

Alternate restoration methods may be used upon written approval from the engineer. Place base aggregate dense between the subgrade surface and the bottom of the pavement.

C.4 Documentation

Provide documentation to the engineer and include the coordinates, elevations, and sketches of the infrastructure locations tied to known features in the plans. Reference each infrastructure to a proposed alignment with a station and offset. Where near a ramp, reference the ramp alignment. Document the size and/or diameter, composition, and a description of each infrastructure and the location of the elevation with respect to each infrastructure noted. Supply digital photographs of the uncovered infrastructure to the engineer in .jpeg format for future reference.

D Measurement

The department will measure Exposing Existing Infrastructure Paved Area as a unit for each location, acceptably completed. A location may have multiple infrastructures located within the same exposure area. An exposure area will include all infrastructures within 6 lateral feet of each other and payment will only be made for one unit regardless of the number of infrastructures exposed. If the distance from the existing ground elevation, located above the existing infrastructure, to a point 18 inches below the exposed infrastructure is between 0 and 6 feet, the department will measure each location as a single unit of work. If the distance from the existing ground elevation, located above the existing infrastructure, to a point 18 inches below the exposed infrastructure is greater than 6 feet and less than 12 feet, the department will pay for the item as two units of work.

E Payment

The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0151	Exposing Existing Infrastructure Paved Area	EACH

Payment is full compensation for mobilization; for furnishing all excavation; for disposing of all materials; for locating all infrastructure within each respective location; for providing documentation and photographs of infrastructure locations to the engineer; for furnishing all surveying associated with exposing existing infrastructure; for furnishing all maintenance of the location during construction; for furnishing all traffic control, safety barriers, and steel plating required; for temporary shoring; and for furnishing all finishing items including, but not limited to, base aggregate dense, backfill slurry, concrete pavement, HMA pavement, curb and gutter, and sidewalk located above the subgrade elevation.

127. **Baseline CPM Progress Schedule, Item SPV.0060.0170** **Monthly CPM Progress Schedule Updates, Item SPV.0060.0171.**

Replace standard spec 108.4 with the following:

108.4 Critical Path Method Progress Schedule

108.4.1 Definitions

(1) The department defines terms used in 108.4 as follows:

Activity	An administrative or construction task performed during the course of the project with a defined duration and scheduled (or actual) start and finish dates.
Critical Path	The longest continuous chain of activities through the CPM schedule that establishes the minimum overall project duration.
Construction Activity	Construction activities are discrete work activities performed by the contractor, subcontractors, utilities, or third parties within the project limits.
CPM Progress Schedule	A Critical Path Method (CPM) Progress Schedule is a network of logically related activities. The CPM schedule calculates when activities can be performed and establishes the critical or longest continuous path or paths of activities through the project.

Float	Float, as used in this special provision, is the total float of an activity; i.e., it is the amount of time between the date when an activity can start (the early start), and the date when an activity must start (the late start). In cases where the total float of an activity has a different value when calculated based on the finish dates, the lower (more critical) value will govern.
Forecast Completion Date	The completion date predicted by the latest accepted CPM Update, which may be earlier or later than the contract completion date, depending on progress.
Fragnet	A group of logically-related activities, typically inserted into an existing CPM schedule to model a portion of the project, such as the work associated with a change order.
Initial Work Plan	The initial work plan is a time-scaled CPM schedule showing detailed activities for the first 90 calendar days of work and summary level activities for the remainder of the project.
Intermediate Milestone Date	A contractually required date for the completion of a portion of the work, so that a subsequent portion of the work or stage of traffic phasing may proceed.
Department's Project Schedule Template	The department's project schedule template for the overall ZOO Interchange Freeway Program, including interim and final contract completion dates, and containing codes for use as a template for the development of the contractor's schedule.
Work Breakdown Structure (WBS)	A framework for organizing the activities that make up a project by breaking the project into successively greater detail by level. A WBS organizes the project work. It does not address the sequencing and scheduling of project activities.

108.4.2 Department's Project Schedule Template

108.4.2.1 Project Schedule

- (1) Within five business days after award, the department will provide its current Project Schedule Template, containing intermediate milestone constraints, standard activity codes, and a standard WBS for the contractor to use to develop its schedule.

108.4.2.2 Use of Project Schedule Template

- (1) The Project Schedule Template provides information to assist the contractor in preparing its schedule. The Project Schedule Template is not a contract document. The logic contained in the Project's Schedule Template is not intended to alter or supplement contract requirements for the phasing of the work, but to reflect those requirements.

