

SAN FRANCISCO PUBLIC UTILITIES COMMISSION INFRASTRUCTURE CONSTRUCTION MANAGEMENT PROCEDURES	
SECTION: SFPUC INFRASTRUCTURE CONSTRUCTION MANAGEMENT	APPROVED: 
PROCEDURE NO: 012	DATE: 6/7/2019
TITLE: CONSTRUCTION SCHEDULE MANAGEMENT	REVISION: 1

1.0 Policy

All construction schedules, revisions, and updates submitted by the Contractor are reviewed for compliance with the contract scope to verify they meet all the requirements of the Contract Documents and reflect current progress of the Work.

Acceptance of schedule submittals by the RE is of a general nature only and shall not relieve the Contractor from responsibility to do all Work as specified by the Contract Documents. The Contractor has sole responsibility for means and methods of executing the Work.

This SFPUC Infrastructure CM Procedure applies to all personnel working on the SFPUC Infrastructure projects during construction to the extent that their work is affected by this CM Procedure and does not conflict with specific SFPUC policies or the Contract under which the Work is executed.

2.0 Description

This SFPUC Infrastructure CM Procedure establishes the requirements for Construction Schedule Management including submittals, reviews, acceptance and reporting.

3.0 Definitions

3.1 Initial 60-Day Bar Chart Type Plan of Operation

The Initial 60-Day Bar Chart Type Plan of Operation is a bar chart schedule submitted by the Contractor at the Pre-Construction Conference showing all activities during the first two months of the project. It is used to monitor and status the Work until the Baseline Critical Path Method (CPM) Schedule is accepted.

3.2 Baseline CPM Schedule

The Baseline CPM Schedule is the schedule that depicts the Contractor's plan for conducting all the Contract Work within the Contract Time. When reviewed and accepted by the RE, this schedule becomes the Accepted Baseline CPM Schedule for the project and shall be the basis for monthly updated schedules, for activities progress reporting, for updating the Schedule of Values for Applications for Payment, and for measuring any impacts or delays to the project.

3.3 Critical Path Method (CPM)

The Critical Path Method is a network scheduling technique using activity duration and relational ties (logic) between activities to model the execution of the Work. CPM allows for prediction of project duration by analyzing which sequence of activities (which path) has the least amount of schedule flexibility (least amount of total float). Early dates are usually calculated using the forward pass, starting from NTP to the final milestone finish dates. Late dates are calculated by means of a backward pass, starting from the final completion date to construction NTP.

3.4 Revised Schedule

A Revised Schedule is the revised critical path analysis and CPM Schedule of the Accepted Baseline CPM Schedule submitted by the Contractor whenever an approved Change Order affects the completion date or the sequence of activities, progress of any critical activity falls two (2) or more weeks behind schedule, a delay on a non-critical activity changes the course of the critical path, or the Contractor elects to change any sequence of activities affecting the critical path, contractual milestones or project completion date. Once a Revised Schedule is accepted, all subsequent schedule submittals and analysis will be based on the Revised Schedule.

3.5 Recovery Schedule

A Recovery Schedule is a revised critical path analysis and CPM Schedule that demonstrates how the Contractor will recover the progress of any critical activity that falls two (2) or more weeks behind schedule to meet the specified Contract Time. Once a Recovery Schedule is accepted, it shall be incorporated into the Accepted Baseline CPM Schedule as a Revised Schedule. The Recovery Schedule is submitted by the Contractor when requested by the RE.

3.6 Monthly Schedule Update

The Monthly Schedule Update is an update of the Accepted Baseline CPM Schedule or the Accepted Revised Baseline CPM Schedule that shows actual progress of all the Work activities, including those already completed, those of changed Work, and all revisions and adjustments.

3.7 Look-Ahead Schedule

The Look-Ahead Schedule is an extract from the Accepted (or Accepted Revised) Baseline CPM Schedule submitted by the Contractor for each weekly progress meeting that shows all activities for a four (4) week period (past week, current week and forthcoming two (2) weeks).

3.8 Summary Schedule

The Summary Schedule is an extract from the Accepted (or Accepted Revised) Baseline CPM Schedule submitted by the Contractor with the Monthly Schedule Updates that is a rollup of the current Monthly Updated Schedule of 15 to 40 summary activities including all contractual milestones, system shutdowns, Earned Value and payment status. The degree of detail depicted in the Summary Schedule shall be determined by the RE in consultation with the Contractor when the Baseline CPM Schedule is accepted.

