Florida Department of Transportation

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GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT
SECRETARY

January 23, 2019

Khoa Nguyen
Director, Office of Technical Services
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Re: State Specifications Office
Section: **008**
Proposed Specification: **0080302DB Prosecution and Progress – Prosecution of Work - General.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Special Provision.

The changes are proposed by Amy Tootle of the State Construction Office to modify the language.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to dan.hurtado@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Dan Hurtado, P.E.
State Specifications Engineer

DH/dt
Attachment
cc: Florida Transportation Builders' Assoc.
State Construction Engineer

PROSECUTION AND PROGRESS – PROSECUTION OF WORK - GENERAL.
(REV 10-3-1810-29-181-23-19)

SUBARTICLE 8-3.2 is deleted and the following substituted:

8-3.2 General: For this Contract submit the following schedules and reports.

8-3.2.1 Contract Schedule: Submit to the Engineer for acceptance a Critical Path Method (CPM) Contract Schedule for the first 20% of cContract tTime (Ddesign and Cconstruction) of the project within 30 calendar days after execution of the Contract or at the preconstruction conference, whichever is earlier. UponPrior to completion of the first 20% of the original cContract tTime, submit to the Engineer for acceptance a CPM Contract Schedule for the remaining cContract tTime.

The Contract Schedule shall include detailed schedule diagrams and schedule data as described below for that shows how the Contractor intends to complete the work within the entire Contract PeriodTime. Any Contract defined holidays, suspension days, or weather days that affect the Critical Path will be added as they occur. When the project includes a Maintenance of Traffic plamn, Tthe Wwork Bbreakdown Sstructure (WBS) for the Contract Schedule shall be consistent with the Contract Maintenance of Traffic plan, showing activities for each discrete Contract activity to be accomplished within each Maintenance of Traffic phase. When the project does not include a Maintenance of Traffic plan, the Wwork Bbreakdown Sstructure shall be consistent with the phasing shown in the Contract dDocuments. Include activities for deliverables and reviews in the schedule. Sufficient liaison shall be conducted and information provided to indicate coordination with utility owners having facilities within the project limits. The schedule must reflectincorporate the utility adjustmentwork schedules included in the Contract Documents, unless changed by mutual agreement of the utility company, the Contractor and the Department. Show the interdependence (logic) of the utility work schedule activities with other schedule activities in the Contract Schedule for acceptance by the Department, unless otherwise approved by the Engineer.

Failure to include any element of work or any activity relating to utility work will not relieve the Contractor from completing all work within the Contract Time at no additional time or cost to the Department, notwithstanding the acceptance of the schedule by the Department.

The Contract Schedule may indicate a completion date in advance of the expiration of Contract Time. However, the Department will not be liable in any way for the Contractor's failure to complete the project prior to expiration of Contract Time. Any additional costs, including extended overhead incurred between the Contractor's scheduled completion date and the expiration of Contract Time, shall be the responsibility of the Contractor. The Contractor shall not be entitled to claim or recover any such costs from the Department.

The Engineer will withhold monthly payments due for failure of the Contractor to submit an acceptable schedule or monthly updates within the time frame described herein.Acceptance by the Engineer of the Contract Schedule or any updates shall not be construed as approval of any particular construction methods or sequence of construction or to relieve the Contractor of its responsibility to provide sufficient materials, equipment and labor to guarantee the completion of the contract in accordance with the Contract Documents.

8-3.2.2 Schedule Submissions: Develop the schedule in Precedence Diagram Method (PDM) format. All schedule submittals, shall have a copy of the schedule files on a

~~Windows compatible CD or DVD attached. The files shall be in a Primavera format. Make sure to use "Back up" menu selection and ensure that the option "Remove access list during backup" is checked.~~

Each schedule submission and monthly update shall include a minimum of the following ~~four~~seven items:

1. ~~A Critical Path Method (CPM) Network Diagram in time-scale logic diagram, by week starting on Monday, grouped (banded) by phase and location and sorted by early start days. Prominently identify the critical path activities, defined as the longest continuous path of work activities. Submit the Network Diagram, printed in color on D size, 22 inches by 34 inches or E size, 34 inches by 44 inches paper. The network diagram shall contain, as a minimum, the following information for each schedule activity: identification, activity description, total duration, remaining duration, early start date, late finish date, and total float.The files shall be s~~Submit the files electronically in the current Department version of Oracle Primavera P6 format by exporting the full schedule to an .xer file format.

