

The Contractor shall clean all equipment and vehicles with water to remove dirt, seeds, vegetative material, or other debris that could contain or hold seeds of noxious weeds before or upon arriving to, and leaving the project site.

The Contractor shall notify the Engineer a minimum of 14 days prior to obtaining material from a commercial or state-furnished borrow site. The Engineer will inspect the site or stockpile for the presence of noxious weeds or invasive plants.

As directed by the Engineer, the Contractor shall chemically or mechanically treat the borrow material to kill existing nonnative weeds and invasive plants.

As directed by the Engineer, the Contractor shall remove 150 mm of the surface material at the borrow site prior to transporting borrow site soil to the project. As directed by the Engineer, material removed from the surface of the borrow site will be disposed of in accordance with Section 7-1.13 of the Standard Specifications.

The treatment, removal, and disposal of rejected borrow site material will be paid for as extra work in accordance with Section 4-1.03D of the Standard Specifications.

Soil from the borrow site shall not be transported to the project until approved in writing by the Engineer.

KILLING AND DISPOSAL OF NONNATIVE WEEDS FROM THE PROJECT SITE

As directed by the Engineer, the contractor shall kill and dispose of nonnative weeds from the project site. Weeds shall be disposed of in accordance with Section 7-1.13 "Disposal of Material Outside the Highway Right of Way".

The killing and disposal of nonnative weeds from the project site will be paid for as extra work in accordance with Section 4-1.03D of the Standard Specifications.

PAYMENT

Nonnative Plant Preclusion shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved and paid for as "Temporary Fence (Type ESA)" in these special provisions.

The Contractor shall properly maintain temporary fencing as indicated in "Temporary Fence (Type ESA)" in these special provisions throughout the course of construction, and shall repair or replace damaged fencing within 24 hours of notification by the Engineer.

After all other work is complete, temporary fencing shall be removed last to avoid inadvertent damage to protected areas.

10-1.27 TEMPORARY GRAVEL BAG BERM:

Temporary gravel bag berms shall be furnished, installed, maintained, and later removed at the locations shown on the approved Storm Water Pollution Prevention Plan in conformance with "Water Pollution Control, Santa Ana Region (Risk Level 1)" of these Special Provisions, and in conformance with details shown on the plans and these Special Provisions.

Temporary gravel bag berms shall be one of the water pollution control practices for sediment control. The Storm Water Pollution Prevention Plan shall include the use of temporary gravel bag berms.

MATERIALS

Gravel-Filled Bags

Gravel bag fabric shall be nonwoven polypropylene geotextile (or comparable polymer) and shall conform to the following requirements:

Specification	Requirements
Mass per unit area, grams per square meter, min. ASTM Designation: D 5261	270
Grab tensile strength (25-mm grip), kilonewtons, min. ASTM Designation: D4632*	0.89
Ultraviolet stability, percent tensile strength retained after 500 hours, ASTM Designation: D4355, xenon arc lamp method	70

* or appropriate test method for specific polymer

Gravel bags shall be between 600 mm and 800 mm in length, and between 400 mm and 500 mm in width.

Yarn used for binding gravel bags shall be as recommended by the manufacturer or bag supplier and shall be of a contrasting color.

Gravel shall be between 10 mm and 20 mm in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be secured to prevent gravel from escaping. Gravel-filled bags shall be between 13 kg and 22 kg in mass.

INSTALLATION

Temporary gravel bag berms shall be installed as follows:

- A. A single layer of gravel bags shall be placed with ends abutted tightly and not overlapped.
- B. The bedding area for the temporary gravel bag berm shall be cleared of obstructions, including rocks, clods, and debris greater than 25 mm in diameter, prior to installation.
- C. Temporary gravel bag berms shall be installed approximately parallel to the slope contour.

D. The last 2 m of the temporary gravel bag berm shall be angled up-slope.

When no longer required, as determined by the Engineer, temporary gravel bag berm shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary gravel bag berm shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MAINTENANCE

Temporary gravel bag berms shall be maintained to provide a sediment holding capacity of approximately 1/3 the height of the gravel bag berm above the ground. When sediment exceeds this height, or when directed by the Engineer, sediment shall be removed. Removed sediment shall be deposited within the project limits in such a way that the sediment is not subject to erosion by wind or by water.

Temporary gravel bag berms shall be repaired or replaced on the same day the damage occurs. Damage to the temporary gravel bag berm resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

Gravel bags shall be replaced when the bag material is ruptured or when the yarn has failed, allowing the bag contents to spill out.

MEASUREMENT AND PAYMENT

Quantities of temporary gravel bag berm to be paid for will be determined by the meter, measured along the centerline of the installed temporary gravel bag berm.

The contract price paid per meter for Temporary Gravel Bag Berm shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary gravel bag berm, complete in place, including backfill, maintenance, and removal, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.28 TEMPORARY CONSTRUCTION ENTRANCE:

Temporary construction entrances shall be constructed, maintained, and later removed at the locations shown on the approved Storm Water Pollution Prevention Plan (SWPPP) in conformance with "Water Pollution Control, Santa Ana region (Risk Level 1)" of these Special Provisions, and in conformance with details shown on the plans and these Special Provisions.

Temporary construction entrances shall be one of the water pollution control practices for tracking control. The SWPPP shall include the use of temporary construction entrances.

Temporary construction entrances shall be either Type 1 or Type 2.

MATERIALS

Temporary Entrance Fabric

Temporary entrance fabric shall be manufactured from polyester, nylon, or polypropylene material, or any combination thereof. Temporary entrance fabric shall be a nonwoven, needle-punched fabric, free of needles which may have broken off during the manufacturing process. Temporary entrance fabric shall be permeable and shall not act as a wicking agent.

Temporary entrance fabric shall be manufactured from virgin, recycled, or a combination of virgin and recycled polymer materials. No virgin or recycled materials shall contain biodegradable filler materials that can degrade the physical or chemical characteristics of the finished fabric. The Engineer may order tests to confirm the absence of biodegradable filler materials in conformance to the requirements in ASTM Designation: E 204 (Fourier Transformed Infrared Spectroscopy-FTIR).

Temporary entrance fabric shall conform to the following requirements:

Specification	Requirements
Mass per unit area, grams per square meter, min. ASTM Designation: D 5261	235
Grab tensile strength (25-mm grip), kilonewtons, min. ASTM Designation: D4632*	0.89
Elongation at break, percent min. ASTM Designation: D4632*	50
Toughness, kilonewtons, min. (percent elongation x grab tensile strength)	53

* or appropriate test method for specific polymer

Rocks

Rocks shall conform to the material quality requirements in Section 72-2.02, "Materials," of the Standard Specifications for shape and for apparent specific gravity, absorption, and durability index. Rocks used for the temporary entrance shall conform to the following sizes:

Square Screen Size (mm)	Percentage Passing	Percentage Retained
150	100	0
75	0	100

Corrugated Steel Panels

Corrugated steel panels shall be prefabricated and shall be pressed or shop welded, with a slot or hooked section to facilitate coupling at the ends of the panels.

INSTALLATION

Temporary construction entrances shall be installed as follows:

- A. Before placing the temporary entrance fabric, the areas shall be cleared of all trash and debris. Vegetation shall be removed to the ground level. Trash, debris, and removed vegetation shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.
- B. A sump shall be constructed within 6 m of each temporary construction entrance as shown on the plans.
- C. Before placing the temporary entrance fabric, the ground shall be graded to a uniform plane. The relative compaction of the top 0.5-m shall be not less than 90 percent. The ground surface shall be free of sharp objects that may damage the temporary entrance fabric, and shall be graded to drain to the sump as shown on the plans.
- D. Temporary entrance fabric shall be positioned longitudinally along the alignment of the entrance, as directed by the Engineer.
- E. The adjacent ends of the fabric shall be overlapped a minimum length of 300 mm.
- F. Rocks to be placed directly over the fabric shall be spread in the direction of traffic, longitudinally and along the alignment of the temporary construction entrance.
- G. During spreading of the rocks, vehicles or equipment shall not be driven directly on the fabric. A layer of rocks a minimum 150 mm thick shall be placed between the fabric and the spreading equipment to prevent damage to the fabric.
- H. For Type 2 temporary construction entrances, a minimum of 6 coupled panel sections shall be installed for each temporary construction entrance. Before installing the panels, the ground surface shall be cleared of all debris to ensure uniform contact with the ground surface.

Fabric damaged during rock placement shall be repaired by placing a new piece of fabric over the damaged area. The piece of fabric shall be large enough to cover the damaged area and provide a minimum 450-mm overlap on all edges.

Details for a proposed alternative temporary construction entrance or alternative sump shall be submitted to the Engineer for approval at least 7 days before installation. The Contractor may eliminate the sump if approved in writing by the Engineer.

When no longer required as determined by the Engineer, temporary construction entrances shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary construction entrance, including the sumps, shall be backfilled and repaired in conformance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

While the temporary construction entrance is in use, pavement shall be cleaned and sediment removed at least once a day, and as often as necessary when directed by the Engineer. Soil and sediment or other extraneous material tracked onto existing pavement shall not be allowed to enter drainage facilities.

MAINTENANCE

The Contractor shall maintain temporary construction entrances throughout the contract or until removed. The Contractor shall prevent displacement or migration of the rock surfacing or corrugated steel panels. Significant depressions resulting from settlement or heavy equipment shall be repaired by the Contractor, as directed by the Engineer.

Temporary construction entrances shall be maintained to minimize tracking of soil and sediment onto existing public roads.

If buildup of soil and sediment deter the function of the temporary construction entrance, the Contractor shall immediately remove and dispose of the soil and sediment, and install additional corrugated steel panels and spread additional rocks to increase the capacity of the temporary construction entrance.

Temporary construction entrances shall be repaired or replaced on the same day the damage occurs. Damage to the temporary construction entrance resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

MEASUREMENT AND PAYMENT

Quantities of temporary construction entrances will be determined from actual count in place.

The contract unit price paid for Temporary Construction Entrance shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing temporary construction entrance, complete in place, including excavation and backfill, maintenance, and removal, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.29 MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL):

Move-in/Move-out (Temporary Erosion Control) shall include moving onto the project when an area is ready to receive erosion control as determined by the Engineer, setting up all required personnel and equipment for the application of erosion control materials and moving out all personnel and equipment when erosion control in that area is completed.

Quantities of Move-in/Move-out (Temporary Erosion Control) will be determined as units from actual count as determined by the Engineer. For measurement purposes, a move-in followed by a move-out will be considered as one unit.

MEASUREMENT AND PAYMENT

The contract unit price paid for Move-in/Move-out (Temporary Erosion Control) shall include full compensation for furnishing all labor, materials (excluding erosion control materials), tools, equipment, and incidentals and for doing all the work involved in moving in and removing from the project all personnel and equipment necessary for application of Erosion Control (Hydroseed), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of Move-in/Move-out (Temporary Erosion Control) required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the item of Move-in/Move-out (Temporary Erosion Control).

10-1.30 TEMPORARY DRAINAGE INLET PROTECTION:

Temporary drainage inlet protection shall be constructed, maintained, and removed at the locations shown on the approved Storm Water Pollution Prevention Plan (SWPPP) in accordance with "Water Pollution Control, Santa Ana Region (Risk Level 1)" of these Special Provisions, and in accordance with the details shown on the plans and these Special Provisions.

Temporary drainage inlet protection shall be one of the water pollution control practices for sediment control. The SWPPP shall include the use of temporary drainage inlet protection.

The Contractor shall select the appropriate drainage inlet protection in accordance with the details to meet the conditions around the drainage inlet. Throughout the duration of the contract, the Contractor shall provide protection to meet the changing conditions around the drainage inlet.

Temporary drainage inlet protection shall be Type 3A or 3B as shown on plans.

MATERIALS

Erosion Control Blanket

The erosion control blanket shall be a rolled erosion control product (RECP) and shall be classified either as temporary and degradable or long-term and nondegradable, and shall conform to one of the following:

A. Temporary and degradable:

1. Machine produced mats consisting of curled wood excelsior with 80 percent of the fiber 150 mm or longer. The excelsior blanket shall be of consistent thickness with wood fiber evenly distributed over the entire area of the blanket. The top surface of the blanket shall be covered with extruded photodegradable plastic netting or lightweight nonsynthetic netting. The blanket shall be smolder resistant without the use of chemical additives and shall be nontoxic and noninjurious to plant and animal life. The excelsior blanket shall be furnished in rolled strips with a minimum mass per unit area of 0.40-kg/m^2 .
2. Machine produced mats consisting of 70 percent straw and 30 percent coconut fiber with extruded photodegradable plastic netting or lightweight nonsynthetic netting on the top and bottom surfaces of the blanket. The straw and coconut shall adhere to the netting using thread or glue strip. The straw and coconut blanket shall be of consistent thickness, and straw and coconut fiber shall be evenly distributed over the entire area of the blanket. The straw and coconut fiber blanket shall be furnished in rolled strips with a minimum mass per unit area of 0.27-kg/m^2 .
3. Machine produced mats that are 100 percent coir consisting of coconut fiber with extruded photodegradable plastic netting or lightweight nonsynthetic netting on the top and bottom surfaces of the blanket. The coconut fiber shall adhere to the netting using thread or glue strip. The coconut blanket shall be of consistent thickness, with coconut fiber evenly distributed over the entire area of the blanket. The coconut fiber blanket shall be furnished in rolled strips with a minimum mass per unit area of 0.27-kg/m^2 .
4. Machine woven netting that is 100 percent spun coir consisting of coconut fiber with an average open area of 63 percent to 70 percent. Coconut coir netting shall be furnished in rolled strips with a minimum mass per unit area of 0.40-kg/m^2 .

B. Long-term and nondegradable:

1. Geotextile blanket shall conform to the provisions for rock slope protection fabric (Type A) in Section 88-1.04, "Rock Slope Protection Fabric," of the Standard Specifications.

Staples

Staples shall be as shown on the plans. An alternative attachment device such as geotextile pins or plastic pegs may be used instead of staples. The Contractor shall submit a sample of the alternative attachment device for the Engineer's approval before installation.

Gravel-Filled Bags

Gravel-filled bag fabric shall be nonwoven polypropylene geotextile or polymer material and shall conform to the following requirements:

Specification	Requirements
Mass per unit area, grams per square meter, minimum. ASTM Designation: D 5261	270
Grab tensile strength (25-mm grip), kilonewtons, minimum. ASTM Designation: D4632*	0.89
Ultraviolet stability, percent tensile strength retained after 500 hours, ASTM Designation: D4355, xenon arc lamp method	70

* or appropriate test method for specific polymer

Gravel-filled bags shall be between 600 mm and 800 mm in length, and between 400 mm and 500 mm in width.

Yarn used for binding gravel bags shall be as recommended by the manufacturer or bag supplier and shall be of a contrasting color.

Gravel shall be between 10 mm and 20 mm in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be secured to prevent gravel from escaping. Gravel-filled bags shall be between 13 kg and 22 kg in mass.

INSTALLATION

Temporary drainage inlet protection shall be installed at drainage inlets in paved and unpaved areas as follows:

- A. Temporary drainage inlet protection shall be installed such that ponded runoff does not encroach on the traveled way or overtop the curb or dike. Gravel-filled bags shall be placed to control ponding and prevent runoff from overtopping the curb or dike.
- B. The bedding area for the temporary drainage inlet protection shall be cleared of obstructions including rocks, clods, and debris greater than 25 mm in diameter before installation.
- C. A temporary linear sediment barrier shall be installed up-slope of the existing drainage inlet and parallel with the curb, dike, or flow line to prevent sediment from entering the drainage inlet.

Erosion Control Blanket and Geotextile Fabric

The erosion control blanket and geotextile fabric shall be secured to the surface of the excavated sediment trap with staples and embedded in a trench adjacent to the drainage inlet. The perimeter edge of the erosion control blanket and geotextile fabric shall be anchored in a trench.

Gravel-Filled Bags

Gravel-filled bags shall be stacked to form a gravel bag barrier. The gravel-filled bags shall be placed so that the bags are tightly abutted and overlap the joints in adjacent rows. A spillway shall be created by removing one or more gravel-filled bags from the upper layer of the gravel bag barrier.

Gravel-filled bags shall only be used within shoulder areas when placed behind temporary railing (Type K).

MAINTENANCE

Temporary drainage inlet protection shall be maintained to provide sediment holding capacity and to reduce runoff velocities. Temporary drainage inlet protection shall be repaired or replaced immediately after the damage occurs.

Sediment deposits, trash, and debris shall be removed from temporary drainage inlet protection as needed or when directed by the Engineer. Removed sediment shall be deposited within the project limits so that the sediment is not subject to erosion by wind or by water. Trash and debris shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

At locations where rills and other evidence of concentrated runoff have occurred beneath the drainage inlet protection, the protection shall be adjusted to prevent another occurrence.

Sediment in excess of 50 mm above the surface of the erosion control blanket or geotextile fabric shall be removed.

Sediment deposits shall be removed when the deposit is $\frac{1}{3}$ the height of the gravel bag barrier or one half the height of the spillway; whichever is less.

Gravel-filled bags shall be replaced when the bag material ruptures or when the binding fails.

REMOVAL

When the temporary drainage inlet protection is no longer required the protection materials shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Holes, depressions, or other ground disturbance caused by the removal of the temporary drainage inlet protection shall be backfilled and repaired in accordance with the provisions in Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT

Quantities of temporary drainage inlet protection will be determined from actual count in place. The protection will be measured one time only and no additional measurement will be recognized.

PAYMENT

The contract unit price paid for Temporary Drainage Inlet Protection shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the temporary drainage inlet protection, complete in place, including maintenance, removal of materials, including cleanup and disposal of retained sediment and debris, and backfilling and repairing holes, depressions and other ground disturbance, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

No additional compensation will be made if the temporary drainage inlet protection changes during the course of construction.

10-1.31 PROGRESS SCHEDULE (CRITICAL PATH METHOD):

GENERAL

Summary

Critical path method (CPM) progress schedules are required for this project. Whenever the term "schedule" is used in this section, it means CPM progress schedule.

The provisions in Section 8-1.04, "Progress Schedule," of the Standard Specifications do not apply.

Definitions

The following definitions apply to this section:

activity: A task, event or other project element on a schedule that contributes to completing the project. Activities have a description, start date, finish date, duration and one or more logic ties.

baseline schedule: The initial schedule showing the original work plan beginning on the date of contract approval. This schedule shows no completed work to date and no negative float or negative lag to any activity.

contract completion date: The current extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer as specified in Section 8-1.06, "Time of Completion" of the Standard Specifications.

critical path: The longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path will extend the scheduled completion date.

critical path method (CPM): A network based planning technique using activity durations and the relationships between activities to mathematically calculate a schedule for the entire project.

data date: The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."

early completion time: The difference in time between an early scheduled completion date and the contract completion date.

float: The difference between the earliest and latest allowable start or finish times for an activity.

milestone: An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.

narrative report: A document submitted with each schedule that discusses topics related to project progress and scheduling.

near critical path: A chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.

scheduled completion date: The planned project finish date shown on the current accepted schedule.

State owned float activity: The activity documenting time saved on the critical path by actions of the State. It is the last activity prior to the scheduled completion date.

time impact analysis: A schedule and narrative report developed specifically to demonstrate what effect a proposed change or delay has on the current scheduled completion date.

time-scaled network diagram: A graphic depiction of a CPM schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.

total float: The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.

updated schedule: A current schedule developed from the baseline or subsequent schedule through regular monthly review to incorporate as-built progress and any planned changes.

SUBMITTALS

General Requirements

Submit to the Engineer baseline, monthly updated, and final updated schedules, each consistent in all respects with the time and order of work requirements of the contract. Work must be executed in the sequence indicated on the current accepted schedule.

Schedules must show the order in which you propose to prosecute the work with logical links between time-scaled work activities and calculations made using the critical path method to determine the controlling activities. You are responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

Produce schedules using computer software and submit compatible software for the Engineer's exclusive possession and use. Submit network diagrams and schedule data as parts of each schedule submittal.

Schedule activities must include the following:

- A. Project characteristics, salient features, or interfaces, including those with outside entities, that could affect time of completion.
- B. Project start date, scheduled completion date, and other milestones.
- C. Work performed by you, your subcontractors, and suppliers.

- D. Submittal development, delivery, review, and approval, including those from you, your subcontractors, and suppliers.
- E. Procurement, delivery, installation, and testing of materials, plants, and equipment.
- F. Testing and settlement periods.
- G. Utility notification and relocation.
- H. Erection and removal of falsework and shoring.
- I. Major traffic stage switches.
- J. Finishing roadway and final cleanup.
- K. State-owned float as the predecessor activity to the scheduled completion date.

Schedules must have not less than 50 and not more than 500 activities, unless otherwise authorized by the Engineer. The number of activities must be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.

Schedule activities must include the following:

- A. A clear and legible description.
- B. Start and finish dates.
- C. A duration of not less than one working day, except for event activities, and not more than 20 working days, unless otherwise authorized by the Engineer.
- D. At least one predecessor and one successor activity, except for project start and finish milestones.
- E. Required constraints. Constraints other than those required by the special provisions may be included only if authorized by the Engineer.
- F. Codes for responsibility, stage, work shifts, location, and contract pay item numbers.

You may show early completion time on any schedule provided that the requirements of the contract are met. Early completion time is considered a resource for your exclusive use. You may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently, or by completing activities earlier than planned. You may also submit for approval a cost reduction incentive proposal as specified in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications that will reduce time of construction.

You may show a scheduled completion date that is later than the contract completion date on an update schedule, after the baseline schedule is accepted. Provide an explanation for a late scheduled completion date in the narrative report that is included with the schedule.

