**NOTES TO ARCHITECT/ENGINEER (A/E) & DAS/CS PROJECT MANAGER:**

This version of the Division 01 General Requirements is for **ALL** CT Department of Administrative Services (DAS) Construction Services (CS) **Design-Bid-Build (DBB) AND Construction Manager at Risk (CMR) Capital Construction Projects.**

USE THIS SECTION WHEN THE PROJECT TO BE ADMINISTRATED HAS A CONSTRUCTION COST ESTIMATE OVER $5,000,000. Use Section 01 32 16 "Construction Progress Schedules" when the project to be administrated has a construction cost estimate under $5,000,000. The Project Manager must decide if it is appropriate to use Section 01 32 16 "Construction Progress Schedules" for a specific project over $5,000,000.

IMPORTANT NOTE: Section 01 32 16.13 CPM Schedules includes administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work. It is appropriate for complex single contract Work.

**EDITING:** To Show the Editing Notes in this MS Word document the show/hide symbol (¶) button must be must turned on in the MS Word Toolbar. To print this document show/hide symbol (¶) must be turned off in the MS Word Toolbar, this will enable the document to indicate the correct number of total pages.

**TEXT:** The below **blue text** are project specific information that must be completed by the A/E as applicable to the specific project. When complete change **blue text** to **black text.** The ***bold and italicized text*** is for example purposes only and must be modified and edited by the A/E to make it project specific. For **text boxes**, left click on **Insert** and then insert project specific information over the word **Insert** in the underlined space.

**TABLES:** To view the Table Grid in this MS Word document, click inside any table, then go to the **Table Tools > Layout** tab, **Table** group, and click **View Gridlines.**

**HEADERS: The header** for each page of the Project Manual shall match the format, font (Arial), size (9 pt), font style (BOLD & CAPITALIZED) and line borders, of the header shown herein. The header of each page shall contain the Section Number, the Section Title, and the page number & number of pages as shown herein.

**FOOTERS: The footer** for each page of the Project Manual shall match the format, font (Arial), size (9 pt), font style (BOLD & CAPITALIZED) and line borders, of the footer shown herein. The footer shall contain the project number in the right hand side as shown herein. The revision date in the left side of the footer is to remain as it is for Department informational purposes only and should not be altered by the Architect/Engineer.

**SECTIONS AND PARAGRAPHS:** If a **Section** is not part of the project scope, **do not use** the Section in the General Requirements. Check “**NOT USED**” in the Table of Contents. **DO NOT delete** the Section title from the Table of Contents.

If a **Paragraph** is not applicable to the project, **delete the contents** of the Paragraph and renumber the subsequent Paragraphs. Edit **Paragraphs** carefully to reflect specific project requirements. DO NOT include Paragraphs or parts of Paragraphs in the project manual, which have no applicability to the specific project. KEEP IN NUMERICAL SEQUENCE and re-number as necessary.

**GENERAL CONDITIONS:** Please review the General Conditions carefully and coordinate the requirements of those Articles including the Definitions.

**DIVISION 01 SECTIONS** are the organizational key of the Project Manual. All revisions to this Division are the responsibility of the A/E. Division 01 must be closely coordinated with Division 00, Divisions 02 through 49, Division 50 (Project-Specific Available Information), the Drawings, and the Department’s Consultant Bid Data Statement (Form 6005, to be filled out by the A/E for bidding).

**IMPORTANT NOTE REGARDING “HIDDEN TEXT”:**

Each document contains Editing Notes in the form of “hidden text”. The Editing Notes assist the Architect in modifying and editing the document to make it project-specific. In order to show the “hidden text”, click the **Home** tab, and in the **Paragraph** group, click the **Show/Hide** symbol (¶). **Turn off** the Show/Hide symbol (¶) **before printing the document** in order to indicate the correct number of pages. **DELETE THIS NOTE.**

**IMPORTANT NOTE REGARDING FORMATTING:**

Insert a blank page at the end of all *odd numbered* specification sections that states “THIS PAGE INTENTIONALLY LEFT BLANK”. **DELETE THIS NOTE.**

# PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

### **A.** This Section includes administrative and procedural requirements for the preparation, submittal, and maintenance of the Contractor’s computerized progress schedule, reporting progress of the Work, and Contract time adjustments, including the following:

#### **1.** Preliminary schedule.

#### **2.** Baseline schedule.

#### **3.** **Two (2) week** look ahead schedules.

#### **4.** Schedule revisions.

#### **5.** Recovery schedules.

#### **6.** Narratives.

#### **7.** Schedule time extensions.

#### **B.** The above listed Project schedules shall be used for evaluating all issues related to time for this Contract. The Project schedules shall be updated in accordance with the requirements of this Section to reflect the actual progress of the Work and the Contractor’s current plan for the timely completion of the Work. The Project schedules shall be used by the Owner and Contractor for the following purposes as well as any other purpose where the issue of time is relevant:

#### **1.** To communicate to the Owner the Contractor’s current plan for carrying out the Work;

#### **2.** To identify work paths that are critical to the timely completion of the Work;

#### **3.** To identify upcoming activities on the Critical Path(s);

#### **4.** To evaluate the best course of action for mitigating the impact of unforeseen events;

#### **5.** As the basis for analyzing the time impact of changes in the Work;

#### **6.** As a reference in determining the cost associated with increases or decreases in the Work;

#### **7.** To identify when submittals will be submitted to the Owner;

#### **8.** To prioritize the Owner’s review of submittals;

#### **9.** To document the actual progress of the Work;

#### **10.** To evaluate resource requirements of the Contractor and the Owner;

#### **11.** To integrate the Work with the operational requirements of the Owner’s facilities;

#### **12.** To facilitate efforts to complete the Work in a timely manner.

#### **13.** To document the history of the Work.

### **B.** Refer to the General Conditions and the Agreement for definitions and specific dates of Contract Time.

### **C. Related Sections**: The following Sections contain requirements that relate to this Section:

#### Division 01 Section 01 11 00 "Summary of Work" specifies the scope of work for the various phases, requirements regarding the Contractor’s use of premises, occupancy requirements, products ordered in advance, and Owner furnished products.