108.4.3 Contractor's Scheduling Responsibilities

- (1) Prepare and submit a CPM progress schedule that accurately reflects the plan for the performance of the work, based on the physical requirements of the Work, and Traffic Phasing requirements. The CPM schedule is the contractor's committed plan to complete all work within the completion deadlines. Full responsibility is assumed for the prosecution of the work as shown. The CPM schedule is not part of the contract. Schedule the Work in the manner required to achieve the completion date and interim completion dates specified in the Prosecution and Progress Special Provision. The contractor will schedule and attend a CPM Initial Workshop. If necessary, the engineer may modify the workshop schedule to ensure attendance by the necessary department and contractor personnel; however, the CPM Initial Workshop must be completed prior to issuing the Notice to Proceed. The CPM Initial workshop will include:
1. Department presentation of the use of CPM scheduling on the project and presentation of the department's master schedule.
 2. Contractor presentation of the conceptual work plan for the project.
 3. Department and contractor discussion of the level of detail on features in the CPM Initial Work Plan and the Baseline CPM Progress Schedule.
- (2) Use the department-provided Project Schedule Template to develop the Initial Work Plan and the Baseline CPM Progress Schedule. Use the Project's Schedule Template ID coding structure to categorize activities by Contract, Stage, Location, and Responsibility to ensure compatibility with the Project Schedule Template and with schedules prepared by other contractors. Add additional activity codes as necessary, but do not delete the coding structure provided.

- 1.7. Provide activities as necessary to depict third party work related to the contract.
 - 1.8. Make allowance for specified work restrictions, non-working days, time constraints, calendars, and weather; and reflect involvement and reviews by the department, and coordination with adjacent contractors, utility owners, and other third parties.
 - 1.9. With the exception of the Project Start Milestone and Project Completion Milestone, all activities must have predecessors and successors. The start of an activity shall have a Start-to-Start or Finish-to-Start relationship with preceding activities. The completion of an activity shall have a Finish-to-Start or Finish-to-Finish relationship with succeeding activities. Do not use Start-to-Finish relationships. Do not use Finish-to-Start relationships with a lag unless the engineer accepts requested exceptions.
 - 1.10. Schedule all intermediate milestones in the proper sequence and input as either a "Start-no-Earlier-Than" or "Finish-no-Later-Than" date. Provide predecessors and successors for each intermediate milestone as necessary to model each Stage of the Work. Unless the engineer accepts a requested exception, the schedule should encompass all the time in the contract period between the starting date and the specified completion date.
 - 1.11. Using the bid quantities and unit prices, develop an anticipated cash-flow curve for the project, based on the Baseline CPM.
2. Provide three hard copies of a hand-drawn or electronically drafted logic diagram depicting the CPM network. Organize the logic diagram by grouping related activities, based on the activity codes in the CPM.
 3. Provide a written narrative with the baseline CPM explaining the planned sequence of work, as-planned critical path, critical activities for achieving intermediate milestone dates, traffic phasing, and planned labor and equipment resources. Use the narrative to further explain:
 - 3.1. The basis for activity durations in terms of production rates for each major type of work (number of shifts per day and number of hours per shift), and equipment usage and limitations.
 - 3.2. Use of constraints.
 - 3.3. Use of calendars.
 - 3.4. Estimated number of adverse weather days on a monthly-basis.
 - 3.5. Scheduling of permit and environmental constraints, and coordination of the schedule with other contractors, utilities, and public entities.
- (1) Submit electronic copies of the Baseline CPM and the corresponding Oracle Primavera P6 schedule file (XER) in a format acceptable to the engineer.
 - (2) Within ten business days of receiving the Baseline CPM, the engineer will provide comments and schedule a meeting for the contractor to present its Baseline CPM and answer questions raised in the engineer's review.
 - (3) At the meeting scheduled by the engineer, provide a presentation of the Baseline CPM. In the presentation, include a discussion of the staging and sequencing of the work, understanding of traffic phasing, and application of labor and equipment resources to the Work. Address comments raised in the engineer's review.
 - (4) Within five business days after the meeting, the engineer will accept the contractor's Baseline CPM schedule or provide comments. Address the engineer's comments and resubmit a revised Baseline CPM within ten business days after the engineer's request. If the engineer requests justification for activity durations, provide information that may include estimated labor, equipment, unit quantities, and production rates used to determine the activity duration.
 - (5) The department will only make progress payments for the value of materials, as specified in 109.6.3.2, until the contractor has submitted the Baseline CPM Schedule. The department will retain 10 percent of each estimate until the department accepts the Baseline CPM Schedule.
 - (6) The engineer will accept the Baseline CPM based solely on whether the schedule is complete as specified in this section. The engineer's acceptance of the schedule does not modify the contract or validate the schedule.
 - (7) The department will not consider requests for contract time extensions as specified in 108.10 or additional compensation for delay specified in 109.4.7 until the department accepts the Baseline CPM schedule.

