

Improved Measured Mile Analysis Technique

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Abstract: Quantifying lost labor productivity on construction projects is difficult and sometimes subjective. A widely accepted way to quantify losses is the “measured mile” approach. It compares periods of a project that have been impacted by change to those that have not been impacted. As currently practiced the measured mile relies on subjectively identifying that reference period. In this paper the measured mile and a variant, the baseline method, are analyzed and compared to a new, proposed statistical clustering method. This new approach is advocated because it determines its reference period using objective criteria. A case study is included to show how the three methods work, and advantages and disadvantages of each method are presented in this paper.

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Introduction

Diekmann and Nelson (1985); Semple et al. (1994); and Ibbs and Allen (1995), among many others, have written about the epidemic of claims in the construction industry. There are many different types of claims. Schedule delays, design issues, and differing site conditions are among the most common (Hester et al. 1991). The costs of such claims are rooted in various factors such as extra material costs and standby equipment time. One key factor is the lost labor productivity associated with such disruptions. No reliable estimates on the size or value of lost labor productivity could be found, but it is certainly a major portion of the \$65 billion total claim figure reported by Ibbs and Allen (1995).

Supporting and evaluating cost overrun claims because a contractor has suffered labor productivity problems are difficult undertakings. Industry guidebooks (NECA 1976; USACE 1979; MCAA 1986) are one source. They are suspect though because parties with vested interests have developed them and their underlying research methodology is unclear.

Hanna (Hanna et al. 1999a,b); Ibbs (Ibbs and Allen 1995; Ibbs 1997; Ibbs et al. 1998, 2003); and Leonard (Leonard 1988) have tried to fill the gap by independently benchmarking projects. The result has been industry standard statistics, which are somewhat useful. These techniques are based on data collected from a large number of projects and deriving regression curves that show the impact that change has on labor productivity.

Another approach for computing lost productivity is the measured mile approach (Zink 1986). In this technique, periods of unimpacted production are compared to periods in the same project that have suffered substantial productivity loss strictly because of one party's actions (say the Owner). That party (the Owner) is then assigned responsibility for this difference.

In cases where a pure, unimpacted portion of the project cannot be found, a baseline may be defined (Thomas and Sanvido 2000a). From the claimant's perspective this is a conservative measurement because the baseline productivity may still include some lost productivity. But because responsibility for that lost productivity cannot be easily measured and clearly assigned to the respective parties, the claimant uses the baseline period as a reference, even though some lost productivity may still be intertwined in the baseline rate.

There are substantial limitations with these methodologies though. The measured mile method, as defined by Zink, requires that its reference productivity come from a continuous, uninterrupted period. That is not always available though. The baseline method has the shortcoming of using daily output to identify the reference period instead of daily productivity. The result is questionable because daily output may vary because of crew size, not just productivity.

A major problem with both these methods is that they use subjective methods to identify the unimpacted reference periods. The baseline method, as described by Thomas, multiplies the duration of a project by 10% (say 10% of a 100 day project duration=10 days). Then the productivity of those “top 10%” days is computed by averaging the productivities achieved during those days. The basis for using 10% is clearly arbitrary.

To overcome these shortcomings a new statistically based methodology for baseline calculation is proposed in this paper. The mechanics of the procedure are explained through a case study as are the advantages and disadvantages. This new approach to labor productivity loss calculation is valuable to project managers because it provides a scientific basis for determining damages more fairly. Injecting more objectivity into the claims resolution process will, in turn, help stem the rising costs of such disputes because the litigating parties will have a more rational

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