

**PART 1 – GENERAL**

**1.1 SUMMARY**

- A. This Section includes the administrative and procedural requirements for schedules and reports required for proper performance of the Work.
- B. A Construction Schedule shall be prepared and submitted by the Contractor for approval of the Owner's Authorized Representative (OAR) prior to the Contractor commencing with any construction activities.

**1.2 RELATED REQUIREMENTS**

- A. Section 01 11 00, Summary of Work
- B. Section 01 71 13, Mobilization

**1.3 REQUIREMENTS**

- A. Projects with less than six (6) months duration and/or less than \$2 million value will be allowed to submit a project schedule in another format than a P6 schedule.
- B. The Contractor shall prepare and maintain a Construction Schedule in accordance with the requirements of this Section. The requirement for a Construction Schedule is included to:
  - 1. Assure adequate planning and execution of the Work by the Contractor.
  - 2. Assure coordination of the Work of the Contractor with other contractors, subcontractors and suppliers.
  - 3. Incorporate proper coordination of the Work between Owner and the airlines/tenants.
  - 4. Assist the Contractor and the OAR in evaluating:
    - a. Contract performance relative to the Milestones included in the Project Schedule as referenced in Section 01 11 00 Summary of Work
    - b. Monthly progress
    - c. Proposed Contract modifications
- C. The Construction Schedule shall include:
  - 1. Detailed Critical Path Method (CPM) Diagram of all Project activities, including procurement and delivery of major deliverables or field equipment, and subcontractor schedules.
  - 2. Work Breakdown Structure (WBS) as defined by the Project's Scope of Work
  - 3. Respective WBS assignment for each Activity
  - 4. Summary Bar Chart-(Gantt Chart)
  - 5. Resource & cost loading – Refer to subsection 1.3.D for requirements.

The schedule cost loading must include the following:

    - a. Budgeted Cost
    - b. Cost to Date

- c. (S-Curve) graphical report including Contract amount line, Baseline curve, Milestone markers, Work-in-Progress, ETC Curve, EAC line.

The schedule resource loading must include identification of D/S/M/WBE contractors based on the contract commitment in Special Provisions Section 2.0 and as approved by Business Development & Diversity Department (BDDD).

- a. Budgeted Cost associated with the D/S/M/WBE resource must be provided.
- 6. Planned cash flows based on early and late activity dates. Bi-weekly graphical reporting of Earned Value Cost actual cashflow vs. baseline plan.
  - 7. Responsibility Code by Company
- D. The Contractor shall provide a Construction Schedule suitable for planning, scheduling and reporting the Work to be performed under the Contract. The Construction Schedule shall be developed using the Owner's approved project planning software, Oracle-Primavera P6 (current version) as updated by Oracle (Primavera) throughout the Project. Other Primavera P6 versions that are fully compatible with the current version, or other schedule software, may be acceptable if approved by the OAR.

The principles and definitions of terms herein are set forth in the Project Management Institute (PMI) publications, "A Guide to the Project Management Body of Knowledge (PMBOK) 5th Edition" (ISBN: 978-1-933589-67-9), "Practice Standard for Scheduling" (ISBN: 978-1-93069984-7) and "Practice Standard for Work Breakdown Structures, Second edition" (ISBN: 978-1-933890-13-5). In the event of conflicts, the provisions of these articles shall govern.

Acceptance of the planning software and version by the OAR shall be used for the Baseline Schedule, Construction Schedule, and any updates throughout the Project, unless a new planning software version is approved by the OAR.

