FBCTRA Special Specification
CPM Schedules 01310 rev 1-21-03

1. The Contractor shall provide a written statement to the Engineer prior to the preconstruction conference describing his scheduling capabilities for the Engineer to review. This statement shall include the following as a minimum:

    1.1. Identification, qualifications, and experience of the member(s) of the Contractor's scheduling staff or the staff of any scheduling consultant retained by the Contractor.

    1.2. References of not less than two (2) previous projects on which the Contractor, or the Contractor's scheduling consultant, has utilized Critical Path Method (CPM) scheduling, which were of not less than one-half the value of the Contract contemplated. Engineer references shall be included.

    1.3. The scheduling software to be utilized on this project is Primavera Project Planner P3 version 3.1 or later.

2. The Engineer will schedule and conduct a preconstruction conference a portion of which will specifically address the development and maintenance of the CPM schedule.

    2.1. The Contractor shall be prepared to review and discuss the schedule and sequence of operations plus resource and cost loading. The conference shall be attended by:

        2.1.1. Contractor's project management and scheduling staff

        2.1.2. Significant subcontractors or suppliers representatives whom the Contractor may desire to invite or whom the Engineer may request. .

    2.2. The Contractor shall submit to the Engineer a copy of the construction schedule that was used in the preparation of the bid.

3. Contractor acknowledges that it is constructing a revenue generating and revenue financed project. As such, it is expressly understood and agreed that the time of beginning, the rate of progress, and the time of completion of the work are of the essence of this contract. The work shall be prosecuted at such time, in such manner, and on such part or parts of the project as may be required to complete the project as contemplated in the Contract Documents to achieve the completion date and milestones as agreed upon in the Contract.

4. The Contractor shall prepare and submit to the Engineer the initial project schedule within twenty-one (21) days after contract award. The project schedule produced and submitted shall be in the form of a Critical Path Method (CPM) network diagram. Sufficient detail describing the sequence of activities required for complete performance of the all work; the early start and early finish dates of all activities; and an uninterrupted critical path from Notice to Proceed through Project Completion for

the project shall be shown. A tabular report shall accompany the network diagram and shall, at a minimum, include an activity number for each activity; the description and duration of each activity; all predecessors to and successors from each activity; and the early start, early finish, late start, late finish, and total float for each activity. The report shall support the network diagram. The initial project schedule shall also be submitted in electronic format via a disk containing a backup copy of the schedule.

5. The activities included in the contractor's schedule shall be in sufficient detail to assure that adequate planning has been done for proper execution of the work and such that the schedule provides an appropriate basis for monitoring and evaluating the progress of the work. A work activity is defined as an activity which requires time and resources (including manpower, equipment, delivery of materials).

    5.1. Activity durations shall not be less than one (1) day nor more than fourteen (14) calendar days, unless otherwise approved by the Engineer. Activity durations shall be factored to include an allowance for inclement weather and compensation for seasonal weather as appropriate. The use of calendars reflecting inclement weather, holidays, and other non-work periods is encouraged.

    5.2. Each activity in the schedule shall have at least one predecessor and one successor unless approved by the Engineer. All activities, except Notice to Proceed, will be required to have a predecessor. All activities, except project completion, will be required to have a successor.

    5.3. The schedule will have at least one chain of activities, linked by logic, that constitute a critical path from the current data date to the completion of the project. Critical Path is defined as activities on the longest path through the network. All schedule submittals must use the option: Critical Activities = Longest Path.

    5.4. The Contractor shall not use Constraints of any type without prior approval of the Engineer.

    5.5. Hammocks shall not be used without prior approval and permission of the Engineer.

    5.6. As a minimum the Contractor shall apply the activity code structure and activity ID structure provided by the Engineer to each activity in the schedule.

    5.7. If requested by the Engineer, the Contractor shall provide highly detailed, (hourly), short term schedules for specific crucial items or periods, (i.e., traffic changes, tie-ins, main lane closures, etc.).

    5.8. If requested by the Engineer, the Contractor shall resource load short-term schedules to demonstrate that sufficient resources are available and capable of meeting the specific requirements resulting from the need to provide said schedule.

6. Detailed network diagram: The Contractor will only be required to submit printed schedule charts or reports for the initial schedule review and approval process. There after only an electronic backup copy of the schedule submitted on a diskette accompanying the pay request will be required.

