

**ADDENDUM TO THE  
CITY OF AKRON  
AKRON ENGINEERING BUREAU  
CONSTRUCTION AND MATERIAL SPECIFICATIONS  
2008 EDITION  
123 CONSTRUCTION SCHEDULES**

**The following section is a supplement to CMS General Provisions 100.**

**123.01 DESCRIPTION**

- A. Work under this Contract will be planned, scheduled, executed, and reported by the CONTRACTOR. The Critical Path Method (CPM), using the Precedence Diagramming Method (PDM) format shall be the manner in which the CONTRACTOR's Construction Schedules are developed and maintained.
- B. The primary objectives of the CONTRACTOR's Construction Schedules are to ensure the adequate planning, scheduling, and execution of all construction and commissioning activities, in order that they may be prosecuted in an orderly and expeditious manner; and to communicate to the project stakeholders the CONTRACTOR's plan for substantially completing the Work within the Contract Time.

**123.02 DEFINITIONS**

- A. Activity: A discrete part of a Project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: an activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: an activity that precedes another activity in the network.
  - 3. Successor Activity: an activity that follows another activity in the network.
  - 4. Concurrent Activity: an activity that takes place simultaneously with one or more other activities.
- B. As-Planned Schedule: The plan or baseline schedule the CONTRACTOR developed to estimate / bid / contract to perform the Work. The as-planned schedule incorporates planned production rates, work calendars, resource availability, logic ties, constraints and activity durations to meet contract requirements and CONTRACTOR needs or desires.
- C. Baseline Schedule (Original): The CONTRACTOR's 'as-planned' Construction Schedule established at the outset of the Project, it establishes the CONTRACTOR's original plan for completing the Project. It is the standard by which Project performance is measured until the Baseline Schedule is reset.
- D. Baseline Schedule (New): Resetting the original Baseline is done when the scope of the Project has been changed significantly, for example after a negotiated change. At that point, the original Baseline Schedule becomes invalid and the New Baseline Schedule is compared with subsequent Construction Schedule updates.
- E. Concurrent delay: Two or more delays that take place or overlap during the same period, either of which occurring alone would have affected the ultimate completion date.

- F. Cost Loading: In planning and scheduling, assigning an estimated cost or actual cost to an activity. The estimated cost shall be inclusive of both the direct and indirect costs.
- G. CPM: Critical path method, which is a method of planning and scheduling a construction Project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project. CONTRACTOR's Construction Schedules shall employ the Precedent Diagramming Method (PDM) of CPM.
- H. Critical Path: The longest continuous chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- I. Current Schedule: CONTRACTORS monthly update to the Construction Schedule reflecting progress made by the CONTRACTOR in performing the Work. It is compared to the Baseline Schedule that remains frozen until it is reset.
- J. Earned Value: Measure of the value of work performed so far. Earned value uses original estimates and progress-to-date to show whether the actual costs incurred are on budget and whether the tasks are ahead or behind the baseline plan. The budgeted cost of work performed (BCWP). The "value" of the work earned at the date of analysis (data date). Represents the actual value of work performed, rather than the actual cost of the work performed. In comparison to planned value (PV), provides a measure of performance taking into account both time and cost expended.
- K. Earned Value Reports: Cost and schedule performance reports that are part of the performance measurement system. These reports make use of the earned value concept of measuring work accomplishment.
- L. Event: The starting or ending point of an activity. May also be a milestone identified in the CPM.
- M. Float: The amount of time an activity may slip in its start or completion before becoming critical.
  - 1. Float time: Except as provided in CMS Section 123.11(B), all float available in the Schedule, at any time, shall not be considered for the exclusive use of either the City or the CONTRACTOR.
  - 2. Free float: The amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float: The measure of leeway in starting or completing an activity without adversely affecting the Contract Time.
  - 4. City Float: The CONTRACTOR's Baseline Schedule in Paragraph 1.06 shall be prepared with thirty (30) days of float time by scheduling Substantial Completion thirty (30) days prior to the end of the Contract Time. These thirty (30) days of required Float Time shall be for the exclusive use of the City, and shall not be utilized by the CONTRACTOR without written authorization by the City.
  - 5. Contract Float: That Float in the Schedule outside of the thirty (30) days float, or remaining portion, set aside for the City
  - 6. Float suppression techniques such as software constraints, preferential sequencing, special lead/lag logic restraints, extended activity times, or imposed dates, other than as required by the Contract. (Shall be cause for the rejection of any schedule submitted by the CONTRACTOR.)