#### Division 01 Section 01 25 00 "Substitution Procedures" specifies requirements for handling requests for equals and substitutions.

#### Division 01 Section 01 26 00 "Contract Modification Procedures" specifies requirements for handling and processing contract modifications.

#### Division 01 Section 01 29 76 "Progress Payment Procedures" specifies requirements for submitting Schedule of Values and Application for Payments.

#### Division 01 Section 01 31 00 "Project Management and Coordination" specifies requirements for coordinating construction operations.

#### **6.** Division 01 Section 01 31 19 "Project Meetings" specifies requirements for submitting and distributing meeting and conference minutes.

#### **7.** Division 01 Section 01 33 00 "Submittal Procedures" specifies requirements for submitting the monthly computerized progress schedule.

#### Division 01 Section 01 45 00 "Quality Control" specifies requirements for submitting inspection and test reports.

#### Division 01 Section 01 50 00 "Temporary Facilities and Controls" specifies requirements for temporary utilities, support facilities, and security protection.

#### Division 01 Section 01 60 00 "Product Requirements" specifies requirements for submitting the list of products.

#### Division 01 Section 01 77 00 "Closeout Procedures" specifies requirements for Contract closeout.

## 1.3 DEFINITIONS

### **A. Critical Path Method (CPM):** A method of planning and scheduling a construction project where activities are arranged based on activity relationships and network calculations determine when activities can be performed and the critical path of the Project.

### **B. Critical Path**: The longest continuous chain of activities through the network at a given data date for the Schedule to a Contract Milestone or Contract Completion. Where the path to a specific Milestone has become negative, the Critical Path shall be the longest continuous chain of activities with the greatest amount of negative float.

### **C. Near Critical Path:** Any continuous series of activities through the network to the Contract Milestone or the Contract Completion Date where the Total Float of the activity at the data date along that path is within **fifteen (15) days** of the Total Float possessed by the activity at the data date along the Critical Path.

### **D. Network Diagram:** A graphic diagram of a network schedule, showing the activities and activity relationships.

### **E. Activity:** A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

#### 1. Critical activities are activities on the critical path.

#### 2. Predecessor activity is an activity that must be completed before a given activity can be started.

### **F. Event:** An event is the starting or ending point of an activity.

### **G. Milestone:** A key or critical point in time for reference or measurement.

### **H. Float:** Is the measure of leeway in activity performance. Accumulative float time belongs to the Owner.

#### **1.** Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.

#### **2.** Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.

### **I. Total Float:** The number of days from the late finish date (LF) to the early finish date (EF) of an activity at a given data date for the Schedule. When the LF is later than the EF, the Total Float shall be positive. When the LF and the EF are the same, the Total Float shall be zero. When the LF is earlier than the EF, the Total Float shall be negative. Unless otherwise specified all references to "float" shall mean "Total Float."

### **J. Fragnet:** The sequence of new activities and/or activity revisions, logic or resource changes that are proposed to be added to the existing schedule to demonstrate the influence of impacts to the schedule. The Fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities.

## 1.4 QUALITY ASSURANCE

### **A. Construction Scheduler:**

#### **1.** The Contractor is required to employ or retain the services of an individual skilled in construction scheduling ("Construction Scheduler"). For projects with a Contract value greater than five (5) million dollars, the Construction Scheduler shall have at least five (5) years of verifiable experience as the person primarily responsible for preparing and maintaining detailed project schedules on projects of the same or similar size and nature as this project. The Construction Scheduler is required to attend meetings pertaining to scheduling and progress of the work including all progress meetings.

#### **2.** Within **five (5) days** after the Notice of Award, the Contractor shall provide a statement to the Owner with the following:

##### **a.** Identification, qualifications, and experience of the Contractor’s Construction Scheduler and all other members of the Contractor’s scheduling staff.

##### **b.** References of not less than **two (2)** previous projects on which the Contractor’s Construction Scheduler has utilized CPM scheduling.

#### **3.** The Owner reserves the right to disapprove any Construction Scheduler candidate proposed for the project and/or remove, without rights to work on the project, any member of the Contractor’s scheduling staff that is, in the Owner’s opinion, not qualified. In case of disapproval, the Contractor shall resubmit the qualifications and references of the proposed alternate Construction Scheduler within **ten (10) days**. The Contractor must have its Construction Scheduler approved prior to the issuance of the Notice to Proceed and the submission of any schedule.

#### 4. Should the Construction Scheduler leave the employ of the Contractor or be re-assigned or relieved of his/her responsibilities as the Construction Scheduler on the project, the Contractor will be required to submit the qualifications of the proposed replacement Construction Scheduler within **10 days** after the date the former Construction Scheduler is no longer responsible for his/her duties on this Project.

### **B. Scheduling Software:**

#### 1. For Contracts greater than **five (5) million** dollars, the Contractor shall use the latest version of **Primavera Project Planner** as the scheduling software system for use on this Project.

#### 2. The Contractor shall provide one (1) licensed copy of the scheduling software to the Owner’s CA for their use, registered in the Owner’s name, complete with the entire manufacturer’s manual, within **five (5)** days after the Contract award. The software manuals and license shall become the permanent property of the Owner.

## 1.5 CPM SCHEDULE FORMAT/CONTENT

### **A. Format:** All Schedules required by this section shall be computer generated, critical path method (CPM) networks utilizing the precedence diagram method of scheduling.

### **B. Electronic Schedule Naming:** The Contractor shall not submit any two (2) schedule files with the same file name. File names shall be in accordance with the following requirements:

#### **1.** Proposed/Final Preliminary Schedules shall be named P001, P002, P003, etc.

#### **2.** Proposed/Final Baseline Schedules shall be named B001, B002, B003, etc.

#### **3.** Final Updated Schedules shall be named U001, U002, U003, etc. Any revisions that are required at a particular update on a data date shall be numbered UA01, UB01, UC01, etc.

#### **C. Activity Identification:** Each activity in the Project schedules shall have an activity Identifier (activity ID). The Contractor is encouraged to utilize the activity ID to contain a structure enabling easy identification of work type, location, subcontractor, etc. The activity ID of an existing activity shall not be modified or assigned to another activity.

