PART 1 - CRITICAL PATH SCHEDULE AND SCHEDULE CONSTRAINTS

1.01 CRITICAL PATH SCHEDULE

A. GENERAL REQUIREMENTS: The scheduling of the Work shall be the responsibility of the Contractor. The construction of this project will be planned and tracked by use of a conventional Critical Path Method (CPM) schedule, which shall be prepared, maintained, and regularly updated by the Contractor.

The Engineer's review and acceptance of any critical path schedule shall not transfer any of the Contractor's responsibilities to the Owner or to the Engineer. Acceptance implies only that the Engineer has determined that the Critical Path Schedule submittal with any noted exceptions is within reasonable conformity to the requirements of the Contract. Acceptance of any schedule shall not relieve the Contractor of its responsibility to complete the work within the required Contract Time.

All schedules shall meet these general requirements.

The “critical path” is the series of sequentially-linked activities in a project schedule that will take the longest total amount of time to complete. Therefore, at any point in time, the critical path will be the path with the least amount of total float. The critical path does not have to follow the same logic path from start to finish and does not have to have zero total float. A critical task is a discrete work activity within a critical path. “Total Float” is the number of days that a scheduled activity can be delayed without affecting a given intermediate milestone or Physical Completion Date. A milestone is a zero-duration task marking the completion of a significant body of work or important date/event associated with the Contract.

The baseline CPM Schedule and each Critical Path Schedule update shall conform to the following guidelines:

1. Schedules shall be prepared, viewed, and printed utilizing standard Gantt-chart format.
2. Show all activities necessary to complete the Work.
3. Each task shall have a descriptor sufficiently detailed to understand the scope of work encompassed by that task. Overly-broad descriptors (e.g. “grading”, “electrical”, “plumbing”, etc.) may be rejected by the Engineer, especially when in conjunction with long durations.
4. Activities shall be assigned durations consistent with the activity’s scope of work, assuming that work will be done continuously over the entire task duration. Float time shall not be represented as a part of the task duration. Excluding the Preliminary CPM Schedule, the maximum duration for any one activity shall be ten (10) Working Days unless otherwise accepted by the Engineer.
5. Sequential work activities shall be linked logically by precedent/successor activities.

6. Display the Critical Path as a red-colored sequence within the project schedule. Multiple parallel critical paths will not be allowed unless the Contractor can demonstrate that each of the parallel paths has minimal total float time.
7. Comply with all order of Work requirements included in the Contract.
8. Show durations in Working Days.
9. Show Contract milestones including the following:
    a. Notice to Proceed Date,
    b. Substantial Completion Date,
    c. Physical Completion Date,
    d. Any milestones defined in the Special Provisions of this Contract,
    e. Other milestones at the discretion of the Contractor
10. Show required submittals for significant activities. Establish discrete work activities for provision and review of submittals, ensuring durations conform to the time allowed by the Contract.
11. Identify special labor or equipment needs that may constrain or limit the Contractor's ability to perform project tasks simultaneously. These may be shown as "Resources" within the CPM schedule, or described separately in narrative format.
12. Show procurement, manufacture and delivery activities for significant material items of Work that affect the schedule.
13. Show significant Owner activities and/or delivery of Owner-supplied materials that may impact the schedule.
14. Show significant elements of the Construction Stormwater and Pollution Prevention Plans. These elements may include but are not limited to the installation and removal of erosion/sedimentation controls, and stormwater control.
15. Include project close-out items such as punch-list items, provision of O&M manuals and as-built drawings.

Unless otherwise specified in the Contract, the Contractor shall allow the Engineer a reasonable amount of time to perform his activities. Reasonable will be defined as "customary or normal" for the type of work involved.

Float available in the CPM Schedule, at any time, shall not be considered for the exclusive use of either the Contractor or the Engineer. However, any float used by the Owner that is later needed by the Contractor and results in delay to the critical path will be considered an excusable non-compensable delay.