State-owned float is considered a resource for the exclusive use of the State. The Engineer may accrue State-owned float by the early completion of review of any type of required submittal when it saves time on the critical path. Prepare a time impact analysis, when requested by the Engineer, to determine the effect of the action as specified in "Time Impact Analysis". The Engineer documents State-owned float by directing you to update the State-owned float activity on the next updated schedule. Include a log of the action on the State-owned float activity and include a discussion of the action in the narrative report. The Engineer may use State-owned float to mitigate past, present, or future State delays by offsetting potential time extensions for contract change orders.

The Engineer may adjust contract working days for ordered changes that affect the scheduled completion date as specified in Section 4-1.03, "Changes," of the Standard Specifications. Prepare a time impact analysis to determine the effect of the change as specified in "Time Impact Analysis" and include the impacts acceptable to the Engineer in the next updated schedule. Changes that do not affect the controlling operation on the critical path will not be considered as the basis for a time adjustment. Changes that do affect the controlling operation on the critical path will be considered by the Engineer in decreasing time or granting an extension of time for completion of the contract. Time extensions will only be granted if the total float is absorbed and the scheduled completion date is delayed one or more working days because of the ordered change.

The Engineer's review and acceptance of schedules does not waive any contract requirements and does not relieve you of any obligation or responsibility for submitting complete and accurate information. Correct rejected schedules and resubmit corrected schedules to the Engineer within 7 days of notification by the Engineer, at which time a new review period of 7 days will begin.

Errors or omissions on schedules do not relieve you from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Engineer, either you or the Engineer discover that any aspect of the schedule has an error or omission, you must correct it on the next updated schedule.

Computer Software

Submit to the Engineer for review a description of proposed schedule software to be used. After the Engineer accepts the proposed software, submit schedule software and all original software instruction manuals. All software must be compatible with the current version of the Windows operating system in use by the Engineer. The schedule software must include:

- A. Latest version of Primavera SureTrak Project Manager for Windows, or equivalent.
- B. Latest version of schedule-comparing HST SureChange, or equivalent.

If a schedule software equivalent to SureTrak is proposed, it must be capable of generating files that can be imported into SureTrak. The schedule-comparing software must be compatible with schedule software submitted and must be able to compare two schedules and provide reports of changes in activity ID, activity description, constraints, calendar assignments, durations, and logic ties.

The schedule software and schedule-comparing software will be returned to you before the final estimate. The County of Riverside will compensate you as specified in Section 4-1.03D, "Extra Work," of the Standard Specifications for replacement of software or manuals damaged, lost, or stolen after delivery to the Engineer.

Instruct the Engineer in the use of the software and provide software support until the contract is accepted. Within 15 days of contract approval, provide a commercial 8-hour training session for 2 County of Riverside employees in the use of the software at a location acceptable to the Engineer. It is recommended that you also send at least 2 employees to the same training session to facilitate development of similar knowledge and skills in the use of

the software. If schedule software other than SureTrak is submitted, then the training session must be a total of 16-hours for each County of Riverside employee.

Network Diagrams, Reports, and Data

Include the following with each schedule submittal:

- A. Two sets of originally plotted, time-scaled network diagrams.
- B. Two copies of a narrative report.
- C. One read-only compact disk or floppy diskette containing the schedule data.

The time-scaled network diagrams must conform to the following:

- A. Show a continuous flow of information from left to right.
- B. Be based on early start and early finish dates of activities.
- C. Clearly show the primary paths of criticality using graphical presentation.
- D. Be prepared on 860 mm x 1120 mm (34" x 44").
- E. Include a title block and a timeline on each page.

The narrative report must be organized in the following sequence with all applicable documents included:

- A. Transmittal letter.
- B. Work completed during the period.
- C. Identification of unusual conditions or restrictions regarding labor, equipment or material; including multiple shifts, 6-day work weeks, specified overtime or work at times other than regular days or hours.
- D. Description of the current critical path.
- E. Changes to the critical path and scheduled completion date since the last schedule submittal.
- F. Description of problem areas.
- G. Current and anticipated delays:
 - 1. Cause of delay.
 - 2. Impact of delay on other activities, milestones, and completion dates.
 - 3. Corrective action and schedule adjustments to correct the delay.
- H. Pending items and status thereof:
 - 1. Permits.
 - 2. Change orders.
 - 3. Time adjustments.
 - 4. Noncompliance notices.
- I. Reasons for an early or late scheduled completion date in comparison to the contract completion date

Schedule submittals will only be considered complete when all documents and data have been submitted as described above.

Preconstruction Scheduling Conference

Schedule a preconstruction scheduling conference with your project manager and the Engineer within 15 days after contract approval. The Engineer will conduct the meeting and review the requirements of this section with you.

Submit a general time-scaled logic diagram displaying the major activities and sequence of planned operations and be prepared to discuss the proposed work plan and schedule methodology that comply with the requirements of this section. If you propose deviations to the construction staging, then the general time-scaled logic diagram must also display the deviations and resulting time impacts. Be prepared to discuss the proposal.

At this meeting, also submit the alphanumeric coding structure and activity identification system for labeling work activities. To easily identify relationships, each activity description must indicate its associated scope or location of work by including such terms as quantity of material, type of work, bridge number, station to station location, side of highway (such as left, right, northbound, southbound), lane number, shoulder, ramp name, ramp line descriptor, or mainline.

The Engineer reviews the logic diagram, coding structure, and activity identification system, and provide any required baseline schedule changes to you for implementation.

Baseline Schedule

Beginning the week following the preconstruction scheduling conference, meet with the Engineer weekly to discuss schedule development and resolve schedule issues until the baseline schedule is accepted.

Submit to the Engineer a baseline schedule within 20 days of approval of the contract. Allow 20 days for the Engineer's review after the baseline schedule and all support data are submitted. In addition, the baseline schedule submittal is not considered complete until the computer software is delivered and installed for use in review of the schedule.

The baseline schedule must include the entire scope of work and how you plan to complete all work contemplated. The baseline schedule must show the activities that define the critical path. Multiple critical paths and near-critical paths must be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities must be critical or near critical, unless otherwise authorized by the Engineer.

The baseline schedule must not extend beyond the number of contract working days. The baseline schedule must have a data date of contract approval. If you start work before contract approval, the baseline schedule must have a data date of the 1st day you performed work at the job site.

If you submit an early completion baseline schedule that shows contract completion in less than 85 percent of the contract working days, the baseline schedule must be supplemented with resource allocations for every task activity and include time-scaled resource histograms. The resource allocations must be shown to a level of detail that facilitates report generation based on labor crafts and equipment classes for you and your subcontractors. Use average

composite crews to display the labor loading of on-site construction activities. Optimize and level labor to reflect a reasonable plan for accomplishing the work of the contract and to assure that resources are not duplicated in concurrent activities. The time-scaled resource histograms must show labor crafts and equipment classes to be used. The Engineer may review the baseline schedule activity resource allocations using Means Productivity Standards or equivalent to determine if the schedule is practicable.

Update Schedule

Submit an updated schedule and meet with the Engineer to review contract progress, on or before the 1st day of each month, beginning one month after the baseline schedule is accepted. Allow 15 days for the Engineer's review after the updated schedule and all support data are submitted, except that the review period will not start until the previous month's required schedule is accepted. Updated schedules that are not accepted or rejected within the review period are considered accepted by the Engineer.

The updated schedule must have a data date of the 21st day of the month or other date established by the Engineer. The updated schedule must show the status of work actually completed to date and the work yet to be performed as planned. Actual activity start dates, percent complete, and finish dates must be shown as applicable. Durations for work that has been completed must be shown on the updated schedule as the work actually occurred, including Engineer submittal review and your resubmittal times.

You may include modifications such as adding or deleting activities or changing activity constraints, durations, or logic that do not (1) alter the critical path(s) or near critical path(s) or (2) extend the scheduled completion date compared to that shown on the current accepted schedule. Justify in writing the reasons for any changes to planned work. If any proposed changes in planned work will result in (1) or (2) above, then submit a time impact analysis as specified in this section.

Time Impact Analysis

Submit a written time impact analysis (TIA) to the Engineer with each request for adjustment of contract time, or when you or the Engineer considers that an approved or anticipated change may impact the critical path or contract progress.

The TIA must illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate. The analysis must use the accepted schedule that has a data date closest to and before the event. If the Engineer determines that the accepted schedule used does not appropriately represent the conditions before the event, the accepted schedule must be updated to the day before the event being analyzed. The TIA must include an impact schedule developed from incorporating the event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted schedule, the difference between scheduled completion dates of the two schedules must be equal to the adjustment of contract time. The Engineer may construct and use an appropriate project schedule or other recognized method to determine adjustments in contract time until you provide the TIA.

Submit 2 copies of your TIA within 20 days of receiving a written request for a TIA from the Engineer. Allow the Engineer 15 days after receipt to review the submitted TIA. All approved TIA schedule changes must be shown on the next updated schedule.

If a TIA you submit is rejected, meet with the Engineer to discuss and resolve issues related to the TIA. If agreement is not reached, you are allowed 15 days from the meeting with the Engineer to give notice as specified in Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications. Only show actual as-built work, not unapproved changes related to the TIA, in subsequent updated schedules. If agreement is reached at a later date, approved TIA schedule changes must be shown on the next updated schedule. The Engineer withholds remaining payment on the schedule contract item if a TIA is requested and not submitted within 20 days. The schedule item payment resumes on the next estimate after the requested TIA is submitted. No other contract payment is retained regarding TIA submittals.

Final Updated Schedule

Submit a final update, as-built schedule with actual start and finish dates for the activities, within 30 days after completion of contract work. Provide a written certificate with this submittal signed by your project manager or an officer of the company stating, "To my knowledge and belief, the enclosed final update schedule reflects the actual start and finish dates of the actual activities for the project contained herein". An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

PAYMENT

The contract lump sum price paid for Progress Schedule (Critical Path Method) includes full compensation for furnishing all labor, material, tools, equipment, and incidentals, including computer software, and for doing all the work involved in preparing, furnishing, and updating schedules, and instructing and assisting the Engineer in the use of computer software, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Payments for the Progress Schedule (Critical Path Method) contract item will be made progressively as follows:

- A. A total of 25 percent of the item amount or a total of 25 percent of the amount listed for Progress Schedule (Critical Path Method) in "Payments" of these Special Provisions, whichever is less, will be paid upon achieving all of the following:
 - 1. Completion of 5 percent of all contract item work.
 - 2. Acceptance of all schedules and approval of all TIAs required to the time when 5 percent of all contract item work is complete.
 - 3. Delivery of schedule software to the Engineer.
 - 4. Completion of required schedule software training.
- B. A total of 50 percent of the item amount or a total of 50 percent of the amount listed for Progress Schedule (Critical Path Method) in "Payments" of these Special Provisions, whichever is less, will be paid upon completion of 25 percent of all

contract item work and acceptance of all schedules and approval of all TIAs required to the time when 25 percent of all contract item work is complete.

- C. A total of 75 percent of the item amount or a total of 75 percent of the amount listed for Progress Schedule (Critical Path Method) in "Payments" of these Special Provisions, whichever is less, will be paid upon completion of 50 percent of all contract item work and acceptance of all schedules and approval of all TIAs required to the time when 50 percent of all contract item work is complete.
- D. A total of 100 percent of the item amount or a total of 100 percent of the amount listed for Progress Schedule (Critical Path Method) in "Payments" of these Special Provisions, whichever is less, will be paid upon completion of all contract item work, acceptance of all schedules and approval of all TIAs required to the time when all contract item work is complete, and submittal of the certified final update schedule.

If you fail to complete any of the work or provide any of the schedules required by this section, the Engineer makes an adjustment in compensation as specified in Section 4-1.03C, "Changes in Character of Work," of the Standard Specifications for the work not performed. Adjustments in compensation for schedules will not be made for any increased or decreased work ordered by the Engineer in submitting schedules.

10-1.32 OBSTRUCTIONS:

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these Special Provisions.

Existing utility and privately owned facilities shall be protected in accordance with Section 7-1.11, "Preservation of Property," and these Special Provisions. The Contractor is also responsible to protect those facilities that are to be relocated by others prior to or during construction, and shall protect those facilities in both their existing and their ultimate locations. The Contractor shall cooperate with owners and their Contractors of utility and privately owned facilities, for the relocation of said facilities, in accordance with Section 7-1.14, "Cooperation," of the Standard Specifications.

All water valves, gas valves, sewer manholes, survey monuments, survey markers and any other utility appurtenances shall be protected in place. This protection includes any valve/manhole/monument or other utility appurtenance which requires the Contractor to adjust to grade prior to and/or during roadway excavation operations in order to protect the health, safety, and welfare of the public. Full compensation for such protection shall be considered as included in the various bid items.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to

ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

Attention is directed to the requirements of Government Code Sections 4216-4216.9 pertaining to existing utility facilities.

The Contractor shall conduct his operations with the assumption that underground utility facilities exist within the project limits. The Contractor shall exercise caution and best construction practices for safety and for protection of underground facilities. The approximate locations of underground utility facilities, as shown on the plans, are based on information provided by the respective owners, listed below. The Contractor shall also utilize the markings of the regional notification center (Underground Service Alert), and above-ground utility appurtenances to determine the existence and approximate location of underground utilities.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 business days, but not more than 14 days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert	1-800-642-2444 1-800-227-2600 811

Full compensation for all costs, including labor, equipment, materials and incidentals, required to comply with the requirements of this section shall be considered as included in the various items of work, and no additional compensation will be allowed therefor.

If necessary removal and disposal of abandoned utility conduits, conductors, and other facilities shall be considered as incidental excavation, and shall be included in the contract unit price for Roadway Excavation, including cutting and plugging of pipe, and including all labor, materials, equipment and disposal fees.

Adjustments to Grade for Obstructions

The Contractor shall adjust to finish grade any valve covers encountered within the project limits, as required, for those utility valves that are provided with slip cans and are adjustable without the replacement of parts or the removal of concrete collars. In cases where the owning utility company insists upon upgrades in the standards, or when additional parts or the removal of concrete collars are required for the adjustment, said adjustment will be the responsibility of the owning utility company.

Communication and coordination with the owning utility company shall be the responsibility of the contractor.

For public safety, traffic shall not be allowed on temporary or permanent pavement until all manholes are either adjusted to grade or otherwise protected, as approved by the Engineer. The Contractor shall adjust to grade manholes and valves when and as necessary for the protection of the traveling public during construction, and shall coordinate all work on said facilities with the owning utility companies. This requirement is intended for traffic that is to be allowed on temporary surfaces during the course of construction. Final adjustment to grade will be the responsibility of the owning utility company, except as provided herein.

Said work shall be performed in accordance with Section 15-2.05A, "Frames, Covers, Grates, and Manholes," of the Standard Specifications. Full compensation for adjustment of valve covers shall be considered as included in the contract price paid for Hot Mix Asphalt, or applicable items of work in the event that there is no asphalt concrete bid item, and no additional compensation will be allowed therefor.

All existing utility facilities shall be protected from damage by the Contractor's operations.

Unless otherwise provided herein, the owning utility companies will not be obligated to lower their surface utilities (manholes and valve covers) for Contractor's grading, grinding and/or paving operations. The contractor shall lower surface facilities, including manholes and valve covers, to facilitate construction, and the following shall apply:

1. Contractor shall coordinate all work with the utility owner.
2. Contractor shall be responsible for all costs and shall be responsible for any damage caused to the owner's facilities. If the Contractor observes any pre-existing damage to the utility facilities, the Contractor shall notify the Engineer and the utility owner of that damage prior to performing additional work on the facility.
3. Contractor shall, after removing grade rings and covers, arrange for pickup by, or delivery to, the owner's yard. Any and all concrete collars removed by the Contractor shall become the property of the Contractor, and shall be disposed of as specified elsewhere in these special provisions.
4. The Contractor is advised that he is responsible for ensuring that construction materials do not enter the utility owner's facilities. The Contractor shall install traffic bearing steel plates for this purpose, and provide all coordination and transportation necessary. It is recommended that the Contractor request the utility owner to provide such steel plates. If the Contractor provides steel plates, it shall be the Contractor's responsibility to coordinate with the utility owner for the return of the steel plates to the Contractor after final adjustment to grade. If the Contractor utilizes utility owner's steel plates, and if the Contract items of work include adjustment to final grade, the Contractor shall return the steel plates to the Utility owner's yard, or as otherwise arranged with the Utility owner.
5. Prior to paving or covering the plated utility facility, the Contractor shall tie-out the facility utilizing a method acceptable to the utility owner and provide notes and data of all covered facilities to both the utility owner and the Engineer.

6. The Contractor shall notify the utility owner, upon completion of the Contractor's work, when the utility owner may move in to make the final adjustments to grade.
7. The requirements for lowering of surface facilities shall not apply to vaults. The Contractor shall notify the utility owner of the need to make adjustments to such major facilities.
8. The Contractor is reminded that the utility facilities are owned by public and private utility companies that operate their facilities within public rights of way. The utility owner's preferences with regards to the handling of its facilities shall be complied with to the greatest extent feasible.

Method of Payment

Full compensation for initial lowering of surface utilities facilities shall be considered as included in the contract price paid for Hot Mix Asphalt, or applicable items of work in the event that there is no asphalt concrete bid item, and no additional compensation will be allowed therefor.

10-1.33 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES:

Flagging, signs, and temporary traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Category 1 temporary traffic control devices are defined as small and lightweight (less than 45 kg) devices. These devices shall be certified as crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 temporary traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Engineer, the Contractor shall provide written self-certification for crashworthiness of Category 1 temporary traffic control devices at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use. Self-certification shall be provided by the manufacturer or Contractor and shall include the following:

- A. Date,
- B. Federal Aid number (if applicable),
- C. Contract number, district, county, route and kilometer post of project limits,
- D. Company name of certifying vendor, street address, city, state and zip code,
- E. Printed name, signature and title of certifying person; and
- F. Category 1 temporary traffic control devices that will be used on the project.

The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 temporary traffic control devices are defined as small and lightweight (less than 45 kg) devices that are not expected to produce significant vehicular velocity change, but may

cause potential harm to impacting vehicles. Category 2 temporary traffic control devices include barricades and portable sign supports.

Category 2 temporary traffic control devices shall be on the Federal Highway Administration's (FHWA) list of Acceptable Crashworthy Category 2 Hardware for Work Zones. This list is maintained by FHWA and can be located at: http://safety.fhwa.dot.gov/roadway_dept/road_hardware/listing.cfm?code=workzone

The State of California, Department of Transportation also maintains this list at: <http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/Category2.pdf>

Category 2 temporary traffic control devices that have not received FHWA acceptance shall not be used. Category 2 temporary traffic control devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer. The label shall be readable and permanently affixed by the manufacturer. Category 2 temporary traffic control devices without a label shall not be used.

If requested by the Engineer, the Contractor shall provide a written list of Category 2 temporary traffic control devices to be used on the project at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use.

Category 3 temporary traffic control devices consist of temporary traffic-handling equipment and devices that weigh 45 kg or more and are expected to produce significant vehicular velocity change to impacting vehicles. Temporary traffic-handling equipment and devices include crash cushions, truck-mounted attenuators, temporary railing, temporary barrier, and end treatments for temporary railing and barrier.

Type III barricades may be used as sign supports if the barricades have been successfully crash tested, meeting the NCHRP Report 350 criteria, as one unit with a construction area sign attached.

Category 3 temporary traffic control devices shall be shown on the plans or on the State of California, Department of Transportation's Highway Safety Features list. This list is maintained by the Division of Engineering Services and can be found at: http://www.dot.ca.gov/hq/esc/approved_products_list/HighwaySafe.htm

Category 3 temporary traffic control devices that are not shown on the plans or not listed on the State of California, Department of Transportation's Highway Safety Features list shall not be used.

Full compensation for providing self-certification for crashworthiness of Category 1 temporary traffic control devices and for providing a list of Category 2 temporary traffic control devices used on the project shall be considered as included in the prices paid for the various items of work requiring the use of the Category 1 or Category 2 temporary traffic control devices and no additional compensation will be allowed therefore.

When a traffic control system is required by the special provisions, the construction area traffic control devices used as part of the traffic control system will be measured and paid for as provided in these special provisions.

The contract lump sum price paid for Traffic Control System shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Traffic Control System, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.34 CONSTRUCTION AREA SIGNS:

Construction area signs for temporary traffic control shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Attention is directed to "Furnish Sign" of these Special Provisions.

Attention is directed to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions. Type II retroreflective sheeting shall not be used on construction area sign panels. Type III, IV, VII, VIII, or IX retroreflective sheeting shall be used for stationary mounted construction area sign panels.

Attention is directed to "Construction Project Information Signs" of these Special Provisions regarding the number and type of construction project information signs to be furnished, erected, maintained, and removed and disposed of.

Unless otherwise shown on the plans or specified in these Special Provisions, the color of construction area warning and guide signs shall have black legend and border on orange background, except W10-1 or W47 (CA) (Highway-Rail Grade Crossing Advance Warning) sign shall have black legend and border on yellow background.

Orange background on construction area signs shall be fluorescent orange.

Repair to construction area sign panels will not be allowed, except when approved by the Engineer. At nighttime under vehicular headlight illumination, sign panels that exhibit irregular luminance; shadowing or dark blotches shall be immediately replaced at the Contractor's expense.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 business days, but not more than 14 days, prior to commencing excavation for construction area sign posts. The regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert	(800) 642-2444 (800) 227-2600 811

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes. The post hole diameter, if backfilled with portland cement concrete, shall be at least 100 mm greater than the longer dimension of the post cross-section.

Construction area signs placed within 4.6 m from the edge of the travel way shall be mounted on stationary mounted sign supports as specified in "Construction Area Traffic Control Devices" of these Special Provisions.

