The Leonard Curves: Another Tool in Labor Loss Quantification

Executive Summary

Charles Leonard performed a study which resulted in the Leonard curves. These curves may be a helpful tool to quantify your labor productivity loss due to cumulative impacts on your project.

The Deeper Dive

Revay and Associates Limited out of Canada wrote a great comparison article between the Leonard Study of 1988 and other studies done by his contemporaries, then and now. This article you're reading now barely brushes the surface – go here for a deeper dive, but still at a summary level: [QR]

When do I use these curves?

Use them when you have a lot of change orders on a job and you're trying to establish a link between the cumulative impact of these changes on your original base contract labor. Curves exist for civil/architectural work and electrical/mechanical work.

Show me the math and how to use it.

So, as you see in the example in the QR Code link above (page 2 of the article), the author calculates a "Percent Change Orders" number of 43%. That then corresponds to a loss of labor productivity of 29%. And there you have it – your claim for 29% labor loss is quantified. You must use the equations below which are quite simple if you have the data.

The equations used by Mr. Leonard in the development of the curves (the blue equation below is the equation used above to generate the 43%):

$$Percent\ Change\ Orders = \frac{Sum\ of\ Change\ Order\ Hours}{"Actual"\ Hours\ Spent\ on\ the\ Original\ Contract}$$

$$PI\ =\ Productivity\ Index\ = \frac{Earned\ Hours}{Actual\ Base\ Contract\ Hours}$$

$$LOP\ =\ Loss\ of\ Productivity\ =\ (1 - PI) * 100\%$$

Use the green equations to develop the 29% number stated above.

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Is this method bulletproof?

No. No method is. No claims method is bulletproof and will guarantee you a win in dispute resolution or court. This is a tool to help convince your client that you were impacted.

My Story

I serve on a national committee with the ASCE (American Society of Civil Engineers) and we discuss claims and methodology of evaluating productivity loss. This was a recent one I thought I'd present to you.

As I've stated in this ASCE committee, as a claims consultant, the best I can do is equate, using narrative and whatever data I can collect, the financial loss to my clients (and before that my own company). As contractors, we all know that we are impacted, but having tools like this to corroborate the position I'm/we're in can be priceless to at least get the client to come to the table and negotiate. Most times owners feel we carry contingency for these impacts, but the reality is we don't.

3% CHANGE IS WHAT CONTRACTORS EXPECT AND CAN ABSORB WITH NO LABOR PRODUCTIVITY LOSS

What I found very interesting about Revay and Associates Limited's article was on page 5 – it discussed the owner's expectation of what a contractor can absorb in changes without being impacted versus what the data showed contractors could actually absorb. The statement by the author, Mr. McEniry, was that the data showed that contractors could absorb about 3% in change without being impacted (this was compared to 10% which is what many owners figured contractors "expect and plan" for in changed work). So, next time you're in a negotiation with an owner and (s)he says you all plan for 10% changes in a job, everyone knows jobs have changes." You can say, "no, I don't plan on 10% or 20% or whatever, usually we suffer zero impact on labor productivity up to about 3%, the rest is costing us money!"

Work safe!

Bonus: here is the 1988 paper by Mr. Leonard. [QR]

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