



**SPECIAL PROVISIONS
FOR
PROGRESS SCHEDULING**

**Black Hawk County
NHSN-063-6(94)--2R-07
NHSN-063-6(97)--2R-07
NHSX-063-6(75)--3H-07
NHSX-063-6(87)--3H-07
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NHSX-063-6(92)--3H-07
NHSX-063-6(96)--3H-07**

**Effective Date
June 20, 2017**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150280.01 DESCRIPTION.

- A.** The Project Schedule shall define the timeframe for completion of the Project and achievement of milestones and shall be used to monitor progress and denote changes during design and construction.
- B.** The Schedule shall also be used in determining the amount due to the Contractor for progress payments.
- C.** The Contractor's planning, scheduling and execution of the work shall be submitted to the Engineer by submission of the Preliminary Baseline Schedule, Baseline Schedule and Schedule Update information and data specified in this Special Provision.
- D.** The work under this Contract shall be planned, scheduled, and reported using Critical Path Method (CPM) scheduling. When the term "Schedule" is used in the Special Provisions, it shall mean CPM Schedule.
- E.** No contract work shall begin without approval of the Schedule by the Engineer.

150280.02 CPM SCHEDULE GENERAL REQUIREMENTS.

- A. General Requirements.**

1. The Contractor shall establish and utilize a work breakdown structure (WBS) to categorize all activities included in the Schedule. The WBS shall be submitted to the Engineer for review and approval. The WBS shall ensure all work is accounted for by staging/phasing and location; structure number, Highway/road/street number and direction, and/or area of work as defined in the contract documents. Project specific adjustments to the WBS template may be required by the Engineer.
2. Schedules shall show the order in which the Contractor proposes to carry out the work with logical links between time-scaled work activities and retained logic calculations made using CPM to determine the controlling operation or operations. The Contractor is responsible for assuring that all activity sequences are logical and that each Schedule shows a coordinated plan for complete performance of the work within the contract period.
3. Schedules shall comply with the staging, phasing, work restrictions, and milestones defined in the contract documents.
4. Schedules shall be developed with the intent of expeditious completion of the project and continuous flow of operations from project start to project finish.
5. Schedules shall clearly define and identify significant interaction points and action responsibilities between the Contractor, subcontractor(s), Vendor(s), The Engineer and other entities (such as utilities, local governments, railroads, special service districts, adjacent projects or contractors, etc.).
6. Schedules shall have a sufficient number of activities to assure adequate planning of the project, to permit monitoring and evaluation of progress, earned value analysis and to perform analysis of potential impacts to cost and time. Additional activities shall be added at the request of the Engineer.
7. The duration of each activity shall include the necessary work days to actually complete the work defined by the activity and shall be based on the quantity of work divided by a reasonable production rate(s):
 - a. A duration in whole days of not less than 1 working day, except for milestone type activities, and
 - b. Not more than 20 working days, except for non-work type activities such as mobilization, settlement durations, or submittal preparation, unless otherwise approved by the Engineer.
 - c. The duration of activities assigned multiple resources shall be evaluated based on the production rate of each resource assignment.
 - d. Activity durations shall not include time for weather contingency.
8. Schedule activities shall be described in detail so that all of the contracted Work is readily identifiable and the progress on each activity can be readily measured. The Schedule shall include activities to establish a level of detail acceptable to the Engineer. As a minimum, the following attributes shall be uniquely assigned to each activity within the Schedule:
 - a. A unique alphanumeric activity ID shall be assigned to each activity. The proposed activity ID format shall be submitted to the Engineer for approval.
 - b. An Activity description which clearly describes the Work represented by the activity. Each activity description shall indicate its associated scope and or location of work by including such terms as, type or description of work, bridge number, station to station location, side of highway (such as, eastbound or southbound), shoulder, ramp name, pipe number, etc. Activity descriptions shall utilize a similar and consistent format.
 - c. The Contractor shall establish and utilize an activity code structure to be approved by the Engineer. Activity coding shall be assigned consistently and uniformly among all similar activity types.