The Contractor shall maintain accurate information on construction area signs. Signs that are no longer required shall be immediately covered or removed. Signs that convey inaccurate information shall be immediately replaced or the information shall be corrected. Covers shall be replaced when they no longer cover the signs properly. The Contractor shall immediately restore to the original position and location any sign that is displaced or overturned, from any cause, during the progress of work.

Construction area signs shown on the plans, except those signs required for traffic control system for lane closure and unless otherwise specified in these Special Provisions, will be paid for on a lump sum basis, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing construction area signs required for the direction of public traffic through or around the work and for erecting or placing, maintaining (including covering and uncovering as needed) and, when no longer required, removing construction area signs at locations shown on the plans and no additional compensation will be allowed therefor.

10-1.35 MAINTAINING TRAFFIC:

Maintaining traffic shall conform to the provisions in Sections 7-1.08, "Public Convenience," Section 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Closure is defined as the closure of a traffic lane or lanes, including shoulder, ramp or connector lanes, within a single traffic control system.

Closures shall conform to the provisions in "Traffic Control System for Lane Closure" of these Special Provisions.

Closures are only allowed during the hours shown in the lane requirement charts included in this section "Maintaining Traffic" except for work required under Sections 7-1.08, "Public Convenience," and Section 7-1.09, "Public Safety," of the Standard Specifications.

The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Under one-way reversing traffic control operations, public traffic may be stopped in one direction for periods not to exceed 15 minutes.

Unless approved by the Engineer, the maximum length of a single stationary lane closure shall be 3.21 km.

Unless approved by the Engineer, not more than one separate stationary lane closures will be allowed at one time. Concurrent stationary closures shall be spaced no closer than 2.0 km apart.

Local authorities shall be notified at least 5 business days before work begins. The Contractor shall cooperate with local authorities to handle traffic through the work area and shall make arrangements to keep the work area clear of parked vehicles.

Adjacent ramps, in the same direction of travel, servicing 2 consecutive local streets shall not be closed simultaneously unless directed by the Engineer.

SC6-3(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for one business day.

SC6-4(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for more than one business day.

The SC6-3(CA) or SC6-4(CA) signs shall be installed at least 7 days before closing the connector or ramp, but not more than 14 days before the connector or ramp closure. The Contractor shall notify the Engineer at least 2 business days before installing the SC6-3(CA) or SC6-4(CA) signs. The SC6-3(CA) or SC6-4(CA) signs shall be stationary mounted at locations shown on the plans and as directed by the Engineer.

Accurate information shall be maintained on the SC6-3(CA) or SC6-4(CA) signs. The SC6-3(CA) or SC6-4(CA) signs, when no longer required, shall be immediately covered or removed.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including sections closed to public traffic.

Personal vehicles of the Contractor's employees shall not be parked within the right of way. When work vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 7.5-m intervals to a point not less than 7.5 m past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a crashworthy portable sign support with flags. The sign shall be placed where designated by the Engineer. The sign shall be a minimum of 1200 mm x 1200 mm in size. The Contractor shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

If minor deviations from the lane requirement charts are required, a written request shall be submitted to the Engineer at least 15 days before the proposed date of the closure. The

Engineer may approve the deviations if there is no significant increase in the cost to the State and if the work can be expedited and better serve the public traffic.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, the day after Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Special Days are: Martin Luther King Day, Lincoln's Birthday, Good Friday through Easter Sunday, Cesar Chavez, Columbus Day, and December 26th through December 31st.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the SC6-3(CA), SC6-4(CA), W20-1, W21-5b, and C24(CA) signs shall be considered as included in the contract lump sum price paid for Construction Area Signs and no additional compensation will be allowed therefor.

Lane Closure Restriction for Designated Legal Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
X	H xx	xx	xx	xxx						
	SD xx									
X	xx	H xx	xx	xxx						
		SD xx								
	x	xx	H xx	xx						
			SD xx							
	x	xx	xx	H xx	xxx					
	x	xx	xx	SD xx						
				x	H xx					
				x	SD xx					
					x	H xx	xxx			
						SD xx				
				xxx		x	H xx	xx	xx	xx
							SD xx			

Legends:										
	Refer to lane closure charts									
X	The full width of the traveled way shall be open for use by public traffic after 0600.									
Xx	The full width of the traveled way shall be open for use by public traffic.									
Xxx	The full width of the traveled way shall be open for use by public traffic until 1800.									
H	Designated Legal Holiday									
SD	Special Day									

Pedestrian access facilities shall be provided through construction areas within the right of way as shown on the plans and as specified herein. Pedestrian walkways shall be surfaced with hot mix asphalt, portland cement concrete or timber. The surface shall be skid resistant and free of irregularities. Hand railings shall be provided on each side of pedestrian walkways as necessary to protect pedestrian traffic from hazards due to construction operations or adjacent vehicular traffic. Protective overhead covering shall be provided as necessary to insure protection from falling objects and drip from overhead structures.

Full compensation for providing pedestrian facilities shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Chart No. 1 EA#: 08-0E4501 Freeway/Expressway Lane Requirements																									
County: Riv					Route/Direction: 15/nb										PM: 30.2 – 30.6										
Closure Limits:																									
FROM HOUR TO HOUR																									
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Wednesdays	2	2	2	2									2	2	2	2						2	2	2	2
Thursdays	2	2	2	2																			2	2	2
Fridays	2	2	2	2																			2	2	
Saturdays	2	2	2	2	2	2																			
Sundays	2	2	2	2	2	2	2	2	2																2

Legend:

☐ 2 Provide at least two adjacent through freeway lanes open in direction of travel

☐ Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Chart No. 2 EA#: 08-0E4501 Freeway/Expressway Lane Requirements																									
County: Riv					Route/Direction: 15/sb										PM: 30.2 – 30.6										
Closure Limits:																									
FROM HOUR TO HOUR																									
	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	2	2	2	2	2	2					2	2	2	2											2
Fridays	2	2	2	2	2	2																			
Saturdays	2	2	2	2	2	2	2																		
Sundays	2	2	2	2	2	2	2	2	2																2

Legend:

☐ 2 Provide at least two adjacent through freeway lanes open in direction of travel

☐ Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Chart No. 3 EA#: 0E4501 Complete Ramp Closure Hours																																					
County: Riv														Route/Direction: 15 / nb														PM: see closure limits									
Closure Limits: pm 30.196 & 30.60																																					
FROM HOUR TO HOUR																																					
24 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24																																					
Mondays through Thursdays																																					
Fridays																																					
Saturdays																																					
Sundays																																					
Legend: <div style="display: flex; justify-content: space-between; padding: 5px;"> <div><input type="checkbox"/> C Ramp may be closed completely</div> <div><input type="checkbox"/> Work permitted within project right of way where shoulder or lane closure is not required.</div> </div>																																					
REMARKS: Closure at each PM location shall take place only one weekend for 54 hours																																					

Chart No. 4 EA#: 0E4501 Complete Ramp Closure Hours																																					
County: Riv														Route/Direction: 15 / sb														PM: see closure limits									
Closure Limits: pm 30.25 & 30.646																																					
FROM HOUR TO HOUR																																					
24 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24																																					
Mondays through Thursdays																																					
Fridays																																					
Saturdays																																					
Sundays																																					
Legend: <div style="display: flex; justify-content: space-between; padding: 5px;"> <div><input type="checkbox"/> C Ramp may be closed completely</div> <div><input type="checkbox"/> Work permitted within project right of way where shoulder or lane closure is not required.</div> </div>																																					
REMARKS: Closure at each PM location shall take place only one weekend for 54 hours																																					

Chart No. 5 Conventional Highway Lane Requirements																									
County: RIVERSIDE													Route/Direction: INDIAN TRUCK TRAIL										KP: 48.6/49.3		
Closure Limits:																									
FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fridays	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Saturdays	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sundays	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Legend:																									
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 15px; text-align: center; line-height: 15px;">1</div> Provide at least one through traffic lane open in direction of travel																									
REMARKS: If directed by Traffic Operations include a remark regarding a reference to the "Lane Closure Restriction for Designated Legal Holidays and Special Days" table as follows: "See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these Special Provisions for additional closure restrictions".																									

10-1.36 CLOSURE REQUIREMENTS AND CONDITIONS:

Closures shall conform to the provisions in "Maintaining Traffic" of these Special Provisions and these Special Provisions.

CLOSURE SCHEDULE

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Sunday noon through the following Sunday noon. Closures involving work (temporary barrier placement and paving operations) that will reduce horizontal clearances, traveled way inclusive of shoulders, to 2 lanes or less shall be submitted not less than 25 days and not more than 125 days before the anticipated start of operation. Closures involving work (pavement overlay, overhead sign installation, falsework and girder erection) that will reduce the vertical clearances available to the public, shall be submitted not less than 25 days and not more than 125 days before the anticipated start of operation.

The Closure Schedule shall show the locations and times of the proposed closures. The Closure Schedule request forms furnished by the Engineer shall be used. Closure Schedules submitted to the Engineer with incomplete or inaccurate information will be rejected and returned for correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Closure Schedule amendments, including adding additional closures, shall be submitted by noon to the Engineer, in writing, at least 3 business days in advance of a planned closure. Approval of Closure Schedule amendments will be at the discretion of the Engineer.

The Engineer shall be notified of cancelled closures 2 business days before the date of closure.

Closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer.

CONTINGENCY PLAN

A detailed contingency plan shall be prepared for reopening closures to public traffic. If required by "Beginning of Work, Time of Completion and Liquidated Damages" of these Special Provisions, the contingency plan shall be submitted to the Engineer before work at the job site begins. Otherwise, the contingency plan shall be submitted to the Engineer within one business day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. No further closures are to be made until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 business days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to compensation for the suspension of work resulting from the late reopening of closures.

For each 10-minute interval, or fraction thereof past the time specified to reopen the closure, the County of Riverside will deduct \$2000 per interval from moneys due or that may become due the Contractor under the contract.

COMPENSATION

The Engineer shall be notified of delays in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay and will be compensated in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these Special Provisions, except that the Contractor will not be entitled to compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure before the time designated in the approved Closure Schedule, delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

10-1.37 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE:

A traffic control system shall consist of closing traffic lanes and ramps in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these Special Provisions, and these Special Provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

If the traffic control system requires changes due to unforeseen conditions, the Contractor shall be responsible for processing and obtaining approval of the changes to the traffic control system from the Engineer. Changes to the traffic control system plans shall be the responsibility of the Contractor and shall be prepared by a California licensed Traffic Engineer or Civil Engineer in conformance with Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD) and of the California Supplement, and Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications. The modified traffic control plans shall be signed and sealed by a California licensed Traffic or Civil Engineer.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining or removing components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing components when operated within a stationary lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on vehicles which are being used to place, maintain and remove components of a traffic control system and shall be in place before a lane closure requiring its use is completed.

The 500 m section of lane closure, shown along lane lines between the 300 m lane closure tapers on the plans entitled "Traffic Control System for Lane Closures on Freeways and Expressways" and "Traffic Control System for Lane and Complete Closures on Freeways and Expressways" shall not be used.

The traffic cones shown to be placed transversely across closed traffic lanes and shoulders on the plans entitled "Traffic Control System for Lane Closures on Freeways and Expressways" and "Traffic Control System for Lane and Complete Closures on Freeways and Expressways" shall not be placed.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane and ramp closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

The contract lump sum price paid for Traffic Control System shall include full compensation for furnishing all labor, materials (including signs), tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.38 TRAFFIC CONTROL SYSTEM FOR RAMP CLOSURES:

At the times and locations specified under "Maintaining Traffic" of these Special Provisions, ramps shall be closed in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, and these Special Provisions.

The provisions in this section will not relieve the Contractor of the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

If components used for closing a ramp are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When ramp closures are made for work periods only, at the end of each work period, components used for the ramp closure, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

RAMP CLOSED signs [SC6-3 (CA)] shall be used to inform motorists of the temporary closing of a freeway or expressway entrance or exit ramp for not more than one day.

RAMP CLOSED signs [SC6-4 (CA)] shall be used to inform motorists of the temporary closing of a freeway or expressway entrance or exit ramp for more than one day.

The SC6-3 (CA) or SC6-4 (CA) signs shall be installed at least 7 calendar days prior to closing the ramp, but not more than 14 days in advance of the ramp closure. The Contractor shall notify the Engineer not less than 2 calendar days prior to installing the SC6-3 (CA) or SC6-4 (CA) signs. The SC6-3 (CA) or SC6-4 (CA) signs shall be stationary mounted at locations shown on the plans and shall remain in place and visible to motorists during ramp closures.

The Contractor shall be responsible for maintaining accurate and timely information on the SC6-3 (CA) or SC6-4 (CA) signs. The SC6-3 (CA) or SC6-4 (CA) signs, when no longer required or when the information becomes outdated, shall be immediately covered or removed, or the sign message shall be updated.

Full compensation for providing the ramp closures shown on the plans, including furnishing, installing, maintaining, covering, and removing SC6-3 (CA) and SC6-4 (CA) signs, shall be considered as included in the contract prices paid for the various items of work involved and no separate payment will be made therefor.

10-1.39 TEMPORARY PAVEMENT DELINEATION:

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these Special Provisions. Nothing in these Special Provisions shall be construed as reducing the minimum standards specified in the California MUTCD or as relieving the Contractor from the responsibilities specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

GENERAL

When the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place before opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided for traveled ways open to public traffic. On multilane roadways (freeways and expressways) edgeline delineation shall be provided for traveled ways open to public traffic.

The Contractor shall perform the work necessary to establish the alignment of temporary pavement delineation, including required lines or markers. Surfaces to receive application of paint or removable traffic tape temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation, or as determined by the Engineer.

Temporary pavement markers, including underlying adhesive, and removable traffic tape that are applied to the final layer of surfacing or existing pavement to remain in place or that conflicts with a subsequent or new traffic pattern for the area shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE AND CENTERLINE DELINEATION

When lanelines or centerlines are obliterated and temporary pavement delineation to replace the lines is not shown on the plans, the minimum laneline and centerline delineation to be provided for that area shall be temporary pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary pavement markers shall be the same color as the laneline or centerline the pavement markers replace. Temporary pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (180 days or less) in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions. The temporary pavement markers shall be placed in conformance with the manufacturer's instructions. Temporary pavement markers for long term day/night use (180 days or less) shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place the temporary pavement markers in areas where removal of the temporary pavement markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary pavement markers listed for short term day/night use (14 days or less), shall be placed on longitudinal intervals of not more than 7.3 m and shall be used for a maximum of 14 days on lanes opened to public traffic. Before the end of the 14 days the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, the Contractor shall replace the temporary pavement markers and provide additional temporary pavement delineation and shall bear the cost thereof. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

TEMPORARY EDGE LINE DELINEATION

On multilane roadways (freeways and expressways), when edgelines are obliterated and temporary pavement delineation to replace those edgelines is not shown on the plans, the edgeline delineation to be provided for those areas adjacent to lanes open to public traffic shall be as follows:

- A. Temporary pavement delineation for right edgelines shall, at the option of the Contractor, consist of either a solid 100-mm wide traffic stripe tape of the same color as the stripe it replaces, traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 m.
- B. Temporary pavement delineation for left edgelines shall, at the option of the Contractor, consist of either solid 100-mm wide traffic stripe tape of the same color as the stripe it replaces, traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 m or temporary pavement markers placed at longitudinal intervals of not more than 1.8 m.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be as determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the project site to maintain the cones or delineators during the hours of the day that the portable delineators are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these Special Provisions, except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (900 mm) listed in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic as determined by the Engineer.

TEMPORARY TRAFFIC STRIPE (PAINT)

The painted temporary traffic stripe shall be complete in place at the location shown before opening the traveled way to public traffic.

Temporary painted traffic stripe shall conform to the provisions in "Paint Traffic Stripe and Pavement Marking" of these Special Provisions, Section 84-3, "Painted Traffic Stripes and Pavement Markings," of the Standard Specifications, except for payment. The Contractor shall apply 2 coats regardless of whether on new or existing pavement.

TEMPORARY PAVEMENT MARKING (PAINT)

Temporary pavement marking consisting of painted pavement marking shall be applied and maintained at the locations shown on the plans. The painted temporary pavement marking shall be complete in place at the location shown before opening the traveled way to public traffic. Removal of painted temporary pavement marking will not be required.

Temporary painted pavement marking shall conform to the provisions in "Paint Traffic Stripe and Pavement Marking" of these special provisions, except for payment. At the option of the Contractor, either one or 2 coats shall be applied regardless whether on new or existing pavement.

TEMPORARY PAVEMENT MARKERS

Temporary pavement markers shall be applied complete in place before opening the traveled way to public traffic.

Temporary pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used in areas where removal of the pavement markers will be required.

Retroreflective pavement markers conforming to the provisions in "Pavement Markers" of these Special Provisions may be used in place of temporary pavement markers for long term day/night use (180 days or less) except to simulate patterns of broken traffic stripe. Placement of the retroreflective pavement markers used for temporary pavement markers shall conform to the provisions in "Pavement Markers" of these Special Provisions except the

waiting period provisions before placing the pavement markers on new hot mix asphalt surfacing as specified in Section 85-1.06, "Placement," of the Standard Specifications shall not apply and epoxy adhesive shall not be used to place pavement markers in areas where removal of the pavement markers will be required.

MEASUREMENT AND PAYMENT

Temporary traffic stripe and temporary pavement marking shown on the plans will be measured in the same manner specified for paint traffic stripe and paint pavement marking in Section 84-3.06, "Measurement," of the Standard Specifications.

Temporary pavement markers shown on the plans will be measured in the same manner specified for retroreflective pavement markers in Section 85-1.08, "Measurement," of the Standard Specifications.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in painting traffic stripes (regardless of the number, widths and patterns of individual stripes involved in each traffic stripe) and pavement markings including establishing alignment for stripes and layout work, complete in place, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer, shall be considered as included in the contract lump sum price paid for Traffic Control System and no separate payment will be made therefor.

Full compensation for furnishing, placing, maintaining, and removing the temporary pavement markers (including underlying adhesive, layout (dribble) lines to establish alignment of temporary pavement markers or used for temporary laneline and centerline delineation for those areas where temporary laneline and centerline delineation is not shown on the plans and for providing equivalent patterns of permanent traffic lines for those areas when required, shall be considered as included in the contract lump sum price paid for Traffic Control System and no separate payment will be made therefor.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation not shown on the plans shall be considered as included in the contract lump sum price paid for Traffic Control System and no separate payment will be made therefor.

10-1.40 BARRICADE:

Barricades shall be furnished, placed and maintained at the locations shown on the plans, specified in the Standard Specifications or in these Special Provisions or where designated by the Engineer. Barricades shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Attention is directed to "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions regarding retroreflective sheeting for barricades.

Construction area sign and marker panels conforming to the provisions in Section 12-3.06, "Construction Area Signs," of the Standard Specifications shall be installed on barricades in a manner determined by the Engineer at the locations shown on the plans.

Sign panels for construction area signs and marker panels installed on barricades shall conform to the provisions in Section 12-3.06A, "Stationary Mounted Signs," of the Standard Specifications.

Full compensation for furnishing, installing, maintaining, and removing construction area signs and marker panels on barricades shall be considered as included in the contract lump sum price paid for Traffic Control System and no separate payment will be made therefor.

Barricades shown on the plans as part of a traffic control system will be paid for as provided in "Traffic Control System for Lane Closure" of these Special Provisions and will not be included in the count for payment of barricades.

10-1.41 PORTABLE CHANGEABLE MESSAGE SIGN:

Portable changeable message signs shall be furnished, placed, operated, and maintained at locations shown on the plans or where designated by the Engineer and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions. Messages displayed on the portable changeable message signs shall be as specified on the plans and shall conform to Section 12-3.12 "Portable Changeable Message Signs," of the Standard Specifications and "Maintaining Traffic" of these Special Provisions".

A portable changeable message sign shall be placed before and during ramp closures.

The contract lump sum price paid for Portable Changeable Message Sign includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, installing, maintaining, and removing as shown on the plans as specified in the Standard Specifications and these special provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

10-1.42 TEMPORARY RAILING:

Temporary railing (Type K) shall be placed as shown on the plans, as specified in the Standard Specifications or these Special Provisions or where ordered by the Engineer and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Temporary railing (Type K) shall be secured in place before starting work for which the temporary railing is required.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

Temporary railing (Type K) placed in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications will be neither measured nor paid for.

Full compensation for temporary railing is included in the contract lump sum price paid for Traffic Control System and no separate payment will be made therefore.

10-1.43 CHANNELIZER (SURFACE MOUNTED):

Channelizers (Surface Mounted) shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions.

Channelizers (Surface Mounted) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these Special Provisions.

When no longer required for the work as determined by the Engineer, channelizers and underlying adhesive used to cement the channelizer bases to the pavement shall be removed. Removed channelizers and adhesive shall become the property of the Contractor and shall be removed from the site of work.

Channelizers (surface mounted) will be measured from the actual count designated on the plans or ordered by the Engineer. Full compensation for channelizer (surface mounted) is included in the contract lump sum price for Traffic Control System and no separate payment will be made therefor.

10-1.44 TEMPORARY CRASH CUSHION MODULE:

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these Special Provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these Special Provisions.

Attention is directed to Section 7-1.09, "Public Safety," of the Standard Specifications and "Temporary Railing" of these Special Provisions.

Temporary crash cushions shall be secured in place prior to commencing work for which the temporary crash cushions are required.