#### **D. Activity Description:** The activity description shall identify the scope of the activity and shall include a verb or work function (i.e. form, pour, execute, etc.), an object (i.e. slab, footing, wall, etc.), and location (i.e., first floor, roof, etc.). There shall not be any two activities with the same activity description. It shall not be necessary to investigate activity code assignments or logic relationships to identify the scope of an activity. For example, the description "Pour Footing" will not be acceptable. The description "Pour Footing West Wall, Section 2" will be acceptable. The terms "Miscellaneous," "Misc." and other vague adjectives shall not be used in an activity description. The Contractor shall standardize the use of terms and their spelling in all activity descriptions. Abbreviation used in activity descriptions shall be consistent with the abbreviations used throughout the Contract Documents and summarized on the Contract Drawings.

#### **E. Work Activities:** The Contractor shall include activities for work in the following list:

#### **1.** Mobilization.

#### **2.** All required submittals and submittal review.

#### **3.** Equipment and materials procurement/fabrication/delivery.

#### **4.** Installing/operating temporary heat and utilities.

#### **5.** Preliminary testing of equipment, instrumentation and controls.

#### **6.** Final testing, including preparation time.

#### **7.** Substantial Completion: Substantial completion activity shall meet all requirements set forth in Division 01 Section 01 77 00 "Closeout Procedures".

#### **8.** Punch list work.

#### **9.** Operation and maintenance training.

#### **10.** Demobilization.

#### **11.** Final cleaning.

#### **12.** Issuance of Certificate of Occupancy.

#### **13.** Project Specific Issues (If Warranted).

#### **F. Maximum Activity Durations:** The Contractor shall prepare schedule utilizing activity durations in terms of days. Do not exceed **twenty-one (21)** day duration on activities except concrete curing, submittal review and equipment fabrication and deliveries. Where duration of continuous work exceeds **twenty-one (21)** days, subdivide activities by location or other sub-element of the work. At the request of the Owner, the Contractor shall substantiate the need for specific activities having longer durations than stated herein. If the Contractor fails to substantiate this need, then the Contractor shall modify activity durations and the corresponding work scope of the activities to the satisfaction of the Owner.

#### **G. Activity Dates:** Early and late start and finish dates of activities shall be calculated for each activity based upon the schedule data date, actual dates, schedule logic, schedule constraints, calendars and original duration or remaining duration, in accordance with the software to calculate incorrect early and late, start and finish dates, the Contractor shall be responsible to identify all such errors and to determine correct dates consistent with the parameters specified in this Section.

#### **H. Activity Predecessors and Successors:** Every activity shall have logically assigned predecessors and successors in conformance with the requirements of this Section. Unless otherwise specified, Notice to Proceed shall be the only activity in the Project Schedules without a predecessor. Unless otherwise specified, Acceptance and each Contract Milestone(s) shall be the only activity in the Project Schedules without a successor.

#### **I. Activity Constraints:** Activity Constraints can affect activity float calculations and shall not be used unless accepted by the Owner. The imposition of a date constraint on any activity shall only be permitted when the Contractor demonstrates the need for such a constraint to the satisfaction of the Owner.

#### **J. Imposed Project Finish Date:** The imposed project finish date shall be the Contract Completion date, or if the Contractor plans an early completion date, the date it plans to complete the Work.

#### **K. Negative Float:** Negative float is calculated when the user imposes a finish date or other constraint on the schedule and when an activity can only finish after its late finish date. The Contractor shall remove the imposed finish date and/or constraint causing the negative float when directed to do so by the Owner.

#### **L. Activity Codes:** The schedules shall contain activity code classifications and code values. The coding structure shall, at a minimum, include code fields for the following: Phase, Area, Location, Type of Work, Submittal/Procurement, Construction, Responsibility, Original/Extra Work, and **Division. All activities in the schedule must have non-blank values for the required codes.**

#### **M. Calendars:** The planning unit for the Work shall be days. The global calendar shall contain all union holidays. The Contractor shall coordinate holidays to be observed with the Owner and incorporate them into the schedule as non-working days. This Calendar shall be a **5-day** work week, Monday through Friday. Every activity shall be assigned a working day calendar based on when the activity is planned to occur and when it is contractually permitted to occur. The Contractor shall define and submit additional working day calendars for acceptance by the Owner that are necessary for completion of work in accordance with the requirements of the Contract Documents. Only Owner defined or Owner accepted working day calendars shall be utilized in the Project Schedules.

#### **N. Logic:** The Contractor shall be responsible for developing the logic of the Preliminary, Baseline and Recovery Schedules and for updating that logic each month to accurately reflect the progress of the Work to-date and the Contractor’s current plan for the timely completion of the Work.

#### **1.** The following criteria shall form the basis for assembly of the schedule logic:

#### **a.** Which activity must be completed before a subsequent activity can be started?

#### **b.** Which activities can be done concurrently?

#### **c.** Which activities must be started immediately following a completed activity?

#### **d.** What major economic facility or manpower restrictions are required for sequencing these activities?

#### **2.** All paths through the Project schedules shall proceed in the direction representing the progression of time. Activity lag duration shall not have a negative value unless the Contractor substantiates to the satisfaction of the Owner that this is the best representation of reality. The use of activity lags shall be kept to a minimum. The Contractor shall eliminate lags by creating new activities, when the creation of new activities will perform the same function of the lag and when requested to do so by the Owner.

#### **3.** Redundant ties to preceding activities in a sequential series of activities will not be permitted. For example, if activity C is the successor in a finish-start relationship to activity B, and activity B is the successor in a finish-start relationship to activity A, then activity A shall not have a redundant finish-start relationship to activity C. A tie representing a different constraint will not be considered redundant. For example, a logic tie showing that the completion of the work scope of a predecessor is required before the successor can start is different from a logic tie representing a resource limitation and will not be considered redundant.

