

Recommended Contract Language for Schedule Management and Reporting

The construction industry is currently in a dynamic state as it reacts to the impacts of COVID-19 and it plans to manage all of the future implications that seem to be revealing themselves, daily. No matter what the new world may look like, two things will remain the same:

1. Contracts will be the most important vehicle to managing risk prior to the start of a Project
2. Schedules will be the most important vehicles to managing risks throughout construction

What we have found is that schedule management is often at the core of major construction disputes, yet contractual language on this point has traditionally been bare bones. In response to this gap in the industry's approach to schedule management, we offer the below overview of an enhanced approach to contractual clauses related to construction scheduling and project controls.

We validated our experience on such language using Document Crunch's AI tool, and more specifically its "Technical Scheduling Requirements" algorithm, in order to vet several hundred examples of this type of language in pre-existing contracts. The use of this AI tool reinforced our experience and opinion: the vast majority of scheduling provisions contain generic language that a schedule be created and updated periodically.

In light of the traditional and generic approach to scheduling clauses, the basis of the below recommendations is to add more detail to this framework, the idea being that establishing the requisite best practices and detailed requirements will hold the parties accountable to a framework that will create more certainty throughout a project. The rationale behind these clauses is that a strong schedule process exists, with visibility into the schedule data, in a manner that ensures that the schedule data is of the highest quality and integrity and made available on a frequent enough basis.

THE BASIC SCHEDULE CLAUSE AND WHAT'S MISSING:

3.10 Contractor Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

The above clause is the standard clause in the AIA 201. And, as Document Crunch proves out, it is by and large the basic substantive clause (in various formats) across the vast majority of contracts that we have encountered. It is a great starting point; however, as it stands, it is not sufficient to ultimately achieving

success. What is missing in this standard type of clause are parameters regarding the methodologies that shall be utilized to build the schedule, how the schedule should be prepared, how and specifically when the schedule should be delivered, and schedule approval considerations. Defining schedule parameters reduces confusion and puts all stakeholders on a level playing field regarding the project schedule development, format, updating, submission and approval, and delay notification.

A MORE ROBUST CLAUSE ON SCHEDULE DEVELOPMENT:

Incorporating industry best practices and guidelines for schedule development into the contract terms clarifies and outlines the basis for what the project schedule should look like and what the schedule will be evaluated against. Below is an example that defines the aforementioned items:

Baseline Schedule: Within thirty (30) Days after the Effective Date, the Contractor shall prepare and submit a detailed "Baseline" Construction Schedule, both in hard copy and electronically, for the Owner's information and approval. The Baseline Schedules will be submitted for Owner's review and approval based on the criteria defined herein and will be assessed based on completeness, feasibility and quality using industry established scheduling guidelines such as but not limited to the Defense Contract Management Agency (DCMA). The contractor shall prepare the schedule using a Critical Path Method Scheduling Software such as either Primavera P6 or Microsoft Project. Electronic schedules shall be submitted as "native" files in either Primavera P6 (.XER) or Microsoft Project (.MPP) formats. The Construction Schedule shall in all respects conform to and be consistent with the time requirements for the Project as set forth in this Construction Contract.

WHY THIS CLAUSE IS RECOMMENDED: The above section clearly defines that a CPM scheduling program shall be utilized to develop a schedule and that it should be delivered electronically in native file format. When utilized effectively, the CPM method and the use of a software program to develop and monitor the schedule have several advantages:

- The CPM method allows for the prioritization of tasks that affect the project end date and which tasks require a focused effort,
- The CPM method promotes the logical planning of the project tasks, allowing the schedule to react, and provides insight into the effects of changes to the plan,
- Using a CPM software to develop, update, and monitor the CPM schedule allows for automatic calculation of the project's critical activities as well as clear visual illustrations of the network of critical tasks which allows project teams to focus on the critical activities needed to achieve the project end date,
- Using a CPM software allows for quick updates to the plan in the event new tasks are added or tasks are delayed, and
- Using a CPM software allows project teams to understand where delays are occurring and what alternatives may be available.