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be

removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III and Fitch Inertial Modules, manufactured by Energy Absorption Systems, Inc., 35 East Wacker Drive, Suite 1100, Chicago, IL 60601:
 - 1. Northern California: Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734.
 - 2. Southern California: Traffic Control Service, Inc., 1818 E. Orangethorpe, Fullerton, CA 92831-5324, telephone (800) 222-8274, FAX (714) 526-9501.
- B. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672, telephone (949) 361-5663, FAX (949) 361-9205:
 - 1. Northern California: United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112, telephone (408) 287-4303, FAX (408) 287-1929.
 - 2. Southern California: Statewide Safety & Sign, Inc., P.O. Box 1440, Pismo Beach, CA 93448, telephone (800) 559-7080, FAX (805) 929-5786.

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

Temporary crash cushion modules may be placed on movable pallets or frames. Comply with dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

Temporary crash cushion modules will be measured by the unit as determined from the actual count of modules used in the work or ordered by the Engineer at each location. Temporary crash cushion modules placed in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and modules placed in excess of the number specified or shown will not be measured nor paid for.

Repairing modules damaged by public traffic will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications. Modules damaged beyond repair by public traffic, when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Modules replaced due to damage by public traffic will be measured and paid for as Temporary Crash Cushion Module.

If the Engineer orders a lateral move of the sand filled temporary crash cushions and the repositioning is not shown on the plans, moving the sand filled temporary crash cushion will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications and these temporary crash cushion modules will not be counted for payment in the new position.

Full compensation for temporary crash cushion module shall include furnishing all labor, materials (including sand, pallets or frames and marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing, installing, maintaining, moving, and resetting during a work period for access to the work, and removing from the site of the work when no longer required (including those damaged by public traffic) sand filled temporary crash cushion modules, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer and is included in the contract lump sum price for Traffic Control System and no separate payment will be made therefor.

10-1.45 EXISTING HIGHWAY FACILITIES:

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these Special Provisions.

10-1.46 **ABANDON PIPELINE:**

Existing utility pipelines, where shown on the plans to be abandoned, shall be abandoned in place or, at the option of the Contractor, the pipelines shall be removed and disposed of. Resulting openings into existing structures that are to remain in place shall be plugged with concrete conforming to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications. The concrete shall contain not less than 300 kg of cementitious material per cubic meter.

Abandoning pipelines in place shall conform to the following:

- 1 Pipelines that intersect the side slopes shall be removed to a depth of not less than one meter measured normal to the plane of the finished side slope, before being abandoned.
2. Pipelines 300 mm in diameter and larger, shall, at the Contractor's option, be backfilled with either sand, controlled low strength material or slurry cement backfill conforming to the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications by any method acceptable to the Engineer that completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.
3. The ends of pipelines shall be securely closed by a 150 mm thick tight fitting plug or wall of commercial quality concrete.

Pipelines shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended pipeline abandonment.

If the Contractor elects to remove and dispose of pipeline which is specified to be abandoned, as provided herein, backfill specified for the pipe will be measured and paid for in the same manner as if the pipeline has been abandoned in place.

Backfill will be measured by the cubic meter determined from the dimensions of the pipelines to be abandoned.

Full compensation for concrete plugs, pipe removal, structure excavation, and backfill (including sand, controlled low strength material or slurry cement backfill) shall be considered as included in the contract unit price paid per meter for Abandon Pipeline and no additional compensation will be allowed therefor.

10-1.47 **ABANDON INLET:**

Existing pipe inlets and concrete drainage inlets, where shown on the plans to be abandoned, shall be abandoned.

The top portion of the inlets shall be removed to a depth of 1 m below finished grade.

Removed frames and grates shall be disposed of.

The contract unit price paid for Abandon Inlet shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in abandoning the existing pipe inlet and concrete drainage inlets where shown on the plans to be abandoned, removing the top portion of the inlets to a depth of 1 m below finished grade and removed frame and grates shall be disposed of, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.48 REMOVE SIGN STRUCTURE:

Existing sign structures, where shown on the plans to be removed, shall be removed and disposed of.

Overhead sign structure removal shall consist of removing posts, frames, portions of foundations, sign panels, walkways with safety railings, and sign lighting electrical equipment.

Bridge mounted sign structure removal shall consist of removing sign panels and frames, sign lighting electrical equipment, walkways with safety railings, structural braces and supports, and hardware.

A sign structure shall not be removed until the structure is no longer required for the direction of public traffic.

Concrete foundations may be abandoned in place, except that the top portion, including anchor bolts, reinforcing steel, and conduits shall be removed to a depth of not less than 1.0 m below the adjacent finished grade. The resulting holes shall be backfilled and compacted with material equivalent to the surrounding material.

Electrical wiring shall be removed to the nearest pull box. Fuses within spliced connections in the pull box shall be removed and disposed of.

Electrical equipment, where shown on the plans, shall be salvaged.

The contract unit price paid for Remove Sign Structure shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work, involved in the removal and disposal of the existing sign structures as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.49 REMOVE TRAFFIC STRIPES AND PAVEMENT MARKINGS:

Existing traffic stripes and pavement markings, when no longer required for traffic lane delineation as determined by the Engineer, shall be removed and disposed of.

Blast cleaning/grinding for removal of traffic stripe shall be feathered out to irregular and varying widths.

Pavement markings shall be removed by blast cleaning/grinding a rectangular area, rather than just lettering or markings, so the old message cannot be identified.

Full compensation for removal of traffic stripes and pavement markings shall be included in the contract lump sum price for Traffic Control System and no separate payment will be made therefor.

10-1.50 REMOVE PIPE:

Remove pipe will be measured and paid for by the meter of pipe removed.

Full compensation for cutting the existing pipe and excavation and backfill shall be considered as included in the contract price paid per meter for Remove Pipe and no separate payment will be made therefor.

10-1.51 REMOVE INLET:

Existing inlets where any portion of these structures is within one meter of the grading plane in excavation areas, or within 0.3-m of original ground in embankment areas, or where shown on the plans to be removed, shall be completely removed and disposed of.

Full compensation for removing inlets, including furnishing all labor, tools, materials, equipment, and incidentals, for doing all the work, involved in the removal and disposal of the existing inlets, including excavation and backfilling void left by removal, shall be considered as included in the contract unit price paid for Remove Inlet and no additional compensation will be allowed therefor.

10-1.52 REMOVE ASPHALT CONCRETE DIKE:

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed. The dike shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Full compensation for removing asphalt concrete dike shall be considered as included in the contract unit price paid for Roadway Excavation and no separate payment will be made therefor.

10-1.53 REMOVE ASPHALT CONCRETE OVERSIDE DRAIN:

Existing asphalt concrete overside drain, where shown on the plans to be removed, shall be removed. The asphalt concrete overside drain shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

The contract unit price paid for Remove Asphalt Concrete Overside Drain shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removing and disposal, of the existing asphalt concrete overside drain, as shown on the plans to be removed, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.54 REMOVE ROADSIDE SIGN:

Existing roadside signs, at those locations shown on the plans to be removed, shall be removed and disposed of.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

Full compensation for remove road side sign is included in the contract lump sum price for Traffic Control System and no separate payment will be made therefor.

10-1.55 RECONSTRUCT CHAIN LINK FENCE:

Existing chain link fence, at the locations shown on the plans, shall be removed and reconstructed. Fence removed in excess of that required for reconstructing chain link fence shall be disposed of.

The contract unit price paid per meter for Reconstruct Chain Link Fence shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Reconstruct chain link fence as shown on the plans as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer, no separate payment will be made therefor.

10-1.56 RELOCATE ROADSIDE SIGN:

Existing roadside signs shall be removed and relocated to the new locations shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

The contract unit price paid for Relocate Roadside Sign shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in relocating the existing roadside signs, complete in place, as shown on the plans as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.57 COLD PLANE ASPHALT CONCRETE PAVEMENT:

Existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 750 mm in width and shall be operated so that no fumes or smoke will be produced. The cold planing machine shall plane the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

The depth, width, and shape of the cut shall be as shown on the plans or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the plans. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Planed widths of pavement shall be continuous except for intersections at cross streets where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 45 mm will not be allowed between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If Hot Mix Asphalt (HMA) has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary HMA taper shall be constructed. HMA for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical: Horizontal) or flatter to the level of the planed area.

HMA for temporary tapers shall be the same quality as the HMA used elsewhere on the project or shall conform to the material requirements for minor HMA. HMA for tapers shall be compacted by any method that will produce a smooth riding surface. Temporary HMA tapers shall be completely removed, including the removal of loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Operations shall be scheduled so that not more than 7 days shall elapse between the time when transverse joints are planed in the pavement at the conform lines and the permanent surfacing is placed at the conform lines.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Removal operations of cold planed material shall be concurrent with planing operations and follow within 15 m of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square meter. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

The contract price paid per square meter for Cold Plane Asphalt Concrete Pavement shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cold planing asphalt concrete surfacing and disposing of planed material, including furnishing the HMA for and constructing, maintaining, removing, and disposing of temporary HMA tapers, as specified in the Standard Specifications and these Special Provisions and as directed by the Engineer.

10-1.58 REMOVE CONCRETE (SLOPE PAVING):

Concrete, where shown on the plans to be removed, shall be removed. The pay quantities of concrete to be removed will be measured by the cubic meter, measured before and during removal operations.

Concrete removed shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

The contract price paid per cubic meter for Remove Concrete (Slope Paving) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in remove slope paving, complete in place, including excavation, backfill and disposal of materials as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.59 DEVELOP WATER SUPPLY:

Developing a water supply and applying watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications and these Special Provisions.

The lump sum price paid for Develop Water Supply shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in developing a sufficient supply of water and furnishing pipe lines or other

necessary equipment to supply water to the application equipment for all water required for the work, including work paid for as extra work.

Full compensation for the quantity of water used in the performance of the work, including work paid for as extra work, will be considered as included in the lump sum price paid for Develop Water Supply and no separate payment will be made therefor.

No adjustment of compensation will be made for the lump sum item of Develop Water Supply for increase or decrease in the quantity for water required, regardless of the reason for such increase or decrease. The provisions in Section 4-103, "Changes," of the Standard Specifications shall not apply to the item of develop water supply.

10-1.60 EARTHWORK:

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

Attention is directed to the tieback wall construction sequence indicated in the contract plans.

Surplus excavated material shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for Roadway Excavation and no additional compensation will be allowed therefor.

Reinforcement or metal attached to reinforced concrete rubble placed in embankments shall not protrude above the grading plane. Prior to placement within 0.6-m below the grading plane of embankments, reinforcement or metal shall be trimmed to no greater than 20 mm from the face of reinforced concrete rubble. Full compensation for trimming reinforcement or metal shall be considered as included in the contract prices paid per cubic meter for the types of excavation shown on the plan and as directed by the Engineer, or the contract prices paid for furnishing and placing imported borrow or embankment material, as the case may be, and no additional compensation will be allowed therefor.

The "0.2-m" dimensions in the fifth paragraph of Section 19-3.08, "Payment," of the Standard Specifications are increased to "0.3-m" on this project.

Geocomposite drainage system behind tieback walls and retaining walls shall be constructed in accordance with the details shown on the plans and the following:

- A. Attention is directed to "Engineering Fabrics" under "Materials" of these Special Provisions.

- B. Geocomposite drain shall consist of a manufactured core not less than 6.35 mm thick nor more than 50 mm thick with one or both sides covered with a layer of filter fabric that will provide a drainage void. The drain shall produce a flow rate, through the drainage void, of at least 25 liters per minute per meter of width at a hydraulic gradient of 1.0 and a minimum externally applied pressure of 168 kPa.
- C. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for the geocomposite drain certifying that the drain produces the required flow rate and complies with these Special Provisions. The Certificate of Compliance shall be accompanied by a flow capability graph for the geocomposite drain showing flow rates for externally applied pressures and hydraulic gradients. The flow capability graph shall be stamped with the verification of an independent testing laboratory.
- D. Filter fabric for the geocomposite drain shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications.
- E. The manufactured core shall be either a preformed grid of embossed plastic, a mat of random shapes of plastic fibers, a drainage net consisting of a uniform pattern of polymeric strands forming 2 sets of continuous flow channels, or a system of plastic pillars and interconnections forming a semirigid mat.
- F. The core material and filter fabric shall be capable of maintaining the drainage void for the entire height of geocomposite drain. Filter fabric shall be integrally bonded to the side of the core material with the drainage void. Core material manufactured from impermeable plastic sheeting having nonconnecting corrugations shall be placed with the corrugations approximately perpendicular to the drainage collection system.
- G. The geocomposite drain shall be installed with the drainage void and the filter fabric facing the embankment. The fabric facing the embankment side shall overlap a minimum of 75 mm at all joints and wrap around the exterior edges a minimum of 75 mm beyond the exterior edge. If additional fabric is needed to provide overlap at joints and wrap-around at edges, the added fabric shall overlap the fabric on the geocomposite drain at least 150 mm and be attached thereto.
- H. Should the fabric on the geocomposite drain be torn or punctured, the damaged section shall be replaced completely or repaired by placing a piece of fabric that is large enough to cover the damaged area and provide a minimum 150-mm overlap.
- I. Plastic pipe shall conform to the provisions for edge drain pipe and edge drain outlets in Section 68-3, "Edge Drains," of the Standard Specifications.
- J. Treated permeable base to be placed around the slotted plastic pipe at the bottom of the geocomposite drain shall be cement treated permeable base conforming to the provisions for cement treated permeable base in Section 29, "Treated Permeable Bases," of the Standard Specifications and these Special Provisions.

- K. The treated permeable base shall be enclosed with a high density polyethylene sheet or PVC geomembrane, not less than 250 μm thick, which is bonded with a suitable adhesive to the concrete and geocomposite drain. Surfaces to receive the polyethylene sheet shall be cleaned before applying the adhesive. The treated permeable base shall be compacted with a vibrating shoe type compactor.
- L. Concrete for use in drainage pads shall be minor concrete, except the concrete shall contain not less than 300kg of cementitious material per cubic meter.

PAYMENT

The excavation of ditches and channels which have a bottom width of less than 4 m, as shown on the plans, except as hereinafter provided, will be paid for at the contract price per cubic meter for Ditch Excavation.

The above price and payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating ditches completely, as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

Quantities of Roadway Excavation, measured as specified in Section 19-2.08, "Measurement," of the Standard Specifications, will be paid for at the contract price per cubic meter. That price shall include excavating, sloping, and rounding tops and ends of excavations, loading, hauling, depositing, spreading and compacting the material complete in place, and preparing subgrade at the grading plane as specified in Section 19-1.03, "Grade Tolerance," of the Standard Specifications.

The contract price paid per cubic meter for Roadway Excavation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing roadway excavation work completely as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

10-1.61 STRUCTURE EXCAVATION AND BACKFILL:

Structure Excavation and Backfill shall conform to the provisions of Section 19-3, "Structure Excavation and Backfill," of the Standard Specifications and these special provisions.

TIEBACK EARTHWORK

Tieback wall earthwork, consisting of excavating for tieback wall construction and backfilling around completed tieback walls, shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

The Contractor shall submit to the Engineer working drawings for the proposed method of tieback wall construction for the site in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The drawings shall be signed

by an engineer who is registered as a Civil Engineer in the State of California. One set of the drawings and one copy of the design calculations shall be furnished to the Engineer.

Working drawings for tieback wall earthwork shall contain all information required for the construction and quality control of the earthwork, including the following:

- A. The proposed schedule and detailed construction sequence. Construction sequence shall include measures to ensure wall and slope stability during various stages of wall construction including provisions for discontinuous rows of nails or anchors.
- B. Methods of excavation to the staged lifts indicated and excavation equipment types.
- C. Temporary shoring plans.
- D. Drilling methods and equipment including proposed drill hole size and any variation of these along the alignments.
- E. Information on space requirements for installation equipment.
- F. A detailed construction dewatering plan addressing all elements necessary to divert, control, and dispose of surface water and ground water (if encountered).

The Contractor shall allow two weeks after complete drawings and all support data are submitted for the review and approval of the proposed method of soldier pile wall construction.

In the event the Engineer fails to complete the review and approval within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the manner as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Excavation for walls shall be limited to that area which can be anchored and covered with shotcrete during the same work shift in which the excavation is done. Subsequent excavation shall not be made within 3 meters of previously anchored and covered portions of the wall until those anchored and covered portions are structurally complete. A portion of the wall will be considered structurally complete when the micropiles are installed (where shown on the plans), the tieback anchors have been installed, the shotcrete cover has set, anchor bearing assemblies installed, and specified anchorage testing has been completed for that portion of the wall, and the test results have been furnished to the Engineer.

Excavation to the final wall alignment for the full wall height shall incorporate a working berm which shall be constructed from the top down in a staged lift sequence as shown on the approved wall earthwork working drawings. The ground level in front of the wall face shall not be excavated more than 1 meter below the level of the row of tieback anchors to be installed in that same lift.

The Contractor shall protect installed tieback anchors during excavation and subsequent operations. Any tieback anchors damaged during construction shall be replaced by the Contractor, at the Contractor's expense.

The Contractor shall remove all cobbles, boulders, rubble, or debris which are encountered at the final wall alignment during wall face excavation and which protrude from the excavated

face more than 13 mm into the design shotcrete thickness as shown on the plans. Such over excavation shall be backfilled with shotcrete.

MEASUREMENT AND PAYMENT

Measurement and payment for structure excavation (tieback wall), structure excavation (retaining wall), structure backfill (tieback wall), and structure backfill (retaining wall) shall conform to the provisions in Sections 19-3.07, "Measurement," and 19-3.08, "Payment," of the Standard Specifications and these Special Provisions.

Full compensation for working drawings and supplements, and shoring, if required, for tieback wall and retaining wall construction shall be considered as included in the contract price paid per cubic meter for Structure Excavation (Tieback Wall) or Structure Excavation (Retaining Wall) and no additional compensation will be allowed therefor.

Full compensation for shotcrete used to fill voids created by the removal of cobbles and boulders or other obstructions shall be considered as included in the contract price paid per cubic meter for Shotcrete and no additional compensation will be allowed therefor.

If structure excavation or structure backfill for retaining walls is not otherwise designated by type and payment for the structure excavation or structure backfill has not otherwise been provided for in the Standard Specifications or these Special Provisions, the structure excavation or structure backfill will be measured and paid for as Structure Excavation or Structure Backfill (Retaining Wall), respectively

10-1.62 SHOULDER BACKING:

This work shall consist of constructing shoulder backing adjacent to the edge of new pavement surfacing in conformance with the details shown on the plans and these Special Provisions.

Material for shoulder backing shall be imported material or material processed from reclaimed portland cement concrete, lean concrete base, cement treated base, or a combination of any of these materials, conforming to the following grading and quality requirements:

Grading Requirements		Quality Requirements		
Sieve Sizes	Percentage Passing	Specification	California Test	Requirement
50 mm	100	Sand Equivalent	217	10 minimum-30 maximum
25 mm	75 - 100	Resistance (R-value)	301	50 minimum
4.75 mm	40 - 60	Percentage Crushed Particles	205	75% minimum
600 µm	12 - 35	Durability Index	229	20 minimum
75 µm	5 - 20			

At the option of the Contractor, aggregate for shoulder backing may consist of material processed from reclaimed asphalt concrete conforming to the following grading and quality requirements:

Grading Requirements		Quality Requirements		
Sieve Sizes	Percentage Passing	Specification	California Test	Requirement
50 mm	100	Resistance (R-value)	301	50 minimum
19 mm	70 - 100	Percentage Crushed Particles	205	75% minimum
4.75 mm	30 - 80	Durability Index	229	20 minimum

Coarse aggregate consisting of material retained on the 4.75-mm sieve, shall consist of material of which at least 75 percent by mass shall be crushed particles with a minimum of two fractured faces, as determined in conformance with California Test 205.

Shoulder backing material shall have a minimum unit weight of 1682 kg/m^3 as determined in conformance with California Test 212 using the Rodding Method.

Shoulder backing material consisting of reclaimed asphalt concrete, shall not be placed within 30 m measured horizontally of any culvert, watercourse, or bridge within the project limits.

The areas where shoulder backing is to be constructed shall be cleared of weeds, grass, and debris. Removed weeds grass and debris shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Prior to placement of shoulder backing material, basement material shall be scarified to a minimum depth of 75 mm. Immediately prior to placement of shoulder backing material, scarified material shall be watered. Shoulder backing material shall be placed, watered, and rolled a minimum of two passes with a steel tired roller weighing not less than 7.2 tonne to form a smooth, compacted surface. Watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications.

Shoulder backing material shall not be deposited on new pavement surfacing prior to placing the material in the final position, nor shall the material be deposited onto new pavement surfacing during mixing, watering, and blading operations.

Shoulder backing construction shall be completed along the edges of any portion of new pavement surfacing within 5 days after completion of that portion of the new surfacing. Prior to opening a lane adjacent to uncompleted shoulder backing to uncontrolled public traffic, the Contractor shall furnish, place, and maintain portable delineators and W8-9 (LOW SHOULDER) signs off of and adjacent to the new pavement surfacing. Portable delineators shall be placed at the beginning and along the drop-off of the edge of pavement, in the direction of travel, at successive maximum intervals of 150 m on tangents and 60 m on curves. W8-9 (LOW SHOULDER) signs shall be placed at the beginning and along the drop-off at successive maximum intervals of 600 m. The portable delineators and W8-9 (LOW SHOULDER) signs shall be maintained in place at each location until the shoulder backing is completed at that location. Portable delineators and signs shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, except the signs may be set on temporary portable supports or on barricades.

Quantities of Shoulder Backing will be measured by the cubic meter in conformance with the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications, except that the mass of water in the aggregate will not be determined and no deduction will be made from the mass of material delivered to the work.

