

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary construction schedule.
 - 2. Contractor's construction progress schedule.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Field condition reports.
 - 6. Special reports.
- B. Related Sections:
 - 1. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
 - 3. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.
 - 4. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction progress schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise accepted by Architect.

- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract 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 Project completion date.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point of time for reference or measurement.
- I. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. A minimum of three (3) paper copies, two (2) will be returned following the Architect's review. Contractor will forward one (1) copy to Owner.
- B. Preliminary construction schedule.
 - 1. Acceptance of cost-loaded start-up construction schedule will not constitute acceptance of schedule of values for cost-loaded activities.
- C. Start-up Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Progress Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- E. CPM Reports: Concurrent with CPM schedule, submit three (3) copies of each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 3. Total Float Report: List of all activities sorted in ascending order of total float.
- F. Daily Construction Reports: Submit two (2) copies at weekly intervals.
- G. Material Location Reports: Submit two (2) copies at weekly intervals if other than stored at project site.
- H. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.
- I. Special Reports: Submit three (3) copies at time of unusual event.
- J. Qualification Data: For scheduling consultant or qualified personnel.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Owner's or Architect's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction 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 constraints, including phasing work stages area separations interim milestones and partial Owner occupancy.
 4. Review time required for review of submittals and resubmittals.
 5. Review requirements for tests and inspections by independent testing and inspecting agencies.
 6. Review time required for completion and startup procedures.
 7. Review and finalize list of construction activities to be included in schedule.
 8. Review submittal requirements and procedures.
 9. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate and update Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of final completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than thirty (30) days, unless specifically allowed by Architect.
 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 Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with Contractor's submittal schedule.
 4. Startup and Testing Time: Include time for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for acceptance of Substantial Completion.
 6. Punch List and Final Completion: Include not more than thirty (30) days for punch list and final completion following acceptance of Substantial Completion unless otherwise accepted by Owner and Architect.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 1. Phasing: Arrange list of activities on schedule by phase as applicable.
 2. Work under More Than One Contract: Include a separate activity for each contract as applicable.
 3. Work Restrictions: Show the effect of the following items on the schedule as applicable:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.

- f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
- 4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections, including assembly testing.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
- 5. 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 to provide for the following:
 - a. Structural completion.
 - b. Permanent space enclosure and dry-in.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents, or as applicable, in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Recovery Schedule: When periodic update indicates the Work is fifteen (15) or more calendar days behind the current accepted schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- F. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit start-up horizontal bar-chart-type construction schedule within seven (7) days of date established for commencement of the Work.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first sixty (60) days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within seven (7) days of date established for commencement of the Work. Outline significant construction activities for the first ninety (90) days of construction. Include skeleton diagram for the remainder of the Work.
- C. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than thirty (30) days after date established for commencement of the Work.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's acceptance of the schedule.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 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 Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. 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. Testing.
 - i. Punch list and final completion.

- j. Activities occurring following final completion as applicable.
- 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Contract Modifications: For each proposed contract modification 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 project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Principal events of activity.
 - 4. Immediate preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.
 - 7. Activity duration in workdays.
 - 8. Total float or slack time.
 - 9. Average size of workforce.
 - 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 - 1. Identification of activities that have changed.
 - 2. Changes in early and late start dates.
 - 3. Changes in early and late finish dates.
 - 4. Changes in activity durations in workdays.
 - 5. Changes in the critical path.
 - 6. Changes in total float or slack time.
 - 7. Changes in the Contract Time.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including occurrence of inclement events.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (refer to special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Requests for inspections by the authorities having jurisdiction.
 15. Inspections provided by the authorities having jurisdiction.
 16. Change Orders received and implemented.
 17. Construction Change Directives received and implemented.
 18. Architect's Supplemental Instructions received and implemented.
 19. Services connected and disconnected.
 20. Testing of materials or assemblies.
 21. Equipment or system tests and startups.
 22. Partial completions and occupancies.
 23. Substantial Completions authorized.
- B. 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.
- C. 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.

2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one (1) 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, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 - 1. In-House Option: 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: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one (1) 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 report of each such meeting.
 - 2. Include a report 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 completion percentage for each activity.
- C. Distribution: Distribute copies of accepted schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor 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 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.

END OF SECTION 013200