- N. Frag-net: A frag-net is typically made up of related work activities to allow greater detail and better control of the work. A portion or fragment of a CPM network usually used to illustrate changes to the whole network.
- O. Gantt Chart: A Gantt chart (bar-chart), commonly used in Project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity.
- P. Out-of-sequence progress: Progress that has been reported even though activities that have been deemed predecessors in project logic have not been completed. P6 scheduling software has a "switch" to turn on or off how the calculations deal with out-of-sequence progress.
- Q. PDM (Precedence Diagramming Method): Sometimes also known as the Activity on Node Diagramming Method, PDM is a graphical representation technique, which shows the inter-dependencies among various Project activities. This diagramming method is used to draw the Project schedule network diagrams. The main benefit of PDM is that it shows the activity dependencies.
- R. Progress Override: One of two types of scheduling software logic used to handle activities that occur out of sequence. When specified, it treats an activity with out-of-sequence progress as though it has no predecessor constraints; its remaining duration is scheduled to start immediately, rather than wait for the activities predecessors to complete.
- S. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled. Resource loading will not be a requirement of this Contract.
- T. Retained Logic: One of two types of logic used to handle activities that occur out of sequence. When used, scheduling software schedules the remaining duration of an out-of-sequence activity according to current network logic – after its predecessors.
- U. Substantial Completion: Unless otherwise stated, the Date certified by the CMT when the Work is sufficiently complete, in accordance with the Contract Documents, so that the City can fully occupy and utilize the Work or designated portion thereof for the use for which it is intended, with all of the Project's parts and systems operable as required by the Contract Documents. Only incidental corrective work, any final cleaning or minor documentation that does not affect the City's use in any way, may remain unaccomplished at Substantial Completion.
- V. Time Impact Analysis (TIA): A schedule impact analysis technique that recreates the actual status of the job at the time of an event, updates the schedule, inserts delays, and quantifies singular impact; although retrospective in that it is done after the fact, it has a contemporaneous orientation, not a hindsight perspective.
- W. Work Breakdown Structure (WBS): Framework for organizing and ordering the Work activities that makes up a Project. It is a systematic approach to reflect a top-down hierarchy structure with each lower level providing more detail and smaller elements of the overall work.

### 123.03 CONTRACTOR RESPONSIBILITIES

- A. It is intended that the CONTRACTOR's Construction Schedules reflect the CONTRACTOR's as-planned construction schedule for completing the Work. The CONTRACTOR is required to comply with all control procedures specified herein and with any reasonable changes that may

be necessary, in the opinion of the CM, during the Contract Time. After acceptable disposition, as defined in Section 01 33 00, Submittals, the CONTRACTOR shall be fully responsible for the maintenance of the CONTRACTOR's Construction Schedules.

- B. The following submittals are to be submitted within 30 day of award of the contract due to the possibility of long lead times:
  - 1. 13 34 19 - Pre-Engineered Metal building
  - 2. 14 24 00 - Hydraulic Elevator

#### 123.04 **CONTRACT TIME**

- A. If the CONTRACTOR should desire or intend to substantially complete the Work earlier than the Contract Time, the City or the CM shall not be liable to the CONTRACTOR for any costs or other damages should the CONTRACTOR be unable to substantially complete the Work before the Contract Time. The duties, obligations, and warranties of the City to the CONTRACTOR shall be consistent with and applicable only to the substantial completion of the Work in the Contract Time required in the Contract.

#### 123.05 **CONTRACTOR PRELIMINARY CONSTRUCTION SCHEDULE (PCS)**

- A. No later than fourteen (14) calendar days following Contract Award, the CONTRACTOR shall submit to the CM for review a cost-loaded Preliminary Construction Schedule (PCS) that provides, as a minimum, a general overview of the Work activities for the first ninety (90) calendar days of the Contract. The PCS is expected to be at the level of detail of the CONTRACTORS Baseline Schedule as specified below in Paragraph 1.06. The CONTRACTOR shall submit five (5) paper copies, plus one (1) copy of electronic files, in Gantt bar-chart format with the Reports defined in CMS Section 123.07(A)(1) through (A)(8).
- B. The CM shall review the PCS and return review comments to the CONTRACTOR within ten (10) calendar days.
- C. The CONTRACTOR shall revise the PCS according to the comments received from the CM and submit electronic files of the revised schedule to the CM within ten (10) calendar days after receipt. An "Accepted 90-Day Preliminary Construction Schedule" shall be a prerequisite to the CM certification of the CONTRACTOR's first progress payment application.
- D. The CONTRACTOR shall update the PCS every month that it is in effect reporting progress in accordance with CMS Section 123.08 below as applicable.

