

# Can the Future be Predicted? Of Course it Can!

## A Case Study using ASTM E2691: Standard Practice for Job Productivity Measurement

BY JENNIFER DANESHGARI  
AND DR. PERRY DANESHGARI,  
MCA, INC.

Everyone wishes, at one time or another, that they had access to a crystal ball to see the future. We may want to see the future for ourselves, our friends and family, or maybe the outcome of the big game. For today, let's focus on the outcome of our latest job / project. That crystal ball does need a bit of input to accurately tell the future, but it's well worth it!

Picture this. You're about to start a fairly large project spanning two years and you're concerned that the estimate is tight; you know you're going to need to focus to bring this project in on target. We suggest you use a Who, What, Where, When, Why, and How approach. **Where** do you even start? At the beginning of the project, before you're on the job. **How** you do this is:

1. Break down the large project into three-month sections (or as far as you can see), dividing the estimated hours up into these sections / buckets as well.
2. Break down the work in the first section

with the use of a Work Breakdown Structure (WBS) (See November / December 2022 Insights). This is done by breaking the project down, by the field leads (**Who**), into hierarchical work across several labor codes, as they see the project being built. This is **What** your plan is.

3. Compare your breakdown of hours of work to the estimated hours in that bucket, recognizing a difference between the two likely needs discussion and reasons for the differences noted.
4. Start working your plan.
5. When you see flags that the actual project is not going to plan, address it!
  - a. If it's good, keep it going.
  - b. If it's not favorable, make changes!
6. When you're about a month out from the next section, repeat the steps above for the next bucket of work, working through to the end of the job.

With a plan for the work, you can now measure against a reference point (your WBS). That measurement for productivity is explained in Figure 1. If you work to the plan and use the same number of hours you have planned, you'll be 'on' the 0 percent

line (no variance to plan). If you are more productive, you'll be above the 0 line and if you're less productive, your project's Productivity Differential (PD) will be below the line.

**Why** you break down the work in Step 2 above is demonstrated in Figure 2. The Components of Response Time (shortening Time to Detect and allowing more Time to Correct a Problem) is one the foundational principles that Agile Construction® is built upon. Working to learn quickly and uncover potential issues will get you on the path to success quickly (building your future!). While the figure mentions that the faster you see the problem, the faster you can fix it, this is also how the crystal ball predicts the future!

Your crystal ball is the application of ASTM E2691, such as JPAC® (Job Productivity Assurance and Control). For this project, there's a lot of work, several parts to the job, and it is not going well (to say the least!). Things are slow and drawings aren't representative for the areas of the old building. In this situation, the work was broken down all at once.