2. A ~~report with the following schedule activity information for each construction activity: identification, description, original duration,~~Gantt chart grouped by W~~work B~~breakdown S~~structure~~, then phase, sorted by early start~~, early finish,~~ then total float~~, percent complete, and budgeted cost~~. The ~~bar~~ chart ~~diagram~~ shall ~~not be~~ include~~d in this report.~~ the following columns: ~~It will be submitted on 8.5 by 11 inch paper.~~

a. Activity ID
b. Activity Name
c. Calendar
d. Activity Type
e. Original Duration
f. Remaining Duration
g. Duration % Complete
h. Early Start
i. Early Finish
j. Late Start
k. Late Finish
l. Total Float
m. Budgeted Total Cost

The chart shall also include activity bars using the Oracle Primavera P6 default color coding for the bars. The chart shall be submitted as a Portable Document Format (.pdf) file and formatted on 11 inch by 17 inch landscape oriented sheets, with the activity table and bars.

3. A ~~schedule narrative report describing current project schedule status and identifying potential delays. This report will include a description of the progress made since the previous schedule submission and objectives for the upcoming 30 calendar days. It will be submitted on 8.5 inches by 11 inches paper. This report shall at a minimum include the following information:~~ Gantt chart with the same columns and bars listed in 8-3.2.2(2), but filtered for the longest path, not grouped but sorted by early start, then early finish. The chart shall be submitted as a .pdf file and formatted on 11 inch by 17 inch landscape oriented sheets, with the activity table and bars.

4. The Schedule log for the calculated schedule, submitted as a.pdf file and formatted on 8-1/2 inch by 11 inch portrait oriented sheets.

5. A schedule narrative report with the following information:

a. Current project schedule status and identify potential delays

b. A description of the progress made since the previous schedule submission

c. Objectives for the upcoming 30 calendar days

~~a~~d. ~~This report shall i~~Indicate if the project is on schedule, ahead of schedule or behind schedule.

1. If ~~the project is~~ ahead ~~of schedule~~ or behind schedule, ~~the report shall in~~~~clu~~dicate the specific number of calendar days.

2. If ~~the project is~~ behind schedule, ~~the report shall~~ include a detailed recovery plan that will put the ~~project~~schedule back on ~~schedule~~track or identify the alleged delay event for which a preliminary request for an ~~Time E~~extension~~. include a properly~~of Contract Time has been submitted, which if granted by the Department, will account for the amount of time the project is behind schedule, or provide a fully supported request for a Contract Time ~~E~~extension, which if granted by the Department, will account for the amount of time the project is behind schedule.

~~b~~e. ~~The report will d~~Description of the current critical path ~~of the project~~ and indicate if th~~is~~e critical path has changed in the last 30 calendar days.

f. Discussion of current successes or problems that have affected either the critical path's length or have caused a shift in the critical path within the last 30 calendar days.

g. Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path.

~~c~~h. List all changes to schedule logic, calendars, calendar assignments, activity types, activity names, changes to constraints, added activities or duration changes (original and remaining) that have been made to the schedule since the previous submission.

For each change, describe the basis for the change and specifically identify the affected activities by ~~identification number~~activity ID.

~~d~~i. Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc.

~~4~~6. A ~~copy of the schedule files on a Windows compatible CD or DVD in Primavera format.~~ detailed logic report that provides a list of activities in the schedule sorted by activity ID, no grouping and submitted as a .pdf file and formatted on 8-1/2 inch by 11inch portrait oriented sheets. For each activity listed, the report shall include the activity's predecessors and successors, including the relationship type and lag.

7. A chart showing the budgeted total cost versus time shall be submitted as a pdf file and formatted on 8-1/2 inch by 11 inch landscape oriented sheets. The chart shall include the following two curves:

a. budgeted total cost versus time based on the early dates.

b. budgeted total cost versus time based on the late dates.

