

GENERAL REQUIREMENTS for CONSTRUCTION

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Contract Documents, including but not limited to, the Drawings and individual Specification Sections and Bid Milestone Schedule, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements to plan, schedule and document the progress of construction during the performance of the Work, including the following:
 - 1. Critical Path Method (CPM) schedule and reports.
 - 2. Material location reports.
 - 3. Field condition reports.
 - 4. Special reports.
- B. Related Sections:
 - 1. Section 011200 – Contract Summary of Work, for preparing a combined CPM Schedule.
 - 2. Section 013300 – Submittal Procedure, for submitting schedules and reports.
 - 3. Section 014000 – Quality and Code Requirements, for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Project: Work at the Site carried out pursuant to one or more Contracts.
- B. Activity: A discrete part of the Contract that can be identified for planning, scheduling, monitoring, and controlling the Project. Activities included in a CPM schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that has no total float.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- C. Bid Milestone Schedule: Interim milestones, included in the Contract Documents, which the Contractor utilizes to formulate the Baseline Schedule.
- D. Baseline Schedule: Initial schedule, prepared by the Contractor, to complete the Work of the Contract in accordance with the Contract duration and starting point to which schedule updates are compared.

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- E. CPM: Critical Path Method is a scheduling method used to plan and schedule construction projects where activities are arranged based on activity relationships creating a time scaled network diagram.
- F. PDM: Precedence Diagram Method follows the standard CPM calculations and allows for special logic relationships creating an interdependent relationship throughout the network.
- G. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no total float.
- H. Data Date: The date when the status of the CPM schedule is determined, showing the calendar start date for the update period.
- I. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either the Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Substantial Completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Substantial Completion date.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in both electronic (PDF) file format and as electronic backup file in native software format.
- B. CPM Schedule: Schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (baseline or updated) and date on label.
- C. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain; activity ID number, activity description, original duration, remaining duration, actual duration, early and late start and finish dates and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by early or actual start date in each phase, area and level following the physical divisions of the Work.
 - 2. Short Term Activity Report: Lists all activities occurring from the update data date in a two month forward and one month back window.
 - 3. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by early or actual start date. Include activity ID number and float path(s).
 - 4. Total Float Report: Provide a cumulative list of total float from each update period with comments associated to any and all variances.

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5. Procurement Report: List all procurement activities sorted in order of the item being procured.
 6. Narrative Report: The project scheduler shall describe the nature of the submission, interpretation of calculations, issues affecting progress and a milestone analysis comparing progress against the baseline and update schedules.
- D. Material Location Reports: Submit at monthly intervals.
- E. Field Condition Reports: Submit at time of discovery of differing conditions.
- F. Special Reports: Submit at time of unusual event.
- G. Qualification Data: For project scheduler.

1.5 QUALITY ASSURANCE

- A. Project Scheduler Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within timeframes requested by the Owner. The project scheduler shall have or be able to obtain certification as a Planning and Scheduling Professional (PSP) or have a minimum of five years of demonstrated experience scheduling large capital projects.
- B. Prescheduling Conference: The Owner may conduct conference at the Project site to comply with requirements in Section 013100 - Project Management and Coordination. Review methods and procedures related to the Baseline Schedule and the CPM schedule, including, but not limited to, the following:
1. Review software limitations and content and format for reports.
 2. Verify availability of qualified personnel needed to develop and update schedule.
 3. Discuss coordination, including phasing, work stages, area separations, interim milestones and Beneficial Occupancy.
 4. Review delivery dates for Owner-furnished products.
 5. Review schedule for work of Owner's separate contracts.
 6. Review time required for review of submittals and resubmittals.
 7. Review requirements for tests and inspections by independent testing and inspecting agencies.
 8. Review time required for completion and startup procedures.
 9. Review and finalize list of construction activities to be included in schedule.
 10. Review submittal requirements and procedures.
 11. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate preparation and processing of CPM schedules and reports with the performance of the Work and with CPM scheduling and reporting of separate Contractors.
1. Coordinate new Baseline Schedules and CPM schedule updates with separate Contractor's when additional Contracts are executed during the entire duration of the Project.

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- B. Coordinate CPM schedule with the Contractor's Submission Schedule, progress reports, and other required schedules and reports.
 - 1. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CRITICAL PATH METHOD SCHEDULE, GENERAL

- A. Bid Milestone Schedule: The Owner shall provide a Bid Milestone Schedule, which is attached to this section as a template for the Baseline Schedule. Nothing in the Bid Milestone Schedule, Baseline Schedule or CPM schedule shall preclude the Contractor from advancing the Work of the Contract.
 - 1. Include milestones indicated in the Contract Documents in Baseline Schedule, including, but not limited to, the Notice to Proceed, interim milestones, Substantial Completion, and Contract close-out.
 - 2. Substantial Completion date shall not be changed by submission of a schedule that shows an early completion date, unless approved by the Owner.
 - 3. No time for weather will be apportioned for foreseeable occurrences in a specific regional area. The Contractor shall be responsible to determine reasonable averages and make allowances in the performance of the Work.
- B. Activities: Treat each numbered activity as a consumable resource for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 15 days, unless specifically allowed by the Owner.
 - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 - Submittal Procedures in schedule. Coordinate submittal review times in the CPM schedule with dates entered in the Contractor's Submission Schedule.
 - 4. Startup and Testing Time: Include not less than 15 days for startup and testing.
 - 5. Substantial Completion: Indicate completion on the date established for Substantial Completion, and allow time for the Owner's administrative procedures necessary to execute the Notice of Substantial Completion (NOSC).
 - 6. Incomplete Work items and Contract Closeout: Include not more than 60 days for incomplete Work items and Contract Closeout Requirements.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents, or approved by the Owner prior to use and show how date constraints affect the sequence of the Work.