#### **4.** The Contractor is required to use manpower and equipment restraints, separately noted, to optimize and level manpower and equipment requirements. Such resource leveling shall reflect a reasonable plan for accomplishing the Work. The individual activities involved may be sequenced within the limits of the available Total Float. However, when this leveling technique is used in establishing the initial schedule, it shall be reflected in the logic with restraints identified as "restraint for manpower or equipment leveling purposes only." Critical or near Critical Paths resulting from the use of manpower restraints shall be kept to a minimum.

#### **5.** All activities with resource restraints shall be supplemented with resource loading information as noted in Paragraph G.

#### **6.** The Contractor shall correct all incorrect logic relationships in the Schedule Updates to eliminate any out-of-sequenced logic. The Contractor shall make all changes in the logic or other adjustments found to be incorrect by the Owner.

#### **O. Progress Data:** Actual start and finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software systems. The primary source of actual starts and finishes and period percentage completes shall be by field verification. The Contractor is to insure that progress is based of a current estimate of remaining duration to complete the Work and not the activity percent complete which calculates the remaining duration based on the original estimated duration.

#### **P. Submittals:**

#### **1.** Each submission that is required by the Contract Documents shall have a corresponding activity, for the preparation and review and approval at the submission. When the Contractor plans on making a submission in parts, each part of the submission shall have corresponding preparation and review and approval activities.

#### **2.** The timing, sequencing and duration of all submitted review and approval activities shall be in accordance with the Contract Documents.

#### **3.** All submissions designated "Revise and Resubmit" shall require that the Contractor insert new submittal preparation and review and approved activities with appropriate logic into the schedule.

#### **4.** When submittal receives a partial approval and the partial approval is sufficient to enable the commencement of a successor activity, then the original submittal activity shall be broken down into multiple activities as necessary to accurately reflect the logic of the Contractor’s current plan.

#### **5.** When multiple items are included in a single submittal, the "Review and Approve" activity for the submittal shall be a predecessor to every activity representing the fabrication and delivery of any of the materials.

#### **Q. Delivery Activities:** The schedules shall include activities for all fabrication and delivery work except for short lead time items. "Short lead time" shall be defined as a period of fourteen (14) days or less from placement of order to delivery of material to the project site. Activities representing the delivery of materials or equipment for more than **one (1)** installation activity will permitted in accordance with the following conditions.

#### **1.** The material delivery activity shall be a predecessor to the first activity representing the installation of the material in each area.

#### **2.** When partial deliveries are received and those deliveries are adequate to enable the commencement of some, but not all, successor activities, then the original delivery activity shall be broken down into multiple activities as necessary to accurately reflect the logic of the Contractor’s current plan.

#### **R. Inspections/Testing:** The Contractor shall include an activity for each inspection and test required by the various officials and agencies, including the Building Inspector, and Fire Marshall. The Contractor shall schedule these activities in accordance with the availability of the corresponding agency/official.

#### **S. Progress Override/Retained Logic:** The Contractor shall use retained logic to calculate all schedules required by this section. The use of progress override is not allowed without prior approval of the Owner.

#### **T. Weather Days Allowance:** The Contractor shall include as a separate identifiable activity on the Critical Path, and activity labeled "Weather Days Allowance." Insert this activity immediately prior to the substantial completion milestone.

#### The Contractor shall be fully responsible for determining the number of weather delay days to be included in the CPM Schedule. This determination shall be based on the normal anticipated weather for the project location and the nature of the project work. The CPM Schedule shall be based on the contractor’s determined weather delay allowance, immediately prior to the Substantial Completion milestone.

#### The minimal allowed duration of the Weather Days Allowance shall be calculated as follows (decimals rounded to nearest whole number):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contract Time** *(Calendar Days)* | **multiplied by** | **7** | **equals** | **Weather Days Allowance** *(Calendar Days)* |
| **365** |

#### The Contractor shall insert an activity in the Critical Path to reflect weather day occurrences when weather days are experienced and accepted by the Owner. Identify this activity as a weather delay.

#### The Contractor shall reduce duration of Weather Days Allowance activity as weather delays are experienced and inserted into the schedule. Remaining weather days in Weather Day Allowance at completion of project is considered float. Weather delay, when justified, are considered allowable, non compensable.

#### **Regulatory/Third Party Approvals:** The Contractor shall include activities in its schedule for all approvals required by regulatory agencies or other third parties.

#### **Resource Loading:** The Contractor shall resource load the schedules when required by this Specification and/or if requested to do so by the Owner. When required, the schedules shall be resource loaded for both the Contractor and all of its subcontractors as detailed below or as otherwise directed by the Owner. The Contractor may propose additional or alternative resource loading for the Owner review and acceptance. Defining a resource shall consist of identifying the resource name, resource description, unit of measure, and calendar assignment.

#### **1. Labor Resources:** Labor shall refer to all craft labor including foreman. Labor shall be measured in person-days. The labor resource definitions shall be consistent with the subcontractor work scope.

#### **2. Construction Equipment Resources:** The planned use of equipment requiring a licensed operator shall be reflected in equipment resource assignments to activities.

#### **3. Limits on Resources:** The Contractor shall indicate in its Narrative the expected amount of resource and shall define the normal or expected usage along with a maximum limit available to the Contractor. Resource limits may vary for different stages of the work. Resource limits shall be revised to reflect the Contractor’s current plan for the timely completion of the work.

#### **W. Activity Logs:**

#### **1.** Activities that are modified or added by change order shall be identified in the activity log. The change order number, as issued by the Owner, and the date the activity was modified or added shall be clearly recorded.

#### **2.** Activities affected by logic changes, resource changes, duration changes and calendar changes shall be identified in the activity log. The date the activity was modified, the nature of the change and the reason for the change shall be clearly recorded.

## 1.6 PRELIMINARY SCHEDULE AND PRELIMINARY SCHEDULE UPDATES

### For projects with a construction cost estimate over five (5) million dollars, the Contractor shall submit a Preliminary Schedule and Preliminary Schedule Updates. The Notice to Proceed will not be issued and the Contractor will not be allowed to start work at the Project site until the Preliminary Schedule has been submitted and accepted.

### The Preliminary Schedule shall contain a detailed plan of operations for the first 90 days of Work after receipt of the Notice to Proceed.