For each submission of the Contract Schedule and monthly update, ~~T~~the Engineer will have ~~30~~21 days to accept the Contract Schedule or monthly update or to schedule a

meeting, if needed, within that time, with the Contractor to resolve any problems that prevent acceptance of the schedule. Attend the meeting scheduled by the Engineer, and submit a corrected schedule to the Engineer within seven days after the meeting. The process will be continued until a Contract Schedule or monthly update is accepted or accepted as noted by the Engineer.

Upon the Engineer's acceptance of the Contract Schedule, submit monthly updates of the Contract Schedule, including all months prior to the start of construction, reflecting progress through the monthly estimate cut-off date within ~~7~~8 calendar days after the monthly estimate cut-off date.

The Engineer may withhold monthly payments due for failure of the Contractor to submit an acceptable schedule or monthly updates within the time frame described herein.

8-3.2.3 Schedule Content: All schedule submissions shall comply with the following content guidelines as appropriate to the specific submission:

~~Outline~~The ~~S~~schedules ~~Diagrams and Data~~ shall ~~show~~include the sequence, order, and interdependence of major construction milestones and activities. Include ~~ordering and~~ procurement of ~~major~~project specific materials and equipment that require submittals and are not readily available, long-lead time items, and key milestones identified by the Contract. ~~Identify planned work schedule(s) and include all non-workdays. Provide a description of each major construction activity or key milestone.~~

~~Detailed Schedule Diagrams shall include activity number, description, early dates, float, and all relationships (i.e. logic ties), resources and costs.~~ Show the sequence, order, and interdependence of activities in which the work is to be accomplished. Include allowance for Department ~~oversight~~review, acceptance and return of submittals, samples and shop drawings where Department acceptance is specifically required (in accordance with 5-1.4.6 of the standard specifications). In addition to construction activities, ~~detailed network~~schedule activities shall include the submittals, procurement, and Department or Utility activities ~~impacting progress~~:

1. Submittal activities shall include ~~oversight~~submittal preparation, Department review, and acceptance of submittals If the Department's action on any submittal is "Not Accepted" or "Revise and Resubmit", a new series of submittal preparation activities shall be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original acceptance activity and the successor of the new acceptance activity will be the fabrication/delivery activity for the equipment or material.

2. Procurement activities shall include all project specific materials and equipment that require submittals and are not readily available, receipt of materials with estimated procurement costs of major items for which payment of stockpiled materials will be requested in advance of installation, fabrication of special material and equipment, and their installation and testing.

3. Show activities of the Department or Utilities that affect progress and contract-required dates for completion of all or parts of the work.

Detailed ~~S~~sschedule ~~D~~ddata: shall conform to the following:

1. All activities shall be assigned to a specific project calendar within the software. Specific project calendars will be defined within the software to include planned work days and planned non-work days. These project calendars will include both Contractor and Contract defined holidays and suspension days as non-workdays. The use of

global calendars is not permitted. Project calendars shall not inherit holidays from global calendars. Work shifts identified for each project calendar shall be consistent with the Contractor's planned workdays. Actual start and finish date times shall be consistent with the work shift hours on the calendar assigned to the activities.

2. Each schedule activity shall be cost loaded. Activity cost loading shall be consistent with the bid breakdown. The sum total of the activity cost loading shall be equal to the current contract value.

3. At a minimum, each schedule activity shall contain codes by:

~~1~~a. Responsibility: including, but not be limited to, Department, Utility, Contractor/~~S~~subcontractor, ~~S~~supplier/~~V~~vendor, ~~C~~consultant, etc.

~~2~~b. Phasing: identify the appropriate Maintenance of Traffic phase or subphase.

The required coding can be accomplished by ~~work breakdown structure~~WBS codes or project activity codes.

4. Key milestones as identified by ~~c~~Contract. At a minimum, the start and finish of each Maintenance of Traffic phase or subphase shall be represented by a milestone activity. Milestone activities shall be start or finish milestone type activities, as appropriate.

5. All non-procurement activities must be less than or equal to 20 workdays unless approved by the Engineer ~~to be greater by the Engineer~~. Sufficient explanation for activities over 20 days shall be provided for the Engineer's review and approval.