- E. The Construction Schedule shall be resource & cost loaded at the WBS Level if the period of Work from the Notice to Proceed (NTP) to Substantial Completion exceeds 12 months, or if the Contract Amount exceeds \$2.0 Million, or upon written notice by the OAR based on necessity to evaluate the Construction Schedule performance regardless of whether the above limits apply.
  - 1. Cost can be loaded as either a lump sum non labor resource or a price per unit labor/material resource as appropriate and agreed upon by the OAR.
  - 2. The cost shall be broken down to align with the WBS level and loaded to match the Contract Items or Schedule of Values (SOV) breakdown/milestone payments, as appropriate, for the Contract.
  - 3. A Mobilization- Payment activity shall be loaded across a Level of Effort (LOE) activity and invoiced as required in Section 01 71 13. Also, a discreet Mobilization task (non-LOE) shall be represented in the schedule as appropriate that reflects the contractor's mobilization period.
  - 4. Period Cost and Cost to Date shall be coordinated between consecutive Payment Applications and the construction activity progress.
  - 5. Cumulative amount of cost loaded Work activities shall equal total Contract Amount.

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6. Change Orders, including changes that are addressed using one or more Allowances, shall be added to the Construction Schedule, and Cost Loaded with corresponding cost, activity description, and logic. An updated CPM Diagram, Gantt Chart and S-Curve must be submitted with all Change Order requests and will include the impact of each request.
  7. Notwithstanding paragraph D above, all schedules must include the D/S/M/WBE resource based on the contract commitment in Special Provisions Section 2.0 and as approved by BDDD and must include the associated cost.
  8. The Contractor shall include additional cost breakdown or information requested by the OAR at no additional cost.
  9. Refer to subsection 1.7.D.5.c for additional reporting requirements.
- F. The Construction Schedule shall, at a minimum, adhere to industry standards for scheduling of activities maximum durations, use of open-ended activities, the percentage of logic types, the use of constraints and their type, and the use of activity leads and lags, etc.
- G. The Contractor shall use the following Planning Schedule Logic:
1. Calculate Start-to-Start lag from Early Start.
  2. Calculate the schedule using the Retained Logic scheduling option.
  3. Define Critical Activities as; Total Float less than or equal to zero.
  4. Show Open-Ends as Non-Critical.
  5. Calculate Total Float as Late Finish – Early Finish.
  6. Calendar for scheduling shall be seven (7) days/week with no holidays considered. This should include contractual weather days.
  7. Blackout dates should be loaded as separate activities that constrict only affected tasks. They shall not be loaded as a separate calendar.
  8. The use of Terminal Float or Buffering Activities within the Construction Schedule shall not constitute Ownership of that Float by the Contractor.
- H. The Contractor shall use assign Activity Assignments to the following:
1. Duration type is Fixed Duration and Units.
  2. Activity % Complete Type should be as Physical.
  3. Activity Type should be Task Dependent for “working” activities.
- I. The Contractor shall use the following Project Calculation and Settings:
1. Link Actual to Date and Actual this Period.
  2. Link Budget and Estimate to Completion (ETC) for non-progressed activities.
- J. Schedule Detail shall be broken down such that the Activity Duration is no longer than fourteen (14) Calendar Days.
- K. Activity Descriptions shall be unique and follow the naming convention of “LOCATION –VERB NOUN”. That is: a common Location ID followed by an action verb (i.e., DEMO, INSTALL, SET, etc.), followed by the item name (noun) requiring action.

- L. Summary Bar Chart (Gantt Chart)
1. The Summary Bar Chart shall be based on the activity durations and logic indicated in the CPM Diagram area of the schedule.
  2. The Contractor and the OAR shall jointly select Summary Level activities.
  3. Each Summary Level activity shall include:
    - a. A concise description of the Work represented by the activity
    - b. A Time Bar indicating planned/actual Activity Start and Activity Finish dates and actual Cumulative Percent Complete at the end of each reporting period.
    - c. A status line as of the end of the reporting period. (Data Date)
    - d. Major procurement items required to support the summary activity duration.
  4. The Summary Bar Chart shall display all Contract milestones.
  5. Contract Time extensions for abnormal weather will be granted in accordance with subsection 1.10 only to the extent that the actual time lost during a particular month exceeds the average lost time indicated in the General Provisions, Section 80, Prosecution and Progress. Contract Time extensions granted for abnormal weather are not compensable. Any abnormal weather event must impact critical path work to be considered for Contract Time extensions.
- M. The Contractor shall not use the following types of logic relationships:
1. Negative lags
  2. Positive lag in excess of ten (10) workdays
  3. Start-to-Finish relationships
  4. Open ends.