9. All activities shall be assigned at least one predecessor and one successor activity, except for project start and finish milestones.
10. The Contractor shall use submittal review and revised submittal review periods required by Section 1105 of the Standard Specifications. A review period of 30 calendar days shall be used for all review periods not specifically identified in the Standard Specifications.
- 11. Project Calendars.**
 - a. Each activity shall be assigned a Project specific calendar.
 - b. The number of work related calendars shall be minimized to prevent the distortion of total float, However, calendars specific to a particular type of work, such as earthwork, structures, paving, etc. shall be utilized to address seasonal weather limitations based on the type of work. Calendars shall be assigned consistently and uniformly among all similar activities.
12. The Schedules shall be based on work shifts of at least 8 hours per day and a minimum of a 5 day work week except during periods of weather limitations.
13. Schedules shall not include or utilize negative lag durations, open ended activities, float suppression techniques or date constraints which are not contractual. The Schedule shall not include positive lag durations, unspecified milestones, and unreasonable logic ties. Sequestering of total float through the manipulation of calendars, extending activity durations, logic ties or sequences is prohibited. Multiple relationships with the same predecessor or successor and reverse logic conditions are prohibited. Redundant logic shall be removed from the Schedule.
14. The "Level Resources," "Apply Actual," "Update Progress," "Auto Compute Actuals" or similar functions shall not be used to automatically update the Schedule. The Schedule shall be updated manually with actual information.
- 15. Use of Float.**
 - a. Total float and contract float are not for the exclusive benefit of the Contractor or The Engineer, but are an expiring resource available to the Project, to accommodate changes in the work, or to mitigate the effect of events which may delay performance or completion of all or part of the work within the Contract Time. Contract time extensions will not be granted except as may be approved by the Engineer in strict accordance with Articles 1108.06 and 1108.07 of the Standard Specifications.
 - b. The use of float suppression techniques is expressly prohibited. The use of any techniques solely for the purpose of suppressing float will be cause for rejection of the Schedule submittal.
- 16. Schedule Recovery.**
 - a. Whenever the Schedule includes negative float, critical items of construction fall behind the planned Schedule or when items which were not critical become critical the Contractor shall promptly notify the Engineer and undertake appropriate action at no additional cost to The Engineer to recover schedule.
 - b. The Contractor shall submit a written recovery statement to the Engineer describing the cause for the slippage and the actions planned by the Contractor to recover the Schedule within the shortest reasonable time.
 - c. The Contractor's refusal, failure or neglect to take appropriate recovery action or to submit a written recovery statement shall constitute sufficient basis for the Engineer to recommend to withhold payment or identify and order alternate recovery actions on the basis of the information in the Schedule.
17. Errors or omissions on Schedules shall not relieve the Contractor from finishing all work within the contract period specified. If, after a Schedule has been accepted, either the

Contractor or the Engineer discovers that any aspect of the Schedule has an error or omission, it shall be corrected by the Contractor as required by the Engineer.

18. The project schedule shall accommodate, utility coordination, regulatory approvals, and coordination with other adjacent projects or projects within the footprint of the project.

B. Scheduling Software.

1. "Primavera Project Management" (P6), version 8.2, or later shall be used to develop and update the Schedule. When the term "Primavera" is used in the Special Provisions, it shall mean "Primavera Project Management" (P6), version 8.2, or later.
2. Primavera Schedule Option settings:
 - a. Set Method of Scheduling to Retained logic.
 - b. Calculate start-to-start lag from Early Start.
 - c. Define critical activities as Longest Path.
 - d. Compute total float as finish float = late finish – early finish.
 - e. Set Calendar for scheduling relationship lag to predecessor activity calendar, unless directed otherwise by the Engineer.
3. Primavera Project Level settings:
 - a. All Calendars shall be Project level Calendars; not Global or Resource Calendars.
 - b. All Activity Codes shall be Project level; not Global or EPS level Activity Codes.
 - c. The Schedule shall not utilize User Defined fields unless approved by the Engineer.
 - d. The Drive activity dates by default box shall be unchecked.