### The Construction Administrator and Contractor shall meet after receipt of Preliminary Schedule to review and make necessary adjustments. Contractor shall submit a revise Preliminary Schedule incorporating the adjustments with **five (5) days** after meeting.

### All Work contemplated beyond the first **ninety (90) days** shall be shown in sufficient detail such that the Critical Path and all Contract Milestones may be identified.

### The Preliminary Schedule shall be updated monthly during first **ninety (90) days** after issuance of the Notice to Proceed. The first update of the Preliminary Schedule shall show the progress on the actual Notice to Proceed date and shall be submitted to the Construction Administrator within **five (5) days** after the issuance of the Notice to Proceed. Subsequent updates shall show the progress through the last day of the month and shall be submitted to the Construction Administrator by the fifth business day of each month.

### Preliminary Schedule Update revisions that are required as a result of review comments by the Construction Administrator shall be submitted within **five (5) days** of the Contractor’s receipt of the Construction Administrator’s comments. The data date of the revised Preliminary Schedule Update shall remain on the first day of the month.

### The Contractor shall not be permitted to make any schedule revisions (besides progress) to the Preliminary Schedule Update unless approved by the Construction Administrator. When schedule revisions are required, the Contractor shall submit a Schedule Revision per Article 1.11.

## 1.7 BASELINE SCHEDULE

### **A.** For projects with a construction cost estimate over five (5) million dollars, the Contractor shall submit the proposed Baseline Schedule to the Construction Administrator for all the work of the project within forty-**five (45) days** after issuance of the Notice to Proceed. The Accepted Preliminary Schedule shall be incorporated unchanged, as first **ninety (90) days** activity in the Contractor’s Baseline Schedule.

### **B.** The proposed Baseline Schedule shall show sequence and interdependence of all activities required for complete performance of all Work, beginning with date of Notice to Proceed and concluding with date of final completion of the Contract. The Baseline Schedule shall depict the work as bid and as planned as of the Notice to Proceed. The data date shall be the actual date of the Notice to Proceed.

### **C.** The Construction Administrator and the Contractor shall meet after the Construction Administrator’s receipt of the Baseline Schedule to review and make necessary adjustments. Should adjustments be required, the Contractor shall submit a revised Baseline Schedule within five (5) days after the meeting and receipt of the Construction Administrator’s comments. Subsequent follow-up meetings and resubmissions may continue until the Construction Administrator accepts the Baseline Schedule.

### **D.** The Contractor shall require each major Trade Contractor and major supplier to submit in writing a statement certifying that the major Trade Contractor or major supplier has concurred with the Contractor’s Baseline Schedule, the major Trade Contractor’s or major supplier’s related schedule has been incorporated accurately, including the duration of activities and crew allocations. The definition of a "major Trade Contractor" is **one (1)** that provides services valued in excess of **five (5) percent** of the Contract value. The definition of "major supplier" is **one (1)** that provides material(s) or services valued in excess of **one (1) percent** of the Contract value. Failure of the Contractor to provide the required information will delay the approval of the Baseline Schedule.

## 1.8 SCHEDULE UPDATES

### **A.** The Contractor shall update and progress the CPM Schedule through the last day of each month (the Data Date is the first day of the month). Updating and progressing the CPM Schedule shall be completed and submitted by the fifth business day each month. Except as otherwise authorized by the Construction Administrator, monthly submissions received after the due date are considered late.

### **B.** The first update will consist of the approved Baseline Schedule updated as of the first day of the first month which starts after **ninety (90) days** from the Notice to Proceed. Subsequent monthly Schedule Updates will be the previous month’s approved Schedule Update or approved Revision Schedule updated to reflect progress over the last month. Schedule revisions, apart from updating the status of the remaining durations and percent completes of the various work activities will not be permitted in the Schedule Update.

### **C.** The Contractor shall create a copy of the previous month Schedule Update for the purpose of updating and progressing it. The schedule shall be updated to show the work actually accomplished during the preceding month, the actual time consumed for each activity, and the estimated time remaining for any activity that has been started but not completed. The updating of the percent complete and the remaining duration of any activity shall be independent functions; program features that calculate one of these parameters from the other shall be disabled.

### **D.** The Contractor shall make the necessary adjustments to the Schedule Update in accordance with the Construction Administrator’s Schedule Update review comments and shall re-submit the Schedule Update within **five (5) days** after receipt of those comments.

### **E.** The Contractor shall prepare the monthly Schedule Updates every month starting on the month described above through the actual substantial completion date.

## 1.9 TWO-WEEK LOOK AHEAD SCHEDULES

### **A.** The Contractor shall be required to produce and submit to the Construction Administrator a Two-Week Look Ahead Schedule, to be updated and submitted the first day of each week. Except as otherwise authorized by the Owner, submissions received after the due date are considered late.

### **B.** The Two-Week Look Ahead Schedule may be a CPM schedule or a bar chart; it shall be consistent with the previously approved Schedule Update or approved Schedule Revision.

## 1.10 SCHEDULE REVISIONS

#### **A.** If, at any time, the Contractor alters its logic, original durations, or descriptions, adds activities or activity codes, or in any way modifies the accepted Preliminary Schedule, accepted Preliminary Schedule Update, Baseline Schedule or Schedule Update, the Contractor must notify the Construction Administrator of the change(s), in writing and submit a Revision Schedule to the Construction Administrator for review.

#### **B.** The preparation and submission of Revision Schedules will also be required to reflect any Contract Modifications that were approved and Construction Change Directives that were issued during the preceding period and any extra or changed work that the Contractor has started during the preceding period.

#### **C.** With each Revision Schedule, the Contractor shall submit a written narrative explaining the nature of the change(s), the schedule, the reason for the change(s) and the impact on the schedule as a result of the change(s).

#### D. All changes (i.e. duration changes, logic changes, new logic, new or modified activities changes in work sequence, etc.) shall be recorded and a note added to the activity log. The record shall include at a minimum, the date and the reason for the change, and description of the change.

#### **E.** The required Revisions Schedules and Narratives are in addition to the regular Schedule Update. They shall be separate submittals and shall be noted as Schedule Revisions.