#### 123.06 **CONTRACTOR BASELINE CONSTRUCTION SCHEDULE (BASELINE SCHEDULE)**

- A. Immediately upon receipt of the Contract Award, the CONTRACTOR shall commence the preparation of its Baseline Schedule. The CONTRACTOR shall assemble and determine, with the assistance of its Subcontractors and Suppliers, information regarding the Project that includes, but is not limited to:
  - 1. CONTRACTOR's best judgment of how it shall prosecute and complete the Work in compliance within the Contract Time and any other specific dates stipulated in the Contract Documents.
  - 2. The identity and duration of all activities necessary to complete the Work shall be included in this Construction Schedule. Activities shall meet the following criteria:
    - a. Activities shall be numbered, and their descriptions shall be clear and concise. The duration of each Activity shall be readily verifiable. Where applicable, descriptions shall include quantities of work.

- b. Activities shall be coded to allow identification of the Activity as to type of work, work responsibility, process, system or facility, and any other coding necessary to organize the Work and produce the required Reports in CMS Section 123.07.
  - c. All Activities associated with the preparation, submittal and approval or acceptance of information required by the CM shall be coded so they may be readily identified. These Activities shall not be cost-loaded.
  - d. The material quantity and cost component for each Activity shall be provided. The sum of all of the Activity cost components shall equal the Contract Price.
  - e. If the Contract calls for pay items and allowances, the Activity shall also be coded to allow identification with its respective pay item(s). Such Activities shall be cost-loaded and scheduled when they are anticipated to take place.
  - f. Fabrication of materials and/or equipment shall be described in a separate Activity. The cost component of any fabrication Activity shall be zero.
  - g. Activity duration should be sufficiently short to allow each Activity to be identified as a discreet item of work. For most Activities, the duration should not exceed twenty (20) days. However, if the Activity duration must exceed twenty (20) days, quantification of the Activity must be included to aid in updating the Activity's progress.
  - h. Baseline Schedule should reflect Activity's, their duration and logic associated with third parties and utilities.
  - i. Predecessor and successor relationships between Activities shall represent 'hard logic' which has a physical/resource precedent relationship to its successor.
  - j. Preferential or 'soft logic' which is worked out-of-sequence shall be corrected into hard logic by the CONTRACTOR prior to submission of monthly Schedule updates.
3. Procurement Activities: Include procurement process Activities for long lead items and major items, as separate Activities in schedule. Procurement cycle Activities include, but are not limited to, submittals, acceptance, purchasing, fabrication, shop testing and delivery. These Activities shall not be cost-loaded.
  4. Startup and Testing Time: Include activities for startup and testing of major Project components, subsystems and systems.
  5. Substantial Completion: Indicate Substantial Completion and all required predecessor activities and deliverables.
  6. Operational Demonstration: Include activities for Operational Demonstration and all required predecessor activities and deliverables. (If specified)
  7. Achievement of Full Operation: Include activities for Achievement of Full Operation and all required predecessor activities and deliverables.
  8. Closeout: Include activities for Contract closeout and required deliverables.
  9. Warranty Period and Final Acceptance: Indicate Warranty Period and Final Completion and all required predecessor activities and deliverables.
  10. Constraints: Include constraints and work restrictions indicated in the Contract Documents and show how the sequence of the Work is affected.
- B. The submittal and acceptance of the Baseline Schedule is required within ninety (90) days following Notice to Proceed. Progress payments to the CONTRACTOR shall not be made after the expiration of the PCS until the Baseline Schedule is accepted by the CM. The form of submittal of the Baseline Schedule shall be as follows:
1. The CONTRACTOR shall submit to the CM five (5) copies of a time-scaled plot of the Schedule in Gantt Chart (bar-chart) format. This plot shall reflect the Baseline Schedule information produced by the detailed CPM logic network developed by the CONTRACTOR in P6 for finishing the Work within the Contract Time.
  2. CONTRACTOR shall also submit the Baseline Schedule on CD-ROM. The electronic media copy of the Primavera Project files shall use the Primavera P6 "back-up" menu section.