C. Cost Loading.

1. The Schedule shall be cost loaded. Activity level cost loading shall be based on The Engineer bid items. One or more resources shall be assigned to each activity representing the value of the work identified by the activity.
2. One resource shall be defined for each bid item where the resource ID equals the Bid Item Number and resource name equals the Bid Item Description. A prefix may be required to be added to the resource ID and resource name. The resource structure within the scheduling software shall match the bid tab structure to facilitate comparison of cost and resource loading to the bid tab using the scheduling software.
3. The cost loading shall match in quantity, units, unit price and total value of each bid item and the total bid tabulation. The total dollar value shall equal the contract sum +/- 1%.
4. Activity percent complete shall be set to "Physical".
5. Activity Duration type shall be set to "Fixed Durations & Units."
6. Set "Resource Type" to "Material."
7. Select "Calculate costs from Units."
8. Resources shall not drive Schedule dates. All resources shall be assigned to a 7 day calendar.
9. Under Project Calculations ensure "Recalculate actual units and cost when duration % complete changes" is unchecked.

10. The Baseline Schedule Planned Dates will be set to match the current Start and Finish Dates; use global change once Baseline Schedule is approved.
11. Financial periods shall be defined in Primavera to match pay periods.
12. Actual cost shall be updated in each Schedule submittal by updating a level of effort (LOE) activity pertaining to each project contract number. Actual cost corresponding to pay voucher totals shall be inserted into applicable LOE payment activity as actual cost.
13. Create a resource per LOE payment activity representing voucher payments. Payment resource to have an assigned price of \$1 per unit.
14. Actual cost data paid from The Engineer pay vouchers shall be saved to the corresponding pay period within the financial period using Primavera's "Store Period Performance" function.
15. Update cost and resource loaded activities in the Schedule based on "Physical % Complete" only, actual cost information is placed in LOE activities.
16. Mobilization activities and payment amounts shall be created using the Basis of Payment described in Article 2533.05 of the Standard Specifications. Each of these mobilization payment occurrences shall have a unique activity, date, and amount in the Schedule.

D. Submittal Requirements.

1. Schedule submittals shall utilize Project ID and Project Naming conventions approved by the Engineer.
2. The Contractor shall provide the following items with each Schedule submittal; preliminary, baseline, update, time impact, or revised Schedule submittal in electronic format:
 - a. Schedule plot which includes all activities organized by WBS in PDF format.
 - b. Schedule plot of the longest path in PDF format.
 - c. An export of all Schedule data in XER format compatible with Primavera.
 - d. Narrative Report.
3. Schedule plots shall conform to the following:
 - a. Include the following columns in the following order: Activity ID, Activity Name, Original Durations, Remaining Duration, Early Start, Early Finish, Total Float, Budgeted Cost, Actual Cost This Period, and Actual Cost to Date.
 - b. Include a title block, Schedule name, run date, data date and a timeline on each page.
 - c. Sorted by Early Start.
4. The narrative report shall be organized and tabbed in the following sequence and include all applicable and appropriate supporting documentation including, but not limited to:
 - a. Contractor's transmittal letter.
 - b. Narrative description supporting the approach to the Work outlined in the Contract Schedule, including reasons for the sequencing of Work, problem areas, unusual conditions, restrictions regarding labor, equipment or material, use of multiple shifts, specified overtime or work at times other than regular days, potential conflicts, and other items that may affect the Schedule and how they may be resolved.
 - c. Narrative description of the general status of the Project including Work completed during the period, Work planned to be completed during the next reporting period, current total float and calculated percent complete.
 - d. Narrative description of the difference between previously planned Work and the actual Work performed.