#### **F.** Proposed Revision Schedules shall be submitted by the fifth day of the month and shall reflect status as of the first day of the month.

#### **G.** The Construction Administrator and Contractor shall meet after the Construction Administrator’s receipt of the Revision Schedule and Narrative to review and make necessary adjustments. Should adjustments be required, the Contractor shall submit a revised Revision Schedule to the Construction Administrator within **five (5) days** after the meeting and receipt of the Construction Administrator Comments. Subsequent follow-up meetings and resubmissions may continue until after the Construction Administrator accepts the Revision Schedule.

#### **H.** Only upon acceptance of a revision to the Schedule by the Construction Administrator shall the revision be reflected in the next Schedule Update and Two-Week Look-Ahead Schedule.

#### **I.** The Construction Administrator reserves the right to accept or reject any schedule revisions proposed by the Contractor.

## 1.11 RECOVERY SCHEDULES

#### **A.** If, in opinion of the Owner, a Schedule Update indicates that the Contractor has fallen behind schedule, or that a revision in sequence or operations may be necessary for any other reason, the Contractor shall within **seven (7) days** of receiving a written request to perform "Recovery" from the Construction Administrator, immediately institute all necessary steps to improve his progress and shall submit such revised network diagrams, tabulations, operational plans and any supplementary information, as may be deemed necessary by the Owner, to demonstrate the manner in which an acceptance rate of progress will be regained.

#### **B.** Should the Contractor’s "Recovery" efforts not demonstrate an ability to regain an acceptable rate of progress, the Construction Administrator may require the development of a "Recovery Schedule" and the Contractor shall submit the Recovery Schedule within **twenty-one (21)** days of receiving a written request for the Recovery Schedule from the Construction Administrator. The Recovery Schedule is to be supplemented with resource allocations for every task activity and include time-scaled resource histograms. The resource allocations shall be shown to a level of detail that facilitates report generations based on labor crafts and equipment classes for the Contractor and Trade Contractors. The Contractor shall use average composite crews to display the labor loading of onsite construction activities. The Contractor shall optimize and level labor to reflect a reasonable plan for accomplishing the Work of the Contract and to assure that resources are not over allocated in multiple concurrent activities. The time-scaled resource histograms shall show labor crafts and equipment classes to be utilized on the Contract.

#### **C.** In addition to required submittals, the "Recovery Schedule" submission will also include a Narrative as detailed herein, a time-scaled resource histogram and a Monthly Resources Loading Summary Report (tabular) indicating the peak number of resources required for each activity.

#### **D.** The Construction Administrator shall be the sole judge as to whether the Recovery Schedule is sufficiently detailed. Upon acceptance of this Recovery Schedule, it shall form the basis of the new Monthly Schedule Updates going forward.

#### **E.** No additional compensation will be allowed for Recovery Schedules required to overcome delays caused in whole or in part by the Contractor.

## 1.12 NARRATIVES

#### **A.** The Contractor shall prepare and submit a Narrative to accompany the Baseline Schedule, Preliminary Schedule and each Preliminary Schedule Update and Monthly Schedule Update. The Narratives shall include:

##### **1.** Identification of the update period, the data date and the schedule file name.

##### **2.** A description of the current Critical and Near Critical Paths activities that are supposed to start or to be worked on over the coming month.

##### **3.** Changes to the Critical Path, intermediate and completion Milestones

##### **4.** Description of problem areas.

##### **5.** Current or anticipated delays:

###### **a.** Cause of delay.

###### **b.** Impact of delay on other activities, Milestones, and completion dates.

###### **c.** Corrective action and schedule adjustments to correct the delay.

##### **6.** A discussion of work completed during the period.

##### **7.** A comparison of the planned versus schedule progress early on and near Critical Path activities that were to have been worked on over the last month.

##### **8.** A description of any interdependencies between the Contractor’s Schedule and any work by other contractors, third parties, and/or the Owner and its representatives.

##### **9.** A description of the current status of float created by any previous or ongoing compensable or excusable delays, whether or not the Contractor has utilized any of this float over the last period by purposefully slowing down (pacing) and any request to utilize this float over the coming period.

##### **10.** An explanation of how adverse weather has been addressed in Schedule and an accounting of the Weather Day Allowance delineating the activities incorporated into the Schedule to account of work days lost due to weather and the resultant decrease in the duration of the Weather Day Allowance.

##### **11.** A description of planned labor resources to be utilized to complete critical and near Critical Path work as requested by the Construction Administrator.

##### **12.** A description of actual and potential equipment resource limitations.

## 1.13 NETWORK FILES, GRAPHICAL OUTPUT AND REPORTS

#### **A.** With each Preliminary Schedule, Preliminary Schedule Update, Baseline Schedule, Schedule Update, Revision Schedule and Recovery Schedule required by these specifications, the Contractor shall submit to the Construction Administrator the following schedule reports/graphics/files:

##### **1.** **Three (3)** compact disc sets that each include:

###### **a.** A compressed back up of the entire schedule.

###### **b.** Gantt charts in Adobe Acrobat PDF file format, formatted to fit ANSI Size D paper (610mm x 914mm) (24” x 36”), and showing the Activity ID, Activity Description, Original Duration, Remaining Duration, Total Float, Early Start and Finish Dates, and Calendar ID. Types of Gantt Charts to be included are:

**i.** The project critical (longest) path.

**ii.** The Project near Critical Path (excluding Critical Path activities).

**iii.** All uncompleted work activities as of the data date.

##### **2.** Reports in Adobe Acrobat PDF file format, formatted to fit 216mm x 279mm (8½” x 11”) size paper, to include:

###### A listing of all activities, by activity code, with early & late starts and Total Float.

###### A Claim Digger Report that details all changes between the current schedule submittal and the previous month’s update submittal.

###### Detailed Predecessor/Successor Report which included a listing of all activities that immediately precede and immediately succeed that activity in the schedule logic.