Without utilizing CPM scheduling programs, the schedule may be ineffective, incomplete, non-reactive, or take time to develop and update. If utilized effectively, CPM scheduling programs add value to the planning and execution processes – this helps all parties. Projects are at a much greater risk of being mismanaged when a CPM technology is not used.

In addition, a set of guidelines regarding scheduling best practices should be followed. One of the more common guidelines is the DCMA's 14-point schedule assessment which is geared towards ensuring that schedules are useful and complete. CPM scheduling is tricky and requires a high level of experience, following best practices to be of use. Without controls, schedules become misleading. If a schedule is misleading, what is the point of using it? Schedule data is the best data set out there, because it shows how the entire project is interconnected into one system. This is as powerful as data gets in construction. Without a control around the schedule data set, the project is at risk.

Finally, submission in electric format is paramount because it enables both parties to analyze the data separately to understand it from their vantage point. One of the biggest challenges in construction is the competing interests of stakeholders. Being on the same page is paramount, and if one party has more information than the other, both suffer.

SCHEDULE FORMAT:

In regards to utilizing guidelines to dictate the requirements necessary for success, there also should be parameters that speak to the format of the plan. The format of CPM schedules can be difficult to decipher without days to review. It is in the best interest of both parties to agree on the format, so that both parties can easily understand the schedule. Below is an example that further defines the schedule format:

Baseline Schedule Format: The Construction Schedule shall be in the form of a critical path progress schedule that shows, in graphic form, a plan for performance of the Work within the Contract Time. The Construction Schedule shall be prepared, using Primavera P6, as a time-scaled bar chart showing: (1) continuous flow from left to right of activities and milestones that are critical to Owner Occupancy, Tenant-Ready Completion, Substantial Completion, and Final Completion of the Work; (2) identification of "float"; and (3) a clearly highlighted critical path. The Construction Schedule shall be organized with a defined work breakdown structure (WBS) or Activity Code structure that adequately describes and organizes the scope of work, key milestones, and associated tasks/activities to meet the project objectives. Durations and specific calendar days shall be clearly and legibly shown for the early and late start and finish of each activity. Unless approved by Owner, the following schedule parameters shall apply:

- a. No Activity duration shall exceed 20 working days unless approved by Owner;*
- b. Finish-to-Start (FS) logical relationships shall represent a minimum of 90% of total relationships in the schedule*
- c. All interim Activities and milestones, excluding the first and last activities of the schedule, shall have at least 1 predecessor and at least 1 successor relationship, unless approved by Owner.*
- d. There shall be no more than 1% of total activities or milestones with a assigned "start on", "start on or after", or a "mandatory start" constraint*
- e. There shall be no finish constraints assigned to any activity or milestone in the project schedule*
- f. All activities shall have both manpower and cost resources assigned to them such that the total manpower and costs across the entire schedule align with project budget and collective manpower estimate(s).*
- g. There shall be no more than 20% of the total activities and milestones in the schedule containing more than 44 working days of "total float".*

Baseline Schedule Detail: Activities shown in the Construction Schedule shall be in sufficient detail to demonstrate a practical plan to complete the fabrication and construction within the Contract Time and shall, at a minimum, include the following:

- a. Task/Activity ID Number and Task/Activity Description,*

- b. *Predecessor/successor relationships,*
- c. *The planned start and finish date of each activity;*
- d. *The anticipated percentage of completion of each activity at the end of each month;*
- e. *If requested by Owner prior to the Effective Date, the final manpower curves by trade;*
- f. *The anticipated dates for the purchase and delivery of major materials and equipment;*
- g. *The anticipated dates for the receipt and incorporation of Owner-furnished materials, equipment or other items (if any);*
- h. *Governmental Authority Review Periods; and*
- i. *The activities identified as being on the critical path to Owner Occupancy, Tenant-Ready Completion, Substantial Completion, and Final Completion of the Work*
- j. *All major milestones including but not limited to “NTP”, Phased substantial completion, dry in, Temporary Certificate of Occupancy, Certificate of Occupancy, Substantial Completion, Final Completion and any other milestone that results in liquidated damages if not met.*