    6.1. The Contractor's schedule submittal shall include a time-scaled network diagram based upon the calendar the contractor anticipates using for the project inclusive of holidays and weather allowances. The network diagrams shall be Critical Path Method (CPM) precedence format and shall show the sequence, duration, and interdependence of activities required for complete performance of all items of work. A calendar shall be shown on all sheets along the entire sheet length. Each activity shall be plotted such that the beginning and completion dates of each activity can be determined graphically by comparison with the calendar scale. Each sheet shall include a title block.

    6.2. Sufficient care shall be exercised to produce legible and accurate network diagrams. The network diagrams shall be drawn legibly on 24x36, or 11x17 inch media or comparable computerized plot as requested by the Engineer's Project Manager.

    6.3. Contractor, Subcontractor, Engineer responsibility shall be coded and annotated on the network diagrams. In addition, each activity of the network diagrams shall be labeled with a complete description, as well as the planned duration in work days.

    6.4. The Contractor's schedule shall also be presented in a bar chart format based upon work days.

7. The detailed network diagram shall be accompanied by reports, in tabular format, prepared, sorted, and sub-sorted, as follows:

    7.1. All activities sorted by activity number and including predecessor and successor relationships, lag and lead time. Each listing shall show activity number, description, location, responsibility, total duration in working days, early start date, late start date, early finish date, late finish date, total float, free float and status (whether critical or completed) for each activity in the network diagram.

    7.2. All activities sorted by responsibility, sub-sorted by early start and total float. The activity responsibility listing shall segregate in separate sub-listings; the work activities for the Contractor, vendors, subcontractors, and the Engineer, and submittals to the Engineer of all major items of material and equipment.

    7.3. A sub-listing of materials and equipment sorted by equipment tag number. The sub-listing of materials and equipment shall include the following activities: preparation of shop drawings and submittals to the Engineer, review by the Engineer, fabrication and/or delivery of materials and/or

equipment. All of these activities shall be interfaced with the earliest date that the material or equipment is to be installed on the project.

7.4. The detailed network diagram shall also be accompanied by an electronic backup copy of the schedule on a 3 ½ diskette(s) or compact disc. This diskette or disc must be made utilizing the Primavera Backup Utility within the P3 program using the schedule compression option. The diskette or disc must be properly labeled and as a minimum contain the Contractors name, Contract or Segment number, and the data date of the schedule.

8. If the Contractor desires to make a change to the schedule he shall notify the Engineer, in advance of making such change, in writing stating the reason for the change. If the Engineer considers the change to be major, the Engineer may require the Contractor to revise and submit for acceptance, all of the affected portions of the network diagram clearly marked to indicate the proposed changes along with electronic versions of the original schedule and the proposed changes and analysis to show the effect on the entire project. The original network and the proposed revision and analysis shall be submitted to the Engineer within fifteen (15) days after the Engineer notifies the Contractor that the revision is considered major. A change will be considered major if the time estimated to be required for an activity or the sequence of activities is varied from the original plan to a degree that there is reasonable doubt that the contract completion or other contractual milestone date will be met or if the change impacts the work of other contractors involved in the project or follow on projects. Changes to activities having adequate float will generally be considered as minor changes, except that an accumulation of minor changes may be considered a major change when such changes affect the contract completion or other milestone dates.

   The schedule shall clearly indicate the sequence and interdependency of work activities. It shall include, but not be limited to the following items, as appropriate to the contract.

   8.1. Engineering activities, all Engineer review and approvals [allow twenty-one (21) days for Engineer review,
   8.2. Submittals, vendor design activities, vendor supplied information, drawings, engineering, etc.,
   8.3. Mobilization and move-in,
   8.4. Excavation, backfilling, grading, paving, underground utilities,
   8.5. Preparation of approval packages by the Contractor, review by the Engineer, approval/decision milestones [allow twenty-one (21) days for Engineer review],
   8.6. Concrete placement sequence, forming, placing, curing, etc.,
   8.7. Order, manufacture, shipment, delivery, installation, and check-out of major equipment,
   8.8. Order, manufacture, shipment, delivery, and installation of structural steel, misc. metals,
   8.9. Order, manufacture, shipment, delivery, and installation of mechanical equipment,
   8.10. Order, manufacture, shipment, delivery, and installation of electrical equipment,
   8.11. Sitework,