##### **3.** **Three (3)** paper copies of each Gantt Charts in color and report on the paper size specified above.

#### **B.** Schedule submittals will only be considered complete when all materials have been submitted.

## 1.14 FLOAT/CRITICAL PATH

#### **A.** With the exception of the Float described in Paragraphs B and C, Float is not for the exclusive use or benefit of either the Construction Administrator or the Contractor but is an expiring resource available to all parties acting in good faith as needed to meet any Contract Milestone(s).

#### **B.** As float is an expiring resource, if the Work is delayed on the Critical Path due to an excusable delay (either compensable or non-compensable) or by any delay for which responsibility has not yet been agreed upon, the Contractor may not use any float created by such delay on any other path without the express written approval of the Construction Administrator or unless at the time of the float consumption a time extension had been issued for the delay that created the float being consumed. Use of such float on any parallel path without the approval of the Construction Administrator shall be construed as a concurrent inexcusable delay to any delay caused by the Construction Administrator.

#### **C.** It is acknowledged and agreed by the Contractor that Construction Administrator caused delays on the project may be offset by Construction Administrator caused time savings (including, but not limited to: Critical Path submittals returned in less time than allowed for in the Contract, approval of substitution requests which result in a savings of time along the Critical Path for the Contractor, etc.). In such an event, the Contractor shall not be entitled to receive an extension of time or delay damages until the Construction Administrator caused time savings are exceeded and the Contract completion date also exceeded.

## 1.15 EARLY COMPLETION

#### **A.** Should Contractor submit a Preliminary Schedule, Baseline Schedule, Schedule Update or Schedule Revision showing Project Completion more than **twenty (28) days** prior to Contract Completion Date, the Construction Administrator may issue a Change Order, at no cost to Owner, revising the time of performance of Work and Contract completion date to match Contractor’s schedule. Contract Milestone dates, if any, shall be adjusted accordingly. The assessment of liquidated damages shall be measured based on the new Milestone and Contract completion dates.

#### **B.** Should any monthly Schedule Update show the project completion earlier than current Contract completion date, the Contractor shall show early completion time as schedule activity, identified as "Project Float." This float shall be available for use by either party as per the provisions of Article 1.14. The Owner shall not liable for any damages as a result of utilizing this float.

## 1.16 CONTRACT TIME EXTENSIONS

#### **A. Mitigation of Delays:**

##### **1.** The Contractor shall be responsible to develop mitigation measures for all delays regardless of responsibility for the delays and to identify all time and cost impacts to the work associated with those mitigation measures. Unless circumstances otherwise require, the Contractor shall not pursue mitigation action for which it expects the Owner to be liable prior to notifying the Owner and receiving Construction Administrator authorization to proceed with the mitigation action. Any action taken by the Contractor prior to receiving approval from the Construction Administrator shall be at the Contractor’s risk.

##### **2.** When the need for mitigation arises to ensure timely completion, the Contractor shall review all uncompleted activities on the Critical and Near Critical Paths to the Contract Completion Date for errors in scope, duration, and logic and for the feasibility of performing in parallel work currently scheduled sequentially.

##### **3.** Whenever it is possible for the Contractor to mitigate delay without added cost, the Contractor shall do so. The Contractor shall mitigate all delays as efficiently and economically as possible, with the objective of minimizing both the time and cost impact of the delay regardless of responsibility for the delay. The Owner will not be liable for damages which the Contractor could have avoided by reasonable means such as prudent scheduling of the work and judicious handling of forces, equipment or plant. The Owner will not be liable for damages incurred by the Contractor during any period of time when the Contractor has failed to provide notification of delay in accordance with the Contract requirements when having the notification at the specified time could have influenced the Owner’s decision or actions.

#### **B. Time Impact Analysis:**

##### **1.** If the Contractor believes that a proposed change will impact the Project Completion Date or interim Milestones, the Contractor shall submit an analysis with its Change Order Proposal demonstrating the delay to the Critical Path. This analysis shall be in the form of a Time Impact Analysis (TIA).

##### **2.** The Time Impact Analysis shall consist of: 1) a Fragnet of the portion of the schedule that will be affected by the incorporation of the change, which shall include the new activities, revised logic and durations associated with the proposal change; 2) a narrative explanation of how the proposed change would impact the schedule; 3) an impact schedule which shall be developed by incorporating the Fragnet and required changes, including any delay mitigation measures, into the most recent accepted schedule update and; 4) electronic copies of the Fragnet and impact schedule.

##### **3.** The Contractor shall submit its TIA in sufficient time to allow it to be incorporated into a Revision Schedule prior to the change order work proceeding, allowing the Owner **thirty (30)** days after receipt of the TIA and all the supporting information required with the Change Order Proposal to approve or reject the analysis.

##### **4.** Upon agreement on the schedule impact due to the proposed change and the issuance of a time extension, the Contractor shall incorporate the agreed upon Fragnet/schedule revisions in the next monthly update.

##### **5.** The Owner reserves the right to have the Contractor proceed with the change order related work without agreeing on the time associated with it and to measure the actual schedule impact via Contemporaneous Period Analysis.

##### **6.** In cases where the Contractor has not submitted a TIA with its Change Order Proposal for a particular proposed change, the Contractor agrees that the particular proposed change has no impact on the Contract Completion Date or interim Milestones and no time extension is required.

#### **C. Contemporaneous Period Analysis:**

##### **1.** When an accepted Schedule Update indicates the project has been delayed beyond the current Contract Completion Date and the Contractor believes it is entitled to an extension of time, the Contractor shall prepare and submit to the Owner a Contemporaneous Period Analysis (CPA) demonstrating the delay(s) to the Critical Path at the time of the delay, mitigation measures taken or proposed by the Contractor and request an extension of time.

##### **2.** The Contractor’s CPA and time extension request shall be submitted prior to the submission of the next Schedule Update.

##### **3.** The request shall indicate the amount of time requested, the period when the delay was experienced and an explanation as to the cause of the delay.

##### **4.** The CPA shall quantify the delay by comparing the completion dates and Milestone dates on an update by update basis, starting with the update just prior to the delaying event and ending with the update just after the conclusion of the delaying event. Only the accepted schedules/Schedule Updates shall be used in the CPA. The CPA shall determine the cause of the delay by correlating slippage with various unforeseen events.

