July 31, 2014

REVISION OF SECTION 108

PROJECT SCHEDULE

**NOTICE**

This is a standard special provision that revises or modifies CDOT’s *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT’s Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT’s Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

**Instructions for use on CDOT construction projects:**

Use in all projects.

July 31, 2014

1

REVISION OF SECTION 108

PROJECT SCHEDULE

Section 108 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 108.03 and replace with the following:

**108.03 Project Schedule.**

1. *Definitions.*

Activity. An activity is a project element on a schedule that affects completion of the project. An activity has a description, start date, finish date, duration, and one or more logic ties.

Activity ID. A unique, alphanumeric, identification code assigned to an activity and remains constant throughout the project.

Bar Chart. A simple depiction of a Project Schedule without relationships or supporting logic of the schedule.

Calendar. Defined work periods and no work periods that determine when project activities can occur. Multiple calendars may be used for different activities; e.g., a 5-day work-week and a 7-day work-week calendar.

Constraint. A restriction imposed in a schedule, which fixes a value that would otherwise be calculated within the schedule. Examples of values that can be fixed by a constraint include start date, end date, and completion date.

Critical Path. The sequence of activities that determines the duration of the project.

Critical Path Method Scheduling. (CPM Scheduling) is a logic-based planning technique using activity durations and relationships between activities to calculate a schedule determining the minimum total project duration.

Data Date. The starting point from which to schedule all remaining work.

Duration. The estimated amount of time needed to complete an activity.

Float. The amount of time between the earliest date an activity can start and the latest date when an activity must start ,or the earliest date an activity can finish and latest date when an activity can finish before the activity becomes critical. The time between the Project Schedule completion date and the Contract completion date is not considered float.

Gantt Chart. A time-scaled graphical display of the project’s schedule.

Lag. A time-value assigned to a relationship.

Logic. Relationships between activities defining the sequence of work (See also predecessor activity and successor activity).

Milestone. An activity, with no duration used to represent an event.

Open-Ended Activity. An activity that does not have both a predecessor activity and a successor activity.

Predecessor Activity. An activity that is defined by schedule logic to precede another activity.

Relationship. The interdependence between activities.

Salient Feature. An item of work that is of special interest for CDOT in coordinating the project schedule but may not affect the overall completion of the project.

July 31, 2014

2

REVISION OF SECTION 108

PROJECT SCHEDULE

Successor Activity. An activity that is defined by schedule logic to follow another activity.

Time-Scaled Logic Diagram. Gantt chart that illustrates logic links depicting both schedule logic and the time at which activities are performed.

1. *Project**Schedule* **-** *General*

The Contractor shall use either Microsoft Project or Primavera Scheduling software to develop and manage a CPM Project Schedule to plan, schedule, and report the progress of the work. Prior to, or at the Pre-construction Conference, the Contractor shall notify the Engineer in writing, which scheduling software the Contractor shall use to manage the project. The Contractor’s selection and use of particular scheduling software cannot be changed after the first schedule submittal. If the Contractor selects Primavera, the Contractor shall calculate the schedule using the Retained Logic scheduling option. The Department will not allow use of bar charts for the Project Schedule.

The Contractor shall submit schedules for approval by the Engineer. The purpose of these schedules is to allow the Contractor and the Department to jointly manage the work and evaluate progress. The schedules also serve to evaluate the affect of changes and delays to the scheduled project completion. Either party may require a formal schedule review meeting.

The Contractor’s schedule shall consist of a time-scaled logic diagram and shall show the logical progression of all activities required to complete the work.

The Contractor shall use activity descriptions that ensure the work is easily identifiable. The Contractor shall show the no-work days in the schedule calendars.

The Contractor shall use durations for individual construction activities that do not exceed 15 calendar days unless approved by the Engineer. The Contractor may group a series of activities with an aggregate duration of five days or less into a single activity. Non-construction activities may have durations exceeding 15 working days, as approved by the Engineer.

The Contractor may include summary bars in the schedule as long as the detailed activities to complete the work are displayed.

The Contractor shall not use the following:

1. Negative lags
2. Lags in excess of 10 working days without approval by the Engineer. The Contractor’s written request shall justify the need for the lag. Lags shall be identified.
3. Start-to-finish relationships.
4. Open-ended activities - every activity shall have at least one predecessor activity and at least one successor activity, except for the first and last activities in the network. If the contractor uses a start-to-start relationship to link two activities, then both of those two activities should also have successor activities linked by either a finish-to-start or a finish-to-finish relationship.
5. Constraints without approval by the Engineer. The Contractor’s written request shall explain why the use of constraints in the schedule is necessary.