The electronic copy of the Baseline Schedule shall be furnished in the format required by the CM.

3. Work Breakdown Structure (WBS) shall be used by the CONTRACTOR to organize the Work in its Baseline Schedule. The WBS shall be produced on P6 and submitted with the Baseline Schedule. Resetting of the Baseline Schedule CMS Section 123.12 shall be reflected on a revised WBS.
  4. The Baseline Schedule in CPM format shall:
    - a. Show the interdependencies of all Activities that make up the Work including any sequences, interfaces, work-arounds, etc. required by the Contract Documents and/or to perform the Work.
    - b. Delineate the Critical Path.
    - c. Graphics, bar-charts or network diagrams, shall be furnished in color, with necessary legend sheets, and on 11-inch by 17-inch or 22-inch by 34 -inch media.
    - d. Reflect the PCS submitted by the CONTRACTOR, accepted by the CMT and updated by the CONTRACTOR for the first three months of the project.
- C. The Baseline Schedule shall also indicate each of the following:
1. Interfaces with the work of outside entities, e.g., utilities, power, any separate CONTRACTORS.
  2. Description of each Activity including Activity numbers
  3. Estimated and remaining duration for each Activity
  4. Early and late start date for each Activity
  5. Early and late finish date for each Activity
  6. Float available for each Activity
  7. Actual start and finish date for each Activity
  8. The Critical Path for the Project, with said path of Activities being clearly and easily recognizable on the time-scaled network diagram.
  9. The dollar value and quantity of work for each Activity
  10. The responsibility, by CONTRACTOR or Subcontractor, for each Activity or portion thereof
  11. The percentage complete for each Activity in progress or completed
  12. Relationships shall not contain positive or negative lags.
  13. Finish-to-Finish (FF) relationships shall not be used without the consent of the CM.
  14. Start-to-Start (SS) relationships shall not be used without the consent of the CM.
  15. Float suppression constraints shall not be acceptable.
  16. Only contractual milestones, and the last Activity in the network, are allowed to be constrained with a Finish No Later Than constraint.
  17. Open-ended Activities shall not be acceptable.
  18. Mandatory Start and Mandatory Finish dates shall not be used in place of logic relationships.
  19. The link between the remaining duration and percent complete must be disabled since the schedule will be cost loaded.
- D. Cost-Loading the Schedule: Each Activity cost allocation shall include labor, equipment, and material costs, including a pro rata contribution for overhead and profit. The sum of all Activity costs shall be equal to the total Contract Sum. CONTRACTOR and Subcontractor costs for each Activity shall be separated to show which Subcontractor is responsible for performing the Work so that subtotals for the CONTRACTOR and Subcontractors can be prepared. The Contract Pay Item for each Activity shall be indicated. The sum of costs for each Pay Item shall equal the value submitted with the CONTRACTOR's proposal. The review of the Schedule cost loading will verify that the cost assigned to activities shall, in the best judgment of the CONTRACTOR, and the CM, represent a fair and equitable dollar value for each Activity on the Schedule.

- E. A meeting will be held between the CM, the architect, and CONTRACTOR once a month during the 3-month development of the Baseline Schedule. The purpose of these meetings will be for the CM to assess the status of CONTRACTOR efforts in developing the Baseline Schedule and responding to CM review comments. The CONTRACTOR's Baseline Schedule submittal(s) shall include the following:
  - 1. Plots of the Baseline Schedule
  - 2. CD-ROM or DVD of the Baseline Schedule in P6 format
  - 3. Baseline Schedule Reports
  - 4. Computer listings/supporting data as requested by CMT
  
- F. Upon CM acceptance of the CONTRACTOR's Baseline Schedule, the CM will return two (2) copies to the CONTRACTOR. The CONTRACTOR's accepted Baseline Schedule shall then be the Construction Schedule which the CONTRACTOR shall use in:
  - 1. Planning, coordinating, and executing the Work (including all activities of Subcontractors, and Suppliers);
  - 2. Updating monthly Project progress in accordance with CMS Section 123.08 below; and,
  - 3. Evaluating and reporting on the progress of the Work and supporting requests for payment.
  