Only the first activity will have no predecessor and only the last activity will have no successor.
  5. Constraints.

The Contractor may use a limited number of constraints. An appropriate number of constraints is at the sole discretion of the Owner and will be established during Baseline Schedule submission/acceptance.

#### 1.4 SCHEDULE REPRESENTATIVE

- A. Within seven (7) Calendar Days after receipt of the NTP, the Contractor shall designate in writing a schedule representative in the Contractor's organization who shall be responsible for coordinating with the OAR during preparation and maintenance of the Schedule.
- B. The Contractor's schedule representative shall have complete authority to act for the Contractor in fulfilling the Schedule requirements of the Contract, and if such authority is interrupted during the Contract, it shall be obtained in writing by the OAR. This schedule representative cannot be replaced without the approval of the OAR.

**1.5 BASELINE SCHEDULE**

- A. Within fourteen (14) Calendar Days after receipt of the NTP, the Contractor shall submit their Baseline Schedule.
- B. The Contractor and major Subcontractors shall meet with the OAR immediately after the issuance of the NTP to jointly agree on guidelines, WBS, level of detail and summaries to be used in developing the Baseline Schedule. The Contractor must prepare a Baseline Schedule for this meeting showing in detail the activities to be accomplished during the entire Project. The Baseline Schedule will become the final Baseline Schedule upon approval of the OAR and shall not be revised for the remainder of the Project.
- C. The Baseline Schedule needs to include reasonable operational, seasonal, economic, weather, facility or manpower restrictions required for sequencing of Work.
- D. The Contractor shall be responsible for assuring all work sequences are logical and the Baseline Schedule shows a coordinated plan for complete performance of the Work. Failure of the Contractor to include any element of work required for performance of the Contract in the Baseline Schedule shall not excuse the Contractor from completing all Work within the Contract Time.
- E. The Baseline Schedule shall comply with the various limits imposed by the Contract Documents and by any contractually specified intermediate milestone dates and completion dates.
- F. The degree of detail shall be to the satisfaction of the OAR and shall be sufficient to identify:
  - 1. The Work Breakdown Structure of the Project.
  - 2. Contract Milestones and phasing.
  - 3. The types of work to be performed by subcontractor and labor trades involved including the respective quantities and durations required for timely prosecution of stated work.
  - 4. The D/S/M/WBE contractors based on the contract commitment as approved by BDDD.
  - 5. Submittal review, procurement, fabrication, delivery, installation and testing of major materials and equipment.
  - 6. Access and availability to work areas.
  - 7. Manpower, material, space, and equipment constraints.
  - 8. Delivery of Owner-furnished equipment as applicable.
  - 9. Interfaces and dependencies with preceding, concurrent, and following contractors.
  - 10. Cash flow curves showing the planned cash flow at each Payment Application including the cumulative cash flow for the Contract.
- G. The Contractor shall submit the Baseline Schedule to the OAR and/or upload the Baseline Schedule into the Owner's database as directed by the OAR.