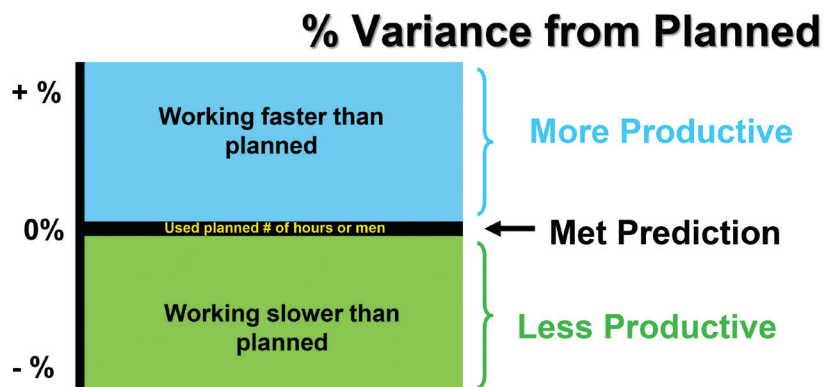


Figure 1

### Components of Response Time The Faster you see it, the Faster you can fix it

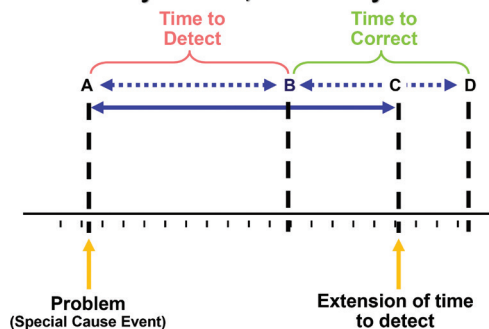


Figure 2

## The Relationship Between: The Estimate, the Work Plan and the Productivity Differential

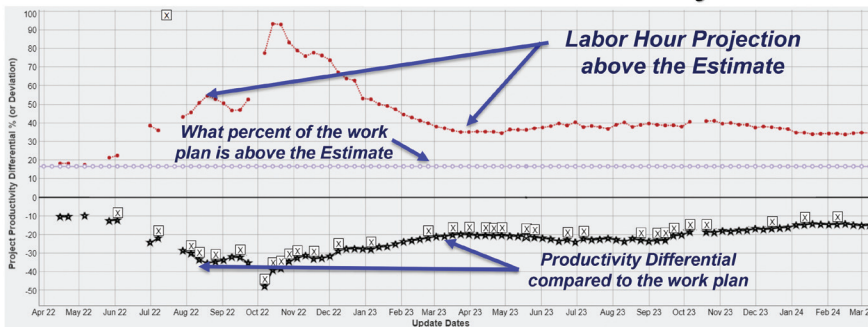


Figure 3

## The Relationship Between: Productivity Differential, Composite Rate and Labor Cost

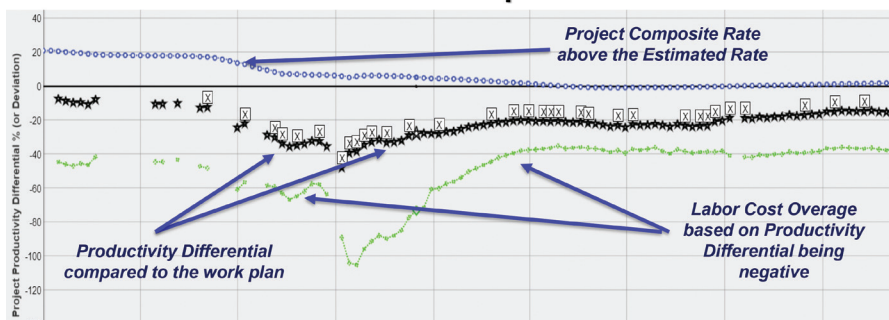


Figure 4

- The first flag is shown in Figure 3 with the purple line. The WBS is 16.7 percent higher than the estimate. The field team predicts it will take them 16.7 percent more hours than the bid planned. This links to Figure 2. We know right at the start that there could be a problem. In this case, the team thought maybe the remodel was making the field team thinks it's going to take longer, but they'll 'pick it up' in the new part and the parking lot.
- The second flag is that the Productivity Differential is below the 0 line / reference point. This means, per Figure 1, that they're working slower than planned.

**The crystal ball is working and the future is being predicted!** In August of 2022, JPAC® is able to flag that the job is in trouble. The red line is using the PD and letting the team know that the labor hours will be well over the estimate by as much as 50 percent 18 months before the end of the job.

Sometimes when you're given a glimpse of the future, it's hard to recognize or accept. There was a project date to be completed in several areas at the start of 2023, so they added labor to the project. The areas were very congested, and the productivity continued to erode. You can see when they got out of the challenging area and into the new area at the end of 2022.

Figure 4 translates now to how this labor productivity will impact the project's bottom line. While the team reduced the composite rate (was 18 percent over the target composite rate in the estimate), the labor that was on the job continued to lower productivity, and therefore increase the overall labor cost on the job. In the last 12 months, the crystal ball has been predicting a labor overage from the estimate of 40 percent. The glimpse to the future was 24 months in advance.

### Can the Future be Predicted? Of Course it Can!

Using a Who, What, Where, When, Why approach can be very helpful in getting to the finish line for your project and using tools and experience that can help you predict the future, like applications of ASTM E2691. **How** do we do this?

1. **Who** — have the team building the project break down the work in the job (don't just measure to the estimate — use it as a guide and look for differences in how the field team sees the work — they're the experts at building the jobs).
2. **What** — look at the full project (including material movement, mobilization, and demobilization); all work should be accounted for to make a plan.
3. **Where** — keep it visible in weekly job meetings, reviewing progress and addressing issues when they occur.
4. **When** — do the plan before you're on the job, if possible. Work ahead in about three-month increments, if the team can't see the full job, and move to the next 'bucket' before you start it.
5. **Why** — because you can predict the future and have predictable results using the ASTM E2691 Standard Job Productivity Management if you know what you're measuring to, you can improve your ability to correct issues if you can detect them quickly.

Enjoy the view of the crystal ball. ⚡

*Jennifer Daneshgari is a vice president of financial services at MCA, Inc. that applies principles of Agile Construction® with contractors and distributors across the country.*

*Dr. Perry Daneshgari is the president and CEO at MCA, Inc. and the creator of Agile Construction®, Agile Distribution®, and JPAC®, among other industry tools validated by clinical research for over 30 years.*

