

Defining Concrete Constructability

A proposal for consideration and action

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Although at least 32 ACI committee documents use the word “constructability” or “constructibility,” we are aware of only three that provide an insight as to what constructability means. Also, while Section 9.6.3 of the ACI Technical Committee Manual (ACI TCM-18)¹ instructs committees to avoid using the word “constructability” in documents and instead use the “constructibility” spelling, neither that document nor ACI Concrete Terminology (ACI CT-16)² defines the term.

More than 110 years passed and well over 100 other committees were formed before ACI established Committee 134, Concrete Constructability, in 2017. With a mission to “Develop and report on best practices for constructability for concrete structures,” the committee membership comprises a diverse group of contractors, structural engineers, and owner’s representatives.

“Concrete constructability” has sometimes been used as a marketing buzzword. It is a catchy phrase, but we believe that it is an overused term that is rarely associated with benefits. ACI Committee 134 now has the opportunity to provide a meaningful definition that can be incorporated into ACI Concrete Terminology and set the stage for other ACI committees to address the associated issues in their documents.

We suggest a working definition based on the work of the Construction Industry Institute (CII), a consortium of more than 130 firms representing the interests of owners, designers, contractors, and suppliers. Based at the University of Texas at Austin, Austin, TX, the CII has been in existence for almost 40 years. The following is CII’s best practice definition of constructability:

“The effective and timely integration of construction knowledge into the conceptual planning, design, construction, and field operations of a project to achieve the overall project objectives in the best possible time and accuracy at the most cost-effective levels.”³



Detailing columns with mechanical couplers can help reduce congestion and improve constructability (photo courtesy of Tipping Structural Engineers)

The most important concept within this definition is the integration of construction knowledge throughout the project duration—from planning and design through construction and closeout. CII states that “The benefits of an effective constructability program include:

- Reduces overall project cost by 4.3% on average;
- Reduces overall project schedule by 7.5% on average;
- Improves project quality (maintainability, reliability, and operability);
- Improves project safety, security, and environmental impact; and
- Minimizes rework and rescheduling on the project.”⁴

CII acknowledges that the customary practice in the industrial/commercial construction industry is to develop a design review team composed of planners, designers, and a variety of construction personnel, with the sole purpose of

reviewing a completed or partially completed design for constructability issues. CII emphasizes, however, that this practice creates the “review” syndrome.⁵ That is, changes at this point are unlikely because:

- Major changes will cause delays and increased expenses; and
- The credibility of the designers will be threatened by late stage changes.

The concrete industry can benefit from true constructability that is incorporated throughout the project life cycle, on every concrete project, and within every project delivery system. Our proposal is for a definition of constructability, based on the CCI best practice definition of constructability, but focused on concrete construction:

“**Constructability**—The effective and timely integration of concrete construction knowledge into the conceptual planning, design, construction, and field operations of a project to achieve the overall project objectives in the best possible time, with the highest safety, and at the most cost-effective level of quality.”

References

1. ACI Technical Activities Committee, “Technical Committee Manual (ACI TCM-18),” American Concrete Institute, Farmington Hills, MI, 2018, 71 pp.
2. “ACI Concrete Terminology (CT-16),” American Concrete Institute, Farmington Hills, MI, 2016 (ERRATA as of Jan. 6, 2017), 74 pp.
3. “Constructability: Best Practice Definition,” Construction Industry Institute, Austin, TX, www.construction-institute.org/resources/knowledgebase/best-practices/constructability.
4. “Constructability Implementation (Best Practice), RT-034 Topic Summary,” Construction Industry Institute, Austin, TX, www.construction-institute.org/resources/knowledgebase/knowledge-areas/design-planning-optimization/topics/rt-034.
5. “Constructability (Best Practice), RT-003 Topic Summary,” Construction Industry Institute, Austin, TX, www.construction-institute.org/topic-summaries/rt-000-100/constructability.

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