

IDENTIFYING ROOT CAUSES OF LONG REVIEW TIMES FOR ENGINEERING SHOP DRAWINGS

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ABSTRACT

Every construction project requires approved shop drawings. Design drawings do not show details required for installation, so (sub)contractors cannot construct/install without approved shop drawings. Shop drawings are generally produced by subcontractors and should be reviewed and approved by appropriate parties promptly in order to avoid production delays. Observations on the shop drawing review process reveal that engineering review times of such major construction components as structural steels and reinforcing bars are unnecessarily long and often fail to meet the time frames within which contractors expect to receive responses from the design team.

The primary goal of the study is to identify and speculate about possible measures for eliminating the root causes of long review times for engineering shop drawings. Since it is not a simple task to identify and eliminate root causes of any problem because problems are always coupled with their business and work processes, the study uses a systematic problem-solving technique: problem understanding, problem-cause brainstorming, problem-cause data collection and analysis, and root-cause identification. The study reveals that the root cause of long engineering review time is insufficient and unclear information, rather than capability or availability of reviewers.

KEY WORDS

Engineering review, problem solving, root causes, shop drawings

INTRODUCTION

As the design of projects produce ever more complex building systems, more specialty design and construction contractors get involved, increasing the number of organizations involved in projects and the possibility of disputes. Among the different types of information created and exchanged between stakeholders and trades, shop drawings are directly related to on-site production and are carefully controlled and maintained by contractors because of their significant impact on construction production delivery.

A problem is often the result of multiple causes at different levels (Andersen and Fagerhaug 2006); some causes affect other causes that, in turn, create the visible problem. Causes can be classified as symptoms, first-level causes, and higher-level causes (Andersen and Fagerhaug 2006), and the highest-level causes are often called the root causes. We first conducted brainstorming sessions with the purpose of identifying and understanding the possible problem-causing areas. Then we collected the real data to verify the facts offered during the brainstorming sessions. For the

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