4.0 Responsibilities

4.1 Construction Scheduler

The Construction Scheduler conducts in-depth reviews and provides recommendations for acceptance of the Contractor's schedule submittals to the RE. The Construction Scheduler prepares a monthly update of the Summary Schedule according to the Contractor's reported performance as verified by the CM team, and a forecast at completion projection for the RE's Project Construction Progress Reports.

4.1.1 The Construction Scheduler conducts "what-if" schedule studies and provides time impact analysis for proposed schedule revisions, approved change orders, and claims.

4.1.2 The Construction Scheduler will use the updated schedule to provide the RE with information on status of Submittals, procurement activities such as long lead items, testing and start-up and other activities as required by the contract.

4.2 Resident Engineer (RE)

The RE, with assistance from the CM team, is responsible for the management of the contractual requirements of the Contractor's schedule, for monitoring and verifying the progress of the Contractor, for reviewing schedule submittals from the Contractor, and reporting progress, status and forecasts of construction schedules to the Construction Manager or Project Manager (PM).

4.3 Project Controls Engineer

The Project Controls Engineer from the SFPUC Project Controls and Support Group (PCSG), receives the summary schedule and is responsible for tracking and updating the SFPUC generated schedules.

4.4 Project Manager (PM)

The PM manages a group of SFPUC Infrastructure CM Projects, including coordination of all construction projects, and the management and administration of all CM contracts assigned to his/her projects. The PM provides the input for SFPUC Infrastructure CM Monthly Status Updates of all assigned projects.

5.0 Implementation

5.1 Initial 60-Day Bar Chart Type Plan of Operations, Baseline CPM Schedule, and Revised Schedule Submittals

- 5.1.1 The Contractor is required to submit the Initial 60-Day Bar Chart Type Plan of Operations as a bar chart schedule to the RE at the Pre-Construction Conference. The 60-Day Bar Chart Type Plan of Operations shall comply with Contract Specification Section 01 32 16, Construction Progress Schedule and shall show all activities during the first two (2) months from NTP, including all submittals required during this period.
- 5.1.2 The RE will review the Initial 60-Day Bar Chart Schedule and provide comments to the Contractor within fourteen (14) calendar days after receipt.
- 5.1.3 Within 30 calendar days after NTP or as required by the contract specifications, the Contractor is required to submit to the RE a complete Baseline CPM Schedule complying with the Contract Specification Section 01 32 16, Construction Progress Schedule.
- 5.1.4 Upon receipt of the Contractor's Baseline CPM Schedule the RE will convene a scheduling workshop on site for the Contractor to present and explain the CPM Schedule.
- 5.1.5 Within Ten (10) working days after the scheduling workshop, the Construction Scheduler and the RE will review the Baseline CPM Schedule submittal and provide comments or acceptance to the Contractor. The Baseline CPM Schedule is reviewed for compliance with Contract requirements and to verify that the logic is acceptable, durations are reasonable, milestones and constraints are defined and comply with the Contract requirements, resources and cost loading are reasonable, and that the schedule represents a complete, clear and accurate representation of the Contractor's Work Plan within the specified Contract Time.

Comparisons between like activities are made to verify uniform application of resources and to avoid front-end loading. Reviews consider the adequacy of detail in each discipline, system shutdowns, testing activities and start-up. Resource histograms are evaluated to determine that manpower leveling has been considered. Activities related to milestones are reviewed to verify that they are tied to appropriate milestones. Observations

regarding any work that appears to have been omitted, scheduled out of sequence, or loaded with insufficient resources are noted for the Contractor's response.

- 5.1.6 The Contractor is required to resubmit the Baseline CPM Schedule and Submittal Log within five (5) working days after receiving review comments from the RE.
- 5.1.7 The Construction Schedule Review/Acceptance Form (Attachment 012-1) is used to document the review of all initial schedule submittals and revised schedules. The completed form is prepared by the Construction Scheduler and reviewed and transmitted by the RE to the Contractor.