**1.6 ROLLING THREE WEEK LOOK AHEAD SCHEDULES**

- A. A Rolling Three Week Look Ahead Schedule shall be submitted weekly and shall be the basis of the weekly Progress Meetings.
- B. The Rolling Three Week Look Ahead Schedule shall be the actual detailed work plan used by the Contractor in meeting the Project Schedule and Milestones.
- C. The basis of the Rolling Three Week Look Ahead Schedule shall be the updated Construction Schedule.
- D. The Rolling Three Week Look Ahead Schedule shall display at minimum:
  - 1. Activity ID & Description.
  - 2. Planned Activity Expected Duration and representative Dates.
  - 3. Physical Percent Complete.
  - 4. Activities or data for the previous week, current week, and the next two (2) following weeks.
  - 5. Indicator for Action Items that require resolution before execution of the Activity can occur.
  - 6. Indicator of all Critical Path activities with Total Float.
  - 7. Main/Immediate Milestones Status (Plan/Forecast).
  - 8. Any additional information the Contractor wishes to include information to assist in the organization and understanding of the selected Activities.
- E. The Contractor shall prepare a written narrative status report of the project progress and key forecasted activity starts or completions or any anticipated issues to accompany the Rolling Three Week Look Ahead Schedule. The reports shall be submitted to the Project Manager as part of the weekly Contractor meetings. Written status reports shall include but are not limited to:
  - 1. Status of major WBS elements.
  - 2. Progress made on critical activities indicated on the Construction Schedule.
  - 3. Explanations for any lack of work on critical path activities planned to be performed during last week and a recovery plan of how the project will be brought back on schedule.
  - 4. Explanations for any proposed schedule changes, including changes to logic or to activity durations.
  - 5. Status of major material and equipment procurement.
  - 6. Any delays encountered or expected during reporting period and upcoming reporting periods. Delays involving D/S/M/WBE contractors should be specifically addressed.
  - 7. Any changes in the planned early and late cash flow curves.

**1.7 MONTHLY PROJECT STATUS REPORTING AND UPDATING**

- A. After the Baseline Schedule is approved, the Construction Schedule shall be updated monthly until Final Completion. Entering of actual progress made through the end of the reporting period, including actual dates activities started and/or completed, the

- percentage of work completed, Payment Application amounts, and estimated remaining duration for each activity in progress will be subject to approval of the OAR. If requested by the OAR, the Contractor shall participate in pre-update conferences to verify progress and review modifications to the Construction Schedule prior to the formal submittal.
- B. In case of disagreements concerning actual progress to date, the OAR's determination shall govern.
  - C. The Contractor shall update the Construction Schedule to reflect period and cumulative progress and reflect any approved schedule revisions.
  - D. The updated Construction Schedule shall be submitted and entered into the Owner's database within three (3) Calendar Days of the Construction Schedule status date, and with the corresponding Payment Application and early/late/actual cash flow curves, and shall include the following:
    - 1. A PDF file (.pdf) of the complete Construction Schedule sorted Early Start, Total Float, then by Remaining Duration and shall identify the following:
      - a. Activity Identification
      - b. Activity Description
      - c. Original Duration
      - d. Remaining Duration (based on an estimate of the actual days remaining to complete the activity and not the quantity survey percent complete)
      - e. BL Start Date or Actual Start Date
      - f. BL Finish Date or Actual Finish Date
      - g. Total Float
      - h. Variance from BL (baseline)
    - 2. If required by the OAR, a PDF of the 90-day Look Ahead grouped by WBS Sorted by Early Start, Total Float, then by Remaining Duration.
    - 3. If required by the OAR, a PDF of the 90-day Look Ahead Grouped by Responsibility Code (with page breaks), Sorted by Early Start, Total Float, then by Remaining Duration.
    - 4. A copy of the Contractor's updated Primavera P6 .xer file, unless other OAR approved software is being used, and then the data shall be transmitted electronically in a format compatible with the current version of Primavera.
    - 5. A narrative report:
      - a. The Contractor shall explain all progress made during the period.
      - b. Status of critical Project components (percent complete, amount of time ahead or behind schedule) and an explanation of Corrective Actions taken or proposed to bring the Project back on schedule if delays have occurred.
      - c. The Contractor shall include a schedule analysis along with calculations. The following is a minimum analysis to be reported: (Refer to subsection 1.2.D to determine if required).
        - 1. Earned Value at the Project Summary Level