The contract price paid per cubic meter for Shoulder Backing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing shoulder backing, complete in place, including furnishing, placing, maintaining, and removing portable delineators, W8-9 (LOW SHOULDER) signs, and temporary supports or barricades for the signs, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.63 MATERIAL CONTAINING AERIALY DEPOSITED LEAD:

Earthwork involving material containing aerially deposited lead shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

Although testing done at the job site showed no traceable levels of aerially deposited lead, the Contractor may encounter aerially deposited lead within the existing soils during construction. This specification informs the Contractor of his responsibilities if lead is encountered.

LEAD COMPLIANCE PLAN

The Contractor shall prepare a project specific Lead Compliance Plan to prevent or minimize worker exposure to lead while handling material containing aerially deposited lead. Attention is directed to Title 8, California Code of Regulations, Section 1532.1, "Lead," for specific California Department of Industrial Relations, Division of Occupational Safety and Health (Cal-OSHA) requirements when working with lead.

The Lead Compliance Plan shall contain the elements listed in Title 8, California Code of Regulations, Section 1532.1(e)(2)(B). Before submission to the Engineer, the Lead Compliance Plan shall be approved by an Industrial Hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene. The plan shall be submitted to the Engineer for review and acceptance at least 15 days prior to beginning work in areas containing aerially deposited lead.

The Contractor shall not work in areas containing aerially deposited lead within the project limits, unless authorized in writing by the Engineer, until the Engineer has accepted the Lead Compliance Plan.

Prior to performing work in areas containing aerially deposited lead, personnel who have no prior training or are not current in their training status, including Department personnel, shall complete a safety training program provided by the Contractor. The safety training program shall meet the requirements of Title 8, California Code of Regulations, Section 1532.1, "Lead".

Personal protective equipment, training, and washing facilities required by the Contractor's Lead Compliance Plan shall be supplied to Department personnel by the Contractor. The number of Department personnel will be one.

The Engineer will notify the Contractor of acceptance or rejection of the submitted or revised Lead Compliance Plan not more than 10 days after submittal of the plan.

DUST CONTROL

Excavation, transportation, placement, and handling of material containing aurally deposited lead shall result in no visible dust migration. The Contractor shall have a water truck or tank on the job site at all times while clearing and grubbing and performing earthwork operations in work areas containing aurally deposited lead.

STOCKPILING

Stockpiles of material containing aurally deposited lead shall not be placed where affected by surface run-on or run-off. Stockpiles shall be covered with plastic sheeting 0.33 mm minimum thickness or 0.3 m of non-hazardous material. Stockpiles shall not be placed in environmentally sensitive areas. Stockpiled material shall not enter storm drains, inlets, or waters of the State.

MATERIAL TRANSPORTATION

Prior to traveling on public roads, loose and extraneous material shall be removed from surfaces outside the cargo areas of the transporting vehicles and the cargo shall be covered with tarpaulins or other cover, as outlined in the approved Excavation and Transportation Plan. The Contractor shall be responsible for costs due to spillage of material containing lead during transport.

The County of Riverside will not consider the Contractor a generator of the hazardous material, and the Contractor will not be obligated for further cleanup, removal, or remedial action for such material handled or disposed of in conformance with the requirements specified in these special provisions and the appropriate State and Federal laws and regulations and county and municipal ordinances and regulations regarding hazardous waste.

DISPOSAL

Surplus material for which the lead content is not known shall be analyzed for aurally deposited lead by the Contractor prior to removing the material from within the project limits. The Contractor shall submit a sampling and analysis plan and the name of the analytical laboratory to the Engineer at least 15 days prior to beginning sampling or analysis. The Contractor shall use a laboratory certified by the California Department of Health Services. Sampling shall be at a minimum rate of one sample for each 150 m³ of surplus material and tested for lead using EPA Method 6010 or 7000 series.

Materials containing aurally deposited lead shall be disposed of within California. The disposal site shall be operating under a permit issued by the appropriate California Environmental Protection Agency board or department.

Sampling, analyzing, transporting, and disposing of material containing aerially deposited lead excavated outside the pay limits of excavation will be at the Contractor's expense.

No payment for stockpiling of material containing aerially deposited lead will be made, unless the stockpiling is ordered by the Engineer.

Sampling, analyses, and reporting of results for surplus material not previously sampled will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

PAYMENT

The contract lump sum price paid for Lead Compliance Plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing the Lead Compliance Plan, including paying the Certified Industrial Hygienist, and for providing personal protective equipment, training and medical surveillance, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.64 MOVE-IN/MOVE-OUT (EROSION CONTROL):

Move-in/Move-out (Erosion Control) shall include moving onto the project when an area is ready to receive erosion control as determined by the Engineer, setting up all required personnel and equipment for the application of erosion control materials and moving out all personnel and equipment when erosion control in that area is completed.

Quantities of Move-in/Move-out (Erosion Control) will be determined as units from actual count as determined by the Engineer. For measurement purposes, a move-in followed by a move-out will be considered as one unit.

The contract unit price paid for Move-in/Move-out (Erosion Control) shall include full compensation for furnishing all labor, materials (excluding erosion control materials), tools, equipment, and incidentals and for doing all the work involved in moving in and removing from the project all personnel and equipment necessary for application of Erosion Control (Hydroseed), as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

No adjustment of compensation will be made for any increase or decrease in the quantities of Move-in/Move-out (Erosion Control) required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the item of move-in/move-out (Erosion Control).

10-1.65 EROSION CONTROL (HYDROSEED):

GENERAL

Summary

This work includes removing and disposing of weeds and applying erosion control materials including seed, fiber, and tackifier to erosion control (hydroseed) areas shown on the plans.

Comply with Section 20-3, "Erosion Control," of the Standard Specifications.

Comply with "Move-In/Move-Out (Erosion Control)" of these special provisions.

If notified by the Engineer that an area is ready to receive erosion control materials, start erosion control (hydroseed) work within 5 business days of the Engineer's notification to perform the work.

The Engineer will designate the ground location of all erosion control (hydroseed) areas in increments of one meter or smaller by directing the placing of stakes or other suitable markers. Furnish all tools, labor, materials, and transportation required to adequately indicate the various erosion control (hydroseed) locations.

MATERIALS

Seed

Seed not required to be labeled under the California Food and Agricultural Code must be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts or by a seed technologist certified by the Society of Commercial Seed Technologists. Measure and mix individual seed species in the presence of the Engineer.

Seed must contain at most 1.0 percent total weed seed by weight. Deliver seed to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag attached are not accepted. The Engineer takes a sample of approximately 30 grams of seed for each seed lot greater than 1 kilogram.

Seed must comply with the following:

Seed Mix 1 (General Slopes)		
Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Artemisia californica (California Sagebrush)	50	0.1
Encelia californica (Bush Sunflower)	30	1.0
Eriogonum fasciculatum (California Buckwheat)	10	1.0
Nassella pulchra (Purple Needle Grass)	70	6.0
Poa secunda (Pine Bluegrass)	60	0.5
Vulpia microstachys (Small Fescue)	70	3.0
	Total	11.6

Seed Mix 2 (Bioswale/Biostrips)		
Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Plantago insularis (Plantain)	70	6.0
Nassella pulchra (Purple Needle Grass)	70	6.0
Poa secunda (Pine Bluegrass)	60	0.5
Vulpia microstachys (Small Fescue)	70	3.0
	Total	15.5

Seed Sampling Supplies

At the time of seed sampling, provide the Engineer a glassine lined bag and custody seal tag for each seed lot sample.

Tackifier

Tackifier must be:

1. Guar (Plant Based)
2. Psyllium (Plant Based)
3. Starch (Plant Based)

Tackifier must comply with the following:

1. Nonflammable
2. Nontoxic to aquatic organisms
3. Free from growth or germination inhibiting factors
4. Either a plant-based product or a polymeric-emulsion blend

Tackifier classified as a plant based product must comply with the following:

1. A natural high molecular weight polysaccharide
2. A high viscosity hydrocolloid that is miscible in water
3. Functional for at least 180 days
4. Labeled as either guar, psyllium, or starch

Guar:

1. A guar gum based product derived from the ground endosperm of the guar plant, *Cyamopsis tetragonolobus*
2. Treated with dispersant agents for easy mixing
3. Able to be diluted at the rate of 0.5 to 2.5 kilograms per 400 liters of water

Psyllium:

1. Made of the finely ground muciloid coating of *plantago ovata* or *plantago ispaghula* seeds
2. Able to dry and form a firm but rewettable membrane

Starch:

1. A non-ionic, water-soluble granular material derived from corn, potato, or other plant-based source.

Fiber

Fiber must be:

1. Wood

Fiber must comply with the following:

1. Free from lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, or chlorine bleach
2. Free from synthetic or plastic materials
3. At most 7 percent ash

Wood Fiber must comply with the following:

1. Long strand, whole wood fibers, thermo-mechanically processed from clean, whole wood chips
2. Not made from sawdust, cardboard, paper, or paper byproducts
3. At least 25 percent of fibers 10 millimeters long
4. At least 40 percent held on a No. 25 sieve

Coloring Agent

Use a biodegradable, nontoxic coloring agent free from copper, mercury, and arsenic.

CONSTRUCTION

Site Preparation

Immediately prior to applying seed to erosion control (Hydroseed) areas, trash and debris and weeds must be removed.

Removed weeds must be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Application

Apply erosion control (Hydroseed) materials in separate applications in the following sequence:

1. Apply the following mixture with hydroseeding equipment at the rates indicated within 60 minutes after the seed has been added to the mixture:

Seed Mix 1 (General Slopes)	
Material	Kilograms per Hectare(Slope Measurement)
Seed	11.6
Fiber	1800

Seed Mix 2 (Bioswales/Biostrips)	
Material	Kilograms per Hectare(Slope Measurement)
Seed	15.5
Fiber	1800

2. Apply the following mixture with hydro-seeding equipment at the corresponding rates:

Seed Mix 1 and 2	
Material	Kilograms per Hectare(Slope Measurement)
Fiber	1200
Tackifier	100

The ratio of total water to total tackifier in the mixture must be as recommended by the manufacturer.

Hydraulic application of erosion control (hydroseed) materials for rolled erosion control product (Netting) areas must be applied by hose, from the ground. Erosion control (hydroseed) materials must be applied onto the slope face such that the materials are well integrated into the rolled erosion control product (Netting) and in contact with ground surface. Application must be perpendicular to the slope face such that rolled erosion control product (Netting) materials are not damaged or displaced. Once straw work is started in an area, complete tackifier applications in that area on the same working day.

The Engineer may change the rates of erosion control (hydroseed) materials to meet field conditions.

For any area where erosion control (hydroseed) materials are to be applied, the application of all erosion control (hydroseed) materials to be applied to that area must be completed within 72 hours from when the first materials were applied.

MEASUREMENT AND PAYMENT

Erosion Control (Hydroseed) will be measured by the square meter. The area will be calculated on the basis of actual or computed slope measurements.

The contract price paid per square meter for Erosion Control (Hydroseed) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Erosion Control (Hydroseed) complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.66 ROCK BLANKET:

Rock blanket shall be placed as shown on the plans and in conformance with these Special Provisions.

MATERIALS

Rock for the rock blanket shall be clean, smooth rock obtained from a single source.

Rock shall conform to the following grading:

Screen Size (millimeters)	Percentage Passing
203.2	100
152.4	50-85
101.6	0-50

A sample of the rock shall be submitted to the Engineer for approval prior to delivery of the rock to the project site.

Rock shall be secured in place with Class 2 concrete conforming to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these Special Provisions. Concrete aggregate size shall be 19.05 millimeters maximum.

SITE PREPARATION

Prior to beginning rock blanket work, areas to receive the rock blanket shall be cleared in conformance with the provisions in "Roadside Clearing" of these Special Provisions.

Areas to receive rock blanket shall be cleared of trash and debris. Weeds shall be removed to the ground level. Cleared trash, debris and removed weeds shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

After clearing, the areas shall be excavated to the depth shown on the plans, graded to a smooth uniform surface and compacted to a minimum relative compaction of 90 percent. After compaction, the areas shall be sterilized with dichlobenil. The sterilant shall be applied at the maximum label rate and shall not be applied more than 12 inches beyond the rock blanket limits. Soil sterilant shall conform to the provisions in Section 20-4.026, "Pesticides" of the Standard Specifications, except recommendations from a licensed Pest Control Adviser will not be required.

PLACEMENT

Rock shall be placed while concrete is still plastic, and spaced a maximum of 12.7 millimeters apart. The Contractor shall remove concrete adhering to the exposed surfaces of the rock. Loose rocks, or rock with a gap greater than 9.53 millimeters, measured from the edge of the rock to the surrounding concrete bedding shall be reset at the Contractor's expense by methods determined by the Engineer. Rock blanket shall not be placed to within 0.30 meters of ground cover areas and other plants.

MEASUREMENT AND PAYMENT

Rock blanket will be measured by the square meter as determined from actual measurements made parallel to the ground slope.

The contract price paid per square meter for Rock Blanket shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing rock blanket, complete in place, including furnishing and applying soil sterilant, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer, and no additional compensation will be allowed therefor.

10-1.67 IRRIGATION CROSSOVERS:

Irrigation crossovers shall conform to the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications and these Special Provisions.

Conduits shall be placed in open trenches in conformance with the provisions in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications. Where conduits

will be installed under rock blanket hardscape, conduit shall extend a minimum of 0.5 meters outside of the edge of the rock blanket.

Conduits shall be corrugated high density polyethylene (CHDPE) pipe. Corrugated high density polyethylene pipe shall conform to the requirements in ASTM Designation: F 405 or F 667, or AASHTO Designation: M 252 or M 294 and shall be Type S. Couplings and fittings shall be as recommended by the pipe manufacturer.

Water line crossovers shall conform to the provisions in Section 20-5.03C, "Water Line Crossovers," of the Standard Specifications.

Sprinkler control crossovers shall conform to the provisions in Section 20-5.027D, "Sprinkler Control Crossovers," of the Standard Specifications.

Installation of pull boxes shall conform to the provisions in Section 20-5.027I, "Conductors, Electrical Conduit and Pull Boxes," of the Standard Specifications. When no conductors are installed in electrical conduits, pull boxes for irrigation crossovers shall be installed on a foundation of compacted soil.

The contract price paid per meter for the Irrigation Crossover (Corrugated High Density Polyethylene Pipe Conduit) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the installation of the irrigation crossovers, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.68 IRRIGATION SYSTEMS:

Irrigation systems shall be furnished and installed in conformance with the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications, except materials containing asbestos fibers shall not be used.

Attention is directed to the provisions in "Obstructions" of these special provisions, regarding work over or adjacent to existing underground facilities. Excavation for proposed irrigation facilities shall not be started until the existing underground facilities have been located.

Method A pressure testing shall conform to the provisions in Section 20-5.03H(1), "Method A," of the Standard Specifications, except leaks that develop in the tested portion of the system shall be located and repaired after each test period when a drop of more than 35 kPa is indicated by the pressure gage. After the leaks have been repaired, the one hour pressure test shall be repeated and additional repairs made until the drop in pressure is 35 kPa or less.

Pipe supply lines shall be pressure tested in conformance with the provisions in Section 20-5.03H, "Pressure Testing," of the Standard Specifications, except the pipe (supply line) on the discharge side of the control valve shall be tested by Method B as specified in Section 20-5.03H(2), "Method B," of the Standard Specifications.

Only pipeline trenches and excavation pits for supply lines being supplied from one water service point shall be open at one time. After pressure testing is complete, trenches and pits excavated for pipe supply lines, being supplied from one water service point, shall be backfilled prior to commencing excavations for pipe supply lines being supplied from another water service point.

Open Trenches In Existing Surfacing

Pipe supply lines and control and neutral conductors in electrical conduits, to be installed under existing asphalt concrete surfacing and portland cement concrete sidewalks, shall be installed in open trenches. Pipe supply lines and electrical conduits shall be installed in a common trench. Open trenches shall not be excavated across traffic lanes. Pipe supply line and electrical conduit installations shall conform to the provisions in Section 20-5.03D, "Trenching and Backfilling," of the Standard Specifications.

For pipe supply lines 75 mm or less in diameter and electrical conduits Size 78 or less the trench widths in asphalt concrete surfacing shall not exceed 300 mm and in portland cement concrete sidewalks shall not exceed 450 mm. Tops of the installed pipe supply lines and electrical conduits shall be a minimum of 300 mm below finished grade.

For pipe supply lines more than 75 mm to a maximum of 300 mm in diameter and electrical conduits more than Size 78, the trench widths in asphalt concrete surfacing and portland cement concrete sidewalks shall be a minimum of 150 mm outside of the proposed pipe diameter and electrical conduit size. The depth of trench from finished grade to the top of the largest pipe or electrical conduit shall be a minimum of 4 diameters of the largest pipe or conduit size.

Where no joint exists in a monolithic concrete sidewalk, the concrete sidewalk shall be cut on a neat line at the location designated by the Engineer.

Portland cement concrete curbs, concrete drainage gutters and asphalt concrete dikes shall not be cut or removed for installation of the supply lines and electrical conduit.

The outline of areas of surfacing to be removed shall be cut with an abrasive type saw or a rock cutting excavator specifically designed for this purpose. The minimum depth of cuts in asphalt concrete and portland cement concrete shall be 50 mm. Cuts shall be neat and true with no shatter outside the removal area. Removed asphalt concrete, portland cement concrete, and surplus excavated material shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Pipe supply lines and electrical conduits shall be installed at the bottom of trenches and the trenches shall be backfilled with sand to a depth of 50 mm over the top of the pipes and conduits. The remainder of the trench, excluding the surfacing or pavement, shall be backfilled with material excavated from the trenches, except that rocks, broken concrete, asphalt concrete and other lumps larger than 50 mm in greatest dimension shall not be used.

The compacted thicknesses of the replacement underlying material, hot mix asphalt (HMA), concrete surfacing, and portland cement concrete pavement shall be not less than the thickness of the respective material removed. The finished surface of the compacted HMA

and portland cement concrete shall be flush with the adjacent surface. Where HMA or portland cement concrete is placed adjacent to curbs, the finished surface of the HMA and portland cement concrete shall be flush with the top of the adjacent curb.

HMA for replacing removed asphalt concrete facilities and surfacing shall conform to the provisions in "Roadside Paving (Miscellaneous Areas)" of these special provisions.

Portland cement concrete for replacing removed concrete facilities shall be minor concrete conforming to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications. The concrete shall contain not less than 300 kg of cementitious material per cubic meter. Placing and finishing portland cement concrete for trench surfaces and removed facilities shall be performed by methods which will produce a concrete surface of uniform smoothness and texture equal to or better than the adjacent concrete surface.

Placing and finishing portland cement concrete to replace removed facilities and improvements shall be performed by methods which will produce a concrete surface of uniform smoothness and texture equal to or better than the adjacent concrete surface.

Full compensation for cutting, removing, and replacing improvements (including disposing of surplus removed materials) shall be considered as included in the contract price paid per meter for Irrigation Crossover (Corrugated High Density Polyethylene Pipe Conduit) or Welded Steel Pipe and no additional compensation will be allowed therefor.

Irrigation Crossover (Open Trench)

Irrigation crossovers to be installed under existing surfacing shall include conduits, water line crossovers, sprinkler control crossovers, and appurtenances and shall be installed in conformance with the details shown on the plans and these special provisions.

Conduits shall be installed in open trenches and shall conform to the provisions in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications. Conduits shall be bituminous coated corrugated steel pipe.

Conduits shall be corrugated high density polyethylene (CHDPE) pipe.

Conduits shall be alternative conduits and, at the option of the Contractor, shall be one of the following:

1. Bituminous coated corrugated steel pipe,
2. Corrugated aluminum pipe,
3. Acrylonitrile-butadiene-styrene (ABS) composite pipe,
4. Corrugated high density polyethylene (CHDPE) pipe.

Water line crossovers shall conform to the provisions in Section 20-5.03C, "Water Line Crossovers," of the Standard Specifications.

Sprinkler control crossovers shall conform to the provisions in Section 20-5.027D, "Sprinkler Control Crossovers," of the Standard Specifications.

Pull boxes shall be installed in conformance with the details shown on the plans and shall conform to the provisions in Section 20-5.027I, "Conductors, Electrical Conduit and Pull Boxes," of the Standard Specifications.

Conduits to be installed under existing pavement shall be installed in a trench approximately 300 mm wider than the outside diameter of the conduit to be installed. The top of the installed conduit shall be a minimum of 600 mm below finished grade.

Where no joint exists in a monolithic concrete sidewalk, the concrete sidewalk shall be cut on a straight neat line at the location designated by the Engineer.

Portland cement concrete curbs, concrete drainage gutters and asphalt concrete dikes shall not be cut or removed for installation of conduits.

The outline of areas of surfacing to be removed shall be cut with an abrasive type saw or a rock cutting excavator specifically designed for this purpose. The minimum depth of cuts in asphalt concrete and portland cement concrete shall be 50 mm. Cuts shall be neat and true with no shatter outside the removal area. Removed asphalt concrete, portland cement concrete and surplus excavated material shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Backfill for trenches shall be structure backfill conforming to the provisions in Section 19-3.06, "Structure Backfill," of the Standard Specifications.

The compacted thicknesses of the replacement underlying material, hot mix asphalt (HMA), and portland cement concrete shall be not less than the thickness of the respective material removed as specified above. The finished surface of the HMA and portland cement concrete shall be flush with the adjacent surface. Where HMA surfacing or portland cement concrete is placed adjacent to curbs, the finished surface of the HMA surfacing and portland cement concrete shall be flush with the top of the adjacent curb.

HMA for replacing removed asphalt concrete surfacing and facilities shall conform to the provisions in "Roadside Paving (Miscellaneous Areas)" of these special provisions.

