

SECTION 01310**PROGRESS SCHEDULES****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section details requirements for Progress Schedules, including the use of float, schedule recovery, Contract requirements, early completions and non-compliance, CPM (Critical Path Method) schedules and narratives, activity reports, Six-Week Schedules, rate-of-progress data, and tolerances.

1.02 RELATED SECTIONS

- A. Section 01200 – Coordination and Meetings
- B. Section 01300 – Submittals
- C. Section 01370 - Schedule of Values

1.03 CODES AND STANDARDS (NOT USED)**1.04 SUBMITTALS**

- A. Submit the following in accordance with Section 01300 – Submittals:

- 1. Critical Path Method (CPM) Schedule:

- a. The CPM Schedule shall: show the overall priority and sequencing of activities with which the Contractor intends to accomplish the Work, the work remaining to comply with the Contract Time, and the sequences of work specified or indicated by the Contract Documents; anticipate foreseeable events or site conditions that may in any manner affect the cost progress schedule, performance, and furnishing of the Work or work remaining; reflect the means, methods, techniques, sequences, and procedures of construction chosen by the Contractor (subject to the requirements of the Contract Documents); and accurately record how completed work was performed as to sequencing and timing. Verify all data on the CPM Schedule, and review and coordinate the sequences in the CPM Schedule with the requirements of the Work. Each CPM Schedule shall be assigned a revision number, starting with "Rev. 0" for the CPM Schedule for the Work as awarded. After reviewing that the CPM Schedule complies with the above, sign and submit to the Authority six (6) paper copies, one (1) PDF copy and one (1) Primavera P6 copy of the CPM Schedule.

- b. The Authority will review and return the CPM Schedule submittal within the

time described in Paragraph 3.03.E of this Section. The Authority's review will be only for conformance with the Contract Time and those sequences of work indicated in or required by the Contract Documents, to record Early and Late Dates for Milestones, to identify the use of float, to compare as-built data with that represented in six-week schedules, and for conformance with the requirements of this Section and other information given in the Contract Documents which may have a bearing on the CPM Schedule. The Authority's review shall not extend to the accuracy of other matters dealt with by the CPM Schedule. This includes whether or not work is omitted, and whether or not activity durations, the level of labor, materials and equipment, the means, methods, techniques, procedures, or sequences of construction, and sequences and timing for work remaining, are practicable, the correctness of which shall remain the sole responsibility of the Contractor.

- c. When reviewed by the Authority, three (3) copies of each CPM Schedule submittal will be returned to the Contractor as either "Revise and Resubmit" or "No Exceptions Taken". Submittal stamped as "No Exceptions Taken" will represent the most-current Contract Schedule as of the date of the submittal. Neither the Authority review of a CPM Schedule, nor the Authority's statement of "No Exceptions Taken", will relieve the Contractor from responsibility for complying with the Contract Time requirements, adhering to those sequences of work indicated in or required by the Contract Documents, or from completing any omitted work within the Contract Time.
 - d. Make appropriate adjustments or corrections in a CPM Schedule submittal returned as "Revise and Resubmit", and deliver to the Authority six (6) signed paper copies, one (1) PDF copy and one Primavera P6 copy of the CPM Schedule re-submittal directing specific attention in writing to adjustments or corrections made other than those made in response to the Authority's comments on previous submittal. Resubmittals shall use the same revision number followed by the letters "A", "B", etc., as applicable. The Authority will review and return the resubmittals using the same procedures as noted in Paragraph 1.04.A.1.b above.
 - e. Provide a CPM Schedule, noting all shut-downs, connections to existing systems, startups, and testing, that will be continuously updated throughout the project. This schedule shall be provided for review prior to the scheduling meetings detailed in Section 01200 – Coordination and Meetings. The schedule shall be updated monthly, or when dates of shutdowns or other activities change, and shall be reviewed at all project progress meetings.
2. Written recovery schedule as specified herein
 3. CPM Software Submittal

4. Six-Week Schedules

5. Qualifications as specified in Paragraph 1.06 of this Section.

1.05 QUALITY ASSURANCE

- A. In preparing progress schedules, work with each Subcontractor and Supplier to obtain information on activities and sequencing, and request written interpretations of schedule requirements from the Authority as necessary.
- B. Use Primavera P6 CPM scheduling software to produce the progress schedules. This software shall run on PC compatible equipment, be commercially available for lease or purchase, and be capable of processing and plotting progress schedule data as specified in this Section.

