

READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [“ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Tab) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

This Section is narrow in scope to cover the most stringent requirements that may be imposed on a Contractor. It is applicable to a large project. Use Section 01 32 16 - Bar Chart Schedule for smaller projects. The Specifier should edit the Section to define requirements appropriate to the scale of the project.

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Network Analysis Schedules (NAS) and schedule documents described herein are for the following purposes:
 - 1. To define the Contractor’s Baseline Plan (including logic and use of resources) for completing the Work.
 - 2. To assure adequate planning, scheduling and reporting during the execution of the Contract.
 - 3. To assist the Contractor and Engineer in monitoring the progress of the Work and to contemporaneously evaluate proposed changes to the Contract and the Network Analysis Schedule.
 - 4. To assist the Contractor and Engineer in the preparation and evaluation of the Contractor’s monthly progress payment.
 - 5. To serve as a communication tool between the Port and the Contractor, and the Contractor and its subcontractors.
- B. The Port encourages the Contractor to use the Schedule to establish an understanding with all parties of the assumptions regarding the Work and the various constraints and opportunities that are possible within the plan. As the Work progresses, the Contractor and the Engineer will use the Schedule to assess impacts and to formulate the best methods to complete the Work on or ahead of the contractual completion dates.
- C. The Work shall be scheduled and performed pursuant to the provisions of the Contract including any specific dates for Milestones, phase completion or requirements included in the General Conditions, Supplemental Conditions, or

elsewhere in the Contract Documents. Milestone and completion dates listed in these specifications, or elsewhere in the Contract Documents, represent only interface dates or major items of the Work. The Contractor is responsible for completion of all aspects of the Work in accordance with the Contract.

- D. At any time throughout the course of the Work, the Engineer reserves the right to require additional activities to be added to the Schedule to further define the Contractor's plan and intentions regarding the execution of the Work. In each instance, such activities or changes shall be made by the Contractor at no cost or delay to the Port.
- E. Should the Contractor desire or intend to complete the Work, or any portion of the Work, earlier than the specified Contract milestone, phase or similar dates or the overall Contract completion date, the Port will not be liable to the Contractor for any costs or other damages should the Contractor be unable to complete the Work before Contractor's earlier milestone or completion dates. The duties and obligations of the Port to the Contractor shall be consistent with and applicable only to the completion of the Work on the specified Contract milestone dates or the Contract completion dates unless the Engineer and the Contractor otherwise agree to in writing and formalized by a change order.
- F. The services provided by the Engineer, the existence of schedules, networks or any other charts or services prepared or performed by the Engineer, shall in no way relieve the Contractor of the responsibility for complying with the requirements of the Contract Documents, including but not limited to, the responsibility for completing the Work within the Contract Time and the responsibility of planning, scheduling, and coordinating the Work. Comply with all schedule procedures specified herein and with reasonable procedure changes that may be necessary, in the opinion of the Engineer, during the Contract duration.
- G. The Contractor, including the Project Manager, Superintendent, and Schedule Manager, shall hold an orientation meeting with the Port, wherein the Contractor presents the approach to planning the Work, developing the schedules, and meeting the requirements of this Section. This orientation meeting shall be held prior to submittal of the Preliminary Schedule. The Contractor shall not delay preparation of the required schedules and schedule documents prior to this meeting; however the Contractor shall be responsible for any changes or corrections to its scheduling as a result of this meeting.

1.02 DEFINITION OF SCHEDULE DOCUMENTS AND SUBMITTAL REQUIREMENTS

Determine if a Preliminary Schedule is applicable to the project. Select the duration of the preliminary schedule from the brackets. If No, delete sub-paragraph 1 in its entirety. In sub-paragraph 2, select the number of days after Notice to Proceed that the baseline schedule is to be provided. This duration should be determined based on whether or not a preliminary schedule is specified.