108.4.4.3 Monthly CPM Updates

- (1) Submit CPM Updates on a monthly basis after acceptance of the Baseline CPM as follows:
 1. Include actual start dates, completion percentages, and remaining durations for activities started but not completed, and actual finish dates for completed activities, through the final acceptance of the project.
 2. Include additional activities as necessary to depict additions to the contract by changes and logic revisions as necessary to reflect changes in the contractor's plan for prosecuting the work.

- (3) To ensure compatibility with the Project Schedule Template, use the latest version of Primavera P6 Project Management, by Oracle Corporation, Redwood Shores, CA, to prepare the Initial Work Plan, Baseline CPM Progress Schedule, and Monthly CPM Updates.
- (4) Designate a Project Scheduler who will be responsible for scheduling the Work and submit a professional resume describing a minimum of three years of scheduling experience on urban, interstate-highway reconstruction work of similar size and complexity, including recent experience with P6. Obtain approval of the submitted resume before scheduling the work.

108.4.4 Submittals

108.4.4.1 Initial Work Plan

- (1) Within ten business days after the CPM Initial Work Plan Workshop, submit an Initial Work Plan as follows:
 1. Develop the Initial Work Plan using the Project Schedule Template. Identify the contemplated start and completion dates for each activity.
 2. Provide a detailed plan of activities to be performed within the first 90 calendar days of the contract. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.
 3. Provide activities as necessary to depict administrative work, including submittals, reviews, and procurements that will occur within the first 90 calendar days of the contract. Show additional activities that require department review or approval. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.
 4. Provide summary activities for the balance of the project. Summary activities may have durations greater than 28 calendar days (20 business days).
 5. Submit electronic copies of the Initial Work Plan and the corresponding Oracle Primavera P6 schedule (XER) in a format acceptable to the engineer.
 6. The engineer will accept the contractor's Initial Work Plan or provide comments within five business days after receipt of the Initial Work Plan. Address comments and resubmit the Initial Work Plan as necessary. Do not begin work until the engineer accepts the Initial Work Plan. The department will use the initial work plan to monitor the progress of the work until the Baseline CPM Progress Schedule is accepted.
 7. Submit an updated version of the Initial Work Plan monthly until the engineer accepts the Baseline CPM Progress Schedule. With each update, include actual start dates, completion percentages, and remaining durations for activities started but not completed. Include actual finish dates for completed activities.
 8. Ensure the Initial Work Plan shows completing the work within the interim completion dates and specified completion date.
 9. Include activities that describe essential features of the work and activities that might potentially delay contract completion. Identify activities that are controlling items of work.

108.4.4.2 Baseline CPM Progress Schedule

- (1) Within 15 business days after the CPM Initial Workshop, submit a Baseline CPM Progress Schedule and written narrative. The department will use the schedule to monitor the progress of the work.
 1. Develop the Baseline CPM using the Project Schedule Template. The Baseline CPM is the contractor's committed plan to complete the Work within the time frames required to achieve the contract completion date and intermediate milestone dates.
 - 1.1. Provide a detailed plan of activities to be performed during the entire contract duration, including all administrative and construction activities required to complete the work as described in the contract documents. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.
 - 1.2. Provide activities as necessary to depict administrative work, including submittals, reviews, procurements, inspections, and all else necessary to complete the work as described in the contract documents. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.
 - 1.3. Submit a temporary drainage plan showing the interface between various stages of a project as well as the interface with adjacent projects.
 - 1.4. Include activities that describe essential features of the work and activities that might potentially delay contract completion. Identify activities that are controlling items of work.
 - 1.5. Show completing the work within interim completion dates and the specified completion date.
 - 1.6. Provide summary activities for the balance of the project. Summary activities may have durations greater than 28 calendar days (20 business days).