HMA for replacing removed asphalt concrete surfacing and facilities shall conform to the following requirements:

1. HMA shall be produced at a central mixing plant.
2. Paving asphalt and aggregates shall be commercial quality.
3. The amount of asphalt binder to be mixed with the aggregate shall be between 5 percent and 10 percent by mass of the dry aggregate. The exact amount will be determined by the Engineer.
4. The aggregate shall have a Sand Equivalent value of not less than 30.
5. The aggregate shall conform to the 9.5-mm grading specified for HMA Type B in Section 39-1.02E, "Aggregate," of the Standard Specifications.
6. A Certificate of Compliance shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

HMA shall be spread at a temperature of not less than 121°C. HMA shall be spread and compacted by methods that will produce a hot mix asphalt surfacing of uniform smoothness and texture.

HMA placed in trenches may be placed in one layer provided the compacted thickness is 76 mm or less.

HMA shall be thoroughly compacted. Where practicable, HMA shall be rolled with power rollers. Where the power rollers cannot be operated, compaction shall be obtained by hand rollers or an impactor.

Concrete for replacing removed concrete facilities shall be minor concrete conforming to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications. Placing and finishing concrete for removed concrete facilities shall be performed by methods which will produce a concrete surface of uniform smoothness, color and texture equal to or better than the adjacent concrete surface.

Full compensation for water line crossover appurtenances, cutting, removing and disposing of existing asphalt concrete surfacing and concrete facilities; excavation and backfill; replacing existing asphalt concrete surfacing with HMA and portland cement concrete facilities; and checking and pressure testing supply line pipe in conduit shall be considered as included in the contract price paid per meter for Irrigation Crossover (Corrugated High Density Polyethylene Pipe Conduit) or Welded Steel Pipe and no separate payment will be made therefor.

Full compensation for water line crossover appurtenances, cutting, removing and disposing of existing asphalt concrete surfacing and concrete facilities; excavation and backfill; replacing existing asphalt concrete surfacing with HMA and Portland cement concrete facilities; and checking and pressure testing supply line pipe in conduit shall be considered as included in the contract price paid per meter for Irrigation Crossover (Corrugated High Density Polyethylene Pipe Conduit) or Welded Steel Pipe and no separate payment will be made therefor.

10-1.69 AGGREGATE SUBBASE:

Aggregate subbase must comply with Section 25, "Aggregate Subbases," of the Standard Specifications and these Special Provisions.

Aggregate subbase must be Class 2.

Do not store reclaimed asphalt concrete or aggregate subbase with reclaimed asphalt concrete within 30 m measured horizontally of any culvert, watercourse, or bridge.

Quantities of Aggregate Subbase will be paid for at the contract price per cubic meter and shall conform to the provisions in Section 25-1.06, "Measurement," and Section 25-1.07, "Payment," of the Standard Specifications and these Special Provisions.

10-1.70 AGGREGATE BASE:

Aggregate base must comply with Section 26, "Aggregate Bases," of the Standard Specifications and these Special Provisions. Aggregate base must be class 2.

Do not store reclaimed asphalt concrete or aggregate base with reclaimed asphalt concrete within 30 m measured horizontally of any culvert, watercourse, or bridge.

The first paragraph of Section 26-1.02A, "Class 2 Aggregate Base," of the Standard Specifications shall be modified to read:

Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious matter, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm and stable base. Aggregate may consist of broken and crushed asphalt concrete or Portland cement concrete and may contain crushed aggregate base or other rock materials. The material may contain no more than 3 percent brick by weight as determined by California Test Method 202 as modified: Brick material retained on a No.4 sieve shall be identified visually and separate manually. Brick quantification shall be based on total weight of dry sample. Also, material retained on the 4.75 mm (No.4) sieve shall contain no more than 15 percent of particles (gravel) that have no more than one fractured face.

The Quality Requirements contained in Section 26-1.02A, "Class 2 Aggregate Base" of the Standard Specifications shall be modified to read:

QUALITY REQUIREMENTS

Test	Contract Compliance
Resistance (R Value)	
Virgin Rock	78 Minimum
Crushed Miscellaneous	80 Minimum
Sand Equivalent	35 Minimum
Durability Index	35 Minimum
Percentage Wear	
100 Revolutions	15 Maximum
500 Revolutions	52 Maximum

Quantities of Aggregate Base will be paid for at the contract unit price per cubic meter and in accordance with the provisions of Section 26-1.07 "Payment," of the Standard Specifications.

Aggregate may include processed glass. Place aggregate base with glass only where the material is to be permanently covered.

10-1.71 LEAN CONCRETE BASE:

Lean concrete base shall conform to the provisions in Section 28, "Lean Concrete Base," of the Standard Specifications and these Special Provisions.

The finished surface of lean concrete base shall not be above the grade established by the Engineer, or more than 15 mm below the grade established by the Engineer.

The quantity of Lean Concrete Base to be paid for will be measured by the cubic meter. The volume to be paid for will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any change ordered by the Engineer. No allowance will be made for lean concrete base placed outside those dimensions unless otherwise ordered by the Engineer.

The contract price paid per cubic meter for Lean Concrete Base shall include full compensation for furnishing all labor, materials (including cement in the amount of 160 kg per cubic meter of lean concrete base), tools, equipment and incidentals, and for doing all the work involved in constructing lean concrete base as shown on the plans, as specified in these specifications and the Special Provisions, and as directed by the Engineer.

10-1.72 HOT MIX ASPHALT:

GENERAL

Summary

This work includes producing and placing hot mix asphalt (HMA) Type A, using the Standard process.

Comply with Section 39, "Hot Mix Asphalt" of the Standard Specifications.

Submittals

Data Cores

Three business days before starting coring, submit proposed methods and materials for backfilling data core holes.

Submit to the Engineer and electronically to Coring@dot.ca.gov:

1. A summary of data cores taken
2. A photograph of each data core

For each data core, the summary must include:

1. Project identification number
2. Date cored
3. Core identification number

4. Type of materials recovered
5. Type and approximate thickness of unstabilized material not recovered
6. Total core thickness
7. Thickness of each individual material to within:

7.1 For recovered material, 12.5 mm

7.2 For unstabilized material, 25 mm

8. Location including:

- 8.1. County
- 8.2. Route
- 8.3. Post mile
- 8.4. Lane number
- 8.5. Lane direction
- 8.6. Station

Each data core digital photograph must include a ruler laid next to the data core. Each photograph must include:

1. The core
2. Project identification number
3. Core identification number
4. Date cored
5. County
6. Route
7. Post mile
8. Lane number
9. Lane direction

After data core summary and photograph submittal, dispose of cores under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

MATERIALS

Asphalt Binder

The grade of asphalt binder mixed with aggregate for HMA Type A must be 19-mm.

Aggregate

The aggregate for HMA Type A must comply with the 19-mm grading.

CONSTRUCTION

Vertical Joints

If you perform half-width paving, at the end of each day's work the distance between the ends of adjacent surfaced lanes must not be greater than can be completed in the following day of normal paving.

Before opening the lane to public traffic, pave shoulders and median borders adjacent to a lane being paved.

Do not leave a vertical joint more than 45 mm high between adjacent lanes open to public traffic.

Place HMA on adjacent traveled way lanes so that at the end of each work shift, the distance between the ends of HMA layers on adjacent lanes is between 1.5 m and 3.0 m. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place Kraft paper or another approved bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.

Widening

If widening existing pavement, construct new structural section on both sides of the existing pavement to match the elevation of the existing pavement's edge for the project's entire length before placing HMA over the existing pavement.

If widening existing pavement, construct new structural section on both sides of the existing pavement to match the elevation of the existing pavement's edge at each location before placing HMA over the existing pavement.

If widening existing pavement, construct new structural section on both sides of the existing pavement to match the elevation of the existing pavement's edge in increments of at least 1.5 meters left or 2.4 meters right before placing HMA over the existing pavement.

Conform Tapers

Place shoulder conform tapers concurrently with the adjacent lane's paving.

Place additional HMA along the pavement's edge to conform to road connections and private drives. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

Data Cores

Take data cores that include the completed HMA pavement, underlying base, and subbase material. Protect data cores and surrounding pavement from damage.

Take 100-mm or 150-mm diameter data cores:

1. At the beginning, end, and every 800 m within the paving limits of each route on the project
2. After all paving is complete
3. From the center of the specified lane

On a 2-lane roadway, take data cores from either lane. On a 4-lane roadway, take data cores from each direction in the outermost lane. On a roadway with more than 4 lanes, take data cores from the median lane and the outermost lane in each direction.

Each core must include the stabilized materials encountered. You may choose not to recover unstabilized material but you must identify the material. Unstabilized material includes:

1. Granular material
2. Crumbled or cracked stabilized material
3. Sandy or clayey soil

PAYMENT

Hot Mix Asphalt will be paid for at a unit price per tonne as a combined item, including mineral aggregate and asphalt binder.

The Data Cores are included in the contract prices paid per tonne for Hot Mix Asphalt and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in constructing hot mix asphalt, complete in place, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

The County of Riverside will pay for HMA dike at the contract price per linear meter for Place Hot Mix Asphalt Dike and by the tonne for Hot Mix Asphalt. The contract prices paid per linear meter for Place Hot Mix Asphalt Dike shall include full compensation for furnishing all labor, tools, equipment, and incidentals, and for doing all the work involved in placing HMA dike, complete in place, including excavation, backfill, and preparation of the area to receive the dike, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

10-1.73

HOT MIX ASPHALT (TYPE A BOND BREAKER):

Hot Mix Asphalt (Type A Bond Breaker) shall conform to the provisions specified for Type A Hot Mix Asphalt in Section 39, "Hot Mix Asphalt," of the Standard Specifications and these special provisions. Hot Mix Asphalt (Type A, Bond Breaker) shall be placed as shown on the plans.

The aggregate for Hot Mix Asphalt (Type A Bond Breaker) shall conform to the 9.5-mm, maximum, grading specified in Section 39-2.02, "Aggregate," of the Standard Specifications. The grade of asphalt binder to be mixed with aggregate for Hot Mix Asphalt (Type A, Bond Breaker) shall be Grade PG 64-10 and shall conform to the provisions in Section 92, "Asphalt," of the Standard Specifications.

The amount of asphalt binder used in asphalt concrete (Type A Bond Breaker) shall be increased by one percent by mass of the aggregate over the amount of asphalt binder determined for use in Type A Hot Mix Asphalt in conformance with the requirements in California Test 367. The asphalt content of the asphalt mixture will be determined in conformance with the requirements in California Test 379 or in conformance with the requirements in California Test 382.

The finished surface of the Hot Mix Asphalt (Type A Bond Breaker) shall not extend above the grade established by the Engineer. Hot Mix Asphalt (Type A Bond Breaker) with a surface higher than the grade established by the Engineer shall be cold planed until the surface of Hot Mix Asphalt (Type A Bond Breaker) conforms to the tolerances specified. Cold planing equipment shall be power driven and specifically designed to produce a smooth surface that conforms to the straight edge requirements specified in Section 39-6.03, "Compacting" of the Standard Specifications. Hot Mix Asphalt (Type A Bond Breaker) with a surface lower than 15 mm below the grade established by the Engineer shall be removed and replaced with Hot Mix Asphalt (Type A Bond Breaker) which complies with requirements of these specifications.

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced with Hot Mix Asphalt (Type A Bond Breaker), except when eliminated by the Engineer.

Paint binder (tack coat) shall be, at the option of the Contractor, either slow-setting type asphaltic emulsion, rapid setting asphaltic emulsion or paving asphalt. Slow-setting type asphaltic emulsion and rapid setting asphaltic emulsion shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications.—When paving asphalt is used for paint binder, the grade will be determined by the Engineer. Paving asphalt shall conform to the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and the provisions in Section 92, "Asphalts," of the Standard Specifications.

Paint binder (tack coat) shall be applied in the liter per square meter range limits specified for the surfaces to receive hot mix asphalt in the tables below. The exact application rate within the range will be determined by the Engineer.

Application Rates for Asphaltic Emulsion Paint Binder (Tack Coat) for <u>Hot Mix Asphalt</u> (Type A Bond Breaker) on Portland Cement Concrete Pavement		
Type of surface to receive paint binder (tack coat)	Slow-Setting Asphaltic Emulsion L/m ² (Note A)	Rapid-Setting Asphaltic Emulsion L/m ² (Note B)
Lean Concrete Base	0.20 – 0.35	0.10 – 0.20

Note A: Slow-setting asphaltic emulsion is asphaltic emulsion diluted with additional water. Water shall be added and mixed with the asphaltic emulsion (containing up to 43 percent water) so the resulting mixture contains one part asphaltic emulsion and not more than one part added water. The water shall be added by the emulsion producer or at a facility that has the capability to mix or agitate the combined blend.

Note B: Undiluted rapid-setting asphaltic emulsion.

Application Rates for Paint Binder (Tack Coat) for <u>Hot Mix Asphalt</u> (except Open Graded)	
Type of surface to receive paint binder (tack coat)	Paving Asphalt L/m ²
Lean Concrete Base	0.05 – 0.10

When asphaltic emulsion is used as paint binder (tack coat), Hot Mix Asphalt (Type A Bond Breaker) shall not be placed until the applied asphaltic emulsion has completely changed color from brown to black.

White pigmented curing compound shall be applied to the finished surface of the asphalt concrete (Type A, Bond Breaker) prior to placement of the portland cement concrete pavement. Pigmented curing compound shall conform to the requirements of ASTM Designation C 309, Type 2, Class A. Curing compound shall be applied in 2 separate applications to the area to be surfaced with portland cement concrete pavement. Each application of curing compound shall be applied at the approximate rate of one liter per 3.7 m².

Hot Mix Asphalt (Type A, Bond Breaker) will be measured and paid for in the same manner specified for Type A asphalt concrete in conformance with the requirements of Section 39-8, "Measurement and Payment," of the Amendments to the Standard Specifications.

Full compensation for the additional one percent of asphalt binder used in Hot Mix Asphalt (Type A Bond Breaker) and for furnishing and applying white pigmented curing compound to the surface of the Hot Mix Asphalt (Type A Bond Breaker) shall be considered as included in the contract price paid per cubic meter for Hot Mix Asphalt (Type A Bond Breaker).

10-1.74 HOT MIX ASPHALT (MISCELLANEOUS AREAS):

GENERAL

Summary

This work includes producing hot mix asphalt (HMA) and placing it on miscellaneous areas.

Comply with Section 39, "Hot Mix Asphalt," of the Standard Specifications.

CONSTRUCTION

In median areas adjacent to slotted median drains, each layer of HMA must not exceed 66 mm maximum compacted thickness.

MEASUREMENT AND PAYMENT

If there is a contract item for Place Hot Mix Asphalt (Miscellaneous Area) paid for by the square meter, this item is limited to ditches, overside drains, aprons at the ends of drainage structures, and is in addition to the contract items for the materials involved.

Full compensation for tack coat for miscellaneous areas is considered as included in the contract price paid per tonne for the Hot Mix Asphalt used in miscellaneous areas and no separate payment will be made therefor

10-1.75 TACK COAT (PAINT BINDER):

GENERAL

Summary

This work includes applying liquid tack coat. The Engineer designates areas receiving tack coat.

Comply with Section 39, "Hot Mix Asphalt," of the Amendments to the Standard Specifications.

MATERIALS

Liquid asphalt for tack coat must be Grade SS-1h.

CONSTRUCTION

Apply as specified in Section 39-1.09C, "Tack Coat," of the Amendments to the Standard Specifications.

MEASUREMENT AND PAYMENT

If there is no contract item for liquid asphalt (tack coat), full compensation for furnishing and applying the tack coat is included in the contract price paid per tonne for Hot Mix Asphalt and no separate payment will be made therefor.

10-1.76 PRIME COAT:

GENERAL

Summary

This work includes applying liquid asphalt prime coat. The Engineer designates areas receiving prime coat.

Comply with Section 93, "Liquid Asphalts," of the Standard Specifications.

MATERIALS

Liquid asphalt for prime coat must be Grade SC-70.

CONSTRUCTION

Apply at least 0.90 L of prime coat per square meter of designated area. Do not apply more prime coat than can be absorbed completely by the aggregate base in 24 hours.

Contractor may request in writing the Engineer's approval to modify prime coat application rates.

Before paving, prime coat must cure for 48 hours.

Close public traffic to areas receiving prime coat. Do not track prime coat onto pavement surfaces beyond the job site.

MEASUREMENT AND PAYMENT

The Engineer determines prime coat quantities under the specifications for liquid asphalt in Section 93-1.04, "Measurement," of the Standard Specifications.

If there is no contract item for liquid asphalt (prime coat), full compensation for furnishing and applying the prime coat is included in the contract price paid per tonne for Hot Mix Asphalt and no separate payment will be made therefor.

COMPENSATION ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS:

The provisions of this section shall apply only to the following contract items:

ITEM CODE	ITEM
390102	HOT MIX ASPHALT (TYPE A)
390102A	HOT MIX ASPHALT (TYPE A) BOND BREAKER

The compensation payable for asphalt binder used in hot mix asphalt will be increased or decreased in conformance with the provisions of this section for asphalt binder price fluctuations exceeding 10 percent (I_u/I_b is greater than 1.10 or less than 0.90) which occur during performance of the work.

The adjustment in compensation will be determined in conformance with the following formulae when the item of hot mix asphalt is included in a monthly estimate:

- A. Total monthly adjustment = AQ
- B. For an increase in asphalt binder price index exceeding 10 percent:

$$A = 0.90 (1.1023) (I_u/I_b - 1.10) I_b$$

- C. For a decrease in asphalt binder price index exceeding 10 percent:

$$A = 0.90 (1.1023) (I_u/I_b - 0.90) I_b$$

- D. Where:

A = Adjustment in dollars per tonne of asphalt binder used to produce hot mix asphalt rounded to the nearest \$0.01.

I_u = The California Statewide Paving Asphalt Price Index which is in effect on the first business day of the month within the pay period in which the quantity subject to adjustment was included in the estimate.

I_b = The California Statewide Paving Asphalt Price Index for the month in which the bid opening for the project occurred.

Q = Quantity in tonnes of asphalt binder that was used in producing the quantity of hot mix asphalt shown under "This Estimate" on the monthly estimate using the amount of asphalt binder determined by the Engineer.

The adjustment in compensation will also be subject to the following:

- A. The compensation adjustments provided herein will be shown separately on payment estimates. The Contractor shall be liable to the County for decreased compensation adjustments and the County of Riverside may deduct the amount thereof from moneys due or that may become due the Contractor.
- B. Compensation adjustments made under this section will be taken into account in making adjustments in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

- C. In the event of an overrun of contract time, adjustment in compensation for asphalt binder included in estimates during the overrun period will be determined using the California Statewide Paving Asphalt Price Index in effect on the first business day of the month within the pay period in which the overrun began.

The California Statewide Paving Asphalt Price Index is determined each month on the first business day of the month by the State of California, Department of Transportation using the median of posted prices in effect as posted by Chevron, ExxonMobil, and Union 76 for the Buena Vista, Huntington Beach, and Midway Sunset fields.

In the event that the companies discontinue posting their prices for a field, the State of California, Department of Transportation will determine an index from the remaining posted prices. The State of California, Department of Transportation reserves the right to include in the index determination the posted prices of additional fields.

The California Statewide Paving Asphalt Price Index is available on the Division of Engineering Services website at:

http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html

10-1.78 JOINTED PLAIN CONCRETE PAVEMENT:

GENERAL

Jointed plain concrete pavement shall be constructed in conformance with the provisions in Section 40, "Portland Cement Concrete Pavement," of the Standard Specifications and these special provisions, and as shown on the plans.

Insert method for forming joints in pavement shall not be used.

PREPAVING CONFERENCE

Supervisory personnel of the Contractor and subcontractors who are to be involved in the concrete paving work shall meet with the Engineer at a prepaving conference, at a mutually agreed time, to discuss methods of accomplishing the paving work.

The Contractor shall provide a facility for the prepaving conference within 5 km of the construction site or at a nearby location agreed to by the Engineer. Attendance at the prepaving conference is mandatory for the Contractor's project superintendent, paving construction foreman, subcontractor's workers, including foremen and personnel performing saw cutting, joint sealing, concrete plant manager, and concrete plant operator. Conference attendees shall sign an attendance sheet provided by the Engineer. Production and placement shall not begin nor proceed unless the above-mentioned personnel have attended the mandatory prepaving conference.

JUST-IN-TIME TRAINING

Attending a 4-hour Just-In-Time Training (JITT) shall be mandatory, and consist of a formal joint training class on portland cement concrete and paving techniques. Construction operations for portland cement concrete paving shall not begin until the Contractor's and the Engineer's personnel have completed the mandatory JITT. The Contractor's personnel included in the list of participants for the prepaving conference as well as the Engineer's representatives shall attend JITT. JITT shall be in addition to the prepaving conference.

The JITT class will be conducted for not less than 4 hours on portland cement concrete pavement and paving techniques. The training class may be an extension of the prepaving conference and shall be conducted at a project field location convenient for both the Contractor and the Engineer. The JITT class shall be completed at least 15 days, not including Saturdays or holidays, prior to the start of portland cement concrete paving operations. The class shall be held during normal working hours.

The JITT instructor shall be experienced in the construction methods, materials, and test methods associated with construction of portland cement concrete pavement and paving techniques. The instructor shall not be an employee of the Contractor or a member of the Engineer's field staff. A copy of the course syllabus, handouts, and presentation material shall be submitted to the Engineer at least 7 days before the day of the training. The Contractor and the Engineer shall mutually agree to course instructor, the course content, and training site. The instructor shall issue a certificate of completion to the participants upon completion of the class. The certificate of completion shall include the course title, date and location of the class, the name of the participant, instructor's name, location and telephone number.

