various contractor trades have seen organizational benefits from the methods and technologies used to process materials and prefabricate assemblies and modules away from the job site, or Externalizing the Work®.

Firms that employ prefabrication do so to reap the benefits of labor and material cost improvements and greatly reduced job site schedule, risks, and liabilities. These practices also yield benefits that can reduce the cost or schedule impact of any sustainable initiatives or requirements.

Some of the green benefits are obvious:

- Less material is wasted in the assembly.
- Less material is lost or damaged on the site.
- Less material is ordered.
- Waste materials are handled away from the site.
- Recyclable materials are more easily captured.
- Painting, finishing, or coating is done in a controlled environment.
- Reusable shipping and packaging containers can be used.
- Cleaner job site, less effort, and fewer resources spent on housekeeping.

Some benefits are not so obvious. For example, requirements from CALGreen address soil erosion, material and equipment management, and pollutant control. How can a strategy of prefabrication address these issues on a job site?

1. Soil Erosion

Whether in mud or dust, each vehicle or piece of equipment that moves through increases the soils and contaminants leaving the job site. Having a strategy of prefabrication will allow a number of control tactics:

- Reduce the number of material deliveries.
- Reduce the area required to be cleared for material staging allowing more of the site to remain undisturbed.
- Reduce the number of employees required on site, leading to less vehicle traffic and less area required for parking.
- Use of prepared conduit or pipe or preassembled sections of duct bank and effective scheduling and sequencing reduces the time a trench and spoils are exposed.

2. Material and Equipment Management

Many materials and most equipment take up valuable space and are time-sensitive; they degrade or decay, need maintenance, or leak. Each container of adhesive that freezes, bucket of hydraulic oil that gets dirt in it, box of fittings or fasteners that weathers, or spill absorbent from the leaking bender becomes an environmental contaminant and must be disposed of properly. Proper disposal of many of these materials is a challenge on site. Your strategy of prefabrication

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in a controlled environment can manage, control, minimize, and contain these risks:

- Chemicals and products used in your processes are protected and used more efficiently. One container can support three projects and be disposed of empty rather than three partial containers disposed of improperly.
- Hazardous materials are properly stored and managed, and exposed only when needed.
- Only the material needed is purchased, immediately used, and never exposed to the elements.
- Sites will always need equipment to complete installation tasks. Centralizing as many of these operations off-site as possible reduces the impact of equipment and machines:
  - » Decreasing the on-site quantities and types of equipment and the length of stay reduces the risk of leaks and the need for maintenance and care on site.
  - » One pipe threader or hydraulic bender in a centralized shop and reduce the need for duplicate equipment on multiple sites.
  - » Equipment in a shop environment will have greater lifespans, less downtime, and require less maintenance

3. Pollutant Control

To address multiple concerns, pollutant controls are requirements of green standards as well as specifications of healthcare and technology installations. The cleaner the installed material can be kept, the better adherence to these standards and the lower the cost of final cleaning and certifying.

Many of these benefits are inherently intrinsic to prefabrication:

- Materials are less likely to become soiled or exposed to pest entry.
- Assemblies can be clean and sealed for transport, staying sealed until final use or finish installation.
- Some assemblies can be pre-tested, reducing the time required on-site for commissioning.
- Assemblies and structures that may be exposed to rain or dust during the phases of traditional construction can now be complete and protected.
- Paints, finishes, coatings, and adhesives are cured prior to arrival in the building.
- Better off-site management, control, and disposal of hazardous and volatile materials.

Prefabrication as a Core Strategy in Support of Green

How can prefabrication benefit your entire organizational structure? Every innovation must meet a series of tests to prove its viability and profitability. One key test is: Can this be produced and sold at a profit?

Whether it's an ice cream sandwich or a microchip, the process of production must be perfected. The design and production technologies available to the market now are making possible the Industrialization of Construction®.

It is said that change is inevitable. Better that change be strategic. The difficulty in planning change is identifying what and how to change. Establishing a strategy of prefabrication will provide clear pathways for organizational improvements. To produce the perfect and profitable ice cream sandwich requires the organization align process to support that production.

By setting prefabrication as a key strategy in project development and execution, improvements will be seen in design, collaboration, planning, and quality. When these benefits fully mature, your project can't help but be green!

Companies large and small have benefited greatly by seeking out extensive training and/or prefabrication design through companies, like MCA Inc., who have dedicated decades of research to bettering today's industry.

Dr. Perry Daneshgari is the president/CEO of MCA Inc. MCA Inc. is a research and implementation company that focuses on implementing process and product development; waste reduction; and productivity improvement of labor, project management, estimation, accounting, and customer care. He has published four books and an ASTM Standard for Job Productivity Measurement.

Dr. Heather Moore is vice president of Operations for MCA Inc. She holds a Ph.D. in Construction Management from Michigan State University. Additionally, she holds an MBA from University of Michigan (Flint) and a B.S.E. in Industrial and Operations Engineering from the University of Michigan (Ann Arbor). She was a contributor for the ASTM Standard E2691, "Job Productivity Measurement," and was co-author of the newly published ASTM book, "Application of ASTM E2691 Standard Practice for Job Productivity Measurement in Agile Construction®."