If the Engineer deems that the CPM Schedule is not within reasonable conformity to these specifications, it will be returned to the Contractor for correction and re-submittal.

The Contractor, or its Subcontractor(s), shall not deviate from the projected start and completion times for major phase(s) of the Work shown on the accepted CPM Schedule without providing at least fourteen (14) Days advance notice to the Engineer. Failure to notify the Engineer of a deviation from projected start and completion times for a major phase of the Work shown on the schedule may impact costs to the Owner, including the cost of additional community outreach to communicate changes in schedule to the public. Resulting costs due to this "failure to notify" shall be the responsibility of the Contractor. The Owner will deduct these costs from any payment due or to become due to the Contractor.

B. SCHEDULE TYPES

1. **PRELIMINARY CPM SCHEDULE:** The Contractor shall prepare and submit a preliminary critical path schedule at the preconstruction conference. The preliminary schedule shall show the first 30 Days of Work in reasonable conformity to these Specifications. The remaining schedule shall show the critical path schedule using broad Work activities, and major milestones and durations for the purpose of review and discussion at the preconstruction conference.

2. **BASELINE CPM SCHEDULE:** The Contractor shall submit for Engineer's review and acceptance a baseline CPM Schedule no later than seven (7) days after receipt of the Notice to Proceed. The baseline schedule will not be accepted unless it satisfies Section 1-08.3(1)A General Requirements.

   Within seven (7) days of the Engineer receiving the submittal, the Engineer and the Contractor shall meet for joint review, correction, and adjustment of the initial baseline CPM schedule. Within seven (7) days, the baseline schedule shall be resubmitted to the Engineer showing the agreed upon adjustments. Adjusted baseline CPM schedules submitted by the Contractor will be reviewed by the Engineer and returned to the Contractor within seven (7) Days of the Engineer's receiving the submittal. If necessary, the joint review and adjusted schedule submittal process shall be repeated. However, the schedule shall be finalized within 30 Days after Notice to Proceed.

3. **CPM SCHEDULE UPDATE:** The Contractor shall submit monthly Critical Path Schedule updates and whenever changes occur that have potential to delay substantial or physical completion by 5 or more working days. When required, a written narrative describing the project schedule status, the critical path and any revisions to the schedule shall be included with the updates.

   At the discretion of the Engineer, progress meetings may be held monthly for the purpose of updating the critical path schedule. Progress will be reviewed to verify actual start and finish dates, remaining duration and percent complete of uncompleted activities, and any proposed revisions to the schedule. It is the Contractor's responsibility to provide the Engineer with the status of activities at this progress meeting and prepare schedule updates based on this information once it has been verified and agreed upon. If the work is in accordance with the last accepted critical path schedule, the Engineer may waive the monthly update or the final as-built CPM schedule.

The updated critical path schedule shall contain the agreed upon revisions or be resubmitted.

The Contractor shall submit a supplemental Critical Path Schedule update within seven (7) Days of a request by the Engineer and of Substantial Completion. The CPM Schedule updates shall conform to the following additional requirements:

a. Schedule updates shall be presented in a "Tracking Gantt" format, showing two sets of Gantt-style progress bars consisting of 1) the latest approved Baseline CPM versus 2) a combination of the actual start/finish progress of completed tasks and projected start/finish dates of uncompleted tasks.

b. Include columns showing actual or projected start and finish dates of all activities. Identify changes to activity precedents, successors, and/or constraints that have altered the critical path.

c. Highlight any new activities or additional activities resulting from the restructuring/splitting of existing baseline activity(ies).

d. Identify the current critical path, which could vary from the baseline critical path due to actual Work progress, additional work, or changed conditions.

Unresolved issues or disputes with asserted time effects may be reflected in a schedule update by comparing the Baseline critical path to the revised critical path shown in an updated schedule. If Work cannot be completed within the Contract Time, the updated schedule shall reflect the earliest completion date practicable, and a narrative shall be provided by the Contractor addressing the reason(s) behind the delay. Acceptance of late completion schedules will be at the discretion of the Engineer and shall not relieve the Contractor from Liquidated Damages.