The Contractor's or Engineer's personnel involved with portland cement concrete paving operations will not be required to attend JITT if they have completed equivalent training within the previous 12 months of the date of the JITT for this project. The Contractor shall provide a certificate of class completion as described above for each staff member to be excluded from the JITT class. The Engineer will provide the final determination for exclusion of staff member's participation. Attendees of the JITT shall complete, and submit to the Engineer, an evaluation of the training. The Engineer will provide the course evaluation form.

Just-In-Time Training shall not relieve the Contractor of responsibility under the contract for the successful completion of the work in conformance with the requirements of the plans and specifications.

MATERIALS

Concrete

Attention is directed to Section 90, "Portland Cement Concrete," of the Standard Specifications, regarding mix proportions for concrete being determined by the Contractor.

Primary aggregate gradings shall conform to the gradation requirements of Section 90-3, "Aggregate Gradings," of the Standard Specifications. When combined in the proportions determined by the Contractor, the percent passing the 9.5 mm sieve and retained on the 2.36 mm sieve shall not be less than 16 percent of the total aggregate.

The cementitious material content shall not exceed 400 kg/m^3 .

Tie Bars

Tie bars shall be deformed reinforcing steel bars conforming to the requirements of ASTM Designation: A 615/A 615M, Grade 280 or 420; ASTM Designation: A 615/A 615M (Grade 280 or 420), A996/A996M or A706/A706M. Tie bars shall be epoxy-coated in conformance with the requirements in ASTM Designation: A 934/A 934M or A 775/A 775M and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except the epoxy-coating thickness after curing shall be between 175 micrometers to 400 micrometers (7 mils to 16 mils). Fabrication, sampling and jobsite handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except the 2 samples shall be 750 mm long. Epoxy-coated tie bars shall not be bent.

Epoxy (Drill and Bond)

Epoxy for bonding tie bars and dowel bars to portland cement concrete shall be a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V, Grade 3 (Non-Sagging), Class A, B or C. The class used shall be dependent on the internal temperature of the hardened concrete at the time the epoxy is to be applied. Class A shall be used when the internal temperature is below 4°C , but not lower than recommended by the manufacturer. Class B shall be used when the internal temperature is from 4°C to 15°C . Class C shall be used when the internal temperature is above 15°C , but not higher than recommended by the manufacturer. A Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished with the epoxy. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer at least 7 days prior to the start of work. Epoxy shall be applied in conformance with the manufacturer's recommendations.

Dowel Bars

Dowel bars shall be plain round smooth, epoxy-coated steel conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 280 or 420, the details shown on the plans and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that the two samples required in ASTM Designation D 3963/D 3963M shall be 460 mm long. Epoxy coating of dowel bars shall conform to the provisions in ASTM Designation: A 884/A 884M, Class A, Type 1 or Type 2, except that the bend test shall not apply.

Dowel bars shall be free from burrs or other deformations detrimental to free movement of the bars in the concrete.

Bond Breaker

Dowel bars shall be lubricated with a bond breaker over the entire bar. A bond breaker application of petroleum paraffin based lubricant or white-pigmented curing compound shall be used to coat the dowel bars completely prior to placement. Oil and asphalt based bond breakers shall not be used. Paraffin based lubricant shall be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal. Paraffin based lubricant shall be factory applied. White pigmented curing compound shall conform to the requirements of ASTM

Designation: C 309, Type 2, Class A, and shall contain 22 percent minimum nonvolatile vehicles consisting of at least 50 percent paraffin wax. Curing compound shall be applied in 2 separate applications, the last application not more than 8 hours prior to placement of the dowel bars. Each application of curing compound shall be applied at the approximate rate of one liter per 3.7 m².

Dowel Bar Baskets

Dowel bar baskets shall be manufactured with a minimum welded wire gage number of MW 65. Baskets shall be either U-frame or A-frame shape. J-frame shapes shall not be used. Baskets shall be fabricated in conformance with the requirements in ASTM Designation: A 82. Welding of baskets shall conform to the requirements in AASHTO Designation: M 254. A broken weld will be a cause for rejection of the basket. Baskets shall be Class A, Type 1 epoxy-coated in conformance with the requirements in ASTM Designation: A 884/A 884M. Fabrication and job-site handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that sampling of epoxy-coated wire reinforcement will not be required. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished for each shipment of epoxy-coated wire reinforcement certifying that the coated bars conform to the requirements in ASTM Designation: A 884/A 884M and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include the certifications specified in ASTM Designation: A 884/A 884M and a statement that the coating material has been pre-qualified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

Concrete fasteners shall be used for anchoring dowel bar baskets to lean concrete base, hot mix asphalt used as base, asphalt treated permeable base, or cement treated permeable base. Concrete fasteners shall be driven fasteners such as concrete nails, used specifically for fastening to hardened concrete, or hot mix asphalt used as base. Concrete fasteners shall conform to the requirements of ASTM Designation: F 1667. Concrete nails used as fasteners on lean concrete base or hot mix asphalt used as base shall have a minimum shank diameter of 4 mm with a minimum shank length of 64 mm. Concrete nails used as fasteners on asphalt treated or cement treated permeable base shall have a minimum shank diameter of 4 mm with a minimum shank length of 120 mm. Shank length shall be the distance from the point to the bottom of the nail head. Clips and washers shall be commercial quality manufactured for use with dowel bar baskets. The surface of concrete fasteners, clips, and washers shall be either zinc electroplated or galvanized with a minimum coating thickness of 0.005-mm.

Tie Bar Baskets

Tie bar baskets shall be manufactured with a minimum welded wire gage number of MW 65. Baskets shall be either U-frame or A-frame shape. J-frame shapes shall not be used. Tie bar baskets shall be fabricated in conformance with the requirements in ASTM Designation: A 82. Welding of baskets shall conform to the requirements in AASHTO Designation: M 254. A broken weld will be a cause for rejection of the basket. Baskets shall be Class A, Type 1 epoxy-coated in conformance with the requirements in ASTM Designation: A 884/A 884M. Fabrication and job-site handling shall conform to the requirements in ASTM Designation: D 3963 and the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that sampling of epoxy-coated wire

reinforcement will not be required. A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished for each shipment of epoxy-coated wire reinforcement certifying that the coated bars conform to the requirements in ASTM Designation: A 884/A 884M and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include the certifications specified in ASTM Designation: A 884/A 884M and a statement that the coating material has been pre-qualified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

Concrete fasteners shall be used for anchoring tie bar baskets to lean concrete base, hot mix asphalt used as base, asphalt treated permeable base, or cement treated permeable base. Concrete fasteners shall be driven fasteners such as concrete nails, used specifically for fastening to hardened concrete, or hot mix asphalt used as base. Concrete fasteners shall conform to the requirements of ASTM Designation: F 1667. Concrete nails used as fasteners on lean concrete base or hot mix asphalt used as base shall have a minimum shank diameter of 4 mm with a minimum shank length of 64 mm. Concrete nails used as fasteners on asphalt treated or cement treated permeable base shall have a minimum shank diameter of 4 mm with a minimum shank length of 120 mm. Shank length shall be the distance from the point to the bottom of the nail head. Clips and washers shall be commercial quality manufactured for use with tie bar baskets. The surface of concrete fasteners, clips, and washers shall be either zinc electroplated or galvanized with a minimum coating thickness of 0.005-mm.

Reinforcement

Reinforcement shall be epoxy coated and shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications.

Asphalt Rubber Joint Sealant

Asphalt rubber joint sealant shall conform to the requirements of ASTM Designation: D 3405 as modified herein or to the following:

1. Asphalt rubber joint sealant shall be a mixture of paving asphalt and ground rubber. Ground rubber shall be vulcanized or a combination of vulcanized and devulcanized materials ground so that 100 percent will pass a 2.36-mm sieve. The mixture shall contain not less than 22 percent ground rubber, by mass. Modifiers may be used to facilitate blending.
2. The asphalt rubber sealant shall have a Ring and Ball softening point of 57°C minimum, when tested in conformance with the requirements in AASHTO Designation: T 53.
3. The asphalt rubber sealant material shall be capable of being melted and applied to cracks and joints at temperatures below 204°C.

The penetration requirement of Section 4.2 of ASTM Designation: D 3405 shall not apply. The required penetration shall not exceed 120, at 25°C, 150 g, 5 s.

The resilience requirement of Section 4.5 of ASTM Designation: D 3405 shall not apply. The required resilience shall be a minimum of 50 percent recovery, when tested at 25°C.

Each lot of asphalt rubber joint sealant shipped to the job site, whether as specified herein or conforming to the requirements of ASTM Designation: D 3405, as modified herein, shall be

accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, and shall be accompanied with storage and heating instructions and precautionary instructions for use. The Certificate shall be accompanied with a certified test report of the results of the required tests performed on the joint sealant material within the previous 12 months prior to proposed use. The Certificate and accompanying test report shall be provided for each lot of sealant prior to use on the project.

Asphalt rubber joint sealant materials shall be heated and placed in conformance with the manufacturer's written instructions and the details shown on the plans. The manufacturer's instructions shall be provided to the Engineer at the prepaving conference. Asphalt rubber joint-sealant materials shall not be placed when the pavement surface temperature is below 10°C.

Preformed Compression Joint Sealant

Foam Backer Rods

Foam backer rods shall be Type 1, conforming to the requirements of ASTM Designation: D 5249. Foam backer rods shall have a diameter prior to placement at least 25 percent greater than the width of the sawcut and shall be expanded, crosslinked, closed-cell polyethylene foam that is compatible with the joint sealant so that no bond or adverse reaction occurs between the rod and sealant. Hot applied sealant that will melt the foam backer rod shall not be used. The Contractor shall submit a manufacturer's data sheet verifying that the foam backer rod is compatible with the sealant to be used.

Joint Filler Material

Joint filler material shall be preformed expansion joint filler for concrete (bituminous type), conforming to the requirements of ASTM Designation: D 994.

A Certificate of Compliance for the joint filler material shall be furnished to the Engineer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall be accompanied with a certified test report of the results of the required tests performed on the joint filler material within the previous 12 months prior to proposed use. The certificate and accompanying test report shall be provided for each lot of joint filler material prior to use on the project.

Hydraulic Cement Grout (non-shrink)

Hydraulic cement grout (non-shrink) shall conform to the requirements in ASTM Designation: C 1107. At the Contractor's option, clean, uniformly rounded aggregate filler may be used to extend the grout. The extension of grout shall not exceed 60 percent of the mass of the grout or the maximum amount of grout extension recommended by the manufacturer, whichever is less. The moisture content of the aggregate filler shall not exceed 0.5-percent. Grading of the aggregate filler shall conform to the following:

Sieve Size	Percentage Passing
12.5 mm	100
9.5 mm	85-100
4.75 mm	10-30
2.36 mm	0-10
1.10 mm	0-5

PAVEMENT CONCRETE MIX PROPORTIONS

The Contractor shall determine the mix proportions for pavement concrete. The laboratory used to develop the mix proportions shall meet the requirements of ASTM Designation: C 1077, and shall have current AASHTO accreditation for test methods AASHTO Designation: T 97 or ASTM Designation: C 78, and AASHTO Designation: T 126 or ASTM Designation: C 192.

The minimum cementitious materials content or the maximum water to cementitious materials ratio shall be determined in conformance with the requirements in California Test 559. Trial mixtures shall be made no more than 24 months before field qualification. The minimum cementitious materials content or the maximum water to cementitious materials ratio shall be that determined from the trial mixtures curve to produce a minimum modulus of rupture of 3.9 MPa at 28 days age and 4.5 MPa at 42 days age. To account for variances in materials, production of concrete, and modulus of rupture testing, the Contractor shall include as part of the proposed mix proportions an increase to the cementitious material content or a decrease to the water to cementitious materials ratio, determined from trial mixtures, to ensure that portland cement concrete produced during paving operations conforms to the requirements in "Modulus of Rupture," in this section.

At least 15 days prior to field qualification, the Contractor shall submit the proposed pavement concrete mix proportions with laboratory test reports. Laboratory test reports shall include modulus of rupture determined for each trial mixture at ages of 10, 21, 28 and 42 days in conformance with the applicable portions of California Test 559.

Field Qualification

Field qualification of proposed mix proportions will be required prior to placement of pavement concrete. The Contractor shall perform field qualification and submit certified test data to the Engineer. Field qualification data shall be based upon the proposed use of materials, mix proportions, mixing equipment, procedures and size of batch.

Proposed concrete mix proportions will be field qualified when the test results of five beams from a single batch of concrete indicate the average modulus of rupture is at least 3.9 MPa with no single beam lower than 3.8 MPa at an age of the Contractor's choice but not later than 28 days. Beams shall be tested for modulus of rupture at a minimum of 10, 21, and 28 days of age. Test specimens shall be made and tested in conformance with the requirements in California Test 523.

The certified field qualification test data reports shall include the following:

1. Date of mixing,
2. Mixing equipment and procedures used,
3. Volume of batch in cubic meters and the mass or volume,

4. Type and source of ingredients used,
5. Penetration and slump of the concrete,
6. The air content of the concrete, and
7. The age at time of testing and strength of concrete specimens tested.

Field qualification test data reports shall be signed by a certified representative in charge of the laboratory that performed the tests.

If the Contractor changes a source of supply or proportions, the Contractor shall submit a new proposed mix design and furnish samples from the new source, or sources, at least 60 days prior to their intended use. The new mix proportions shall be trial batched and field qualified, unless, the Engineer determines the change is not substantive. No extension of contract time will be allowed for the time required to perform the sampling, testing, preparing and qualifying new mix proportions for new aggregate sources proposed by the Contractor.

MODULUS OF RUPTURE

The Engineer will test portland cement concrete pavement for modulus of rupture in conformance with the requirements in California Test 523. Acceptance will be on a lot basis. Each lot shall not to exceed 750 m³ of concrete pavement. The Engineer will determine sample locations. A minimum of six beam specimens shall be made from each sample. Beam specimens will be tested for modulus of rupture at 10, 21, and 28 days. The modulus of rupture for each lot will be calculated by averaging the results of two beams representing that lot tested at 28 days of age. The difference in modulus of rupture between each individual beam result shall not exceed 0.44-MPa.

The Contractor shall perform sampling and testing of beam specimens through a State or County approved facility to determine if concrete pavement has achieved a modulus of rupture of 2.4 MPa when requesting early use of concrete pavement in conformance with the provisions in Section 90-8.03, "Protecting Concrete Pavement," of the Standard Specifications. Beam specimens shall be made and tested in conformance with the requirements in California Test 523.

INSTALLING TIE BARS

Tie bars shall be installed at longitudinal contact joints and longitudinal weakened plane joints as shown on the plans. Contiguous width of new portland cement concrete pavement tied together with tie bars shall not exceed 15 m. Tie bars shall not be installed at joints between portland cement concrete and hot mix asphalt pavements.

Tie bars shall be installed at longitudinal joints by one of the following methods:

1. Drilling and bonding tie bars with two-component, epoxy-resin that conforms to this section. Drilled holes shall be cleaned in conformance with the epoxy manufacturer's instructions and shall be dry at the time of placing the epoxy and tie bars. Tie bars will be rotated 180° while being inserted into the epoxy filled holes. Immediately after inserting the tie bars into the epoxy, the tie bars shall be supported as necessary to prevent movement during curing and shall remain undisturbed until the epoxy has cured as specified by the manufacturer instructions. Tie bars that are improperly placed or bonded, as determined by the Engineer, will be rejected. If rejected, new

holes shall be drilled and new tie bars shall be placed and securely bonded to the concrete. Rejected tie bars shall be cut flush with the joint face. Exposed ends of tie bars shall be epoxy coated. The center of the new holes shall be offset 75 mm horizontally from the center of the rejected hole to maintain the minimum clearance to the dowel bar. Work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.

2. Inserting tie bars into the plastic slipformed concrete before finishing the concrete. Inserted tie bars shall have full contact between the bar and the concrete. When tie bars are inserted through the pavement surface, the concrete over the tie bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been an insertion performed. Loose tie bars shall be replaced by drilling and bonding as described in A above, at the Contractor's expense.
3. Using threaded dowel splice couplers fabricated from deformed bar reinforcement material, free of external welding or machining. Threaded dowel splice couplers shall be accompanied by a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, and shall be accompanied with installation instructions. Installation of threaded dowel splice couplers shall conform to the requirements of the manufacturer's recommendations.
4. Using tie bar baskets that conform to these special provisions

Tie bars shall be oriented perpendicular to the pavement joint and parallel with the surface of the pavement at mid-slab depth. Tie bar alignment tolerances shall conform to the requirements for dowel bars except embedment length tolerance shall be ± 50 mm.

If tie bar baskets are used, they shall be anchored to the base to hold the tie bars at the specified depth and alignment during concrete placement without displacement. A minimum of 8 alternating, equally spaced, concrete fasteners with clips shall be used to anchor each basket (4 per lower runner wire). Temporary spacer wires shall be cut or removed after the baskets are anchored into position before concrete placement. Concrete pavement shall not be placed if the baskets are not in place at least 60 m in advance of the concrete placement operation. The Engineer may waive this requirement upon written request by the Contractor in areas where access is restricted or other construction limitations are encountered. The Contractor shall demonstrate that the baskets are anchored and shall not shift during concrete placement. The Contractor shall provide longer concrete nails than the minimum lengths for the varying bases beneath the portland cement concrete when baskets demonstrate movement.

Full compensation for providing longer concrete nails shall be considered as included in the contract unit price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

DOWEL PLACEMENT

Dowel bars shall be centered on the joint within a tolerance of ± 50 mm in the longitudinal direction directly over the contact joint or sawcut for the transverse weakened plane joints, as shown on the plans. Prior to placement of dowel bars, the Contractor shall submit to the Engineer a written procedure to identify the transverse weakened plane joint locations relative to the middle of the dowel bars and the procedure for consolidating concrete around the dowel bars.

Dowel bars shall be placed at transverse weakened plane joints within shoulder areas except at drainage inlets.

When dowel bars are placed by mechanical insertion, the concrete over the dowel bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been any insertion performed. When drill and bonding of dowel bars is performed at contact joints, a grout retention ring shall be used.

When dowel bar baskets are used, they shall be anchored to the base to hold the dowel bars at the specified depth and alignment during concrete placement without displacement. A minimum of 8 alternating, equally spaced, concrete fasteners with clips shall be used to anchor each 3.6 m dowel bar basket (4 per lower runner wire). At least 10 concrete fasteners shall be used for basket sections greater than 3.6 m and less than or equal to 4.9 m. Temporary spacer wires connecting dowel bar baskets shall be cut or removed after the dowel bar baskets are anchored into position prior to concrete placement. Paving shall be suspended when dowel bar baskets are not in place at least 60 m in advance of the concrete placement operation. The Engineer may waive this requirement upon written request by the Contractor, in areas, where access is restricted, or other construction limitations are encountered. The Contractor shall demonstrate to the Engineer's satisfaction that dowel bar baskets are adequately anchored and not shift during concrete placement. The Contractor shall provide longer concrete nails than the minimum lengths for the varying bases beneath the portland cement concrete when anchored dowel bar baskets demonstrate movement.

Full compensation for providing longer concrete nails shall be considered as included in the contract unit price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

Dowel bar placement at transverse and longitudinal weakened plane joints	
Horizontal offset	±25 mm
Longitudinal translation	±50 mm
Horizontal skew	9 mm
Vertical skew	9 mm
Vertical depth	($d/3 + 12$ mm) from pavement surface to top of dowel bar or -15 mm below planned placement

Note: d = pavement thickness in mm

CORE DRILLING FOR DOWEL BAR AND TIE BAR PLACEMENT ALIGNMENT ASSURANCE TESTING

Coring to confirm dowel bar and tie bar placement, alignment, and concrete consolidation shall be provided by the Contractor throughout the project, at locations determined by the Engineer. Each day's paving shall be cored within 2 days by performing a minimum of 2 and a maximum of 4 tests for dowel bar placement and position for every 1670 m² of doweled pavement or fraction thereof and one test for tie bar placement and position for every 3340 m² of pavement with tie bars. One test shall consist of drilling two cores, one on each end of a dowel bar to expose both ends and allow measurement for proper alignment. The minimum core hole diameter shall be 127 mm. If the cores indicate that dowel bars or tie bars are not within the allowable tolerances or if air voids exist surrounding the dowel bars or tie bars, additional cores will be required to determine the limits and severity of unacceptable work.

The holes shall be cored by methods that will not damage the concrete adjacent to the holes. Immediately after coring, the concrete cores shall be submitted to the Engineer for inspection, and the cores shall be identified by the Contractor with a location description.

After removal of cores, core hole voids in concrete pavement shall be cleaned and filled with hydraulic cement grout (non-shrink). After placement of hydraulic cement grout, the material while still plastic shall be finished and textured to match the adjacent pavement surface. The backfill material shall be the same level as the pavement surface.

Water for core drilling operations shall be from a local domestic water supply, and shall contain not more than 1000 parts per million of chlorides as CL, nor more than 1300 parts per million of sulfates as SO_4 , nor shall it contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Water from core drilling operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Dowel bar and tie bar alignment shall be within the specified tolerances. If dowel bars or tie bars are found to be installed improperly, the paving operations shall not continue until the Contractor has demonstrated to the Engineer that the problem which caused the improper dowel bar or tie bar positioning has been corrected.

