REDUCING PROJECT COSTS THROUGH EFFECTIVE CONSTRUCTABILITY REVIEWS

A Pre-Construction Best Management Practice

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OVERVIEW

• Experience has shown that the ability to reduce project cost is much greater early in the life of a project.

• Much of the opportunity is past once the project is out for bid.

• Constructability review during the design phase is a key to project success.
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THE INFLUENCE GRAPH

- Influence
- Opportunities to Influence Project
- Costs
- Costs of Unresolved Issues

Time / Stages of Development

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WHAT IS A CONSTRUCTABILITY REVIEW?

- A *structured* review of the project and design documents to ensure:
  - Feasibility of construction
  - Design as represented in the plans and specifications is biddable and constructible
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TWO TYPES OF REVIEWS

Feasibility Review – Early In Design

- Site Constraints
  - Access
  - Lay down areas
  - Availability of utilities
  - Height restrictions

- Schedule Constraints
  - Duration
  - Allowable work hours
  - Sequencing
  - Time of year
  - Weather impacts
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TWO TYPES OF REVIEWS

Feasibility Review (cont.)

• Resource Constraints
  – Materials
  – Labor
  – Equipment
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TWO TYPES OF REVIEWS

Detailed Document Review – Later In Design

• Bidable & Buildable
• Looking for
  – errors
  – omissions
  – ambiguities
  – conflicts
• Coordination
  Sometimes referred to as a Bidability Review

• Complete instructions
• Inclusion of:
  – Permit requirements
  – Geotechnical study recommendations
  – LEED analysis
  – Hazmat report
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CLARIFICATION

• **Constructability Review**
  – Looks at how the design is represented to the contractor
  – Is the contractor provided complete and unambiguous instructions on what to build?

• **Design / Peer Review**
  – Looks at the design per se
  – Is the design correct per engineering, architectural, regulatory, and code standards & requirements?

• **Coordination Review**
  – Coordination of disciplines only
WHY DO CONSTRUCTABILITY REVIEWS?

A design is a unique, one time endeavor requiring scores of individuals making hundreds of decisions on thousands of building components. It does not have the benefit of product testing. A perfect design will not result.

A third party review will help!
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WHY DO CONSTRUCTABILITY REVIEWS?

Suddenly, a heated exchange took place between the king and the most contractor.

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WHY DO CONSTRUCTABILITY REVIEWS?
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WHY DO CONSTRUCTABILITY REVIEWS?

Primary Benefits

• Reduces RFIs
• Reduces change orders
• Reduces likelihood of impact claims
• Reduces impossible and impracticable requirements

Savings = $6 to $27 for each $1 invested in the review
WHY DO CONSTRUCTABILITY REVIEWS?

Primary Benefits (cont.)

• Cleaner contract documents =
  – More attractive project
  – More bids
  – Lower bids – less contingency

More Savings!!
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WHY DO CONSTRUCTABILITY REVIEWS?

Side Benefits

• Less RFIs and Changes =
  – More management on construction
  – Better relationships
  – Better attitudes
• Better quality
• Better schedules
• VE suggestions
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REVIEW FORMATS

• Workshop
  – Better for VE
  – May catch big issues

• Independent Study
  – More detailed
  – Will find more issues
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REVIEW PROCESS

• Compile documents
• Team orientation
• Site visit
• Document review
• A/E Review and Respond
• Reconciliation Meeting
• Back Check
• Final Report
EXAMPLE CONSTRUCTABILITY ISSUES

- Three sizes of generators
- Leland Stanford’s tree
- Overhead power line interference
- Backflow preventer
- Wrong soil elevation
- Conflicting permits
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EXAMPLE CONSTRUCTABILITY ISSUES

• Civil pad elevations
• Civil utility plans/plumbing site plans
• Civil utility plans/landscape plans
• Structural beams/HVAC ducts
• Structural top of steel elevations
• Structural/architectural
• Gridlines & dimensions
LESSONS LEARNED

• Site visit critical
  – As-builts poor
  – Designer & constructor perspectives differ

• Say it once – Say it right

• Need to budget & schedule the review

• Don’t hide the results
LESSONS LEARNED (con’t)

• Back check to get maximum value
• Need qualified reviewers
• Need a developed Review Methodology
• Review with “eyes of a contractor”
• Review team needs all disciplines
LESSONS LEARNED (con’t)

• Benefits designer
• Quality of documents is decreasing
  – Less principal involvement
  – Cut and paste details
  – Workload too high
• There is no industry standard definition of “constructability review”
FAQs

• Why do a constructability review? I’m already paying the designer for good plans and specs.
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FAQs

• Should owner pay to have the designer make the corrections?
FAQs

• How much does a constructability review cost?
FAQs

• How long does a constructability review take?
FAQs

• Can’t you just do a quick review and find all the big problems?
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FAQs

• When is the best time to do a review?
FAQs

• Our change order rate is only 10%, so why should we do constructability reviews?
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FAQs

• Do you spell it “constructability” or “constructibility”? 
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CONCLUSIONS

• While there will never be a perfect set of plans and specs, a constructability review will help improve the quality.

• A constructability review should be viewed as an investment, not an expense.
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QUESTIONS