6. All activities must include adequate d~~D~~etailed activity descriptions ~~of each activity~~to describe the work that is included. In each activity, through the activity name, user defined field, or cost account, give quantity and unit of measure so that the amount of work the activity involves is clearly communicated.

7. Only two ~~(2)~~ open-ended activities (the first and the last) are allowed.

8. Constraints shall only be used for "~~P~~project ~~S~~start," and "~~P~~project ~~C~~completion." Constraints ~~can~~shall not override logic. The project start constraint shall be the Contract execution date. The project completion date shall be the Contract completion date plus any Contract defined holidays and suspension days included on the longest path. The use of any other imposed constraints is not allowed without specific approval by the Engineer. Any other desired constraints must be submitted to the Engineer with the rationale for the use of each desired additional constraint. If allowed by the Engineer, the rationale should be recorded in the activity's ~~log~~notebook field. Mandatory constraints (start and finish) violate network logic and shall not be used.

9. Out of sequence progress~~,~~ ~~if applicable,~~ shall be ~~handled through~~ corrected on each monthly update by modifying the schedule logic so that the logic accurately depicts the actual sequence of the work. The Retained Logic setting shall be used when calculating the schedule. ~~Use of the Progress Override option is not appropriate for this project and will not be allowed.~~

10. ~~Progress shall be calculated based on percent complete.~~

~~11.~~ All changes to activities shall be recorded with a note in the activity ~~log~~notebook field. The ~~log~~notebook entry shall include, as a minimum, the date and reason for the change, as well as reference to a document wherein the Engineer acknowledges and accepts the change.

121. The use of resource leveling, either manual or automatic, is prohibited.

12. Activities shall not be deleted from the schedule. If an activity is not required, then upon approval from the Engineer, the Contractor shall provide actual start and finish dates equal to the date of the Engineer's approval, shall add the word "Removed" to the activity name and shall make a notebook entry explaining the reason for removing the activity from the planned work.

13. Activities with appropriate cost loading shall be added to the schedule upon approval of the Engineer when it is determined that a Contract work element was omitted from the previous accepted Contract schedule or update or if work is added to the Contract.

14. Activity names shall only be changed to reflect changes to the scope of the work element represented by the activity, not as a way to remove and replace activities. Changes to activity names shall be approved by the Engineer.

15. Unless otherwise approved by the Engineer, activity types shall be defined as milestones, level-of-effort, WBS summary or task dependent. rResource dependent type shall not be used. All activities shall have percent complete type set to duration and duration type set to either fixed duration and unit/time or fixed duration and units.

8-3.2.4 Weekly Meetings: Attend weekly meetings scheduled by the Engineer to discuss Contract progress, near term scheduled activities, including utility relocations, problems and their proposed solutions. Submit a Twohree-Week "Look Ahead" Planning Schedule at each weekly meeting, showing the items of workContract schedule activities completed in the previous week and planned for the next two weeks. Develop the Three-Week Planning Schedule in BarGantt Cchart format, from the updated Contract schedule, identifying completed, current and planned activities and related Contract Schedule work activities, including subcontractor work. Designate all activities that are controlling work items as determined by the currently accepted Contract Sschedule. A report shall be submitted at each weekly meeting identifying schedule activity progress including actual start or finish dates achieved for any activities.

8-3.2.5 Float: Float is defined as the amount of time the finish of an activity can be delayed. Two kinds of float are possible: Total float is how much an activity can be delayed without affecting the finish date of the project or an intermediate deadline (constraint); it is the difference between the late finish date and the early finish date. Free float is how much an activity can be delayed without affecting its earliest successor.

Float is not for the exclusive use or benefit of either the Department or the Contractor.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, positive relationship lags, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of finish-to-start lags greater than zero days, start-to-start lags that exceed the duration of the predecessors, or finish-to-finish lags that exceed the duration of the successor, shall not be used without the expressed approval of the Engineer. The use of Resource Leveling, (or similar software features), used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

Negative float shall not be a basis for requesting time extensions. Any extension of time shall be addressed in accordance with 8-3.2. 76 Time Extensions. Scheduled completion date(s) that extend beyond the eContract completion date, (evidenced by negative float), may be used in computations for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

8-3.2.6 Critical Path: The critical path shall be defined as the longest path and is represented by the longest logical path through the remaining activities, resulting in the earliest calculated completion date. There may be more than one longest path in the schedule. However, the use of float suppression techniques as described in 8-3.2.5 shall not be used to force the schedule to have more than one longest path.