- e. The working days per week, number of shifts per day, number of hours per shift, the holidays to be observed, and how the Schedule accommodates adverse weather days for each month or activity.
- f. Planned Production rates with justification of rates above or below typical.
- g. A listing of activity durations exceeding the 20 working day maximum with justification thereof.
- h. A list of activity relationships with lags with justification for use of the lag.
- i. A list of constrained activities with a justification for use of the constraint.
- j. Activities requiring coordination with the Department and/or 3rd parties (i.e. Utilities, adjacent contractors, etc)
- k. Schedule changes - A listing of all changes, and a narrative description of the reason or justification for the changes and the resulting affects or impact of the changes, including addition, deletion or modification of any item such as; activities, activity descriptions, date constraints, lags, logic, calendars, activity durations, and float.
- l. Narrative description of the current longest path.
- m. Comparative analysis of changes to the longest path with the previous Schedule submittal, including identification and justification for the cause of the changes.
- n. Changes to the scheduled completion date since the last Schedule submittal including identification and justification for the cause of the change.
- o. Current and anticipated delays:
 - 1) Cause of delay.
 - 2) Impact of delay on other activities, milestones and completion dates.
 - 3) Corrective action and Schedule adjustments to correct the delay.
- p. Pending items and status thereof:
 - 1) Permits.
 - 2) Contract changes.
 - 3) Time adjustments.
 - 4) Time Impact Analysis.
- q. Cost information:
 - 1) Include a listing and justification for adjustments to cost loading.
 - 2) Comparison of Schedule cost loading and current pay application.
- r. Additional Information as requested by the Engineer.
- s. A statement certifying the Schedule submittal is based on factual, accurate information which represents true planned and as-built conditions accompanied with the signature of the Project Manager. Schedule submittals will be considered complete when all documents and data have been provided as described above to the satisfaction of the Engineer.

150280.03 SCHEDULING CONFERENCE.

- A. The Contractor shall schedule and the Engineer will conduct a scheduling conference with the Contractor's project manager and scheduler within 15 calendar days of receipt of signed contract. At this meeting the Engineer will review the requirements of the special provisions with the Contractor.
- B. Items to be submitted by the Contractor, at least 2 working days before the scheduling conference, include, but are not limited to:
 - 1. Preliminary Baseline Schedule that complies with the requirements of these special provisions. The Preliminary Baseline Schedule shall include the activities and sequence of planned operations for the first 120 days of work after receipt of signed contract and lesser detail for the remainder of the project. The Contractor should be prepared to discuss the proposed work plan and Schedule methodology that comply with the requirements of these special provisions. The Schedule shall be submitted electronically in pdf and xer formats.
 - 2. List of: a) Activity Codes. b) Project level calendars. c) Key Milestones

3. WBS Structure.
 4. Narrative report index.
 5. Graphical reports (time-scaled resource bar charts).
 6. Two Week Detail Schedule.
- C. Items to be reviewed include, but are not limited to:
1. Review of Narrative and report formats.
 2. Review utility, railroad and other third party requirements and schedules.
 3. Review submittal requirements and procedures.
 4. Review time required to review submittals and resubmittals.
 5. Review requirements for tests and inspections.
 6. Review and finalize a list of construction activities to be included in the Schedule.
 7. Review of cost loading.
 8. Review of project calendars.
 9. Review constraints, Activity Codes and WBS structure.
 10. Review procedures for updating the Schedule.
 11. Review proposed modifications to the activity ID, activity code and work breakdown structure.
 12. Review other requirements of the Standard Specifications regarding scheduling that are not specifically listed above.
- D. The Engineer will review the Preliminary Baseline Schedule, proposed modifications, sample reports and other submittals and provide comments or required Baseline Schedule changes to the Contractor for implementation.

150280.04 BASELINE SCHEDULE.

- A. The Contractor shall submit to the Engineer an acceptable Baseline Schedule prior to the start of construction activities, but no later than 45 calendar days from receipt of signed contract. Failure to provide an acceptable baseline schedule within 45 calendar days of receipt of signed contract will result in enforcement of non-compliance provisions within this Special Provision.
- B. The Baseline Schedule shall include the entire scope of work and how the Contractor plans to complete all Work contracted. The Baseline Schedule shall clearly show the activities that define the critical path. Multiple critical paths and near-critical paths shall be minimized by minimizing the number of predecessors and successor relationships between activities and illogical or redundant logic. A total of not more than 30% of the Baseline Schedule activities shall be critical or near critical, unless otherwise authorized by the Engineer.
- C. The Baseline Schedule shall start and finish all work within the contract time(s) established in the contract documents, including but not limited to project start, project finish, intermediate contract periods and milestones, closure limitations, etc. Unless directed otherwise by the Engineer, the Baseline Schedule shall use a data date set to the projects late start date and shall not include

progress or as-built updates. The Baseline Schedule shall not include negative float or utilize any other prohibited scheduling technique.