3. Include a narrative report that includes a brief description of monthly progress, changes to the critical path from the previous update, sources of delay, potential problems, work planned for the next 30 calendar days, and changes to the CPM schedule. Changes to the logic of the CPM schedule include the addition or deletion of activities and changes to activity descriptions, original durations, relationships, constraints, calendars, or previously recorded actual dates. Justify changes to the CPM schedule in the narrative by describing associated changes in the planned methods or manner of performing the work or changes in the work itself.
 4. Submit electronic copies of each CPM Update and the corresponding Oracle Primavera P6 schedule file (XER) in a format acceptable to the engineer.
 5. If additions or changes were made to the CPM schedule since the previous update, submit an updated hard copy of the revised logic diagram.
- (2) Within five business days of receiving each CPM Update, the engineer will provide comments and schedule a meeting as necessary to address comments raised in the engineer's review. Address the engineer's comments and resubmit a revised CPM Update within five business days after the engineer's request.

108.4.4.4 Three-Week Look-Ahead Schedules

- (1) Submit Three-Week Look-Ahead Schedules on a weekly basis after the notice to proceed (NTP). The schedule can be hand drawn or generated by computer. With each Three-Week Look-Ahead include:
 1. Activities underway and as-built dates for the past week.
 2. Actual as-built dates for completed activities through final acceptance of the project.
 3. Planned work for the upcoming two-week period.
 4. The activities underway and critical RFIs and submittals, based on the CPM schedule.
 5. Details on other activities not individually represented in the CPM schedule.
- (2) On a weekly basis, the department and the contractor shall agree on the as-built dates depicted in the Three-Week Look-Ahead schedule or document all disagreements. Use the as-built dates from the Three-Week Look-Ahead schedules for the month when updating the CPM schedule.

108.4.4.5 Weekly Production Data

- (1) Provide estimated and actual weekly production rates for items of work on a weekly basis as follows:
 1. Data on the following items by area or station:
 - 1.1. Retaining Walls
 - 1.1.1. Leveling Pads - LF
 - 1.1.2. Set Panels - SF
 - 1.1.3. Parapets - LF
 - 1.1.4. Wall Face - Bay
 - 1.1.5. Tie Backs – Each
 - 1.1.6. Anchor Slabs – LF
 - 1.1.7. Drilling - Each
 - 1.1.8. Coping – LF
 - 1.1.9. Footing - LF
 - 1.2. Bridge Construction
 - 1.2.1. Footings—Each
 - 1.2.2. Columns—Each
 - 1.2.3. Abutments—Each
 - 1.2.4. Pier Caps—Each
 - 1.2.5. Girder Spans – Each
 - 1.2.6. Decked Spans – Each
 - 1.2.7. Poured Spans – Each
 - 1.3. Roadway Excavation—CY per week
 - 1.4. Roadway Structural Section
 - 1.4.1. Grading/Subgrade Preparation—SY
 - 1.4.2. Base Material Placement—Ton
 - 1.4.3. Base Material Subgrade Preparation—SY
 - 1.4.4. Asphalt Pavement—Ton
 - 1.4.5. Concrete Pavement – SY

- 1.5. Tunnels
 - 1.5.1. Drilled Shafts – Each
 - 1.5.2. Beam Seat/Cap - LF
 - 1.5.3. Girders - Each
 - 1.5.4. Deck – Percent
- 1.6. Noise Walls
 - 1.6.1. Drill/Set Ground Mounted Posts - Each
 - 1.6.2. Install Ground Mounted Panels - Each
 - 1.6.3. Anchor/Set Structure Mounted Posts - Each
 - 1.6.4. Install Structure Mounted Panels - Each

2. The actual daily production for the past week and the anticipated weekly production for the next week.

- (2) Submit the data in an electronic spreadsheet format at the same time the Three-Week Look-Ahead is submitted. On a weekly basis, the department and the contractor shall agree on the production data or document all disagreements.

108.4.5 Progress Review Meetings

108.4.5.1 Weekly Progress Review Meetings

- (1) After completing the weekly submittal of the Three-Week Look-Ahead and production data, attend a weekly meeting to review the submittals with the department. At the meeting, address comments as necessary, and document agreement or disagreement with the department.

108.4.5.2 Monthly Update Review Meetings

- (1) After submitting the monthly update and receiving the engineer's comments, attend a job-site meeting, as scheduled by the engineer, to review the progress of the schedule. At that meeting, address comments as necessary, and document agreement or disagreement with the department. The monthly meeting will be coordinated to take place on the same day and immediately before or after a weekly meeting, whenever possible.