- G. If the CONTRACTOR thereafter desires to make changes in its method of operating and scheduling, it shall follow the procedures set out in CMS Section 123.12, Schedule Revisions, of this Section.
  
- H. Acceptance by the CM of the CONTRACTOR's Baseline Schedule shall not relieve the CONTRACTOR of the responsibility for accomplishing the Work within Contract Time. Omissions and errors in the approved Baseline Schedule shall not excuse performance which is not in compliance with the Contract. Approval by the CM in no way provides that the CM ensures the Baseline Schedule's success. The City, architect, or CM is not liable for resultant time or cost overruns attributable to its shortcomings. The City hereby disclaims any obligation or liability by reason of the CM's approval of or acquiescence to the Baseline Schedule.

#### 123.07 REPORTS

- A. Schedule Reports: Accompanying every Schedule submittal (Baseline, Updates and Recovery) submit each of the following Reports. Format for each activity in Reports shall contain activity number, activity description, cost loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
  - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
  - 3. Total Float Report: List of all activities sorted in ascending order of total float.
  - 4. Earnings Report: Compilation of CONTRACTOR's total earnings from the Notice to Proceed until most recent Application for Payment.
  - 5. Critical path layout and analysis (logic diagram and/or bar-chart format)
  - 6. Narrative Report: In accordance with Subparagraph 1.08E
  - 7. Early and late cost curves. (Earned vs. Planned)
  - 8. Earned value reports
  - 9. Recovery Schedule per CMS Section 123.11 below.
  
- B. Updated Construction Schedule and Reports: Submit with Applications for Payment.

- C. Daily Construction Reports: Submit at weekly intervals.
- D. Material Location Reports: Submit at weekly intervals.
- E. Site Condition Reports: Submit at time of discovery of differing conditions.
- F. Special Reports: Submit at time of unusual event.

#### 123.08 **CURRENT CONSTRUCTION SCHEDULE UPDATES**

- A. Upon CM acceptance of the CONTRACTOR's original Baseline Schedule, it is 'frozen' as the Baseline Schedule for the Project. It also becomes the CONTRACTOR's Current Construction Schedule, to be updated monthly and cumulatively, for the duration of the Contract Time, or until a significant revision is required per CMS Section 123.12 below due to a Change Order or Construction Change Directive.
- B. The CONTRACTOR's Baseline Schedule will serve as the basis for evaluating overall Project progress in comparison to the Current Construction Schedule updates (Schedule Update). This evaluation will be performed by P6 software.
- C. In updating the Current Construction Schedule the CONTRACTOR shall use the 'Retained Logic' option on P6 and as defined in CMS Section 123.02(T) above. Changes to Schedule logic shall be requested in writing by the CONTRACTOR at the meeting in CMS Section 123.08(D) and not be made by the CONTRACTOR without CM approval.
- D. Monthly during the Contract Time, and not less than five (5) calendar days prior to the date of each Application for Progress Payment, the CONTRACTOR and the CMT shall meet at the job site for the purpose of reviewing a draft of the CONTRACTOR's Schedule Update verifying that the Update complies with the requirements of the Contract Documents (following CONTRACTOR's meeting with all concerned Subcontractors and Suppliers. This shall be a prerequisite to the CONTRACTOR submitting the Schedule Update to the CM for acceptance.
- E. The CONTRACTOR shall also submit a Narrative Report with the Schedule Update which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors and their impact, an explanation of corrective action taken, any newly planned Activities, and any proposed logic revisions for a Recovery Schedule (pursuant to CMS Section 123.11). The Narrative Report shall also include:
  - 1. A description of actual Work accomplished during the reporting period.
  - 2. A list of all Claims and Disputes with a designated reference number for each and their current status; this list shall also reference the date of the notification to the CM, person to whom the notification was sent, and associated documentation.
  - 3. A summary per week of major construction equipment used on the Work during the reporting period and any construction equipment idle during the reporting period. This summary shall include all Subcontractors.
  - 4. A summary per week of workers by craft man-hours actually engaged on the work during the reporting period, with such total stated separately as to office, supervisory, and manual personnel. This summary shall include all Subcontractors.
  - 5. Summary of amounts due each Subcontractor for each period, indicating total contract amount, amount paid to date, and amount due this period.
  - 6. Summary of amounts due each major Supplier for each period, indicating total contract amount, amount paid to date, and amount due this period.
  - 7. A manpower and equipment forecast for the succeeding thirty (30) days, stating the total number of workers by craft, including office, supervisory, and manual personnel.