- D. The Engineer reserves the right to withhold approval for all or part of the applications for payment until such time the contractor furnishes an approved Baseline Schedule.

150280.05 SCHEDULE UPDATES.

- A. Schedule updates shall be submitted each calendar month with a data date matching the progress through the last day of the pay request of each month, unless directed otherwise by the Engineer. The first schedule update shall be submitted as prescribed the first month following acceptance of the baseline schedule. Each monthly update shall be submitted within 5 working days of the schedule's data date. Progress meetings shall be scheduled by the Contractor to correspond with the schedule submittals to review progress with the Engineer.
- B. Schedule updates shall include all elements defined for the Baseline Schedule except that a Schedule shall include progress, as-built updates and updated actual units and cost for each activity, etc.
- C. Each Schedule shall show the status of work actually completed up to the data date and the work remaining to be performed as planned. The CPM Schedule diagram shall accurately reflect "as-built" information for each activity shown on previous schedules, including, but not limited to, actual start dates (discounting early starts not representative of true as-built conditions), remaining days of work, percent complete, and actual finish dates (when the activities were completed so that dependent work could proceed) and actual resource utilization.
- D. Schedule updates shall accurately represent all planning changes, adjustments, or updates in the sequencing and timing of work remaining to ensure that the Schedule stays current with the Contractor's plan for performing and furnishing work remaining. If the Schedule submittal indicates slippage or delayed progress, the Contractor shall include a schedule recovery statement.
- E. The Contractor may propose modifications by adding or deleting activities or changing activity names, durations or logic that do not (1) alter the critical path(s) or near critical path(s) or (2) extend the scheduled completion date compared to that shown on the current accepted Schedule and (3) do not disrupt the integrity or comparative relationship between the Baseline and Schedules. The Contractor shall provide written reasons in the update for any changes to Schedule or planned work. The Engineer shall review the justification for changes and either accept or reject the proposed modifications.
- F. If any proposed changes to the schedule or planned work will result in (1), (2) or (3) above, then the Contractor shall submit a time impact analysis as described herein.
- G. The Contractor shall incorporate planning revisions, which have been agreed upon in Contract Changes ordered since the last revision. Those revisions shall conform to the sequencing and time of performance requirements of the applicable instrument. These types of revisions shall be included in the Schedule when reconciling extensions in Contract Time as may be approved by the Engineer in strict accordance with Articles 1108.06 and 1108.07 of the Standard Specifications.
- H. If work is performed out of sequence, the Contractor shall implement logic changes to allow the out of sequence work to proceed. The use of negative lag shall not be permitted.

150280.06 TWO WEEK LOOK-AHEAD (TWLA) SCHEDULES.

- A. At least 7 calendar days prior to beginning work, the Contractor shall prepare and submit to the Engineer an initial TWLA Schedule for any work planned for the first 2 weeks. Every week thereafter, on a day agreed to by the Contractor and the Engineer, the Contractor shall submit to the Engineer, a written TWLA Schedule for the following 2 week period.
- B. The TWLA Schedule shall be submitted on a weekly basis until the completion of all Work.
- C. The TWLA Schedule shall be based on the accepted Schedule, provide a greater breakdown of the Schedule activities, and be developed to a level of detail acceptable to the Engineer.
- D. The TWLA Schedule shall specifically reference the accepted Schedule activity ID numbers and define subsequent specific daily operations at each specific location for all work activities scheduled to be performed during the 2 week period.