8-3.2.7Time Extensions: The Contractor is responsible for submitting a request for Contract Time extension in accordance with 8-7.3.2 of the standard specifications. An extension of time for performance shall be considered only to the extent that an event delay to an activity or activities exceeds the total float along the project critical paths within the current approved scheduleimpacts the completion date of the schedule such that the impacted completion date is later than the Contract completion date as adjusted previously. The Pre-event Schedule is defined as the latest accepted update of the Contract schedule, statused (actual start dates added, actual finish dates added, remaining durations adjusted) to the end of the day before the start of the event. The Post-event Schedule is defined as the accepted update of the Contract Schedule just after the end of the event and de-statused (actual start dates removed, actual finish dates removed, remaining durations adjusted) to the end of the last day of the event.

As a minimum, time extension requests shall contain:

1. A descriptive summary of the changesevent
2. An written analysis of project impactsupported by a:
   a. Pre-event Schedule
   b. Post-event Schedule
3. A fragnet that shows the impacted activities before the changeSchedule submittal items 1, 2, 3 and 4 required in 8-3.2.2 shall be provided, for the Pre-event and Post-event Schedules
4. A fragnet that shows the impacted activities before the change

Time extensions shall not be considered for proposals that do not include full documentation for the schedule changedescribed above. Once a changetime extension has been approved by the Engineer, the specific activities and the overall schedule must be updatedContract completion date shall be changed accordingly.

8-3.2.7 Performance of Work: By submitting a schedule, the Contractor is making a positive assertion that the project has been and will be constructed in the order indicated oin the schedule. Prosecute the work in accordance with the latest accepted Working Contract Schedule or update. Any costs associated with meeting milestones and completing the project within the authorized Contract Time will be borne solely by the Contractor.

8-3.2.8 As-Built Schedule: As a condition for the release of any retainage, submittal of anthe as-built schedule within 10 days of Final Acceptance. The as-built schedule whichshall describes the actual order and start and stop times for all activities by the Contractor is required.

PROSECUTION AND PROGRESS – PROSECUTION OF WORK - GENERAL.
(REV 1-23-19)

SUBARTICLE 8-3.2 is deleted and the following substituted:

8-3.2 General: For this Contract submit the following schedules and reports.

8-3.2.1 Contract Schedule: Submit to the Engineer for acceptance a Critical Path Method (CPM) Contract Schedule for the first 20% of Contract Time (design and construction) of the project within 30 calendar days after execution of the Contract or at the preconstruction conference, whichever is earlier. Prior to completion of the first 20% of the original Contract Time, submit to the Engineer for acceptance a CPM Contract Schedule for the remaining Contract Time.

The Contract Schedule shall include detailed schedule diagrams and schedule data as described below that shows how the Contractor intends to complete the work within the Contract Time. Any Contract defined holidays, suspension days, or weather days that affect the Critical Path will be added as they occur. When the project includes a Maintenance of Traffic plan, the work breakdown structure (WBS) for the Contract Schedule shall be consistent with the Contract Maintenance of Traffic plan, showing activities for each discrete Contract activity to be accomplished within each Maintenance of Traffic phase. When the project does not include a Maintenance of Traffic plan, the WBS shall be consistent with the phasing shown in the Contract Documents. Include activities for deliverables and reviews in the schedule. Sufficient liaison shall be conducted and information provided to indicate coordination with utility owners having facilities within the project limits. The schedule must incorporate the utility work schedules included in the Contract Documents, unless changed by mutual agreement of the utility company, the Contractor and the Department. Show the interdependence (logic) of the utility work schedule activities with other schedule activities in the Contract Schedule for acceptance by the Department, unless otherwise approved by the Engineer.

Failure to include any element of work or any activity relating to utility work will not relieve the Contractor from completing all work within the Contract Time at no additional time or cost to the Department, notwithstanding the acceptance of the schedule by the Department.