5.2 Monthly Schedule Updates

- 5.2.1 The Contractor is required to submit updates to the Accepted Baseline CPM Schedule and the Summary Schedule after the 25th day of each month with, and as a condition of acceptance, of the Application for Payment. The Monthly Schedule Update is reviewed by the RE and Construction Scheduler for accurate representation of progress of each activity, out of sequence work performed or planned, incorporation of approved changes, and recovery schedules, if necessary.
- 5.2.2 The Contractor's monthly evaluation of the Critical Path Analysis shall comply with Specification Section 01 32 16.
- 5.2.3 If at any time the Contractor falls behind the accepted CPM Schedule and cannot prosecute the Work as planned within the established time-frames, or if the accepted CPM Schedule no longer represents the actual prosecution of the Work, the Contractor must, at the request of the RE, submit a Recovery Schedule to revise the approved Baseline CPM Schedule supported by a narrative explaining how the Contract Times will be achieved.

5.3 Look-Ahead Schedules

- 5.3.1 Look-Ahead Schedules are required to be submitted each week by the Contractor to the RE one (1) full working day before the Weekly Progress Meeting. Look-Ahead Schedules shall be extracted from the Accepted Baseline CPM Schedule or approved Monthly Schedule Updates and include all activities from the past week, current week and forthcoming two (2) weeks. Look-Ahead Schedules are reviewed by the Construction Scheduler to ensure they match the approved CPM Schedules and include all the work activities from the approved CPM Schedules.

The Look-Ahead Schedule is discussed at the Weekly Progress Meeting to ensure that the CM team and the Contractor have the same expectations regarding the Work underway and planned Work for the upcoming period. Discussion may include operation

and shutdown logistics, coordination for testing, inspection, environmental monitoring, prerequisite submittals, responses to RFIs, change order work, public communication, pre-installation conferences, or if any preconstruction surveys are required in advance of the Work that is scheduled.

5.4 Summary Schedules

- 5.4.1 The Contractor is required to submit a Summary Schedule with the Baseline CPM Schedule and Monthly Schedule Updates. Summary Schedules must be extracted from the Accepted Baseline CPM Schedule as updated by the Contractor for the reporting period.
- 5.4.2 Summary Schedules are reviewed and verified by the Construction Scheduler and revised to reflect the independent assessment of the CM team as to the progress made and forecast at completion.
- 5.4.3 The RE incorporates the revised Summary Schedule into the Monthly Construction Progress Report that is submitted to the Construction Manager.
- 5.4.4 The RE transmits the Summary Schedule to the SFPUC-PCSG Project Controls Engineer for SFPUC Infrastructure CM Monthly Status Updating and reporting of overall project status.

5.5 Time Impact Analysis for Change Orders

- 5.5.1 The Contractor is required to submit to the RE, as part of each Claim, Change Order Request, or Proposed Change Order, for which the Contractor is requesting an adjustment in the Contract Time, a written time impact analysis showing the effect on the critical path and a sub-network (“fragnet”) of the Accepted Baseline CPM Schedule showing logic revisions and duration changes for the work in question and its relationship to other activities in the CPM Schedule.
- 5.5.2 The Construction Scheduler will review the Contractor’s time extension request and supporting documents and provide an Independent Time Impact Analysis to the RE.
- 5.5.3 The RE uses the Construction Scheduler’s Time Impact Analysis to negotiate any impacts with the Contractor for a Change Order or settlement of Claim.