Dowel bars in rejected joints shall be replaced by the Contractor by saw cutting on each side of the rejected joint a minimum of 0.9-m, lifting out concrete to be removed, installing new dowel bars at the new transverse joints, installing dowel bars and preformed sponge rubber expansion joint filler along the longitudinal joints, placing concrete, and installing new joints. Preformed sponge rubber expansion joint filler shall conform to the requirements in ASTM Designation: D 1752. New dowel bar holes shall be drilled, not more than 3 mm greater than the dowel bar diameter, by the use of an automatic dowel-drilling rig for the dowels to be installed at the contact joints. Dowel bars shall be placed, as shown on the plans, for the 2 new transverse contact joints. Original exposed tie bars, located within the slab replacement area, shall be cut flush with the lane or pavement edge and dowel bars shall be installed to replace the tie bars at an offset of 75 mm, horizontally from the tie bar location. Holes for dowel bars to be placed along the longitudinal joint shall be drilled, not more than 3 mm greater than the dowel bar diameter, by the use of an automatic dowel-drilling rig for the dowel bars to be installed at the contact joints.

When requested by the Contractor and approved by the Engineer, dowel bars which are more than ± 50 mm but less than ± 75 mm from being centered directly over the sawcut for the transverse weakened plane joint, may remain in place, and the Contractor shall pay to the State the amount of \$32.30 per square meter for the quantity of concrete pavement panels represented by the cores indicating incorrect dowel bar alignment or improper concrete consolidation around dowels. The quantity of concrete pavement area used to determine the amount of payment to the State will be calculated using the panel dimensions for panels adjacent to and inclusive of the joints with incorrect dowel bar alignment or improper concrete consolidation around dowel bars. The Department will reduce compensation from moneys due, or that may become due to the Contractor under the contract. This reduced compensation shall be in addition to other adjustments for incorrect tie bar alignment or

improper concrete consolidation around tie bars as specified in these special provisions and for pavement thickness deficiency in conformance with the provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications and in addition to other adjustments for deficient Cleanness Value and coarse aggregate grading; and for deficient Sand Equivalent and fine aggregate grading in conformance with the provisions in Section 90-2.02, "Aggregate," of the Standard Specifications.

Tie bars which are not within the specified tolerance for placement and position, as determined from inspection and measurements of cores, may remain in place when requested by the Contractor and approved by the Engineer. The Contractor shall pay to the State the amount of \$16.15 per square meter for the quantity of concrete pavement panels represented by the cores indicating incorrect tie bar alignment or improper concrete consolidation around tie bars. The quantity of concrete pavement area used to determine the amount of payment to the State will be calculated using the panel dimensions for panels adjacent to and inclusive of the joints with incorrect tie bar alignment or improper concrete consolidation around tie bars. The Department will reduce compensation from moneys due, or that may become due to the Contractor under the contract. This reduced compensation will be in addition to other adjustments for incorrect dowel bar alignment or improper concrete consolidation around dowel bars as specified in these special provisions and for pavement thickness deficiency in conformance with the provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications and in addition to other adjustments for deficient Cleanness Value and coarse aggregate grading; and for deficient Sand Equivalent and fine aggregate grading in conformance with the provisions in Section 90-2.02, "Aggregate," of the Standard Specifications.

LIQUID JOINT SEALANT INSTALLATION

The joint sealant detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Weakened plane joints shall be constructed by the sawing method. Should grinding or grooving be required over or adjacent to joints after sealant has been placed, the joint materials shall be removed and disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications, and replaced at the Contractor's expense. Immediately after sawing, a water wash using less than 0.7 MPa pressure shall be used to remove the slurry from the sawing operation.

Transverse weakened plane joints shall be Type A1 or B as shown on the plans. Longitudinal weakened plane joints shall be Type A2 or B as shown on the plans.

Seven days after the concrete pavement placement and not more than 4 hours before placing backer rods and joint sealant materials, the joint walls shall be cleaned by the dry sand blast method and other means as necessary to remove from the joint objectionable material such as soil, asphalt, curing compound, paint and rust. Sand blasting shall be performed in at least 2 passes, one for each side of the joint, with the nozzle held at an angle to the joint within 25 mm to 51 mm of the pavement. After cleaning the joint, traces of sand, dust and loose material shall be removed from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Surface moisture or dampness shall be removed at the joints by means of compressed air or moderate hot compressed air or other means approved by the Engineer. Drying procedures that leave a

residue or film on the joint wall shall not be used. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 -mm and a minimum pressure of 0.62-MPa.

Backer rods shall be installed when the temperature of the portland cement concrete pavement is above the dew point of the air and when the air temperature is 4°C or above. Backer rod shall be installed when the joints to be sealed have been properly patched, cleaned and dried, as determined by the Engineer. Methods of placing backer rod that leave a residue or film on joint walls shall not be used.

Immediately after placement of the backer rod, joint sealant shall be placed in the clean, dry, prepared joints as shown on the plans. The joint sealant shall be applied using a mechanical device with a nozzle shaped to fit inside the joint to introduce the sealant from inside the joint. Adequate pressure shall be applied to the sealant to ensure that the sealant material is extruded evenly and that full continuous contact is made with the joint walls. After application of the sealant, the surface of the sealant shall be recessed as shown on the plans.

Failure of the joint material in either adhesion or cohesion will be cause for rejection of the joint. The finished surface of joint sealant shall conform to the dimensions and allowable tolerances shown on the plans. Rejected joint materials or joint material whose finished surface does not conform to the dimensions shown on the plans, as determined by the Engineer, shall be repaired or replaced, at the Contractor's expense, with joint material that conforms to the requirements.

After each joint is sealed, surplus joint sealer on the pavement surface shall be removed. Traffic shall not be permitted over the sealed joints until the sealant is tack free and set sufficiently to prevent embedment of roadway debris into the sealant.

CONSTRUCTING TRANSVERSE CONTACT JOINTS

A transverse contact (construction) joint shall be constructed, including dowel bars, at the end of each day's work or where concrete placement is interrupted for more than 30 minutes, to coincide with the next weakened plane joint location.

If sufficient concrete has not been mixed to form a slab to match the next weakened plane joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of excess concrete shall be at the Contractor's expense. Excess material shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of dowel bars.

CONSTRUCTING LONGITUDINAL ISOLATION JOINTS

Final alignment of perpendicular transverse weakened plane joints in pavement shall not be made to match the spacing or skew of the weakened plane joints in the existing parallel concrete pavement. Tie bars shall not be placed across longitudinal isolation joints. The edge of the existing pavement shall be saw cut a width 3 mm and to the full depth of the existing concrete pavement to produce a flat vertical face. Prior to placing concrete, joint filler

material shall be placed as shown on the plans. The joint filler shall be secured to the face of the existing pavement joint face by a method that will hold the joint filler in place and prevent the new concrete from adhering to the existing concrete, during placement of concrete.

Sealant for longitudinal isolation joints shall be Asphalt Rubber placed in conformance with the requirements for liquid joint sealant installation as specified above, except references to backer rods shall not apply.

CONSTRUCTING TRANSVERSE JOINT CONNECTIONS AND ANCHORS

Concrete pavement joints at transitions to hot mix asphalt pavement, pavement end anchors and bridge approach slabs shall conform to the details as shown on the plans. Paint binder shall be applied to the concrete surface that hot mix asphalt pavement will contact. Paint binder shall be applied in conformance with the provisions in Section 39, "Hot Mix Asphalt," of the Standard Specifications.

PROFILE INDEX

The pavement surface shall be profiled, by the Contractor not more than 10 days following concrete placement, in the presence of the Engineer, using a California Profilograph or equivalent in conformance with the requirements in California Test 526, except a blanking band of zero (null) shall be used to determine the Profile Index. Two profiles shall be made within each traffic lane, one meter from and parallel with each lane line.

Profiled pavement shall conform to the following Profile Index requirements:

1. Pavement on tangent alignment and pavement on horizontal curves having a centerline radius of curve 600 m or more shall have a Profile Index of 64 mm or less for each 0.1-km.
2. Pavement on horizontal curves having a centerline radius of curve 300 m or more but less than 600 m and pavement within the superelevation transition of those curves shall have a Profile Index of 128 mm or less for each 0.1-km.

Individual high points in excess of 7.5 mm, as determined by measurements of the profilogram in conformance with the requirements in California Test 526, except using a blanking band of zero (null), shall be reduced by grinding in conformance with the requirements in Section 40-1.10, "Final Finishing," of the Standard Specifications until the high points as indicated by reruns of the profilograph do not exceed 7.5 mm.

Pavement grinding shall not be performed before 10 days have elapsed after concrete placement, nor before the concrete has developed a modulus of rupture of at least 3.8 MPa.

CONSTRUCTING WEAKENED PLANE JOINTS (EARLY ENTRY SAW METHOD)

The Contractor may construct weakened plane joints using lighter weight concrete saws (early entry saws) specifically designed for sawing fresh concrete without the use of water. The early entry saws shall be capable of sawing joints within 2 hours of cure time after placement of the concrete pavement without ravelling or tearing, as defined in Section 40-1.08B(1), "Sawing Method," of the Standard Specifications. Joints sawed with early entry saws that develop random cracking shall be removed to the nearest controlled joint and replaced with concrete pavement containing dowel bars and tie bars in conformance with these special

provisions and as shown on the plans. The removal and replacement work shall be at the Contractor's expense. Weakened plane joints not sawed within 2 hours of placing concrete pavement shall be sawed by conventional power driven wet-type concrete saws in conformance with the requirements of Section 40-1.08B(1), "Sawing Method," of the Standard Specifications.

Sawed grooves shall be cut to a maximum of 3 mm in width for longitudinal and transverse weakened plane joints made with early entry saws. The minimum depth of cut shall be calculated utilizing the formula in Section 40-1.08B(1), "Sawing Method," of the Standard Specifications except

TIE BARS ALONG LONGITUDINAL JOINT FOR SHORT RADIUS CURVES

When paving along short radius curves, the transverse joints shall be maintained in a single continuous straight line across lanes, through the radius point. Tie bars shall maintain minimum clearance from the transverse joint as shown on the plans. If the inside or outside curve of the panel does not allow equal uniform spacing of tie bars at 710 mm between tie bars, then the tie bars shall be equally spaced so that a minimum spacing of 375 mm to a maximum spacing of 710 mm is maintained between tie bars. Additional tie bars shall be considered as included in the contract paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

If dowel bars are specified along longitudinal joint for short radius curves, then dowel bars shall conform to the requirements of this special provision for tie bars spacing and tolerance.

MEASUREMENT AND PAYMENT

Sealing longitudinal and transverse weakened plane joints, and longitudinal isolation joints in Portland cement concrete pavement will be measured by the meter. When a test strip conforms to the specifications for concrete pavement and remains a part of the project paving surface, the sealed pavement joints will be measured and paid for as Seal Pavement Joint.

The contract price paid per meter for Seal Pavement Joint shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in sealing pavement joints complete in place, including sawing, cleaning and preparing the joints in the concrete pavement, furnishing and installing backer rod, repairing and patching spalled or raveled sawed joints, and replacing or repairing rejected joints, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per meter for Seal Longitudinal Isolation Joint shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in sealing longitudinal isolation joints complete in place, including sawing, cleaning and preparing the joints in the concrete pavement, furnishing and installing joint filler material, repairing and patching spalled or raveled sawed joints, and replacing or repairing rejected joints, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Jointed Plain Concrete Pavement will be measured by the cubic meter in conformance with the provisions in Section 40-1.13, "Measurement," of the Standard Specifications. No

deduction will be made for the volume of epoxy-coated dowel bars, epoxy-coated tie bars and, when used, tie bar baskets with fasteners and dowel bar baskets with fasteners, in the concrete pavement. When a test strip conforms to the specifications for concrete pavement and remains a part of the project paving surface, the concrete will be measured and paid for as concrete pavement

The contract price paid per cubic meter for Jointed Plain Concrete Pavement shall include full compensation for furnishing all labor, materials (including cementitious material in the amount determined by the Contractor), tools, equipment, and incidentals, and for doing all the work involved in constructing the portland cement concrete pavement complete in place, including furnishing and placing epoxy-coated dowel bars, epoxy-coated tie bars and, when used, any tie bar baskets and dowel bar baskets with fasteners, submittal to the Engineer all test data for determination of mix proportions of concrete for concrete pavement and for providing the facility, Contractor personnel and all the work involved in arranging and holding the prepaving conference, for constructing and repairing all joints; for performing all profile checks for Profile Index and furnishing final profilograms to the Engineer; for grooving and grinding required for final finishing; and for removing, and replacing pavement for deficient thickness, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for drilling holes and bonding tie bars with epoxy resin shall be considered as included in the contract price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

Costs for providing JITT will be considered as included in the contract unit price paid for Jointed Plain Concrete Pavement, and no additional compensation will be allowed therefor. Costs for providing JITT shall include training materials, class site, and the JITT instructor including the JITT instructor's travel, lodging, meals and presentation materials. All costs incurred by the Contractor or Engineer for attending JITT shall be borne by the party incurring the costs.

Full compensation for core drilling for dowel bar or tie bar alignment and backfilling with hydraulic cement grout shall be considered as included in the contract price per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

If the initial cores show that dowel bars or tie bars are out of alignment tolerances and the Engineer orders additional dowel bar or tie bar coring, full compensation for drilling the additional cores shall be considered as included in the contract price per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

If the initial cores show that dowel bars or tie bars are within alignment tolerances and the Engineer orders more dowel bar coring the additional cores will be paid for as extra work in conformance with the provisions in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Full compensation for drilling holes and bonding dowel bars with epoxy resin shall be considered as included in the contract price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

Full compensation for furnishing and placing epoxy coated reinforcement for transition end panel shall be considered as included in the contract price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

Full compensation for furnishing and placing paint binder (tack coat) for transition end panel shall be considered as included in the contract price paid per cubic meter for Jointed Plain Concrete Pavement and no additional compensation will be allowed therefor.

10-1.79 PILING:

GENERAL

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these Special Provisions.

Unless otherwise specified, welding of any work performed in conformance with the provisions in Section 49, "Piling," of the Standard Specifications, shall be in conformance with the requirements in AWS D1.1.

CAST-IN-DRILLED-HOLE CONCRETE PILES

Cast-in-drilled-hole concrete piling shall conform to the provisions in Section 49-4, "Cast-In-Place Concrete Piles," of the Standard Specifications and these Special Provisions.

Cast-in-drilled-hole concrete piling (rock socket) shall consist of drilling or coring sockets in bedrock to the depths or lengths specified and filling with reinforced concrete in conformance with the details shown on the plans and these Special Provisions. Cored holes, if used, shall conform to the provisions of Section 49-4.03, "Drilled Holes," of the Standard Specifications.

Permanent steel casings are required at the locations shown on the plans. If permanent steel casing is not seated on installed into bedrock at the permanent steel casing tip elevation indicated in the pile data table shown on the plans, the Contractor shall extend the cast-in-drilled-hole concrete piling, including bar reinforcing steel and permanent steel casing to the elevation of achieve the required embedment into bedrock. The Contractor shall extend the specified tip elevation of the cast-in-drilled-hole concrete piling (rock socket) to maintain the length in bedrock as shown on the plans. The Contractor shall also extend the inspection pipes to 100 mm clear of the bottom of the drilled or cored hole.

The provisions of "Welding" of these Special Provisions shall not apply to temporary steel casings.

Cast-in-drilled-hole concrete piles 600 mm in diameter or larger may be constructed by excavation and depositing concrete under slurry.

MATERIALS

Concrete deposited under slurry shall have a nominal penetration equal to or greater than 90 mm. Concrete shall be proportioned to prevent excessive bleed water and segregation.

Concrete deposited under slurry shall contain not less than 400 kg of cementitious material per cubic meter.

Attention is directed to "Corrosion Control for Portland Cement Concrete" of these Special Provisions.

The combined aggregate grading used in concrete for cast-in-drilled-hole concrete piling shall be either the 25-mm maximum grading, the 12.5-mm maximum grading, or the 9.5-mm maximum grading and shall conform to the requirements in Section 90-3 "Aggregate Gradings," of the Standard Specifications.

Portions of cast-in-drilled-hole concrete piles shown on the plans to be formed shall be formed and finished in conformance with the provisions for concrete structures in Section 51, "Concrete Structures," of the Standard Specifications.

Concrete for portions of cast-in-drilled-hole concrete piles to be formed shall contain not less than 400 kg of cementitious material per cubic meter and shall contain $6 \pm 1 \frac{1}{2}$ percent air entrainment in the freshly mixed concrete.

Mineral slurry shall be tested for conformance to the requirements shown in the following table:

MINERAL SLURRY		
PROPERTY	REQUIREMENT	TEST
Density (kg/m^3) - before placement in the drilled hole - during drilling - prior to final cleaning - immediately prior to placing concrete	1030* to 1110* 1030* to 1200*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) bentonite attapulgate	29 to 53 29 to 42	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8 to 10.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning - immediately prior to placing concrete	less than or equal to 4.0	Sand API 13B-1 Section 5
*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m^3 . Slurry temperature shall be at least 4°C when tested.		

Any caked slurry on the sides or bottom of hole shall be removed before placing reinforcement. If concrete is not placed immediately after placing reinforcement, the reinforcement shall be removed and cleaned of slurry, the sides of the drilled hole cleaned of caked slurry, and the reinforcement again placed in the hole for concrete placement.

Synthetic Slurry

Synthetic slurries shall be used in conformance with the manufacturer's recommendations and these Special Provisions. The following synthetic slurries may be used:

PRODUCT	MANUFACTURER
SlurryPro CDP	KB Technologies Ltd. 3648 FM 1960 West Suite 107 Houston, TX 77068 (800) 525-5237
Super Mud	PDS Company c/o Champion Equipment Company 8140 East Rosecrans Ave. Paramount, CA 90723 (562) 634-8180
Shore Pac GCV	CETCO Drilling Products Group 1350 West Shure Drive Arlington Heights, IL 60004 (847) 392-5800
Novagel Polymer	Geo-Tech Drilling Fluids 220 N. Zapata Hwy, Suite 11A Laredo, TX 78043 (210) 587-4758

Inclusion of a synthetic slurry on the above list may be obtained by meeting the Department's requirements for synthetic slurries. The requirements can be obtained from the Office of Structure Design, P.O. Box 942874, Sacramento, CA 94274-0001.

Synthetic slurries listed may not be appropriate for a given site.

Synthetic slurries shall not be used in holes drilled in primarily soft or very soft cohesive soils as determined by the Engineer.

A manufacturer's representative, as approved by the Engineer, shall provide technical assistance for the use of their product, shall be at the site prior to introduction of the synthetic slurry into a drilled hole, and shall remain at the site until released by the Engineer.

Synthetic slurries shall be sampled and tested at both mid-height and near the bottom of the drilled hole. Samples shall be taken and tested during drilling as necessary to verify the control of the properties of the slurry. Samples shall be taken and tested when drilling is complete, but prior to final cleaning of the bottom of the hole. When samples are in conformance with the requirements shown in the following tables for each slurry product, the bottom of the hole shall be cleaned and any loose or settled material removed. Samples shall be obtained and tested after final cleaning and immediately prior to placing concrete.

SlurryPro CDP synthetic slurries shall be tested for conformance to the requirements shown in the following table:

SLURRYPRO CDP KB Technologies Ltd.		
PROPERTY	REQUIREMENT	TEST
Density (kg/m ³) - during drilling - prior to final cleaning - just prior to placing concrete	less than or equal to 1075* less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling -prior to final cleaning - just prior to placing concrete	53 to 127 less than or equal to 74	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	6 to 11.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning - just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m³.</p> <p>Slurry temperature shall be at least 4°C when tested.</p>		

Super Mud synthetic slurries shall be tested for conformance to the requirements shown in the following table:

SUPER MUD PDS Company		
PROPERTY	REQUIREMENT	TEST
Density (kg/m ³) - prior to final cleaning - just prior to placing concrete	less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling - prior to final cleaning - just prior to placing concrete	34 to 64 less than or equal to 64	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8 to 10.0	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning - just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m³.</p> <p>Slurry temperature shall be at least 4°C when tested.</p>		

Shore Pac GCV synthetic slurries shall be tested for conformance to the requirements shown in the following table:

Shore Pac GCV CETCO Drilling Products Group		
PROPERTY	REQUIREMENT	TEST
Density (kg/m ³) - prior to final cleaning - just prior to placing concrete	less than or equal to 1025*	Mud Weight (Density) API 13B-1 Section 1
Viscosity (seconds/liter) - during drilling - prior to final cleaning - just prior to placing concrete	35 to 78 less than or equal to 60	Marsh Funnel and Cup API 13B-1 Section 2.2
pH	8.0 to 11.0	Glass Electrode pH Meter or pH Paper
Sand Content (percent) - prior to final cleaning - just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m³.</p> <p>Slurry temperature shall be at least 4°C when tested.</p>		

Novagel Polymer synthetic slurries shall be tested for conformance to the requirements shown in the following table:

NOVAGEL POLYMER Geo-Tech Drilling Fluids		
PROPERTY	REQUIREMENT	TEST
Density (kg/m ³)		
- during drilling	less than or equal to 1075*	Mud Weight (Density) API 13B-1 Section 1
- prior to final cleaning - just prior to placing concrete	less than or equal to 1025*	
Viscosity (seconds/liter)		
- during drilling	48 to 110	Marsh Funnel and Cup API 13B-1 Section 2.2
- prior to final cleaning - just prior to placing concrete	less than or equal to 110	
pH	6.0 to 11.5	Glass Electrode pH Meter or pH Paper
Sand Content (percent)		
- prior to final cleaning -just prior to placing concrete	less than or equal to 0.5	Sand API 13B-1 Section 5
<p>*When approved by the Engineer, slurry may be used in salt water, and the allowable densities may be increased up to 32 kg/m³.</p> <p>Slurry temperature shall be at least 4°C when tested.</p>		