150280.07 TIME IMPACT ANALYSIS (TIA).

- A. The Contractor shall submit a written TIA to the Engineer with each request for an adjustment of Contract time, when an accepted or anticipated change may impact the critical path or Contract progress or when directed by the Engineer in strict accordance with the provisions of Articles 1108.06 and 1108.07 of the Standard Specifications. The Contractor shall take all steps necessary to mitigate the effects to cost and, or time resulting from impacts caused by delay regardless of who is found responsible for the delay.
- B. The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate. The analysis shall use the accepted Schedule that has the closest data date prior to the event. If the Engineer determines that the accepted Schedule used does not appropriately represent the conditions prior to the event, the accepted Schedule shall be updated to the day before the event being analyzed. The TIA shall include an impact schedule developed from incorporating the event into the accepted Schedule by adding or deleting activities, or by changing durations or logic of existing activities. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted Schedule, the difference between scheduled completion dates of the two schedules may be considered for an adjustment of Contract time. The Engineer may construct and utilize an appropriate project schedule or other recognized method to determine adjustments in Contract Time until the Contractor provides the TIA.
- C. The Contractor shall submit a TIA in duplicate within 15 calendar days of receiving a request for a TIA from the Engineer. The Contractor shall allow the Engineer 15 calendar days after receipt to accept or reject the submitted TIA. Changes that do not affect the controlling operation on the longest path will not be considered as the basis for a time adjustment. All accepted TIA schedule changes shall be shown on the next updated Schedule.
- D. If a TIA submitted by the Contractor is rejected by the Engineer, the Contractor shall meet with the Engineer to discuss and resolve issues related to the TIA. The Contractor shall only show actual as-built work, not unaccepted changes related to the TIA, in subsequent updated Schedules. If agreement is reached at a later date, accepted TIA schedule changes shall be shown on the next update Schedule.
- E. A time impact analysis shall consist of one or all of the steps listed below:
 1. Step 1. Establish the status of the project before the impact using the most recent approved Schedule prior to the impact occurrence.
 2. Step 2. Predict the effect of the impact on the most Schedule prior to the impact occurrence. This requires estimating the duration of the impact and inserting the impact into the schedule update. The Contractor shall demonstrate how the impact was inserted into the schedule

using a fragment. This is the presentation of a fragmentary portion of the schedule network showing the added or modified activities and the added or modified relationships. Any other changes made to the schedule including modifications to the calendars or constraints shall be noted.

3. Step 3. Track the effects of the impact on the schedule during its occurrence. Note any changes in sequencing, and mitigation efforts.
4. Step 4. Compare the status of the work prior to the impact (Step 1) to the prediction of the effect of the impact (Step 2), and to the status of the work during and after the effects of the impact are over (Step 3).

150280.08 SCHEDULE REVIEWS.

- A. The Engineer will review the Preliminary, Baseline, and subsequent Schedule update submittals for acceptance within 7 working days of receipt of the Contractor's complete submittal. Review and acceptance by the Engineer will be based on conformance with the requirements of this provision and the Contract.
- B. Review and acceptance by the Engineer will not constitute a waiver of any Contract requirements and will in no way assign responsibilities of the work plan, scheduling assumptions, and validity of the work plan or schedule to The Engineer. Failure of the Contractor to include in the Schedule any element of work required by the Contract for timely completion of the Contract shall not excuse the Contractor from his contractual obligations.

150280.9 NON-COMPLIANCE.

A. Non-Compliance.

1. The Engineer will remedy the non-compliance by retaining an amount equal to 100% of the total estimated value of the work performed during each period in which the Contractor fails, refuses or neglects to satisfy the requirements of this Special Provision and Standard Specifications, or the Contract Schedule submittals precludes a proper evaluation by the Engineer, or the Contract Schedule submittals preclude an "Acceptable" determination, or if the Contractor fails to conform said submittals within the submittal time requirements herein.
2. Retention due to this non-compliance shall be in addition to all other retentions provided for under the Contract. The retention withheld for non-compliance will be released for payment on the next pay estimate for partial payment following the date the Engineer determines compliance has been achieved and, or the submittal(s) are found Acceptable.

B. Progress and Performance.

If the project falls 10 calendar days behind schedule, the Engineer may take steps specified in Article 1108.02, I of the Standard Specifications to suspend the Contractor's bidding qualifications. If the Contractor fails to take action within 14 calendar days, the Engineer may take steps specified in Article 1108.10 of the Standard Specifications to declare the contract in default.

150280.10 METHOD OF MEASUREMENT AND BASIS OF PAYMENT.

The full cost of complying with this Special Provision, including preparing and revising Baseline Schedules and CPM Progress Schedules shall be included in the bid item for Mobilization.