

Data Collection for Construction Projects

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The modern construction project can be inundated with data and paper trails that could fill gigabytes of computer storage and rooms full of project files. This article discusses the types of onsite data collection that are most valuable to understand and manage a cost overrun or delay, form the basis of lessons learned for subsequent work, or document a request for additional time and compensation. In our experience it is not the quantity of data maintained but rather the quality of the information and its relevance to the project challenges that dictates effective document preparation and retention.



Onsite data collection on construction projects varies considerably from contractor to contractor and even from project to project. Working in the field of project forensics, our team has seen projects with sparse, missing or even destroyed documentation, as well as projects that either collect too much information, the wrong information, or incorrect information due to ineffective or not-followed procedures. Based on this experience, this paper

outlines the most important information to effectively aid project management or dispute resolution.

The three primary goals of onsite documentation are to monitor the project's progress, to satisfy all contract requirements and to track productivity for project management and profitability purposes.

First, a contractor needs to be able to understand what is going on with the project and decide whether or not corrective actions need to be taken before the end of the project. Obviously, without contemporaneous records, these objectives are impossible.

Second, contractors should become intimately familiar with the accounting and financial reporting requirements in the contract. On the commercial side, these requirements are generally governed by surety requirements or contract documents and can be relatively simple to maintain. On the governmental side, however, contractors are subject to multiple levels of government actors with multiple regulatory requirements. On the federal side, Request for Proposals and award standards are dictated by Federal Acquisition Requirements, the Cost Accounting Standards, the False Claims Act, and other agency-specific codes. The need to maintain appropriate records is mandated not only by contract clauses, but is also dictated logically by both public and private owners in their need to understand the basis of a request for additional compensation.

Finally, contractors also have a need to maximize profitability, and to that end most have equipped their onsite teams with some form of productivity and/or schedule monitoring capability. How well these systems are implemented – often a conglomeration of PC and

tablet software and traditional daily reports – varies widely among contractors and can make the job of understanding “what happened here” very easy or very complicated.

In either event, by meeting these two primary goals, it is also possible to make significant strides toward collecting the types of data your auditor, claims consultant and attorney would consider most advantageous, should your project receive an unexpected audit, fall behind schedule, or encounter cost overruns.

Documenting Onsite Activity

This section identifies the types of activities and records that should be maintained on every project. Though often perceived in the field as “more paperwork” these minimum requirements are not overly burdensome for the average project management team if implemented in a straightforward and systematic way. If properly maintained, these records will not only provide a contract-compliant management trail but they will also aid in the factual analysis of a claim, if required.

As anyone who has sat through even one onsite meeting can attest, maintaining meeting minutes is essential to tracking issues, responsible parties (e.g. “ball in court”), and resolutions. But while meeting minutes are probably the most frequently consulted documentation of onsite activity, other fact-recording tools and systems should also be utilized. A robust cost accounting system and the meaningful daily logs and weekly reports of the project superintendent(s) and project management staff should cover the topics discussed below.



Deviations from Contractor’s Schedule

In addition to accurately maintaining updated project schedules, the most important information is often not communicated effectively from the page of the CPM schedule updates to the project management (or third party) decision makers. These omissions include decreased float on high risk activities, development of new alternate critical paths and/or clear prediction as to the project end date. The as-built schedule is a critical part of the Window Analysis forensic technique and other types of retrospective Time Impact Analyses. An

effective solution is for Monthly Reports (and Weekly Reports on large projects) to include a section written in conjunction with the scheduling team that covers all schedule developments using narrative words to identify the important facts that may ultimately contribute to project delays.

1. Schedule Maintenance – Accurate documentation of the start and end dates of onsite activities will assist in completing the as-built schedule.

2. Missed Deadlines – By the owner, designer, contractor and subcontractor

3. Processes Taking Longer than Normal – Architect’s responses to RFIs/submittals, subcontractor delays, incomplete or untrained trade staffing, unexpected logistics issues, owner’s review of change order requests

4. Unusual Project Events – Suspensions of Work, verbal directives outside the chain of authority, approved but unfunded/underfunded change orders

Notes Explaining Hot Issues

The ability to artfully and neutrally document contentious issues is a necessary skill for professional project managers. It is important to document hot issues using a neutral tone supported by facts. Sarcastic or cynical e-mails and other correspondence are simply not helpful and can be a disadvantage if litigation occurs.

These four categories are often the most contentious but also the most important to get on the record.

1. What Happened – The contemporaneous record should contain a clear explanation of the event or situation that caused the impact to productivity or time. Details of where, what drawing, who was affected, pictures that show the issue, and additional efforts required should be maintained.

2. Context of Project Delays – Where possible, identify current delays on the project, actions being taken to mitigate or resolve the delays, and the expected resolution of the delaying issue.

3. Additional Scope or Staffing – Document directions from owner or architect regarding additional work, clearly identifying the limits of the project as bid; or identify facts necessitating unanticipated staffing levels, crew shifts and/or overtime.

4. Additional or Extended General Conditions – Document project events that necessitate the need for

project supervision or other support beyond the level of effort anticipated at the time of the bid.



Documentation of Productivity

It is beneficial for contractors, subcontractors, owners and their construction management teams to monitor onsite productivity. At some basic level, earned value tracking is generally required as part of the invoicing function. However, some of the most efficient contractors monitor subcontractor production on a weekly and even daily basis implementing sophisticated tablet-based systems. Regardless of the hardware/software package, productivity tracking always comes down to measuring the completion of the project against some parametric, usually employing different measurement units for different activities. As such, a properly detailed estimate is important to use as a benchmark against actual activities in the field. Although there are many contractor estimating and accounting systems, there are basic objectives that, if met, will streamline the measurement of field productivity.

1. The estimate and the project accounting records should show labor hours as well as cost on a per unit basis for all major tasks to be performed.
2. The Work Breakdown Structure (WBS) of the estimate and the project cost accounting system should line up to the extent possible.
3. Owned equipment should be estimated and costed using the same WBS as labor, and should identify both operating and standby hours.
4. Reports that compare the planned versus actual productivity should be prepared at least monthly, and/or be segregated at the beginning and the end of significant events.
5. Subcontractors who are experiencing the same productivity issues should be encouraged to maintain the same level of records.

Further Reading and Conclusion

Other sources of information on delay and cost overrun claims include:

- Mechanical Contractors Association of America (MCAA)
- National Electrical Contractors Association's (NECA)
- Reed Construction Data (R.S. Means)
- Business Roundtable research studies
- The Association For The Advancement Of Cost Engineering (AACE) Cost Engineering Magazine and Source
- The Association For The Advancement Of Cost Engineering (AACE) International Recommended Practices
- Construction Management Association of America (CMAA)
- Construction Industry Institute (CII)
- Project Management Institute (PMI)

About the Authors

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Mr. Allen has spent over 30 years working with contractors, owners and developers in overall project development, preparing and monitoring project cost controls and helping to manage risk throughout the construction and operational processes. As a litigation consultant, he has served as an expert witness on some of the largest construction and real estate claims in the U.S. and overseas, analyzing issues such as labor and equipment costs, acceleration costs, lost profits, cumulative costs of changes, insurance claims, and delay costs.

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