8. A list of CONTRACTOR-supplied permanent plant materials and equipment indicating current availability and anticipated job site delivery date
  9. Changed or additions to CONTRACTOR's supervisory personnel since the preceding progress report.
  10. Recovery Schedule according CMS Section 123.11.
- F. Before the date of Application for Payment, the CONTRACTOR shall produce updated copies of all Reports referred to in CMS Section 123.07. The CM will not be obligated to review or to process any Application for Payment until the CONTRACTOR has submitted all such Reports and Schedule Update.

#### 123.09 PROGRESS PAYMENTS

- A. No Applications for Payment shall be submitted by the CONTRACTOR until the specified Schedule update has been reviewed by the CM and has received an acceptable disposition as defined in Section 01 33 00, Submittals.
- B. The submission and acceptance of Schedule update and the corresponding values of Work completed by period for each Activity shall be based on the percentage complete for that Activity, less the amount previously paid for previous Work complete. Retainage shall comply with CMS Section 109.09, Retainer. The CONTRACTOR shall be entitled to Progress Payments only as determined from the current accepted Schedule Update.
- C. Progress Payments will be made through the last date listed in the Contract until the Final Payment. If extensions in the Contract Time total thirty (30) days or more, there shall be additional Progress Payments for each full thirty (30) days of Contract Time extensions.

#### 123.10 CONTRACTOR'S SCHEDULER

- A. The CONTRACTOR shall maintain, as part of its Project organization, a Scheduler that is knowledgeable in the use and application of CPM. The Scheduler's responsibilities will be to develop, maintain, update and revise the Baseline and Current Schedules, monitor Project progress, and provide specified P6-generated schedule-based reports.
- B. Scheduler shall have a minimum of five (5) years' experience in scheduling construction work of a complexity and cost comparable to the Project using Primavera Project Planner P6. CONTRACTOR's Scheduler shall have use of the necessary computer facilities capable of delivering schedules and reports within twenty-four (24) hours of CM request.

#### 123.11 RECOVERY SCHEDULE

- A. If the Current Construction Schedule indicates that the CONTRACTOR is fourteen (14) or more days behind schedule at any time during construction, the monthly Schedule Report shall include a Recovery Schedule.
- B. CONTRACTOR shall prepare and submit to the CM a Recovery Schedule in the form of a frag-net with accompanying reports in accordance with CMS Sections 123.06, 123.07 and 123.11; however, it shall not be incorporated into the Current Construction Schedule. The frag-net shall be submitted in a form and detail which explains and displays how the CONTRACTOR intends to reschedule those Activities behind schedule, in order to regain compliance with the Contract Time during the immediate subsequent pay period. Both the preparation of the Recovery Schedule, and all necessary acts under that Recovery Schedule required to recover compliance with the mandatory dates, shall be at no additional cost to the City.

- C. The CONTRACTOR shall do the following after determination of the requirement for a Recovery Schedule:
1. CONTRACTOR shall submit, a Recovery Schedule reflecting its approach to recovering lost time due to circumstances under its control. The Recovery Schedule shall be presented in CPM frag-net with a Narrative Report. The Recovery Schedule shall represent the CONTRACTOR's best judgment as to how it shall reorganize the Work for returning the Project on schedule to finish within the Contract Time.
  2. The CONTRACTOR and major Subcontractors shall provide the CM with such information as is required to assist in the review of the Recovery Schedule. The Recovery Schedule shall be prepared to a similar level of detail as the Current Construction Schedule and shall have a maximum duration of one (1) month, which shall coincide with the subsequent pay period.
  3. Within five (5) calendar days, the CONTRACTOR shall participate in a meeting with the CM to review and evaluate the Recovery Schedule. Any revisions necessary as a result of this review shall be resubmitted by the CONTRACTOR for approval within two (2) calendar days of the meeting. The approved Recovery Schedule shall then become the schedule for that portion of the Work behind schedule which the CONTRACTOR shall use in planning, coordinating, and executing the Work (including all activities of Subcontractors, equipment vendors, and suppliers) for its one (1) month duration, to regain compliance with the Contract Time.
  4. During implementation of the Recovery Schedule, the CM and the CONTRACTOR will meet weekly, daily if necessary, at the job site to update and evaluate the effectiveness of the Recovery Schedule, and determine whether the CONTRACTOR has regained compliance with the Contract Time. At the direction of the CMT, one of the following will occur:
    - a. If, in the opinion of the CMT, the CONTRACTOR is still behind schedule, the CONTRACTOR shall prepare another Recovery Schedule, at the CONTRACTOR's expense, pursuant with this CMS Section 123.11, which will take effect during the immediate subsequent pay period.
    - b. If in the opinion of the CM, the CONTRACTOR has sufficiently regained compliance with the Contract Time, for that portion of the Work on the Recovery Schedule, this recovery shall be reflected in the next Current Schedule update.

