

New Challenges and Responsibilities Facing Contractors in a Low-Carbon World

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Agenda

- The Challenges:
 - Design Codes and Specifications
 - Resistance to Change
 - Financial Focus
 - Lack of Clarity and Standardization
 - Moving Beyond “Cement”
 - New Materials
 - Speed to Market
- The Opportunities:
 - Shifting the Project Delivery Narrative
 - Allowing Alternatives
 - Flourishing of New Technologies
 - Separate the Cream of the Crop
- The Responsibilities:
 - Open Minded
 - Solution Driven
 - Be Part of the Solution

Challenge: Design Codes

IN-LE Inch-Pound Units

An ACI Standard

Building Code Requirements
for Structural Concrete
(ACI 318-19)

Commentary on
Building Code Requirements
for Structural Concrete
(ACI 318R-19)

Reported by ACI Committee 318

ACI 318-19



ACI 360R-10

Guide to Design of Slabs-on-Ground

Reported by ACI Committee 360



American Concrete Institute®



Challenge: Specifications



4 inch
Slump
Maximum

Maximum w/c
(without a
durability need)

Supplementary
cementitious
materials not allowed

Maximum cementitious
contents and/or
replacement limits



Challenge: Resistance to Change



Please...GC/EOR/Owner...will...you...just...hear...me...out?

Challenge: Financial Focus

- Developers' short term financial decisions are given higher priority than long term financial and environmental decisions
- Difficult to propose alternative design materials and methodologies



Challenge: Lack of Clarity and Standardization

A lack of clarity and standardization (and some would say transparency) in low-carbon design and construction practices makes it difficult for owners, contractors and designers to reach the best decisions.



Challenge: Moving Beyond “Cement”



**CHANGE
THE
NARRATIVE**

 **IT'S
NOT
CEMENT
= ITS =
CONCRETE**



Challenges: New Materials – Risk and Reward



Two important considerations:

1. Material changes bear more risks to some constructed elements than others
2. Not all material changes are bad...some are just poorly communicated and coordinated



Binary Cements
(PLCs, Type IL)



Ternary
Cements



Type K Cement

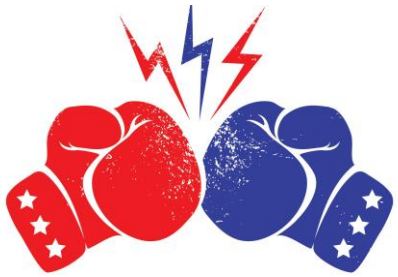


Challenges: Speed to Market

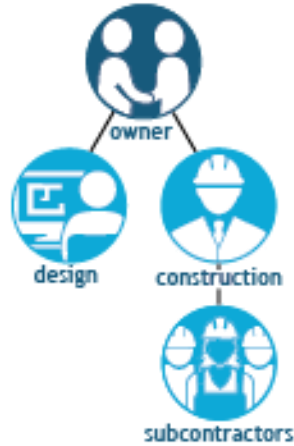
- Developers want faster...
 - Challenges in design phase
 - Challenges in budgeting phase
 - Challenges in construction phase
- The current project delivery system is not suited to lowering carbon in a risk-sensitive industry



Opportunity: Shifting the Project Delivery Narrative



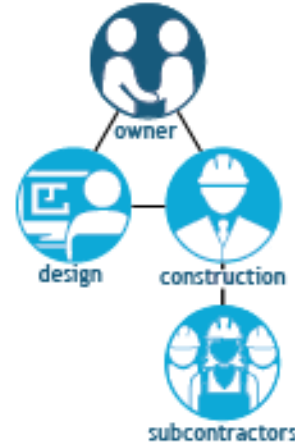
Design-Bid-Build



Design/Build



Construction Manager-at-Risk



Integrated Delivery



Opportunity: Allowing Alternatives

- ACI 318-19
 - Section 1.10: allows the possibility of alternative systems of design and/or construction, and alternative materials not covered by the Code

Delegated design slab systems often provide the greatest opportunities to reduce the carbon footprint of the slab, whether on ground or elevated!



Opportunity: Flourishing of New Technologies; Delegated Design System delivered by Contractors



SigmaSlab®

BUILDING SUSTAINABLE STRUCTURES

CCL's latest innovation, in partnership with Bekaert, combines XU/XF post-tensioning (PT) systems with Dramix® steel fibers delivering sustainability benefits for environmental impact, material transport, construction speed and resiliency.