1.06 QUALIFICATIONS

- A. Perform the Work covered by this Section with personnel having at least three (3) years of experience using computer-based scheduling programs on construction projects.

1.07 DELIVERY, STORAGE, AND HANDLING (NOT USED)

1.08 PROJECT/SITE CONDITIONS (NOT USED)

1.09 DEFINITIONS

- A. The following terms used in this Section shall have the following meanings:
 - 1. Activity - An element in a CPM Schedule or Six-Week Schedule establishing the time and resources required for performing or furnishing a part of the Work, or a requisite step.
 - 2. Contract Float - Working days between the Contractor's anticipated date for early completion of the Work, or specified part, and the corresponding Contract Time.
 - 3. Contract Schedule - The most current version of the CPM Schedule that has been reviewed by the Authority and returned to the Contractor stamped "No Exceptions Taken." The as-planned Contract Schedule is the initial (Rev.0) Contract Schedule.
 - 4. CPM Schedule - Computerized schedule which accounts for the entire Work and reflects work remaining and how completed work was performed as to sequencing and timing, in CPM format.
 - 5. Critical Path - A sequence of activities controlling achievement of Contract Time.
 - 6. Early Dates - The early start dates and early finish dates, i.e., the dates each activity

will start and finish if each is started at the earliest end of the range of dates that the CPM Schedule indicates the activities can be performed.

7. Late Dates - The late start dates and the late finish dates; i.e., the dates each activity will start and finish if each is started at the latest end of the range of dates that the CPM Schedule indicates the activities can be performed and still achieve the Milestones and Contract Time.
8. Progress Schedule - All of the information and data required for disclosure by this Section.
9. Six-Week Schedule - A detailed Progress Schedule disclosing the next six-week's work and the as-built schedule for the previous six-week's work.
10. Total Float – Number of working days by which a part of the Work in the Progress Schedule may be delayed from its Early Dates without necessarily extending the Contract Time.

1.10 TOLERANCE (NOT USED)

1.11 REQUIREMENTS

- A. Planning, scheduling and execution of the Work shall be included in progress schedules.
- B. References to the CPM shall be to established technical standards for CPM not in conflict with this Section.

1.12 USE OF FLOAT

- A. Float belongs to the Project and may be used as agreed upon with the Authority to accommodate changes in the Work, or to mitigate the effect of events that delay performance or conformance with the Contract Time.
- B. Changes or delays that influence activities that have float and that do not extend the Critical Path are not justification for an extension of the Contract Time.

1.13 SCHEDULE RECOVERY

- A. When directed in writing by the Authority, undertake appropriate action, at no additional cost to the Authority, to recover schedule whenever the Contract Schedule is not met, or the progress is not commensurate with that required to adhere to the Contract Time.
- B. Submit with the next Application for Payment (following recognition of the problem) a written recovery schedule to the Authority describing the cause for the slippage and the actions planned to recover schedule within the shortest amount of time whenever

activities are not completed within the Late Dates in the Contract Schedule.