- A. The following outlines the schedules and schedule documents required by this section to be submitted by the Contractor. Details on each item (and all items) to be submitted are provided in further paragraphs in this section.
 - 1. Preliminary [60] [90]-Day Schedule: This schedule shall detail all Contractor Work, including procurement activities, mobilization, submittals,

and construction activities for the first [60][90] calendar days following the date of NTP of the Contract and shall be used while the Contractor is developing the will Baseline Schedule. All critical or completion dates required in the Contract shall be incorporated into this schedule. The following requirements apply to the Preliminary Schedule:

- a. Submit as a Preconstruction Submittal per Section 01 32 19 - Preconstruction Submittals. Submit using the same format requirements as for the Baseline Schedule.
 - b. Preliminary Schedules shall be submitted no later than fourteen (14) calendar days after Contract Execution. The Preliminary Schedule shall show submittal dates for all preconstruction submittals as identified in Section 01 32 19-Preconstruction Submittals.
2. Baseline Schedule: This is a detailed schedule, developed using the Critical Path Method (CPM) and Precedence Diagram Method (PDM) and includes a narrative detailing the Contractor's approach to completing the Work and includes manpower loading. It represents the Contractor's plan for the Work from the date of Execution of the Contract to Contract Completion. The following requirements apply to the Baseline Schedule:
- a. The Baseline Schedule shall be submitted in a format and with content acceptable to the Engineer within [30][60] [90] calendar days of the Notice to Proceed.
 - (1) Allow fourteen (14) calendar days for initial review and fourteen (14) calendar days for re-submittal reviews by the Engineer.
 - b. Schedule Narrative: The narrative shall define the key aspects of the Contractor's plan for the Work that includes the following key sections: [Coordinate with a scheduler to determine requirements and expand each of the key sections]
 - (1) The layout (activity coding) and logic used in the Schedule
 - (2) Critical submittals
 - (3) Long lead equipment and material procurement.
 - (4) Constrained activities (constraint type and date)
 - (5) Milestone activities
 - (6) The critical path
 - (7) An overall float analysis
 - (8) Any interface concerns
 - (9) Manpower Loading
 - c. The following bar chart and tabular reports shall be provided with the Baseline Schedule:
 - (1) Complete Schedule organized by Major Area, sorted by sub area and early start date. Provide in a bar chart format.

- (2) Critical Path Schedule: All schedule activities sorted by Total Float, Early Start. Provide in a bar chart format.
 - (3) All schedule activities sorted by responsibility and early start dates. Provide in a bar chart format.
 - d. Manpower Loading:
 - (1) The Baseline manpower loading shall numerically illustrate the planned manpower for all construction tasks.
 - e. Contractor shall provide to the Engineer a certification letter stating the Contractor has communicated and coordinated with each major subcontractor (those having Contract values greater than 5% of the Work) in the development of the Schedule and the major subcontractors agree to the requirements for timing and duration of activities as stated therein.
3. Progress Schedule: This is a detailed schedule which is derived from the Baseline Schedule. The first Progress Schedule is the initial monthly progress update of the Baseline Schedule. Subsequent Progress Schedules shall be submitted on a monthly basis (or more frequently as may be directed by the Engineer) that updates the previously issued Progress Schedule. The Progress Schedule will also be used to compare percent complete requested by the Contractor in the monthly progress payment applications, to analyze delays and impacts in all Time Impact Analyses (TIA), and to determine whether a Recovery Schedule is needed from the Contractor. The following requirements apply to the Progress Schedule:
- a. Progress Schedules are due monthly to coincide with the progress payment requests and shall be submitted via CMS Submittal workflow.
 - (1) Allow fourteen (14) calendar days for initial review and fourteen (14) calendar days for re-submittal reviews required by the Engineer.
 - b. Narrative of Schedule Status: The narrative shall describe the following key aspects of the submitted schedules. The narratives submitted with the Progress Schedules are required to be stand-alone documents that do not require Progress Schedules to be attached in order for Port management personnel to understand them:
 - (1) Progress in Last Period
 - (2) Critical Path Progress and Concerns
 - (3) Changes to schedule logic or sequencing of the Work including the addition of or deletion of activities.
 - (4) Changes in Milestone dates
 - (5) Potential Delays and Time Impact Analyses
 - (6) Submittal Status (focus on critical submittals and concerns)
 - (7) Equipment and Material Delivery Status