6.0 Other Procedural Requirements

None

7.0 References

7.1 Technical Specifications

Section 01 32 16 Construction Progress Schedule

7.2 SFPUC Infrastructure CM Procedures

No. 010 Applications for Payment

No. 011 Construction Change Management

7.3 Others

None

8.0 Attachments

012 – 1 Construction Schedule Review/Acceptance – Form

012 – 2 Revision Control Log

Attachment 012 – 1

Page 1 of 3

Construction Schedule Review/Acceptance – Form

CONTRACT NO. AND TITLE: _____

<p>TYPE OF REVIEW:</p> <p><input type="checkbox"/> INITIAL BASELINE SUBMITTAL</p> <p><input type="checkbox"/> INITIAL BASELINE RE-SUBMITTAL</p> <p><input type="checkbox"/> MONTHLY UPDATE (MONTH: _____)</p> <p><input type="checkbox"/> UPDATE RE-SUBMITTAL (MONTH: _____)</p> <p><input type="checkbox"/> CHANGE ORDER INCORPORATION / REBASELINE (MONTH: _____)</p> <p><input type="checkbox"/> SCHEDULE OF VALUES INITIAL: _____ RE-SUBMITTAL: _____</p>	<p>DATE RECEIVED: _____</p> <p>DATE RETURNED: _____</p> <p>Review Action Code</p> <p><input type="checkbox"/> No Exceptions Taken</p> <p><input type="checkbox"/> Make Corrections Noted</p> <p><input type="checkbox"/> Amend - Resubmit</p> <p><input type="checkbox"/> Rejected - Resubmit</p> <p><input type="checkbox"/> No Action - Record Only</p> <p><small>Note : Review and acceptance by the SFPUC of the Contractor's CPM Construction Schedule does not relieve the Contractor of any of its responsibility whatsoever for the accuracy or feasibility of the CPM Construction Schedule.</small></p> <p>See Correction/Rejection Criteria Pg3</p>
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SUBMITTAL INCLUDES:

	Required	Received	Remarks (Use additional sheet if needed)
Basis of Schedule (Narrative)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Plot(s)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Tabular Report(s)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Project File (File: _____)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Cost Loading	<input type="checkbox"/>	<input type="checkbox"/>	_____
Equipment Loading	<input type="checkbox"/>	<input type="checkbox"/>	_____
Manpower Loading	<input type="checkbox"/>	<input type="checkbox"/>	_____
Material Loading	<input type="checkbox"/>	<input type="checkbox"/>	_____
'S-Curve' for Dollar Expenditures	<input type="checkbox"/>	<input type="checkbox"/>	_____
Materials Resource Curves	<input type="checkbox"/>	<input type="checkbox"/>	_____
Equipment & Manpower Resource Curve	<input type="checkbox"/>	<input type="checkbox"/>	_____
	<input type="checkbox"/>	<input type="checkbox"/>	_____

PROGRESS ASSESSMENT:

	<u>Physical Progress</u>
Planned	<input type="checkbox"/>
Actual	<input type="checkbox"/>
Variance	<input checked="" type="checkbox"/>
Variance Compared to Last Month (Actual vs. Planned - Physical Progress)	
Variance Last Month	<input type="checkbox"/>
Variance This Month	<input type="checkbox"/>

ATTACHMENTS: (As Applicable)

	<u>Included</u>
A. Schedule Analysis	<input type="checkbox"/>
B. Summary Schedule	<input type="checkbox"/>
C. Physical Progress Curve (\$)	<input type="checkbox"/>
D. Overall Cash Flow (\$)	<input type="checkbox"/>
E. Resource/Matls./Equip. Curves	<input type="checkbox"/>
F. Milestone Comparison	<input type="checkbox"/>
G. Critical Path	<input type="checkbox"/>
H. Diagnostics/Changes Reports	<input type="checkbox"/>
I. Contractor's Narrative	<input type="checkbox"/>
J. Progress Photos	<input type="checkbox"/>
k. Other	<input type="checkbox"/>

Reviewer: _____ Construction Manager: _____

cc: _____

Attachment 012 – 1



Page 2 of 3

Construction Schedule Review/Acceptance - Form

CONTRACT NO. AND TITLE:  _____ 

REVIEW COMMENTS:

END

MILESTONE ANALYSIS:		Contractual Milestone Dates are correct		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
#	Milestone Description	Contract Date	Date Per This Submittal	Variance (Calendar Days)	
					(A)
					(A)
					0
					0

SCHEDULE ANALYSIS (By Major Work Area)

END

Attachment 012 – 1
Page 3 of 3
Construction Schedule Review/Acceptance - Form

CONTRACT NO. AND TITLE:



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CORRECTION/REJECTION CRITERIA:

(Cite specific paragraph of 01311 when not in compliance).

Attachment 012 - 2
Revision Control Log

Revision No.	Revision Date	What changed?
Rev 1	6/7/19	<ul style="list-style-type: none">• Minor format changes• Section 2.0 minor text change• Section 3.0; 3.3 and 3.6 minor text changes• Section 4.0; 4.2 added Senior to PM• Attachments - revised• Revision Control Log - updated
Rev 0	11/14/16	Signed