The Project Schedule shall show all activities required by all parties to complete the work. The Project Schedule shall include subcontracted work, delivery dates for critical material, submittal and review periods, permits and governmental approvals, milestone requirements, utility work by others and no work periods. The Contractor, its subcontractors, suppliers, and engineers, at any tier, shall perform the work according to the approved Project Schedule.

July 31, 2014

3

REVISION OF SECTION 108

PROJECT SCHEDULE

Float within the Baseline Schedule or any other Project Schedule is not for the exclusive use or benefit of either party, but is a project resource available to both parties as needed until it is depleted.

For any schedule submittal that shows completion in less than 85 percent of the Contract Time, the Contractor shall submit planned production rates in the schedule for all activities with float of 10 days or less. The Engineer may require additional methods statements for activities with float of 10 days or less.

The Engineer’s review of the schedule will not exceed 10 calendar days. The Engineer will provide the Contractor with one of the following responses within 10 days after receipt of the Project Schedule:

(1) Approved, no exceptions taken;

(2) Approved-as-Noted; or

(3) Revise and Resubmit within 10 days.

The Contractor shall not assume that approval of the Project Schedule relieves the Contractor of its obligation to complete all work within the Contract Time.

1. *Schedule Submittals.* The Contractor shall include a time-scaled logic diagram with all schedule submittals that:
	1. Is plotted on a horizontal time-scale in accordance with the project calendar.
	2. Uses color to clearly identify the critical path.
	3. Is based on early start and early finish dates of activities.
	4. For Schedule Updates and Schedule Revisions, shows actual completion dates up to but not including the data date.
	5. Clearly shows the sequence and relationships of all activities necessary to complete the contract work.
	6. Includes an activity block for each activity with the following information:

|  |  |
| --- | --- |
| Activity ID | Activity Description |
| Original Duration | Total Float  |
| Early start date  | Early finish date  |
| Late start date\* | Late finish date\* |
| Actual Start date^ | Actual Finish date^ |
| Calendar used on the activity | Activity Responsibility  |
| Remaining Duration^ | Duration Percent Complete^ |
| Gantt chart (time-scaled logic diagram) |
| \*Required with the Preliminary and Baseline Schedule.^Required with the Project Schedule Update and Schedule Revision. |

The Contractor shall include the following with all schedule submittals:

1. A Job Progress Narrative Report that includes the following:
2. A description of the work performed since the previous month’s schedule update.
3. A description of problems encountered or anticipated since the previous month’s schedule submission.
4. A description of unusual labor, shift, equipment, or material conditions or restrictions encountered or anticipated.

July 31, 2014

4

REVISION OF SECTION 108

PROJECT SCHEDULE

1. The status of all pending items that could affect the schedule.
2. Explanations for milestones forecasted to occur late.
3. Scheduled completion date status and any change from the previous month’s submission.
4. An explanation for a scheduled completion date forecasted to occur before or after the contract completion date or contract time.
5. Schedule Delays:
	1. A description of current and anticipated delays including: Identification of the delayed activity or activities by Activity ID(s) and description(s).
	2. Delay type with reference to the relevant specification subsection.
	3. Delay cause or causes.
	4. Effect of the delay on other activities, milestones, and completion dates.
	5. Identification of the actions needed to avoid a potential or mitigate an actual delay.
	6. A description of the critical path impact and effect on the scheduled completion date in the previous month’s schedule update.
6. A list of all added and deleted activities along with an explanation for the change.
7. All logic and duration changes along with an explanation for the change.
8. A Predecessor Activity and Successor Activity report that defines all schedule logic and clearly indicates all logical relationships and constraints.
9. An Early Start report listing all activities, sorted by actual start/early start date.
10. A Float report listing all activities sorted in ascending order of available float.
11. A Critical Path report listing all activities not yet complete with the percent complete, sorted by float and then by early start.
12. A listing of all non-work days.

For all required schedule submittals, the Contractor shall submit two electronic copies on two compact disk, USB flash drive, or other media as directed by the Engineer. Electronic copies of CPM schedules shall be submitted both in the native schedule format and in “PDF” format. The Contractor shall also provide two printed copies of the CPM Schedule and all reports.

Each schedule submittal shall be appropriately labeled as a Preliminary Schedule, Baseline Schedule, Project Schedule Update, or Schedule Revision. The title bar shall include the CDOT project number, subaccount, project name, contractor name, schedule data date. If an originally submitted schedule is revised during review, the title bar shall also include a revision number (REV1, REV2, etc.) and revision date.