8.12. Order, manufacture, shipment, delivery, and installation of instrumentation and control equipment,
8.13. Painting,
8.14. All other major construction activities,
8.15. Subcontractor's items of work,
8.16. Punchlist and clean-up,
8.17. Shutdown periods,
8.18. Performance and acceptance testing and supervisory service activities
8.19. Delivery, installation, and checkout of Engineer furnished equipment and materials if applicable,
8.20. Start-up and testing of facilities,
8.21. Operator and maintenance personnel training,
8.22. All contractual milestones, substantial completion dates, and final completion dates,
8.23. Final clean-up, and
8.24. Demobilization

9. Any activity that requires unusual shift work, such as two (2) shifts, six (6) day work weeks, etc., shall be clearly identified in the schedule.

10. The Contractor's schedule shall begin with the date of issuance of the Notice to Proceed and conclude with the date of final completion of the contract. Float, slack time, or contingency within the schedule (i.e., the difference in time between the project's early completion date and the completion date), and total float with the overall schedule, is not for the exclusive use of either the Engineer or the Contractor, but is jointly owned by both and is a resource available to and shared by both parties as needed to meet the contract milestones and the contract completion date.

11. The Contractor shall not sequester shared float through such strategies as extending activity duration estimates to consume available float, using preferential logic, or using extensive crew or resource sequencing, etc.

12. The Engineer, within ten (10) working days after receipt of the preliminary Contractor's schedule, shall meet with the Contractor and selected subcontractors requested by the Engineer, to review the schedule submitted. Within ten (10) working days after receipt of the Engineer's written review comments, the Contractor shall revise the preliminary schedule in accordance with the Engineer's comments, and resubmit the schedule to the Engineer. The revised Contractor's schedule shall be accepted or rejected by the Engineer, within ten (10) working days after receipt. It is expected that no more than two (2) submittals of the Contractor's schedule will be needed in order to obtain an accepted schedule.

    12.1. If more than two (2) submittals are required, the Engineer shall have the right to withhold progress payments until the Contractor complies with the Engineer's requirements and submits a schedule that is approved.

    12.2. The Contractor's schedule, when accepted by the Engineer, shall constitute the initial schedule, and shall stand until updated schedules are submitted to reflect actual completed work, approved changes, or recognized delays.

12.3. The receipt of the Contractor's schedule shall be a condition precedent to the Contractor receiving his first payment under the contract. No subsequent progress payments will be processed if not accompanied by a current schedule update furnished electronically per paragraph 7.4 of this specification.

13. The Contractor shall execute the Work in accordance with the Contractor's schedule. Upon issuance of a change order or notice to proceed with a change, the approved change shall be reflected in the next schedule submittal by the Contractor, or other schedule update submittal accepted by the Engineer.

14. Once each week, or as approved by the Engineer, the Contractor shall submit a report or schedule listing activities begun, completed, and in progress in the past week, and activities scheduled to begin, be complete or activities in progress for the succeeding two (2) weeks. This report shall cover all work activities listed on the schedule. The report shall be a tabular report, commonly referred to as a "turn-around document," sorted by activity ID number.

15. Predicated upon the results of the Engineer's review of monthly submissions of the updated schedule, or the joint Engineer/Contractor review in any given month, the Contractor may be required to revise the schedule. Conditions under which a revision will be required include the following:

    15.1. When a delay in completion of any work activities or sequences of work activities result in an indicated extension of the project completion or milestone dates.

    15.2. When delays in submittals or equipment or material deliveries, or work stoppages are encountered which make re-planning or re-scheduling of the work necessary.

    15.3. When the schedule does not represent the actual prosecution and progress of the project.

16. All revisions and additions the Contractor's schedule are subject to review and acceptance or rejection by the Engineer.

17. If any time during the project, the Contractor fails to complete any activity by it's latest scheduled completion date, which late completion will impact the end date of the work past the contract completion date, or other contractual milestone, the Contractor shall, within five (5) working days, submit to the Engineer a written statement as to when, and how, the Contractor will re-organize his work force to return to the current approved schedule.