#### 123.12 BASELINE SCHEDULE REVISIONS

- A. Should, in the opinion of the CM, a Change Order introducing a significant change in the scope of the Work and/or a change in the Contract Time, require a revision to the CONTRACTOR's Current Construction Schedule, the CONTRACTOR shall revise its Current Construction Schedule incorporating the approved change(s). This revision shall be considered a 'resetting' of a new Baseline Schedule for the balance of the Project, against which, all future progress reporting will be measured.

#### 123.13 OWNERS FLOAT TIME

- A. Except as provided in this CMS Section 123.13, all float available in the Current Construction Schedule, at any time, shall not be considered for the exclusive use of either the City or the CONTRACTOR. The CONTRACTOR acknowledges and agrees that actual delays affecting the paths of Activities containing any float time shall not have any effect upon specific dates in the Current Construction Schedule providing the actual delay does not exceed the float time associated with those Activities.
- B. The CONTRACTOR's original Baseline Schedule in CMS Section 123.06 above shall be prepared with thirty (30) days of float time by scheduling Substantial Completion thirty (30) days prior to

the end of the Contract Time. These thirty (30) days of required City Float Time shall be for the exclusive use of the City, and shall not be utilized by the CONTRACTOR without written authorization by the City. This City's Float Time is intended to be used for any Activities in connection with City-directed changes which cannot be accomplished concurrent with work required in the Contract Documents. The CONTRACTOR's work shall proceed according to early start dates.

**123.14 SCHEDULE FLOAT MANAGEMENT**

- A. Since Contract Float belongs to the Project, the Contract Time will not be extended, or any otherwise allowable recovery for any delay permitted, until all Contract Float, including the thirty (30) days of City Float, is used or consumed and performance or completion of the Work extends beyond the corresponding Contract Time.
- B. The CONTRACTOR shall adjust or remove any float suppression techniques as a prerequisite to a request for an increase in Contract Price or Contract Time. Use of restraint dates shall be minimized and require prior approval by the CM.
- C. Schedule with Contract Float, if submitted by the CONTRACTOR, may be approved by the CM. However, even if it were otherwise allowable under the Contract, no Claim for delay, extended field office overhead, extended home office overhead, site supervision or other overhead/indirect expenses shall be allowed unless the delay extends the Work beyond the original Contract Time.

**123.15 REQUESTED TIME ADJUSTMENT**

- A. If the CONTRACTOR believes it is entitled to an extension of the Contract Time under the provisions of the CMS 108.06, the CONTRACTOR shall submit to the CM, a Claim indicating adjustments in the Contract Time which should, in the opinion of the CONTRACTOR, be made in accordance with the Contract Documents for time adjustments, which are due to changes, delays, or conditions occurring during the past month or previously, or which are expected or contemplated by the CONTRACTOR (whether such conditions are excusable under the Contract or are alleged to be due to CONTRACTOR or City fault).
- B. This Claim shall be generated on P6 in accordance with the requirements of Paragraph 1.06 of this Section, unless otherwise approved by the CM, and shall be accompanied by a formal Time Impact Analysis (TIA), as described in Paragraph 1.16 below with a detailed Narrative Report justifying the time extension requested.
- C. Upon receiving the CONTRACTOR's time extension request, the CM will consider the CONTRACTOR's submission to be incomplete unless it fully complies with the Contract requirements and demonstrates that the Work cannot be completed within the Contract Time less remaining City float.
- D. It is important that the CONTRACTOR demonstrate the steps it has taken to mitigate the effects from the claimed delay and that it has fully complied with the Contract requirements to do so. The CM can dismiss the time extension request due to lack of CONTRACTOR's compliance with these Contract Documents.
- E. To the extent any Claims are pending at the time of any update of the Current Construction Schedule, the Claim shall also be updated to reflect any adjustments made by CONTRACTOR in the logic, sequence, or duration of any Activities, any time extensions previously granted by the

City, and to reflect actual or expected progress, in order that Claim analysis shall clearly and accurately reflect CONTRACTOR's actual intention and proposed time adjustments.