108.4.6 CPM Progress Schedule Revisions

- (1) Revision by the contractor if necessary due to changes in the Work or project conditions and authorized by the engineer, a CPM Progress Schedule Revision may be submitted, although the next Monthly CPM Update is not yet due. Prepare the CPM Revision in the same format as required for Monthly CPM Updates, including justification for changes to the schedule. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. If the CPM Revision is accepted, prepare the next monthly update based on the revised CPM. If the CPM Revision is rejected, prepare the next monthly update based on the previous month's update.
- (2) Engineer's Right to Request Revisions—The engineer will monitor the progress of the work and may request revisions to the CPM schedule. Revise the schedule as requested by the engineer and submit a CPM Progress Schedule Revision within ten business days of the request. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. The engineer may request that the contractor revise the CPM schedule for one or more of the following reasons:
 - 1. The forecast completion date is scheduled to occur more than 14 calendar days after the contract completion date.
 - 2. An intermediate milestone is scheduled to occur more than 14 calendar days after the date required by the contract.
 - 3. The engineer determines that the progress of the work differs significantly from the current schedule.
 - 4. A contract change order requires the addition, deletion, or revision of activities that causes a change in the contractor's work sequence or the method and manner of performing the work.

108.4.7 Documentation Required for Time Extension Requests

- (1) To request a time extension to an intermediate milestone date or the contract completion date associated with changes to the work, provide a narrative detailing the work added or deleted and the other activities affected, based on the latest accepted CPM Update. For added work, submit a proposed fragnet of activities to be added or revised in the CPM schedule, indicating how the fragnet is to be tied to the CPM schedule.

(2) To request a time extension to an intermediate milestone date or the contract completion date associated with delays to the work, provide a narrative detailing the affected activities and the cause of the delay, based on the latest accepted CPM Update. Requests for time extensions due to delays should meet the following criteria:

1. For requests to extend the contract completion date, include a description of how the delay affected the project's critical path, based on the latest accepted CPM Update.
2. For requests to extend an intermediate milestone date, include a description of how the delay affected the controlling (longest) path to the milestone, based on the latest accepted CPM Update.
3. The department and the contractor agree that the float is not for the exclusive use or financial benefit of either party. Either party has the full use of the float on a first come basis until it is depleted.

108.4.8 Payment for CPM Progress Schedule

(1) The department will pay for measured quantities at the contract unit price for work, acceptably completed under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0170	Baseline CPM Progress Schedule	EACH
SPV.0060.0171	Monthly CPM Progress Schedule Updates	EACH

- (2) The department will only make progress payments for the value of materials, as specified in 109.6.3.2.1, until the Baseline CPM schedule has been submitted. The department will retain ten percent of each estimate until the department accepts the Baseline CPM schedule.
- (3) The department will only make progress payments for the value of materials, as specified in 109.6.3.2.1, until the Monthly CPM schedule updates have been submitted. The department will retain ten percent of each estimate until the department accepts the Monthly CPM schedule update.
- (4) Payment is full compensation for all work required under these bid items. The department will pay the contract unit price for the Baseline CPM schedule after the department accepts the schedule. Then, the department will pay the contract unit price for each Monthly CPM Update acceptably completed.

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**128. Outlet Control Manhole 6-FT, Item SPV.0060.0200;
 Outlet Control Manhole 7-FT, Item SPV.0060.0201;
 Outlet Control Manhole 8-FT, Item SPV.0060.0202;
 Outlet Control Manhole 10X10-FT, Item SPV.0060.0203.**

A Description

This special provision describes furnishing and installing manhole structures with baffle walls for storm sewer in-line detention.

B Materials

Furnish concrete manhole structures with a baffle wall and restrictor holes that are according to standard spec 501 and 611 and as shown on the plans.

C Construction

Field verify all existing connections. Ensure the sump depth as shown on the plans is 2-feet below the lowest pipe invert.

Conform to standard spec 611.

D Measurement

The department will measure Outlet Control Manhole (size) by each unit, acceptably completed

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.0200	Outlet Control Manhole 6-FT	EACH
SPV.0060.0201	Outlet Control Manhole 7-FT	EACH
SPV.0060.0202	Outlet Control Manhole 8-FT	EACH
SPV.0060.0203	Outlet Control Manhole 10x10-FT	EACH