

Ci3 India: Action Item – 3a – Design Process Improvement

Kick off Concept Paper

1. Background:

The focus of construction project management has conventionally been on the construction phase. This is primarily due to the fact that most of the spending occurs during this phase. However, the decisions and outcomes of the design phase have a strong influence on construction and the project outcome as illustrated in the classic cost-influence curve shown in figure-1. Further, buildings have evolved from products with a primary focus on structural requirements to complex products with multiple systems and multiple performance (often contradicting) requirements to be delivered on a compressed schedule. This has resulted in increased challenge and complexity of the building design process. However, the systems to specify and manage design deliverables have not evolved to match the challenge and complexity of the process - hence the quality of the deliverables from design are compromised which has a detrimental effect on the overall project outcome.

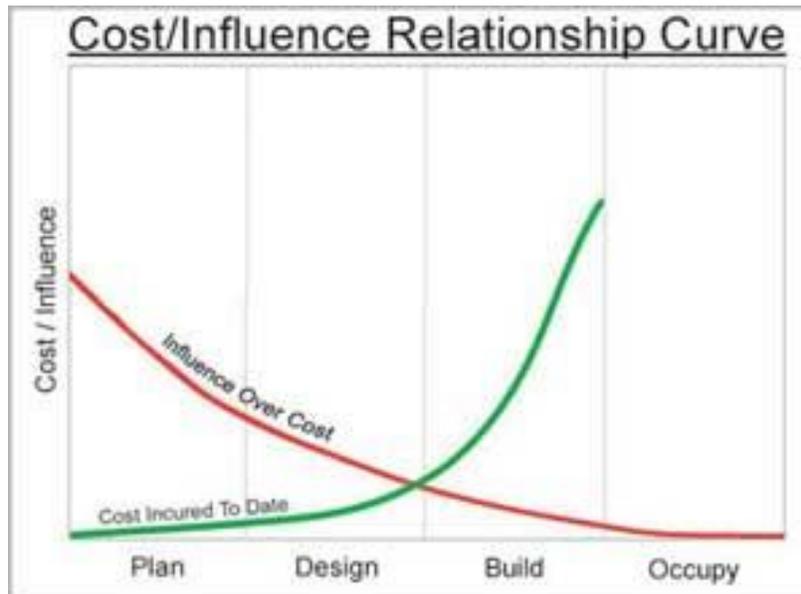


Fig. 1. Cost-Influence curve

2. Objective:

The objectives of the forum with respect to this action item are:

- (i) Identify and categorize issues in the current design process which impact project objectives.
- (ii) Discuss and propose mitigation measures which can be initiated by the client to resolve the issues identified.
- (iii) Prioritize the mitigation measures based on implementability and impact and implement selected measures on pilot projects and study the impact.

3. Methodology:

The proposed methodology to address the above objectives:

- (i) Workshop to discuss, identify and categorize the issues in the current design process. Participants should also provide anecdotes, case lets to illustrate specific factors.*
- (ii) Report compiling factors by research team and identification of possible mitigation strategies and prioritization model*
- (iii) Workshop to discuss, prioritize mitigation measures to be implemented on pilot project & identification of pilot projects.*
- (iv) Implementation and evaluation on pilot implementation*
- (v) Report on findings from pilot implementation*

4. Preliminary Step:

As a preliminary step factors which influence the design process are identified below. These factors are provided as a step towards generating discussion within the forum:

1. Field conditions / investigations not thoroughly documented.
2. Construction started before Design is complete - management of design-construction interface is weak
3. Vendor data not available or incorrectly assumed
4. Design is expedited leading to poor quality and errors
5. Overreliance on software without in-depth knowledge of concepts
6. Increased complexity of design
7. Inappropriate code requirements
8. Technology not utilized effectively
9. Design intent is not clearly conveyed or interpreted
10. Multiple objectives/requirements not clear
11. Frequent changes in scope
12. Errors in design
13. Errors and omissions in drawings
14. Excessive Iterations in Design for optimization
15. Delays in client drawing approvals
16. Delays in third party drawing approvals
17. Design skills / experience is low
18. Constructability not considered during design
19. Construction Sequence/Priority not addressed in design
20. Design effort estimation not accurate
21. Lack of coordination within multi-disciplinary design teams
22. Contract ambiguous on design
23. No tools to plan and monitor design
24. Poor organization communication
25. Poor interpersonal communication
26. Excessive delay in permits and clearances
27. In appropriate organizational structure
28. Organizational culture
29. Concurrent design through geographically distributed teams
30. Ill-structured stakeholders involvement