WHY THIS CLAUSE IS RECOMMENDED: The general premise behind this clause is to establish with certainty, the level of detail required by the schedule. Far too often generic schedules with long durations and minimal explanations are developed. In these scenarios, it is easy to overlook logic inconsistencies and therefore, appropriate ties are not established for predecessor and successor activities. The above clause provides for accountability regarding the amount of detail and logic necessary to establish a workable and accurate schedule. Further, resources and cost details are beneficial in 1) making sure true progress is calculated, because of the reality that different activities represent different amounts of work even if they have the same duration and 2) enabling one to translate schedule into budget which allows for more accurate understanding of impacts, overruns and damages. Finally, another key in this clause advocates for less float to be embedded in the schedule as high amounts of total float in a schedule indicates missing logic, too many constraints, or missing crew logic.

SCHEDULE UPDATING:

In addition to discussing the parameters around the baseline schedule, it is important to ensure that a clause exists to clearly outline the updating process, which is the most valuable aspect of the CPM scheduling process in construction. Establishing the frequency and manner in which schedules are updated reinforces project controls and monitoring.

3.10.1.2 Construction Schedule Updates. The Contractor shall use the construction schedule as a management tool in gauging progress. At regular monthly intervals the Contractor shall issue to the Owner an updated schedule with project status that shall (i) identify all activities individually for each component of the site improvements and buildings with start and/or completion dates, (ii) identify interim milestone dates from completion as established in this Agreement and, (iii) show actual starts and progress for each activity through the date of the update. Schedule updates shall be submitted in electronic or native format in either Primavera P6 (.XER) or Microsoft Project (.MPP) format. Schedule updates shall adhere to formatting and detail requirements outlined in the above schedule sections.

WHY THIS CLAUSE IS RECOMMENDED: CPM Scheduling is a process that enables parties to quickly and efficiently divide the project into discrete parts (activities) and associate these parts together in order by assigning relationships. Through this process, parties establish an original plan (the Baseline) which

graphically exhibits a plan. One of the benefits of the of the CPM scheduling process is that it establishes a priority for tasks to get completed and for entire series of activities to be complete in simultaneous fashion. In other words, schedules tell users which activities are critical toward achievement of the intended completion dates and which activities are not. This is powerful. The fact that you can quickly update these plans is even more powerful because things never go as planned in construction and its important to note where things stand at any given point in time, while recalculating the priority activities. Without an update clause, the CPM schedule process is nearly useless.

In order to be successful with implementing the aforementioned clauses, agreement and compliance by all parties is required. One should not commit to adopt an approach to scheduling that one is not capable of managing to; in other words, one should only commit to schedule requirements that are within one's competency. Once a contractual commitment is made, project teams must ensure consistency in administration. One of the biggest issues surrounding scheduling disputes is that project teams do not actively and accurately update schedules and/or logic as projects progress. It is imperative to consult with internal and external subject matter experts to ensure that what you are committing to in the contract can be managed and administered at the Project level. This is critical to providing schedule management and dispute avoidance. By adopting the aforementioned recommended clauses, more certainty can be added to the scheduling development, updating, reporting and approval process.

For additional information, or if interested in technologies that can assist in contract review or implementation of the scheduling practices outlined in the clauses above, you can do so by visiting by clicking the following links:

[SmartPM Technologies, Inc.](#)

[Document Crunch AI](#)

ABOUT SMARTPM:

SmartPM™ is committed to serving and supporting the construction industry by simplifying schedule information and analysis to a level that all parties can understand in an automated fashion. SmartPM™ eliminates confusion regarding the project schedule and performance resulting in less arguments and more team collaboration.

ABOUT DOCUMENT CRUNCH:

Document Crunch™ harnesses state-of-the-art artificial intelligence technology and leverages it to reduce cost, increase speed, and improve the overall quality of contract and policy reviews. For each document type offered, Document Crunch is trained to quickly identify what Industry Curators and Advisors believe are the most important provisions for review, as well as key insights and rationale, and sample contract provisions and other language, putting the power of their collective experience in the user's hands.