- F. The CM and owner have no obligation to consider any time extension Claim unless the CONTRACTOR has complied with the requirements of the Contract Documents. The CONTRACTOR's failure to perform in accordance with the Current Construction Schedule shall not be excused, nor be chargeable to the City, because the CONTRACTOR has submitted a time extension Claim.

#### 123.16 **TIME IMPACT ANALYSIS (TIA)**

- A. Adjustments to the Contract Time submitted in accordance with CMS 108.06 shall be validated using the Time Impact Analysis (TIA) methodology described below.
- B. The TIA shall incorporate the actual project history into the CONTRACTOR's Current Construction Schedule. Any delay, change, or disruption (event) to the Schedule shall be depicted in a TIA that isolates and quantifies the event by inserting the event, in the form of a CPM frag-net, into the Schedule and the adjusted completion duration is determined. All impact to the Schedule – such as a critical path shift, float consumption, or new links between activities may be required – shall be analyzed in a Narrative Report that explains what the effect of the event is.
- C. The goal of the TIA approach is to give full consideration to the actual effect of events individually and acting together (concurrent), and to evaluate the effect of ongoing delays. The goal of the method is to examine the evolution of the critical path and the impact of delaying events on that path.
- D. CONTRACTOR shall follow the guidelines in the AACE Recommended Practice 52R-06 TIME IMPACT ANALYSIS – AS APPLIED IN CONSTRUCTION in preparing and submitting its TIA.

#### 123.17 **CONTRACTOR COVENANTS AND GUARANTEES**

- A. The CONTRACTOR hereby covenants and guarantees that it will not misrepresent to the CM, architect, or owner in its planning, scheduling, or execution of the Work; utilize schedules materially different from those made available by CONTRACTOR to the City or CM or to any Subcontractor for the direction, execution and coordination of the Work, or which are not feasible or realistic; or prepare schedules, updates, revisions, or reports for the work which do not accurately reflect the actual intent or reflect the reasonable and actual expectations of CONTRACTOR and its Subcontractors pertaining to the Work.
- B. CONTRACTOR's failure to substantially comply with the foregoing covenants and guarantee shall be a substantial and material breach of Contract, which will permit the City to terminate the Contract for default, or withhold payments under the Contract Documents, and shall entitle the City to the damages afforded for misrepresentation or fraud by these Contract Documents or applicable law.
- C. Should CONTRACTOR fail to substantially comply with the provisions of the Contract Documents relating to planning, scheduling, and execution of the Work in accordance with the Current Construction Schedule, the City shall have the right, at its option, to retain the services of scheduling consultants or experts (including attorneys, if necessary, in their opinion) to prepare a Project Schedule in accordance with the Contract Documents and to review and analyze same, in order to allow the CM to evaluate the progress of the Work by the CONTRACTOR, to determine whether CONTRACTOR is substantially complying with the Contract Documents, and

to direct such action on the part of the CONTRACTOR, as permitted by the Contract Documents, as required to ensure, under the City's Project Schedule prepared hereunder, that CONTRACTOR will comply with such schedule. All costs incurred by City in preparing the schedule hereunder shall be charged to CONTRACTOR. If the CONTRACTOR fails to substantially comply with the scheduling and execution requirements of the Contract Documents, the CONTRACTOR hereby agrees, in such instance, to comply with such schedules, directions, activity sequences, and durations as the CM may require. There will be no additional cost to the City (subject only to cost adjustments for such changes in the Work as the City may direct) to ensure completion within the Contract Time.

123.18 **DEFAULT**

- A. Failure of the CONTRACTOR to substantially comply with the requirements of this Section shall constitute reason to adjudge that the CONTRACTOR is failing to prosecute the Work with such diligence as will ensure its completion within the Contract Time and shall be considered grounds for termination by the City.

END OF SECTION