2. EV to Pay Application Request Variance
  3. Cash Flow Variance
  4. Estimated at Completion (EAC)
  5. Estimate to Completion (ETC)
  6. Current and projected schedule Variance
  7. Cost Variance
- d. Updates for the forthcoming report period.
  - e. Status of major material and equipment procurement.
  - f. Mitigation measures on all negative variances.
  - g. Delaying factors / problem areas, current and anticipated.
  - h. Identify known current and or potential risks and detail mitigation options for each.
  - i. Identify and provide explanations for all schedule changes, including changes to logic or to activity durations.
  - j. Explanations for any lack of work on Critical Path activities planned to be performed during the last period.
  - k. Identify any changes to the Critical Path and the drivers for them.
  - l. Report indicating actual versus planned resource loading for each trade and each activity.
  - m. Any variances related to D/S/M/WBE contractors should be specifically addressed.
  - n. The Contractor may include any other information pertinent to status of project.
  - o. The Contractor shall include additional status information requested by the OAR at no additional cost.
- E. Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation. Refer to the requirements in the General Provisions and Special Provisions of the Contract to address these matters.
- F. If the Contractor's update of the Construction Schedule reflects, or OAR determines, that the Contractor is at least ten percent (10%) or fifteen (15) or more Calendar Days behind the approved Baseline Schedule for any of the Project interim or completion milestones, then the Contractor shall submit a Recovery Schedule. The OAR may also request Bi-Weekly (every other week) schedule updates where this condition exists on a project.
- A Recovery Schedule shall be submitted separate from the update of the Construction Schedule within seven (7) Calendar Days of identification of a recovery condition or upon receipt of a written request from the OAR.



**1.8 SCHEDULE REVIEW AND APPROVAL**

- A. The OAR and the Contractor shall meet within five (5) Working Days of receipt of the Baseline Schedule for joint review of the proposed Baseline Schedule. The Contractor shall revise any areas which, in the opinion of the OAR, conflict with either the intent of this Section or the timely completion of the Project.
- B. If the Contractor fails to define any element of work activity or logic currently designed and the OAR review does not detect this omission or error, such omission or error shall be corrected by the Contractor with the Baseline Schedule or the next update to the Construction Schedule.
- C. The Contractor shall revise the Baseline Schedule in accordance with agreements reached during the joint review meeting of the Baseline Schedule. The final Baseline Schedule shall be submitted in the same form and detail as the Baseline Schedule.
- D. Approval of the Baseline Schedule will be a condition precedent to any Progress Payment under the Contract.
  - 1. All or part of any Progress Payment may be withheld for work performed prior to the approval of the Baseline Schedule. Approval of the Baseline Schedule will not be unreasonably withheld.
  - 2. All or part of any Progress Payment may be withheld for work performed during the subsequent progress periods without acceptance of the respective update to the Construction Schedule. Acceptance of any update to the Construction Schedule will not be unreasonably withheld.
  - 3. Acceptance of approval of the Baseline Schedule by the OAR does not relieve the Contractor of any of its responsibility for the accuracy or feasibility of the Baseline Schedule; however, to the extent that the approved Baseline Schedule is reasonable, it shall become a part of this Contract and defines the obligations of both the Contractor and the Owner to achieve a timely contract completion.
  - 4. If the approved Baseline Schedule indicates the Contractor's Finish Date will be prior to Final Completion, the Contractor and the Owner may execute a Change Order adjusting the Final Completion to coincide with the Contractor's planned Finish Date at no expense to the Owner.

**1.9 CONSTRUCTION SCHEDULE REVISIONS**

- A. The update to the Construction Schedule to reflect Actual Progress to Date shall not be considered a revision of the Construction Schedule. All schedule revisions must follow the process prescribed for Contract changes in the General Provisions.
- B. The Contractor shall revise the Construction Schedule when one or more of the following conditions occur:
  - 1. When a change or delay significantly affects any specified intermediate milestone dates or completion dates.
  - 2. When the Contractor elects to change any sequence of activities affecting the Critical Path or to significantly change the previously approved Baseline Schedule logic.
  - 3. When the Contractor has received written approval from BDDD to add, remove or replace a D/S/M/WBE Contractor.