The Contract Schedule may indicate a completion date in advance of the expiration of Contract Time. However, the Department will not be liable in any way for the Contractor's failure to complete the project prior to expiration of Contract Time. Any additional costs, including extended overhead incurred between the Contractor's scheduled completion date and the expiration of Contract Time, shall be the responsibility of the Contractor. The Contractor shall not be entitled to claim or recover any such costs from the Department.

Acceptance by the Engineer of the Contract Schedule or any updates shall not be construed as approval of any particular construction methods or sequence of construction or to relieve the Contractor of its responsibility to provide sufficient materials, equipment and labor to guarantee the completion of the contract in accordance with the Contract Documents.

8-3.2.2 Schedule Submissions: Develop the schedule in Precedence Diagram Method (PDM) format.

Each schedule submission and monthly update shall include a minimum of the following seven items:

1. Submit the files electronically in the current Department version of Oracle Primavera P6 format by exporting the full schedule to an .xer file format.

2. A Gantt chart grouped by WBS, then phase, sorted by early start then total float. The chart shall include the following columns:

a. Activity ID
b. Activity Name
c. Calendar
d. Activity Type
e. Original Duration
f. Remaining Duration
g. Duration % Complete
h. Early Start
i. Early Finish
j. Late Start
k. Late Finish
l. Total Float
m. Budgeted Total Cost

The chart shall also include activity bars using the Oracle Primavera P6 default color coding for the bars. The chart shall be submitted as a Portable Document Format (.pdf) file and formatted on 11 inch by 17 inch landscape oriented sheets, with the activity table and bars.

3. A Gantt chart with the same columns and bars listed in 8-3.2.2(2), but filtered for the longest path, not grouped but sorted by early start, then early finish. The chart shall be submitted as a .pdf file and formatted on 11 inch by 17 inch landscape oriented sheets, with the activity table and bars.

4. The Schedule log for the calculated schedule, submitted as a.pdf file and formatted on 8-1/2 inch by 11 inch portrait oriented sheets.

5. A schedule narrative report with the following information:

a. Current project schedule status and identify potential delays

b. A description of the progress made since the previous schedule submission

c. Objectives for the upcoming 30 calendar days

d. Indicate if the project is on schedule, ahead of schedule or behind schedule.

1. If ahead or behind schedule, indicate the specific number of calendar days.

2. If behind schedule, include a detailed recovery plan that will put the schedule back on track or identify the alleged delay event for which a preliminary request for an extension of Contract Time has been submitted, which if granted by the Department, will account for the amount of time the project is behind schedule, or provide a fully supported request for a Contract Time extension, which if granted by the Department, will account for the amount of time the project is behind schedule.

e. Description of the current critical path and indicate if the critical path has changed in the last 30 calendar days.

f. Discussion of current successes or problems that have affected either the critical path's length or have caused a shift in the critical path within the last 30 calendar days.

g. Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path.

h. List all changes to schedule logic, calendars, calendar assignments, activity types, activity names, changes to constraints, added activities or duration changes (original and remaining) that have been made to the schedule since the previous submission.

For each change, describe the basis for the change and specifically identify the affected activities by activity ID.

i. Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc.

6. A detailed logic report that provides a list of activities in the schedule sorted by activity ID, no grouping and submitted as a .pdf file and formatted on 8-1/2 inch by 11inch portrait oriented sheets. For each activity listed, the report shall include the activity's predecessors and successors, including the relationship type and lag.

7. A chart showing the budgeted total cost versus time shall be submitted as a pdf file and formatted on 8-1/2 inch by 11 inch landscape oriented sheets. The chart shall include the following two curves:

a. budgeted total cost versus time based on the early dates.

b. budgeted total cost versus time based on the late dates.

For each submission of the Contract Schedule and monthly update, the Engineer will have 21 days to accept the Contract Schedule or monthly update or to schedule a meeting, if needed, within that time, with the Contractor to resolve any problems that prevent acceptance of the schedule. Attend the meeting scheduled by the Engineer, and submit a corrected schedule to the Engineer within seven days after the meeting. The process will be continued until a Contract Schedule or monthly update is accepted or accepted as noted by the Engineer.

Upon the Engineer's acceptance of the Contract Schedule, submit monthly updates of the Contract Schedule, including all months prior to the start of construction, reflecting progress through the monthly estimate cut-off date within 8 calendar days after the monthly estimate cut-off date.