- (8) Manpower Loading (utilization of resources)
- c. The following bar charts and tabular reports shall be provided with the Progress Schedule:
 - (1) Complete Schedule organized by Major Area, sorted by sub area and early start date, with "Target" schedule included. Provide in a bar chart format.
 - (2) Critical Path Schedule: All schedule activities sorted by Total Float, Early Start. Provide in a bar chart format.
 - (3) All schedule activities sorted by responsibility and early start dates. Provide in a bar chart format.
 - (4) Schedule log (comparison report) of all changes made to the logic or sequencing of the Work. Provide in tabular format.
- d. Manpower Loading:
 - (1) The Progress manpower loading shall numerically compare the planned (from the accepted baseline) and actual to date manpower for the project.
- 4. Weekly Look Ahead Schedule: The Contractor shall prepare and issue a more detailed day-to-day plan of upcoming Work identified on the Network Analysis Schedule. The Work activities planned shall be keyed to NAS activity numbers and updated each week to show the planned Work for the current and following two-week period and include Work accomplished in the week prior to the Progress Meeting. The Look Ahead schedule shall also include upcoming outages, closures, preparatory meetings and any other contractual or coordination requirements not readily identified in the NAS as a schedule activity. Identify critical path activities on the Three-Week Look Ahead Schedule. Activities shall not exceed 5 work days in duration and shall provide sufficient level of detail to assign crews, materials and equipment required to complete the Work. The detailed Work plans are to be bar chart type schedules, maintained separately from the project NAS on an electronic spreadsheet program and printed on 8-1/2x11 sheets. Provide the Schedule in a format acceptable to the Engineer.
 - a. Submit PDF to Engineer 24 hours prior to the Progress Meeting.
- 5. Recovery Schedule: The Recovery Schedule shall represent the Contractor's best judgment as to how the Contractor's Work shall be reorganized such that the Work may return to the accepted Progress Schedule within a maximum one-month period. The Recovery Schedule shall be prepared at a similar level of detail as the Progress Schedule and shall be based on the accepted Progress Schedule. The following requirements apply to Recovery Schedules:
 - a. Conditions Requiring a Recovery Schedule: Should any conditions exist, such that certain activities shown on the Progress Schedule fall behind schedule to the extent that any of the mandatory critical dates or milestone completion dates are at risk of being delayed, the Contractor shall, at no cost to the Port, submit to the Engineer a Recovery Schedule.

- b. Submit seven (7) calendar days after notice from the Engineer that a Recovery Schedule is required. Allow seven (7) calendar days for review by the Engineer. Any revisions that result from the Engineer's review shall be resubmitted within five (5) calendar days by the Contractor for acceptance by the Engineer.
 - c. Narrative: Provide narrative describing the recovery schedule logic including any increases in manpower and shift work.
 - d. Schedule Sorts:
 - (1) Complete Schedule organized by Major Area, sorted by sub-area and early start date. Provide in bar chart format.
 - (2) Critical Path Schedule: This schedule shall show only the critical path activities sorted by total float, early start. Provide in bar chart format.
 - e. Manpower Loading updated to reflect the Recovery Schedule.
 - f. The accepted Recovery Schedule shall then be the Schedule that the Contractor shall use in planning, organizing, directing, coordinating, performing and executing the Work (including all activities of subcontractors, equipment vendors and suppliers) that is included on the Recovery Schedule. All other Work shall proceed per the accepted Progress Schedule.
 - g. No later than seven (7) calendar days prior to the expiration of the Recovery Schedule, the Engineer and Contractor will meet to determine whether the Contractor has regained compliance with the accepted Progress Schedule. At the direction of the Engineer, one of the following will occur:
 - (1) If, in the opinion of the Engineer, the Contractor is still behind schedule, the Contractor shall prepare another Recovery Schedule, at no cost to the Port, to take effect for a maximum of one additional month from the start of the new Recovery Schedule.
 - (2) If, in the opinion of the Engineer, the Contractor has sufficiently regained compliance with the Progress Schedule, the use of the Progress Schedule shall be resumed.
6. Time Impact Analysis (TIA) for Changed Conditions: Time impact analysis shall illustrate the influence of each change or delay on the critical path or milestones. This schedule analysis shall be part of the back-up data required from the Contractor in the event the Contractor claims that Contract changes delayed or impacted the Work and shall be included in any change proposal claiming increase in time. The following requirements apply to Time Impact Analysis:
- a. Each formal TIA shall be submitted in accordance with Document 00 70 00 - General Conditions. Submit as part of a detailed breakdown required by Document 00 70 00, General Conditions.
 - b. Narrative:

- (1) Describe the Event or Change requiring a TIA and the impact of the Event or Change on the critical path or milestone.
 - (2) Provide a list of affected activities with their associated schedule activity ID.
 - (3) Provide a mitigation plan that reduces or eliminates the claimed delay. The mitigation plan shall include specific Port and Contractor actions as well as the cost to the Contractor to proceed with the mitigation.
- c. Schedule Sorts:
- (1) Provide a time scaled logic diagram format that depicts how the changed or delayed Work affects other activities in the current accepted Progress Schedule. The logic diagram shall clearly show how the changes or delays affect critical path activities including contractual completion milestones.
 - (2) Provide complete Schedule organized by Major Area, sorted by sub-area and early start date. Provide in bar chart format.
- d. Manpower Loading updated to reflect Time Impact Analysis.
- e. Extensions of time will be granted only to the extent that such changes or delays cause the time for the changed activity and related activities to exceed the total float along the affected path of activities at the time of the Port directive to proceed with the change or the actual commencement of the delay included in the TIA.
- f. Project float is not for the exclusive use or benefit of either the Contractor or the Port. Liability for delay to Contract or milestone dates rests with the party whose action (or inaction) caused the delay beyond the float that was available at the time of the delaying action (or inaction).
- g. A copy of the Port accepted TIA will be incorporated in the change order signed by the Port. Any changes to the Schedule shall be incorporated into the next update of the Progress Schedule following the Port's acceptance of the TIA.
- h. The Contractor shall be responsible for costs associated with the preparation of the TIA and the incorporation of accepted TIA's, or accepted portion of TIA's, in the Progress Schedule.
- i. If agreement is not reached on a TIA or a portion of a TIA, the Progress Schedule, including any time extensions, shall be revised only to the extent accepted by the Port. For any TIA, or portion of a TIA, that is not accepted by the Port, the Contractor may submit a claim in accordance with the Document 00 70 00 – General Conditions.
7. As-Built Schedule: At the end of the Work, an As-Built Schedule shall be derived from the final Progress Schedule showing all activities completed.

The As-Built Schedule shall be submitted in the same format as the Progress Schedule.

- a. Submit within 30 days of Physical Completion.
- b. Allow fourteen (14) calendar days for initial review and fourteen (14) calendar days for re-submittal reviews required by the Engineer.

8. Schedule of Submittals: Submit per the following table:

| DELIVERABLE | ELECTRONIC COPIES | SUBMITTAL DUE | REMARKS |
|--------------------------------|--|---|--|
| Preliminary (60-Day) Schedule: | 1 PDF, 1 Export file .XER | 30 calendar days prior to NTP [Delete row if no Preliminary Schedule is used.] | Pre-construction submittal per Section 01 32 19 |
| Baseline Schedule: | 1 PDF of each report, 1 Export file .XER | [If no Preliminary, edit to 30 calendar days before NTP. If Preliminary is used, edit to No Later Than 30 calendar days after issuance of NTP.] | Submittal per 01 33 00 – Submittals; Includes narrative; |
| Progress Schedule: | 1 PDF of each report, 1 Export file .XER | Monthly at same time as request for Progress Payment | Submittal per 01 33 00 – Submittals; Includes narrative |
| As-Built Schedule: | 1 PDF of each report, 1 Export file .XER | 30 calendar days prior to Physical Completion | Submittal per 01 33 00 – Submittals |
| Weekly Look Ahead Schedule: | 1 PDF | 24 hours prior to construction Progress Meetings | |
| Recovery Schedule: | 1 PDF of each report, 1 Export file .XER | No later than 7 calendar days after notice to submit | Submittal per 01 33 00 – Submittals |
| Time Impact Analysis (TIA) | 1 PDF of each report, 1 Export file .XER | No later than 30 calendar days of date of event | Submit with all changes requesting time extensions |