4. When, in the opinion of the OAR, the Construction Schedule and supporting analysis is no longer representative for planning and evaluation of the Work.
  - C. Submit any revision to the Construction Schedule in the same form and detail as the approved Baseline Schedule.
  - D. The OAR must approve any revision to the Construction Schedule.
- 1.10 TIME IMPACT ANALYSIS FOR CONTRACT MODIFICATIONS, DELAYS, AND TIME EXTENSIONS
- A. When changes to the Contract are initiated or delays are experienced, the Contractor shall submit to the OAR a written Time Impact Analysis (TIA) illustrating the influence of each change or delay on any specified intermediate Milestone and the current projected completion date.
    1. TIA must use an updated and approved schedule within 30 days of the delay event.
    2. The Contractor, as required by the General Provisions and Special Provisions of the Contract, shall notify the OAR of a change that may impact an intermediate Milestone or Final Completion.
    3. Calendar for Time Impact shall be seven (7) days/week with no holidays considered.
    4. Each TIA shall include a fragmentary network (fragment) indicating all necessary logic, duration of impact, D/S/M/WBE resources affected, and demonstrate how the Contractor proposes to incorporate the change or delay into the current approved Construction Schedule.
    5. The event times used in the TIA shall be those included in the latest update of the detailed progress schedule or as adjusted by mutual agreement to reflect project status at the time the delay occurred, or notification of the change was issued.
    6. The TIA should include any additional supporting evidence that the OAR deems necessary.
    7. A .pdf copy of the TIA shall be submitted and entered into the Owner's document control system or as otherwise directed by the OAR.
    8. A Primavera P6 .xer of the Construction Schedule representing the impact calculations shall be submitted to the OAR.
    9. A narrative in the same form and detail as the Construction Schedule update identifying all steps taken to calculate the impact and Recovery Schedule, shall be submitted to the OAR for review and acceptance.
    10. Upon agreement by the Contractor and the OAR, the influence of changes and delays shall be incorporated into the next update of the Construction Schedule.
    11. Where the OAR has not completed a determination of any Contract Time extension, or the OAR and Contractor are unable to agree as to the Contract Time extension due, the Contractor shall reflect that amount of time extension in the update to the Construction Schedule as the OAR may determine to be appropriate for such interim purpose. It is understood and agreed that any such interim determination shall not be binding upon either party for any other purpose

and that, after the OAR has determined any Contract Time extension, the Contractor shall revise the update(s) to the Construction Schedule prepared thereafter in accordance with the final determination.

12. It is understood and agreed that schedule Float time is not for the exclusive use of either the Owner or the Contractor. Extensions of Contract Time for performance under any and all of the provisions of this Contract will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the Total Float along the channels involved at the time a delay occurred or notification of a change was issued. It is expressly agreed and understood that the Contractor shall not be entitled to any compensation or damages on account of potential delays which can be avoided by re-sequencing activity times or logic used to sequester the available Float.
13. TIA related to a Contract Time extension and/or changed work shall be incorporated into and attached to the applicable Contract Change Order.

#### **1.11 RESPONSIBILITY FOR COMPLETION**

- A. The Contractor shall furnish sufficient forces, offices, facilities, and equipment, and shall work such hours including night shift and overtime operations, as necessary to ensure the prosecution of the Work. If, in the opinion of the OAR, the Contractor, due to its own action, falls behind in meeting the Construction Schedule, the Contractor shall take such steps as may be necessary to improve its progress, and the OAR may require the Contractor to increase the hours of work, the number of shifts, the amount of supervision, overtime operations and/or the amount of construction plant and equipment without additional cost to the Owner. The provisions of this Section shall not be construed as prohibiting work on Saturdays, Sundays, and/or holidays, if the Contractor so elects and gives reasonable notice to the OAR. Work hours shall conform to Section 01 11 00, Summary of Work, and the Plans.
- B. The Contractor may improve its progress by performing sequential activities concurrently, by performing activities more quickly than planned, or by revising the logic within the Construction Schedule to reflect a work around sequence. The Contractor may make minor logic changes, which are required to reflect actual work as it is performed, pertaining to out-of-sequence work. The minor logic changes shall be included in the schedule narrative and incorporated into the Construction Schedule in the approved format.

#### **PART 2 – PRODUCTS**

Not Used.

#### **PART 3 – EXECUTION**

Not Used.

#### **PART 4 – MEASUREMENT AND PAYMENT**

Not Used.

**- END OF SECTION -**