The Engineer may withhold monthly payments due for failure of the Contractor to submit an acceptable schedule or monthly updates within the time frame described herein.

8-3.2.3 Schedule Content: All schedule submissions shall comply with the following content guidelines as appropriate to the specific submission:

The schedules shall include the sequence, order, and interdependence of major construction milestones and activities. Include procurement of project specific materials and equipment that require submittals and are not readily available, long-lead time items, and key milestones identified by the Contract.

Show the sequence, order, and interdependence of activities in which the work is to be accomplished. Include allowance for Department review, acceptance and return of

submittals, samples and shop drawings where Department acceptance is specifically required (in accordance with 5-1.4.6 of the standard specifications). In addition to construction activities, schedule activities shall include the submittals, procurement, and Department or Utility activities:

1. Submittal activities shall include submittal preparation, Department review, and acceptance of submittals If the Department's action on any submittal is “Not Accepted” or “Revise and Resubmit”, a new series of submittal preparation activities shall be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original acceptance activity and the successor of the new acceptance activity will be the fabrication/delivery activity for the equipment or material.

2. Procurement activities shall include all project specific materials and equipment that require submittals and are not readily available, receipt of materials with estimated procurement costs of major items for which payment of stockpiled materials will be requested in advance of installation, fabrication of special material and equipment, and their installation and testing.

3. Show activities of the Department or Utilities that affect progress and contract-required dates for completion of all or parts of the work.

Detailed schedule data: shall conform to the following:

1. All activities shall be assigned to a specific project calendar within the software. Specific project calendars will be defined within the software to include planned work days and planned non-work days. These project calendars will include both Contractor and Contract defined holidays and suspension days as non-workdays. The use of global calendars is not permitted. Project calendars shall not inherit holidays from global calendars. Work shifts identified for each project calendar shall be consistent with the Contractor’s planned workdays. Actual start and finish date times shall be consistent with the work shift hours on the calendar assigned to the activities.

2. Each schedule activity shall be cost loaded. Activity cost loading shall be consistent with the bid breakdown. The sum total of the activity cost loading shall be equal to the current contract value.

3. At a minimum, each schedule activity shall contain codes by:

a. Responsibility: including, but not be limited to, Department, Utility, Contractor/subcontractor, supplier/vendor, consultant, etc.

b. Phasing: identify the appropriate Maintenance of Traffic phase or subphase.

The required coding can be accomplished by WBS codes or project activity codes.

4. Key milestones as identified by Contract. At a minimum, the start and finish of each Maintenance of Traffic phase or subphase shall be represented by a milestone activity. Milestone activities shall be start or finish milestone type activities, as appropriate.

5. All non-procurement activities must be less than or equal to 20 workdays unless approved by the Engineer. Sufficient explanation for activities over 20 days shall be provided for the Engineer’s review and approval.

6. All activities must include adequate detailed activity descriptions to describe the work that is included. In each activity, through the activity name,

user defined field, or cost account, give quantity and unit of measure so that the amount of work the activity involves is clearly communicated.

7. Only two open-ended activities (the first and the last) are allowed.

8. Constraints shall only be used for “project start,” and “project completion.” Constraints shall not override logic. The project start constraint shall be the Contract execution date. The project completion date shall be the Contract completion date plus any Contract defined holidays and suspension days included on the longest path. The use of any other imposed constraints is not allowed without specific approval by the Engineer. Any other desired constraints must be submitted to the Engineer with the rationale for the use of each desired additional constraint. If allowed by the Engineer, the rationale should be recorded in the activity's notebook field. Mandatory constraints (start and finish) violate network logic and shall not be used.

9. Out of sequence progress shall be corrected on each monthly update by modifying the schedule logic so that the logic accurately depicts the actual sequence of the work. The Retained Logic setting shall be used when calculating the schedule.

10. All changes to activities shall be recorded with a note in the activity notebook field. The notebook entry shall include, as a minimum, the date and reason for the change, as well as reference to a document wherein the Engineer acknowledges and accepts the change.