1.03 CONTRACTOR’S SCHEDULE MANAGEMENT

- A. Scheduling Organization: For the duration of the Contract, the Contractor shall provide adequate staff including one employee or consultant designated as the Contractor’s Scheduling Manager (CSM) dedicated exclusively to the implementation and management of the scheduling requirements of the Contract Documents. The CSM (who shall not be the Contractor’s Project Manager, Superintendent, Project Coordinator or quality control manager) shall have previously developed and maintained at least 3 schedules for projects similar in

nature and complexity to this project and shall be experienced in the use of the scheduling software specified in this Section.

1. Contract Work will not be permitted to be performed on site without an acceptable CSM, unless otherwise authorized in writing by the Engineer.
- B. Qualifications of Contractor's Scheduling Manager:
1. The CSM shall demonstrate acceptable professional familiarity with software, have previously developed and maintained at least 3 schedules for projects similar in nature and complexity to this project and have the experience necessary to implement all scheduling requirements of the Contract in a timely and expeditious manner. Submit qualifications as a Preconstruction Submittal in accordance with Section 01 32 19 - Preconstruction Submittals and Section 01 31 00 - Contractor's Project Organization. [PM cross-check both of these Sections to verify inclusion].
 2. The Engineer will monitor the performance of the CSM. The CSM's performance will be judged on the timeliness and completeness of the Contractor's compliance with the scheduling requirements of the Contract Documents. If the CSM fails to perform in accordance with the scheduling requirements of the Contract Documents, the CSM shall, at the direction of the Engineer, be replaced at no cost to the Port or delay allowable to the project.

1.04 COORDINATION

- A. The Contractor shall coordinate the Work with that of the Port, other Port contractors, Port Operations, Port tenants, and utility companies, and shall cooperate fully with the Engineer in maintaining an orderly progress toward completion of the Work as scheduled.
- B. A Time Impact Analysis (TIA) shall be required to support any claim by the Contractor for delay caused by failure of Port-furnished equipment and materials to arrive as scheduled, or failure of other Port interface work or tenants to meet their schedules. The TIA shall be based on Port activities having the same level of predecessor and successor logic to display delay impacts as the Contractor's Work.
- C. The Contractor shall inform its subcontractors of the delivery status of Port-furnished equipment and material, and of the progress of other interfacing Port construction work while the Work is underway.

From this point onward, technical review by a scheduler is required.

1.05 SCHEDULE FORMAT REQUIREMENTS

- A. Unless otherwise specified, the Schedules shall be produced utilizing Microsoft Windows based Primavera Enterprise P6 version 7.0 or newer. The Contractor may request to use different project scheduling software as a substitution in accordance with Specification Section 01 25 00 - Substitutions. Only scheduling software meeting all specified requirements will be considered. If alternative software is accepted, the Contractor will be required to supply the Engineer with an authorized (licensed) Microsoft Windows based version of the software with all user support manuals.