Opportunities: Cream of the Crop



Responsibilities: Open to New Ideas

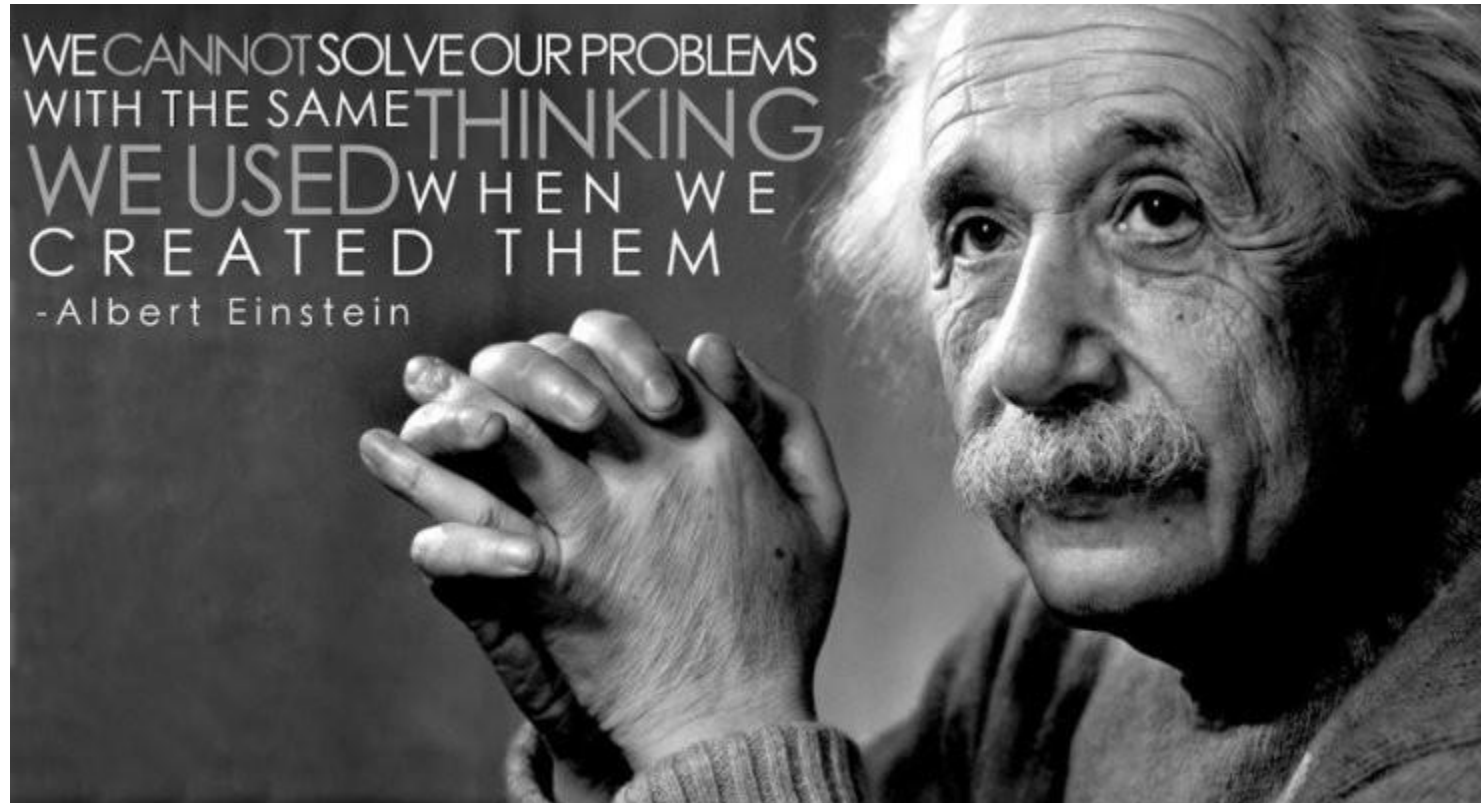
Problems and Misconceptions

- GCs aren't interested or don't want to be bothered with it
- Engineers won't listen
- Owners won't pay for it

If you don't ask, you won't know!



Responsibilities: Solutions Driven



THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



Responsibilities: Be Part of the Solution