##### **5.** The CPA will consist of: 1) an update by update accounting of all delay(s) during the period in question; 2) an update by update narrative explanation of how the delay(s) affected the completion date or would have affected the completion date but for other concurrent delay(s); 3) chronologies of the issues affecting the schedule period in question; and 4) a day by day accounting and description of the unanticipated work/work stoppage on the Critical Path and/or path in question; 5) a Gantt chart comparing the as-planned schedule just prior to the start of the delay to the actual as-built for the path(s) in question.

#### **D.** The Owner may require the Contractor to correct errors in its TIA or CPA at anytime, whether or not the schedules have been accepted and/or time extension issued and agreed upon. Should the errors affect the outcome of the TIA or CPA, the Owner reserves the right to adjust the time extension accordingly. Generally, a schedule will be found to be in error if it does not properly reflect the sequencing, timing and durations of all the work and required events as well as mitigation efforts contemplated or which should have been contemplated at the time of the data date of the schedule.

#### **E.** Time Extensions will be granted only to the extent that equitable adjustments for the activity or activities affected exceed or exceeded the total or remaining float along the Critical path or activities at the time of the actual delay. Actual delays in activities which do not affect the Critical Path work or which do not move the Contractor’s planned completion date beyond the Contract completion date or current completion date as affected by previous delays, will not be the basis for an adjustment to the Contract time. Time Extensions shall not be granted until a delay occurs that is:

##### **1.** Beyond control of and without fault of or negligence of the Contractor and the major Trade Contractors or Suppliers at any time.

##### **2.** Extends the actual performance of the work beyond the Contract completion date or other specified Interim Milestones.

#### **E.** Should a non-compensable excusable delay be concurrent with one or more compensable delays, the Contractor and Owner agree that the net result is a non-compensable, excusable delay to the extent the delay is caused by the non-compensable event.

#### **F.** The Contractor shall have no claim for damages of any kind, or extensions or increase to the Contract time(s) or Contract Milestone(s), or adjustments of Contract Price on account of any delay, interruption or suspension of the Work or any portion thereof (herein after collectively referred to as “Delay”), due to whatever cause unless the prerequisites of this Subsection are met. The requirements of this Subsection are in addition to and not in lieu of the requirements of any other applicable subsection.

## 1.17 REVIEW AND ACCEPTANCE OF PROJECT SCHEDULE SUBMITTALS

#### **A.** The Construction Administrator shall review schedule submittals for conformance with the requirements of the Contract Documents. Schedule review comments by the Construction Administrator may address whether items of Work are omitted, activity durations are reasonable or that the level of labor, materials, and equipment, the means, methods, timing, and sequencing of the Work are practicable. The planning, scheduling or execution of the Work and the accuracy of any Project Schedule shall remain the sole responsibility of the Contractor.

#### **B.** During the review of any of the submissions required by this section, if any of the following conditions are discovered the submittal shall be returned by the Construction Administrator without further review for correction and re-submittal:

##### **1.** The submittal is incomplete.

##### **2.** The submittal does not comply with the specified format.

##### **3.** A component of the submittal has not been prepared in accordance with all of the requirements of this section.

##### **4.** The quality of the submittal indicates that the Contractor has failed to perform an internal quality control review prior to submission.

##### **5.** There is an inconsistency between electronic files and printed material.

#### **C.** It is the Contractor’s responsibility to ensure that all Project Schedules are in compliance with all of the requirements of the Contract Documents. The Construction Administrator’s failure to return a submittal shall not be construed to mean that the submittal is in compliance with the requirements of the Contract Documents. The Construction Administrator, at its discretion, may choose to complete a submittal review even though the submittal fails to meet one of more of the conditions for rejection stated herein.

#### **D.** The acceptance of any Project Schedule by the Construction Administrator does not constitute acceptance or approval of any change to the requirements of the Contract Documents including but not limited to any mandated construction sequences. The Construction Administrator is not responsible for any erroneous assumptions or information in any Project Schedules regardless of origin.

#### **E.** The Contractor shall be responsible for all delays due to its failure to submit complete submittals in accordance with the requirements of the Contract Documents.

#### **F.** The Schedule submitted will not be considered acceptable until all of the Construction Administrator’s comments are incorporated into the schedule to the Construction Administrator’s satisfaction.

#### **G.** Errors in any Project Schedule accepted by the Construction Administrator, including but not limited to activity durations, relationships between activities, resource allocation or other float suppression techniques that do not accurately reflect the work may be identified at any time and once identified shall be corrected by the Contractor.

#### **H.** Construction Administrator’s acceptance of a Schedule Update shall not constitute the approval of a time extension should the Project Completion Date or Contract Milestone(s) be shown as delayed.

#### **I.** Notwithstanding any review, review comments, acceptance, scheduling assistance or direction to change an/or revise any schedule by the Construction Administrator, the schedules shall at all times be the Contractor’s schedule for performing the Work and not be considered as any Construction Administrator direction constituting a change unless the Contractor gives appropriate notice and the other Contract provisions for determining merit and entitlement are met.

## 1.18 PAYMENT

#### **A.** When the Contractor submits its schedule of values in accordance with the General Conditions, it shall include an amount for the scheduling work associated with this section, this cost to be paid in accordance with section (01 29 76).

#### **B.** Failure of the Contractor to submit a Baseline Schedule or Revised Baseline Schedule for any portion of the work in accordance with t his specification may result in the withholding all Contract payment until the schedule is submitted to, and accepted for compliance with the specification and reasonableness, by the Construction Administrator.

#### **C.** In the event the project extends beyond the original completion date by more than 30 days, and a time extension is granted to the Contractor, the Construction Administrator may require additional CPM updates which will be paid at the per month cost for the Scheduling Update services.

## 1.19 DISTRIBUTION

### **A.** Distribute copies of the computer generated schedules to Construction Administrator, Architect, Owner, Subcontractors, suppliers, and other concerned parties.

### **B.** Instruct recipients to promptly report, in writing, problem anticipated by projections indicated in schedules.

# PART 2 - PRODUCTS (Not Applicable)

# PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 32 16.13