- B. The Schedules shall employ the Critical Path Method (CPM) using retained logic for the planning, scheduling and reporting of the Work to be performed under this Contract. The type of schedule shall be Precedence Diagramming Method (PDM).
- C. Default progress data is disallowed. Actual start and actual finish dates on the Schedule shall match the dates on the Contractors Daily Construction Reports.
- D. Software Settings: Schedule calculations and out-of-sequence progress (if applicable) shall be handled through Retained Logic, not Progress Override or Actual Start Dates. All activity durations and float values shall be shown in days. Activity progress shall be shown using Remaining Duration.
- E. Schedules shall include but not be limited to:
 - 1. All critical Milestone and Completion dates defined in the Contract.
 - 2. Activities designating Contract Execution, Notice To Proceed, Mobilization, Completion of each Phase, Final Inspections, Substantial Completion and Physical Completion.
 - 3. Critical procurement and submittal activities including shop drawings and other key submittals, Port review of submittals, re-submittals and Port review of re-submittals, fabrication and delivery for all key, critical paths, near critical path and long-lead equipment and material. The Port reserves the right to require the Contractor to add procurement activities to the schedule for any key or long-lead equipment, materials or submittals it deems necessary to monitor the Contractor's schedule for this Work.
 - 4. Testing activities hold and witness points in construction, Commissioning, Training and Closeout activities.
 - 5. Offsite activities that interface with the Contractor's Work, including work by the Port and Port contractors, delivery of Port-furnished materials and equipment, programming, utilities, agencies, critical Port operations, Port tenants, or similar activities.
 - 6. Construction Activities to the level of detail defined elsewhere in this section.
 - 7. Major construction equipment mobilization and demobilization, for example cranes.
 - 8. Activities that are impacted by Change Order or Event.
- F. Activity Coding and Descriptions
 - 1. The description of Work by activity. Activity descriptions and activity coding shall contain the area of the Work as well as the specific type of Work.
 - 2. Once an activity exists on the schedule, it may not be deleted or renamed to change the scope of the activity and shall not be removed from the schedule logic without approval from the Engineer.
 - 3. Coding of Activities shall be based on the following coding structure, as a minimum. Contractor may add codes as he requires:
 - a. Major Area – Major site area or grouping of activities
 - b. Sub-Area – A further breakdown of the Major Area
 - c. Location – Subset of the sub-area coding

- d. Responsibility – Contractor, Subcontractor, Supplier, or Organization responsible for the Work
- e. Specification – Specification section for the Work
- 4. Activity Code Structure:
 - a. Global codes and Enterprise Project Structure (EPS) codes are not to be used unless approved by the Port.
 - b. Activity Codes shall be maintained at a project level.
 - c. Activity Code Identifier shall utilize the Work Project (WP) number. e.g. “[WP number] – Responsibility”
- 5. Activity boundaries shall be easily measurable and descriptions shall be clear and concise. The beginning and end of each activity shall be readily verifiable and physical progress shall be quantifiable.
- 6. Responsibility for each activity shall be identified with a single performing organization (i.e. Contractor/subcontractor). Where deemed necessary to define critical, key or unusual Work, the Port reserves the right to require additional activities be added to the Contractor’s schedule. The organization related to the activity shall be identified in a background sort code, such that reports sorted by organization can be made using the scheduling software.
- 7. Activity durations shall be in work days. Activity durations over fifteen (15) working days shall be kept to a minimum and shall be used only for non-construction activities, such as shop drawing and sample submittals, fabrication and delivery of materials and equipment, concrete curing, and General Conditions activities. Exceptions to this shall be accepted in writing by the Port.
- 8. For critical path and near critical path activities, Contractor shall use Finish-to-Start (FS) relationships to the extent possible. Contractor shall use more activities if necessary to use Finish-to-Start (FS) relationships in preference to using Start-to-Start relationships. Lag durations contained in the project schedule shall not have a negative value. Do not use Start-to-Finish (SF) relationships.
- 9. Activities that constitute the controlling operations or critical path shall be identified by use of color (red). The critical path is defined as activities with total float less than one day. Near critical is defined as total float in the range of one (1) to ten (10) days. The critical path and near critical activities shall be less than 25 percent of the total activities in the Baseline Schedule.
- 10. Imposed completion dates for events other than the Milestone Dates or Completion Dates are generally not permitted. Artificial constraints (imposed start or finish dates, zero free float or zero total float) are generally not permitted, except possibly for use in Port-furnished materials, Port interface dates and or similar activities. All Port-furnished materials and Port interface dates shall have an early start/finish and late start/finish range. All Port dates shall be related to the Contractor’s Work with predecessor and successor logic such that float is correctly calculated on Port-furnished materials and Port interface dates.