- C. Appropriate recovery actions may include, but not be limited to, assignment of additional labor, Subcontractors, or equipment, shift or overtime work, expediting of submittals or deliveries, or any combination thereof. Overlapping of activities or sequencing changes to increase activity concurrence shall be deemed appropriate only if properly substantiated in the submittal.
- D. Refusal, failure or neglect to take appropriate recovery action or to submit a written recovery schedule shall constitute enough evidence that the Contractor is not prosecuting the Work, or separable part, with the diligence that will ensure its completion within the Contract Time and shall constitute sufficient basis for the Authority to recommend to withhold any payment otherwise due, or identify and order alternate recovery actions on the basis of the information in the Contract Schedule, or to take any other action allowable under the Contract Documents.

1.14 CONTRACT REQUIREMENTS

- A. All versions of the Progress Schedule up to, and including, the as-planned Contract Schedule, shall be based solely on the requirements of the Contract Documents.

1.15 EARLY COMPLETION

- A. An early completions CPM Schedule is one which anticipates completion of all, or an identified part, of the Work ahead of the corresponding Contract Time.

1.16 NON-COMPLIANCE

- A. The Authority will withhold payment if, in the Authority's opinion, the Contractor's failure, refusal or neglect to provide the required Progress Schedule information precludes a proper evaluation of the Contractor's progress.

PART 2 PRODUCTS

2.01 CPM SCHEDULE

- A. The CPM Schedule shall break down the Work into activities and relationships to disclose the overall approach to the Work as itemized in Paragraph 1.04.A, and to allow the Authority to fulfill the review objectives itemized in Paragraph 1.04.A. The CPM Schedule shall divide the Work into activities and shall specify the progression from the Notice to Proceed to the end of the Contract Time. It shall also identify the requisite duties and responsibilities of the Contractor, and the items related to materials or equipment, including time allowances of 60 days for the resubmittal and re-review of Shop Drawings from Divisions 01 through 16; items of interface with work performed by others; and specified construction, start-up and performance tests. Site-related

activities shall not combine work located in separate structures, distinct areas or elevations within a structure, work corresponding to different Divisions of the Specifications, work performed by different Subcontractors (first and second tiers), nor rough-in and finish work of the same trade. The CPM Schedule shall use the same work breakdown structure specified in Section 01370 – Schedule of Values; however, the breakdown may include more detail to meet the requirements of this Section. Unless otherwise specified, a site-related activity shall span 20 working days or less, and have a value not exceeding \$100,000.

- B. CPM diagrams shall be based on precedence diagram format, shall be plotted on a time-scaled calendar, and shall expressly identify the Contract Time, Milestones, the Critical Path(s), and all activities. Activities shall be identified on their Early Dates, with their Total Float noted beside them. Connections between activities, whether on the same sheet or on different sheets, shall identify both predecessor and successor work.
- C. Activity descriptive data shall include the activity code, activity description fully conveying the work included, and special codes. The use of start or finish restraint dates shall be annotated as to the basis for the chosen restraints.
- D. Intermittent or indirect activities shall be included for indirect or home office activities including such items as supervision, site management, clean-up, dust control, shop drawings, redline drawings, testing, demobilization, and the like. Work being performed by MBE/WBE firms shall be identified as separate CPM activities.

2.02 ACTIVITY REPORTS

- A. Activity reports shall include: code, description and duration; early start and early finish date, late start and late finish dates, Total Float and percent complete or remaining duration. Activity dates shall be stated in days. The Contract Time shall restrain the late finish dates; any Milestones representing commencement of work conditions shall be indicated as restraining early start dates. A report shall also be provided showing each relationship type (lead/lag, lead times, etc.) between each activity and each of its preceding and succeeding activities.

2.03 CPM SCHEDULE NARRATIVE

- A. A CPM Schedule narrative shall compare current Early Dates versus the corresponding as-planned Contract Schedule dates for any Milestones and the Contract Time; provide sufficient detail to allow verifications of the progress of the Work; identify the assumptions made in incorporating work related to Change Orders; describe actual or potential delays, including related causes, and the steps taken or anticipated to mitigate their impact; and itemize any changes in CPM Schedule activities and sequences, and their basis.