11. The use of resource leveling, either manual or automatic, is prohibited.

12. Activities shall not be deleted from the schedule. If an activity is not required, then upon approval from the Engineer, the Contractor shall provide actual start and finish dates equal to the date of the Engineer’s approval, shall add the word “Removed” to the activity name and shall make a notebook entry explaining the reason for removing the activity from the planned work.

13. Activities with appropriate cost loading shall be added to the schedule upon approval of the Engineer when it is determined that a Contract work element was omitted from the previous accepted Contract schedule or update or if work is added to the Contract.

14. Activity names shall only be changed to reflect changes to the scope of the work element represented by the activity, not as a way to remove and replace activities. Changes to activity names shall be approved by the Engineer.

15. Unless otherwise approved by the Engineer, activity types shall be defined as milestones, level-of-effort, WBS summary or task dependent. Resource dependent type shall not be used. All activities shall have percent complete type set to duration and duration type set to either fixed duration and unit/time or fixed duration and units.

8-3.2.4 Weekly Meetings: Attend weekly meetings scheduled by the Engineer to discuss Contract progress, near term scheduled activities, including utility relocations, problems and their proposed solutions. Submit a Three-Week Planning Schedule at each weekly meeting, showing the Contract schedule activities completed in the previous week and planned for the next two weeks. Develop the Three-Week Planning Schedule in Gantt chart format from the updated Contract schedule, identifying completed, current and planned activities. Designate all activities that are controlling work items as determined by the currently accepted Contract schedule

8-3.2.5 Float: Float is defined as the amount of time the finish of an activity can be delayed. Two kinds of float are possible: Total float is how much an activity can be delayed without affecting the finish date of the project or an intermediate deadline (constraint); it is the difference between the late finish date and the early finish date. Free float is how much an activity can be delayed without affecting its earliest successor.

Float is not for the exclusive use or benefit of either the Department or the Contractor.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, positive relationship lags, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of finish-to-start lags greater than zero days, start-to-start lags that exceed the duration of the predecessors, or finish-to-finish lags that exceed the duration of the successor, shall not be used without the expressed approval of the Engineer. The use of Resource Leveling, or similar software features, for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

Negative float shall not be a basis for requesting time extensions. Any extension of time shall be addressed in accordance with 8-3.2. 7. Scheduled completion dates that extend beyond the Contract completion date, evidenced by negative float, may be used in computations for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

8-3.2.6 Critical Path: The critical path shall be defined as the longest path and is represented by the longest logical path through the remaining activities, resulting in the earliest calculated completion date. There may be more than one longest path in the schedule. However, the use of float suppression techniques as described in 8-3.2.5 shall not be used to force the schedule to have more than one longest path.

8-3.2.7Time Extensions: The Contractor is responsible for submitting a request for Contract Time extension in accordance with 8-7.3.2. An extension of time shall be considered only to the extent that an event impacts the completion date of the schedule such that the impacted completion date is later than the Contract completion date as adjusted previously. The Pre-event Schedule is defined as the latest accepted update of the Contract schedule, statused (actual start dates added, actual finish dates added, remaining durations adjusted) to the end of the day before the start of the event. The Post-event Schedule is defined as the accepted update of the Contract Schedule just after the end of the event and destatused (actual start dates removed, actual finish dates removed, remaining durations adjusted) to the end of the last day of the event.

As a minimum, time extension requests shall contain:

1. A descriptive summary of the event
2. A written analysis supported by a:
    a. Pre-event Schedule
    b. Post-event Schedule
3. Schedule submittal items 1, 2, 3 and 4 required in 8-3.2.2 shall be provided, for the Pre-event and Post-event Schedules

Time extensions shall not be considered for proposals that do not include full documentation described above. Once a time extension has been approved by the Engineer, the Contract completion date shall be changed accordingly.

8-3.2.7 Performance of Work: By submitting a schedule, the Contractor is making a positive assertion that the project has been and will be constructed in the order indicated in the schedule. Prosecute the work in accordance with the latest accepted Contract Schedule or update. Any costs associated with meeting milestones and completing the project within the authorized Contract Time will be borne solely by the Contractor.

8-3.2.8 As-Built Schedule: As a condition for the release of any retainage, submit the as-built schedule within 10 days of Final Acceptance. The as-built schedule shall describe the actual order and start and stop times for all activities by the Contractor.