11. Activity numbering shall be spaced (or gapped) to allow inclusion of new activities between existing activities while still maintaining a similarity of numbering for like activities. Numbering by area, level, etc. is encouraged to assist in analysis. The numbering may be alphanumeric to allow easier identification of areas, etc.
12. All activities shall be “scheduled” based on the data date of each submitted schedule. Planned durations for remaining Work and planned completions of remaining Work on activities shall be used. Activities shall not “ride” the data date line with scheduled completions being the remaining durations unless the Contractor actually plans to complete Work within the remaining duration.
13. Manpower loading: The activities shall be field manpower loaded. The summarized manpower in the Schedule shall be the total of all field manpower required for all Contract Work. Manpower loading shall be entered using workmen for the loading not work crews. Resource identifier for manpower shall utilize the Work Project (WP) number. e.g. [Work Project Number] - Manpower

G. Schedule Layout and Sequence of Activities

1. The layout shall be consistent with the Work required to meet the Project Conditions and Contract milestone dates. In general, it is desired to have the Work needed to meet the Contract milestones be detailed activities that summarize, or roll-up to provide plan and status information reported for the milestone. Work to complete each milestone shall be easily identifiable in the Contractor’s overall schedule. The summarized overall schedule shall allow reporting of physical progress and manpower loading for the entire Work.
2. The Contractor shall establish the layout that is needed to meet Contract responsibilities. The Contractor shall use the selected layout to coordinate with the Contractor’s submitted progress payment applications, such that the Schedule, physical progress, the progress payment application and physical progress can be compared to determine the actual progress payments to be made to the Contractor.

H. Formats of Schedules Submitted to Engineer

1. The formats of schedules and schedule documents shall be submitted to the Engineer are described below. The formats described are solely for reporting information and analysis use with the Port and are not intended to direct the Contractor in its own methods of scheduling. Schedules and schedule documents shall be submitted with clear identification of the Port and Contractor’s job numbers, schedule names, descriptions, plot dates, and data dates. Schedules submitted shall be formatted in a fixed sequence of summary and detail activities for the Contract duration for ease of reference in progress updates. This sequence shall be established by the Contractor and acceptable to the Engineer. The sequence shall be set up in the software such that re-sequencing or reorganizing of the Schedules is not required to generate Port required schedules and reports. This allows a one to one comparison of each Schedule issued with previous Schedules for analysis purposes, including the As-built Schedule.

2. Schedules shall be submitted with the activity description data listed from left to right, as follows: Activity ID, Activity Description, Original Duration, Remaining Duration, Total Float, Percent Complete, Early Start, Early Finish, and budgeted manpower units. The early start and finish dates shall be designated by an "A" after the actual date the activity was started or finished. The Baseline Schedule shall also include the late start and late finish dates to the right of the early finish dates. The Port reserves the right, at no cost, to require the Contractor to add or delete fields from these reports.
 3. Schedules shall be submitted in bar chart format with activity data on the left side and bars on the right side. Logic shall not be displayed. Activity descriptions shall be displayed in the bar area. The bar chart schedules shall be 11x17 inch in size.
 4. The Progress Schedule shall display the previous month's Progress Schedule as a "Target" schedule for comparison use. The first Progress Schedule shall use the Baseline Schedule as the "Target" schedule. The "Target" bars shall be of smaller size, of different color, and below the current schedule's bars. The bar chart size shall be 11" x 17".
 5. All schedules and schedule documents submitted to the Engineer shall be electronic. Submit via CMS and provide a separate PDF file for each report, schedule, or chart. Provide an Export File format [.XER] from the Scheduling software.
- I. Manpower Loading
1. The manpower loading and numerical information shall be combined on one chart. The chart shall be no larger than one 11x17 page, unless the project is particularly long or the information becomes unreadable.
 2. Definitions
 - a. Planned Manpower - represents the average daily field crew size during the monthly or weekly periods for the duration of the project. The average crew size is derived from the baseline schedule and represents the crew loading required to complete the baseline Work.
 - b. Actual Manpower - represents the average daily field crew during each month or week period as recorded through the Contractors Daily Construction Report.
 - c. Forecast Manpower - represents the anticipated average daily field crew size during the monthly or weekly period commencing after the last reported Actual Manpower period and continue for the remainder of the project. The Forecast Manpower shall be as accurate as possible and reflect any anticipated changes to the project. Approved Recovery and TIA scheduling changes would also be incorporated.
 - d. Planned Progress - represents the cumulative baseline percent complete at the end of each monthly or weekly period for the duration of the project.