18. The written statement must be accompanied by a revised schedule that will indicate how the plan described in the Contractor's written statement will actually affect the current Contractor's schedule.

19. Whenever it becomes apparent from the monthly progress evaluation and updated schedule data that any milestone date(s) or the contract completion date will not be met, the Contractor shall take some or all of the following actions:

    19.1. Increase manpower in such quantities and crafts on critical activities to substantially eliminate the backlog of work and meet the current completion date.

    19.2. Increase the number of working hours per shift, the number of shifts per day, the number of work days per week, or the amount of equipment, or any combination of the foregoing sufficient to substantially eliminate the backlog of work.

    19.3. Reschedule work to achieve concurrent accomplishment of work activities.

20. Under no circumstances will the addition of equipment or construction forces, increasing work hours, or any other method, manner, or procedure to return the work to the contractually required completion date, or milestone, be considered justification for a change order, or treated as an acceleration, or entitle the Contractor to additional compensation.

21. No time extensions shall be granted, nor delay damages paid, unless the delay can be clearly demonstrated by the Contractor on the basis of the updated schedule current as of the month the change was issued, or the delay occurred, and which delay cannot be mitigated, offset, or eliminated through such actions as revising the intended sequence of work or other means.

22. The schedule shall be cost loaded. Each activity shall be assigned a value that accurately reflects the total cost of the work described, including labor, materials, equipment, subcontracts, etc. The sum of the values assigned to the activities in the Contractor's schedule shall be equal to the contract value. A resource named "CASH" will be used for cost loading. These values are to be utilized to assist the Authority in cash flow predictions and as an additional measure of project progress.

23. The schedule shall be resource loaded using man hours of effort. Each activity shall be assigned a value that accurately reflects the total man hours of effort to accomplish the work described. The sum of the values assigned to the activities in the Contractor's schedule shall be equal to the total number of man hours estimated for the project including subcontractors. A resource named "MNHR" will be used for resource loading manhours.

24. The Contractor shall utilize a sequential naming system for each schedule submittal acceptable to the Engineer. Each schedule submitted to the Engineer will be identified by a unique name conforming to the sequential numbering convention agreed to. Ex. A101, A102, A103, etc.

25. At least once each month, on a date established by the Engineer, a review meeting for the coordination of the schedule will be held. The meeting shall be attended by the Contractor's project manager, superintendent, and scheduler, and those major subcontractors as determined to be necessary by the Engineer or the Contractor.

26. Time Impact Statements: If the Contractor believes that he is due additional time because of changes made by the Engineer, or Time Suspensions not received in writing from the Engineer, or by other causes not within his control, other than weather, he may request additional time. Such request must be made within fourteen (14) days from the time the event requiring the adjustments occurrence, or within fourteen (14) days from the date the Contractor should have reasonably been expected to know of the event. In no event will any request for additional time be considered after the next months time charges have been presented to the Contractor by the Engineer. The Engineer can furnish TIS forms upon the Contractor's request.

    Each Time Impact Statement must clearly contain the following:

    26.1. A clear description of the event or reason for the request
    26.2. The reason the event or cause is not the Contractors responsibility
    26.3. Background information or data sheets to support the request
    26.4. A copy of the portion of the schedule being impacted clearly indicating the activities being impacted before the event and after the event
    26.5. The amount of time being requested in calendar days

    No request for additional time will be considered with out a Time Impact Statement containing all of the information described in this section.

27. Weather Delays – This is a calendar day project. It is the Contractor's responsibility to consider the geographic location including the local weather conditions and the period in which this project will be constructed as well as the contract duration in order to marshal the necessary resources to complete this project on time.

    27.1. No time extensions will be granted for normal or seasonal rain or adverse weather conditions.
    27.2. The Contractor may request additional time for unusually severe or adverse weather using paragraph 26 of this section. Such request will be considered in the same manner as any other request for additional time.
    27.3. The contractor must provide background data on what the expectation for working days was for normal weather versus the actual weather was for the period in question.
    27.4. Any such claim for unusually severe weather may be offset by the Authority's request for a reduction in the contract duration due to unusually good weather.

If the Contract fails to mobilize within 10 days of the date of the Notice to Proceed, the Owner will be entitled to off-set any requested time extensions by the number of days from the date of the Notice to Proceed to the date of mobilization.

(END OF SECTION)