2.04 SIX-WEEK SCHEDULES

- A. Six-Week Schedules may be in precedence diagram or bar chart form with appropriate logic ties between bars. Each site-related activity shall reflect the work of a specific crew, span 20 working days or less, and indicate which CPM Schedule activity includes the same work. Procurement-related activities shall reflect, in detail, all items involved in the preparation, submittal, review and return of shop drawings and samples, and in the fabrication, delivery, receipt and inspection of the items of materials and equipment, and shall not combine items furnished by separate Suppliers (first and second tiers).
- B. A Six-Week Schedule shall consist of “look-ahead” and “as-built” charts. The look-ahead chart shall record the Contractor’s plan for the current six-week period. The as-built chart shall record when and how work on the previous look-ahead chart was performed.

2.05 RATE-OF-PROGRESS DATA

- A. Rate-of-progress data shall consist of monthly and cumulative quantity plots for significant measurable quantities of work as specified by the Authority at the pre-construction meetings, labor plots for trades associated with the significant measurable quantities, and payment plots. Rate-of-progress plots shall compare the anticipated rate of progress for the most-current Contract Schedule and the as-planned Contract Schedule, and shall conform to the corresponding activity Early and Late Dates. The plots shall be in forms acceptable to the Authority.

PART 3 EXECUTION

3.01 TOLERANCES

- A. If the Authority elects to review an early-completion CPM Schedule submittal showing activities on the Critical Path with Total Float less than the appropriate Contract Float, the Authority will do so with the understanding that schedule is to be deemed to include an activity at the end of the Critical Path of duration equal to the difference between the Contract Float and the indicated Total Float values.
- B. The review of a portion of the CPM Schedule or an incomplete CPM Schedule submittal shall not indicate acceptance of the entire CPM Schedule.

3.02 CPM SOFTWARE SUBMITTAL

- A. Within 15 working days after Notice to Proceed, furnish a fully-licensed copy of the Primavera P6 software to the Authority for the Authority’s exclusive use for the duration of the Contract, at no additional cost to the Authority.

3.03 Rev.0 CPM SCHEDULE

- A. The CPM Schedule Rev.0 submittal shall consist of the CPM diagrams, the Schedule of Values, computer reports, rate-of-progress plots, narrative, and a CD or DVD with CPM software files duplicating the Contractor's files in an Authority specified ASCII format. The CPM report shall be sorted by 1) activity code in order of ascending activity number, 2) Total Float in order of ascending Total Float values, and by: (a) ascending early start dates; (b) ascending activity numbers, within the same Total Float values; and 3) early start dates, in chronological order (and by ascending activity numbers within the same early start dates).
- B. Submit the Rev.0 CPM Schedule within ten (10) working days after the date of the Notice to Proceed. The Rev.0 submittal shall reflect the Work as awarded. Receipt by the Authority of a Rev.0 submittal shall be a condition precedent to processing the first Application for Payment.
- C. In addition to the requirements in Paragraph 2.03, the CPM Schedule narrative shall identify the Contractor's plan for management of the Site (e.g., lay down and staging areas, construction traffic, etc.), the utilization of construction equipment and the buildup of trade labor. Proposed Change Orders shall not be incorporated into the CPM Schedule.
- D. Two (2) sets of rate-of-progress data shall be provided: one (1) set shall correlate to the Early Dates, and the other to the Late Dates, as identified in the Rev.0 CPM Schedule.
- E. The Authority will return the Rev.0 submittal within 30 working days. If a resubmittal is required, respond with the revised, CPM Schedule resubmittal, labeled as Rev.0A, within ten (10) working days.
- F. Once the Rev.0, or Rev.0A, submittal is returned by the Authority as "No Exceptions Taken", it will be considered as the as planned Contract Schedule for the Work, and as such become the basis for (a) the monitoring progress against Milestones and Contract Time, and (b) the evaluation and reconciliation of extensions in Contract Time, if and when the Contract Time is indeed extended.
- G. All schedules shall be in accordance with the Contract Time requirements of the Contract. Nothing contained in this Section shall relieve the Contractor from compliance with the Contract Time.