4. LOOK-AHEAD SCHEDULE: At each weekly progress meetings, the Contractor shall submit a look-ahead schedule showing the Contractor's, and all subcontractors' proposed Work activities and any Owner activities or supplied Materials for the next 3 weeks. Include the description, duration and sequence of Work, and highlight any deviations between planned and regular hours of Work. The 3-week look-ahead may be reduced to a 2-week look-ahead with the approval of the Engineer. Unless otherwise specified in the Contract, the Contractor shall notify the Engineer at least 2 Working Days in advance of changing Work as shown in the look-ahead schedule; an updated look-ahead schedule shall be submitted with the notification

C. SUBMITTALS: The Contractor shall submit one (1) copy of the CPM schedule (in Gantt chart format, with columns displayed to show predecessors and successors of each activity), and any narrative; and one (1) full electronic copy in selected CPM software format. Unless approved otherwise by the Engineer, the CPM Schedule shall be printed on 24" x 36" paper or larger. The CPM Schedule and any narrative shall also be submitted in PDF format.

The Gantt chart format is a standard method of presenting schedule information. The following standard requirements apply:

1. The schedule shall include a horizontal time scale consistent with the project calendar.
2. Each activity/task/milestone shall be listed in order of start date in a tabular grid to the left of the time scale. The tabular grid shall include the task number, description, start date, finish date, predecessors, successors, and float. Baseline schedules shall show the baseline-planned start and finish dates. Update schedules shall show the actual/projected start and finish dates.
3. Each activity shall be provided with a corresponding task bar in the horizontal time scale, with a plotted length conforming to its duration and dates.
4. Linked activities shall be indicated by logic arrows in the timescale portion of the Gantt chart, as needed to clearly show the sequence and interdependence of all activities required for complete performance of all items of Work under the Contract.
5. Activities on the critical path shall be highlighted using red task bars.

The electronic copy of the Critical Path Schedule shall be compatible with Microsoft Project or other Engineer approved software. The Contractor shall submit a functional and complete CPM schedule electronically via email, on compact disk (CD), or other medium accepted by the Engineer.

D. **EARLY COMPLETION:** The Engineer has established the number of Working Days allowed for Substantial Completion and Physical Completion within Section 3 of the Division 00 52 00 Agreement Form submitted with the Bid, and these timeframes may only be amended by subsequent change order(s). The Engineer allocates resources to a Contract based on the Contract Time. The Engineer will review and accept a Critical Path Schedule indicating an early Substantial and/or Physical Completion Date but cannot guarantee the accuracy of the Contractor's accelerated schedule, nor that Owner resources will be available to meet the accelerated schedule. No additional compensation or time will be allowed if the Contractor is not able to meet its accelerated schedule due to the unavailability of Owner resources, for unforeseen conditions, or for other reasons beyond the Engineer's control.

E. **PAYMENT:** Compensation for the cost necessary to complete the Work described in this section is considered incidental to and included in all Bid items of Work. No separate payment will be made for the work required in this section.

1.02 SCHEDULED WORK ITEMS:

A. ***(None at this time - Edit).***

1.03 SCHEDULE CONSTRAINTS

The Contractor's CPM schedule shall reflect constraints imposed by applicable laws and regulations, and those specified in the Contract. Constraints include but are not limited to the following:

1. Submittal Requirements and Review Durations per Section 01 33 10 - Submittals.

2. Holiday Construction Moratorium per Section 01 11 00 - Summary of Work.
3. Safety Restrictions per Section 01 35 29 - Health & Safety.
4. Traffic Control Restrictions per Section 01 55 80 - Public Convenience & Safety-Temporary Traffic Control
5. Environmental Restrictions per Section 01 57 19 - Temporary Environmental Pollution Control.

PART 2 - PRODUCTS: *(Not Used)*

PART 3 - EXECUTION*: (Not Used)*

END OF SECTION