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1. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities.
- D. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered RFIs.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
- E. Recovery CPM Schedule: When periodic update indicates the Work is 15 or more calendar days behind the current approved CPM schedule, submit a separate recovery CPM schedule indicating means by which the Contractor intends to regain compliance with the CPM schedule. Indicate changes to working hours, working days, crew sizes, and equipment required achieving compliance, and dating by which recovery will be accomplished, subject to Owner's approval.
- F. Computer Scheduling Software: Prepare CPM schedules using current version of a program that has been developed specifically to manage CPM schedules and interface with the Owner's electronic file of the Bid Milestone Schedule.
1. Utilize Primavera P6 or P3 Primavera Project Planner operating system.

2.2 CRITICAL PATH METHOD SCHEDULE (CPM SCHEDULE)

- A. Baseline Schedule: Prepare schedule using a time-scaled PDM network diagram representing the Work of the Contract. Total float time shall be equal to or greater than zero in the Baseline Schedule.
1. Submit Baseline Schedule within 15 days of the date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work based on indicated activities.
 2. Develop network diagram in sufficient time to submit Baseline Schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for the performance of the Work shall not excuse the Contractor from completing the Work of the Contract within applicable completion dates, regardless of the Owner's approval of the schedule.
- B. CPM Schedule: Prepare contemporaneous schedules using a time-scaled PDM network for sequencing the Work and showing the progress of the Work.
1. Establish procedures for monitoring and updating the CPM schedule and for reporting progress. Coordinate procedures with the progress meeting and payment request date.
 2. Coordinate the Work occurring concurrently through the integration of other Contractors Baseline Schedules into the CPM schedule.
 3. Conduct educational workshops to train and inform the Contractor's key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.

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4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract durations.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work of the Contract. At minimum, each individual specification section, including General Requirement sections, as indicated in the Project Manual, shall be listed as an activity.
1. Activities ID: Provide a unique identifier to each activity. No activity ID shall be recycled or reused.
 2. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by the Contractor's activities.
 - i. Testing and commissioning.
 - j. Incomplete Work items and Contract closeout.
 3. Actual Activity Dates: Once an activity has been assigned an actual date of occurrence, the status of that activity shall not change. Any change to actual dates must be accompanied with supporting data and approved by the Owner. No actual start date shall occur ahead of the data date.
 4. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with the Bid Milestone Schedule dates.
 5. Processing: Process data to produce output data status on a computer-drawn, PDM network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract duration.
 6. Calculations: The schedule network shall be calculated allowing activities to retain their original logic. Progress override shall not be used when calculating the network status.
 7. Logic: Leads and lags will not be used when the creation of an activity will perform the same function. Lag durations contained in the schedule shall not have negative value. Lead and lag durations shall not exceed the durations of the activity they are assigned.
 - a. There shall be only two open ended activities; (1) Notice to Proceed, with no predecessor logic, and (2) Final Payment, with no successor logic. All intermediate activity logic shall be connected.
 - b. Out of sequence activities that have progressed before all preceding logic will be allowed only on a case by case basis, as approved by the Owner. The Contractor shall propose logic corrections to eliminate all out of sequence progress and correct out of sequence progress that continues for more than two update cycles by logic revisions, as approved by the Owner.

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8. Float: The Owner shall reject the schedule and schedule updates for the use of float suppression techniques such as preferential sequencing, special lead lags logic constraints, zero total or zero free float constraints, extended activity times, or imposing constraint dates other than what is required by the Contract.
 - a. The use of resource leveling used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is prohibited.
 - b. A schedule showing work completing in less time than the Contract duration and accepted by the Owner, will be considered to have float.
 - c. Any float generated during the performance of the Work, due to efficiencies of the Owner or any Contractor is not for sole use of the party generating the float.
 - d. Negative float will not be a basis for requesting time extensions and will not be construed as a means of acceleration or schedule extension.
9. Format: Follow the applicable individual specification sections of the Work as the bases for the content of the CPM schedule. Organize the CPM schedule to provide the necessary detail for each area, level, quadrant and section as needed in the performance of the Work.

D. Changes in the Work: For each proposed change and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall CPM schedule.

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed, including the reason each adjustment was necessary.
2. Changes in early and late finish dates.
3. Changes in activity durations in workdays.
4. Changes in the critical path.
5. Changes in total float or slack time.
6. Changes in the duration for Substantial Completion.

2.3 REPORTS

- A. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

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2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise the Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CPM SCHEDULE

- A. Project Scheduler: Engage a consultant or person skilled in construction planning and scheduling to provide planning, scheduling, evaluation, and reporting services using CPM scheduling.
 - 1. In-House Option: The Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Project scheduler shall attend all meetings related to the Project progress, alleged delays, and time impact.
- B. CPM Schedule and CPM Reports Updating: Prior to each scheduled progress meeting, update schedule to reflect actual construction progress and activities. Issue schedule and reports one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the CPM reports of each such meeting. As a minimum, schedule update submissions shall occur monthly and within 30 days of the schedule Data Date.
 - 2. Include CPM reports with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final remaining duration for each activity.
- C. Distribution: Submit one electronic copy, in format specified, to the Owner and distribute copies of approved schedule and reports to the Owner, Design Professional, separate contractors, testing and inspecting agencies, and other parties identified by the Owner with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules and reports to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

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END OF SECTION 013200