3.04 CPM SCHEDULE REVISIONS

- A. Each schedule revision, starting with the Rev.1 submittal, shall consist of the required copies of the updated CPM diagram, reports, rate-of-progress plots, narrative, and CD or DVD data, as specified in Paragraph 3.03.A. CPM Schedule revisions shall update and revise the current Contract Schedule with data every month following review of the

initial CPM Schedule, for the duration of the Contract. Receipt by the Authority of a compliant submittal will be a condition precedent to processing that Application for Payment.

- B. CPM Schedule revisions shall represent all changes, adjustments, or updates in the sequencing and timing of work remaining to be made, or required to be made, to ensure that the CPM Schedule stays current with the revised plan for performing and furnishing work remaining. If the CPM Schedule submittal indicates slippage or delayed progress caused by delays failing to meet the requirements for extensions in Contract Time, follow the schedule recovery requirements as specified in Paragraph 1.14 of this Section. Any revisions made due to the issues covered under Paragraph 3.04.B shall be considered revisions made for convenience, and shall be excluded when reconciling an extension to any Milestone or Contract Time until the timing and sequences purported by those revisions actually take place.
- C. Incorporate revisions which have been agreed upon in Change Orders ordered since the last revision. These types of revisions shall be included in the CPM Schedule when reconciling extensions in Contract Time. Show any proposed effects resulting from any Change Orders which are being negotiated with the Authority.
- D. Ensure that the CPM Schedule diagram accurately reflects for each activity the "as-built" information indicated on previous Six-Week Schedules, including: actual start dates (discounting early starts not representative of true as-built conditions), remaining days of work, percent complete, and actual finish dates (when the activities were completed so that dependent work could proceed).
- E. The Authority will initially return a revision submittal with comments limited to the uncompleted work items within 15 working days of receipt by the Authority. If a resubmittal is required, respond with the required copies of a revised CPM Schedule revision submittal within ten (10) working days of receipt of the Authority's comments. Once the Contractor's CPM Schedule revision submittal, or resubmittal, is returned as "No Exceptions Taken", it shall represent the Contract Schedule for the Work as of the date of the submittal, and it shall be the basis for the monitoring of performance and progress.

3.05 SIX-WEEK SCHEDULES

- A. The first Six-Week Schedule (Rev.0) submittal is due within five (5) working days after receipt of the Notice to Proceed and shall cover the look-ahead period starting with the Notice to Proceed. Subsequent submittals shall be due monthly, with (attached to) each Application for Payment, and consist of the previous look-ahead chart updated with progress (as-built chart), and a revised look-ahead chart for the next six (6) weeks. Receipt by the Authority of a responsive Six-Week Schedule will be a condition precedent to processing that Application for Payment.

- B. Each Six-Week Schedule submittal shall consist of four (4) copies of the as-built and look-ahead charts, and corresponding rate-of-progress plots for the two (2) periods covered. As-built data for activities which were scheduled in the previous period shall be as specified in Paragraph 3.04.D, except that the data may be conveyed simply by marking-up the previous period's look-ahead chart.
- C. Monthly schedule and payment review meetings shall be held between the Authority and the Contractor within seven (7) days prior to the cutoff date of each progress payment period. Five (5) working days prior to each meeting, deliver the Six-Week Schedule submittal then due so that the Authority may verify as-built data against field and submittal records, evaluate completion and make recommendations as to payments for work performed, and become familiar with the progress objectives for the next month.
- D. Make revisions to the Six-Week Schedule as may be required at the meeting, and include the revised Six-Week Schedule with the resubmittal of that Application for Payment within five (5) working days from the date of the monthly meeting.

**** END OF SECTION ****