- e. Actual Progress - represents the cumulative percent complete at the end of each monthly or weekly period as approved in the monthly progress billings or weekly contractor meetings.
 - f. Forecast Progress - represents the cumulative anticipated percent complete at the end of each monthly or weekly period commencing after the last reported Actual Progress period and continues for the remainder of the project. The Forecast Progress shall be as accurate as possible and reflect any anticipated changes to the project. Approved Recovery and TIA scheduling changes shall also be incorporated.
3. Layout of the numerical data shall be as follows or in a similar format proposed by the Contractor and as agreed to by the Engineer:
- a. The data labels shall be on the left and indicate planned manpower (number of field workers), actual manpower, forecast manpower, planned progress (percent complete), actual progress, and forecast progress.
 - b. The numerical data for each vertical bar or line data point shall be indicated in the table.
 - c. The planned and actual manpower shall be summed on the right-hand side of the table.

1.07 1.08 SCHEDULE UPDATES AND SCHEDULE (NETWORK) REVISIONS

- A. During the course of the Work and issuance of the Progress Schedules, updating to reflect actual progress shall not be considered revisions to the Schedule. Such updating shall include revisions to activity durations and certain sequences on a monthly basis. Included in the Progress Schedule updates shall be activities and changes that have already been reviewed and accepted by the Port such as the effect of accepted Port changes, the agreed duration of delays caused by acts of God or other conditions or events which have affected the progress of the Work. The Progress Schedules, when formally submitted, shall display current progress, as well as displaying the forecast or projected Work to the end of the Project.
- B. On all Progress Schedule submittals, the Contractor shall submit a list of all schedule logic changes along with the reason for each change. This list is an integral part of the Schedule submittal. This list shall be generated from the scheduling software. The Port shall accept this list as part of its overall Progress Schedule submittal review and acceptance process.
- C. Should the Contractor, after Port acceptance of the Baseline Schedule and any Progress Schedules, desire to change the logic of its plan of construction, the Contractor shall submit in writing its requested revisions to the Engineer. The request shall include a written narrative of the reasons for the activity and logic changes, a description of the logic for rescheduling the Work, and the methods of maintaining adherence to mandatory critical dates and milestone dates. In addition, for changes affecting sequences of the Work, the Contractor shall provide a time-scaled logic diagram that compares the original sequence of Work to the requested revised sequence of Work. The Contractor shall submit the requested revision in a timely manner such that the Port may review the request submittal in the same time frame and manner as required for other schedule submittals. Upon

Port acceptance of the request, the Contractor shall include the revision in the next upcoming Progress Schedule.

- D. Neither the updating or revision of the Contractor's Progress Schedule, nor the submittal, updating, change or revision of any schedule (or schedule document) for the Engineer's review and acceptance shall have the effect of amending or modifying in any way, the Contract Time, any Contract completion date, or Contract milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.09 TIMELINESS OF SCHEDULE DOCUMENT SUBMITTALS

- A. The Schedule (and schedule documents) shall be submitted in a timely manner as required by this Section, the General Conditions and the Supplementary Conditions. Failure to submit the Schedule and schedule documents on time and in an acceptable format shall result in withholding of payments and other remedies as defined in the General Conditions of the Contract.

1.10 ACCEPTANCE PROCESS

- A. The Engineer will review the Contractor's Schedule. If required, a meeting will be held between the Engineer and the Contractor's Scheduling Manager (CSM) and Project Manager to resolve any conflicts between the Contractor's schedule and the overall Project Construction. The Contractor shall revise the schedule as required by the Engineer to support the Project Construction and shall submit the revised schedule to the Engineer within seven (7) calendar days for review and acceptance.
- B. Acceptance by the Engineer of the Contractor's Schedule is advisory only and shall not release the Contractor of the responsibility for accomplishing the Work within each and every contractually required Milestone and Completion Date. Omissions and errors in the Schedule shall not excuse performance that is not in compliance with the Contract. Acceptance by the Engineer in no way makes the Port an insurer of the Schedule's success or liable for time or cost overruns as a result of its shortcomings. The Port disclaims any obligation or liability by reason of its acceptance of the Schedule.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

- A. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price] bid for the Project.

End of Section