1. *Preliminary Schedule.* Within 14 days of award of the Contract, the Contractor may submit a Preliminary Schedule showing all planned activities from the Notice to Proceed through the first 60 days of the project. If the Contractor elects not to submit a Preliminary Schedule, then the Contractor shall submit a complete Baseline Schedule within 14 days of award of the Contract, which will be subject to all requirements of a Baseline submittal. The Preliminary Schedule shall not show any progress and it will be approved by the Engineer before work can commence. The Preliminary Schedule shall be used as the basis for the Baseline Schedule.
2. *Baseline Schedule.* If the Contractor elects to submit a Preliminary Schedule, within 45 days of the award of Contract, the Contractor shall submit a Baseline Schedule that includes all work activities completed within Contract Time. The Contractor shall not show progress in the Baseline Schedule. Further partial payments will not be made beyond 60 days after the start of Contract Time unless the Baseline Schedule is approved. When approved, the Baseline Schedule shall become the Project Schedule.

The Contractor shall use all information known by the Contractor at the time of bid submittal to develop the Baseline Schedule.

July 31, 2014

5

REVISION OF SECTION 108

PROJECT SCHEDULE

If the Contractor elects to submit a Baseline Schedule in lieu of a Preliminary Schedule, the Baseline Schedule shall be approved before work can commence.

1. *Methods Statements.*  The Contractor shall submit a Methods Statement for each salient feature or as directed by the Engineer that describes all work necessary to complete the feature. The Contractor shall include the following information in the Methods Statement:
2. Salient feature name;
3. Responsibility for the salient feature work;
4. Planned work procedures;
5. The planned quantity of work per day for each salient feature using the same units of measure as the applicable pay item;
6. The anticipated labor force by labor type;
7. The number, types, and capacities of equipment planned for the work;
8. The planned time for the work including the number of work days per week, number of shifts per day, and the number of hours per shift.
9. *Project Schedule Update.* The Contractor shall submit a monthly update of the Project Schedule updated through the cut-off date for the monthly progress pay estimate, and a projection for completing all remaining activities. A schedule update may show a completion date that is different than the Contract completion date, after the baseline schedule is approved. Approval of this schedule shall not relieve the Contractor of its obligation to complete the work within the Contract Time. In this case, the Contractor shall provide an explanation for a late scheduled completion date in the Job Progress Narrative Report included with the schedule submittal.

When approved, the Project Schedule Update will become the Project Schedule. The Engineer will not issue a monthly progress payment if the Engineer has not received the Project Schedule Update. The Engineer will not make monthly progress payments for the months following the Project Schedule Update submission until the Engineer approves the Project Schedule Update.

When the project has a maintenance or landscape establishment period, the Engineer may waive the monthly update requirement. The Contractor shall submit a final Project Schedule Update that shows all work through the final acceptance date.

1. *Weekly Planning Schedule.* The Contractor shall submit, in writing, a Weekly Planning Schedule that shows the Contractor’s and all Subcontractor’s planned activities for a minimum of two weeks immediately following the date of submittal and actual days worked versus planned for the week prior to the date of submittal. This schedule shall include the description, duration and sequence of work activities and anticipated lane closures for the upcoming two weeks. The Weekly Planning Schedule may be a time-scaled logic diagram or other standard format as approved by the Engineer. subsection 108.03(c) Schedule Submittal requirements for reports do not apply to the Weekly Planning Schedule.
2. *Schedule Revision.* A Schedule Revision is required in the event of any major change to the work. Examples of major changes are:

(1) Significant changes in logic or methods of construction or changes to the critical path;

(2) Addition, deletion, or revision of activities required by contract modification order;

(3) Approval of a Contractor submitted Value Engineering Change Proposal;

(4) Delays in milestones or project completion;

(5) Phasing revisions, or;

(6) If the Engineer determines that the schedule does not reflect the actual work.

July 31, 2014

6

REVISION OF SECTION 108

PROJECT SCHEDULE

This revision shall include a description of the measures necessary to achieve completion of the work within the Contract Time. The Contractor may also need to submit revised Methods Statements. The Contractor shall provide a Schedule Revision within 10 days of written notification and shall include the diagrams and reports as described in subsection 108.03 (b) Schedule - General and (c) Schedule Submittals. In this case, the Contractor shall provide an explanation for a late scheduled completion date in the Job Progress Narrative Report included with the schedule.

Once approved, the Schedule Revision becomes the Project Schedule.

1. *Payment.* All costs relating to the requirements of this subsection will not be paid for separately, but shall be included in the work.