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**DIVISION OF ENGINEERING SERVICES**  
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*Be energy efficient!*

June 20, 2008

03-Nev-80-R5.2/R11.2, 13.3  
03-0A6334

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in NEVADA COUNTY NEAR TRUCKEE FROM 0.1 MILE EAST OF THE CASTLE PEAK ROAD UNDERCROSSING TO 2.1 MILES EAST OF DONNER LAKE UNDERCROSSING AND AT DONNER PARK OVERCROSSING.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on July 2, 2008.

This addendum is being issued to revise the Project Plans, the Notice to Contractors and Special Provisions, the Proposal and Contract, and the Information Handout.

Project Plan Sheets 2, 4, 7, 12, 13, 15, 16, 19, 20, 21, 22, 23, 24, 50, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 271, 272, 274, 286, 292, 311, 312, 313, 314, 315, 317, 318, 321, 361, 362 and 363 are revised. Half-sized copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheet 310A is added. A half-sized copy of the added sheet is attached for addition to the project plans.

Project Plan Sheet 264 is deleted.

In the Special Provisions, Section 4, "BEGINNING OF WORK, TIME OF COMPLETION, AND LIQUIDATED DAMAGES," item 5 is added to the third paragraph as follows:

"5. Copies of the completed applications for all required permits for PCC batch plants and confirmation of their submittal to the proper entities."

In the Special Provisions, Section 5-1.17, "PROJECT INFORMATION," item F is added to the second paragraph as follows:

"F. 401 certification Amendment No. 2."

In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the following paragraph is added after the fifth paragraph:

"Attention is directed to Replace Concrete Pavement (Rapid Strength Concrete) of these special provisions in regards to providing Pre-Operation Conference and the Just-In-Time Training prior to commencing pavement replacement operations."

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In the Special Provisions, Section 10-1.01, "ORDER OF WORK," the first sentence of the seventeenth paragraph is revised as follows:

"At the end of each working day if a difference in excess of 0.15 foot exists between the elevation of the existing pavement and the elevation of excavations within 5 feet left and 8 feet right of the traveled way, that is not separated from public traffic by temporary railing (Type K), material shall be placed and compacted against the vertical cuts adjacent to the traveled way."

In the Special Provisions, Section 10-1.04, "WATER POLLUTION CONTROL," subsection, "STORM WATER POLLUTION PREVENTION PLAN," the seventh paragraph is revised as follows:

"The SWPPP shall include a copy of the Department of Fish and Game 1602 streambed alteration agreement, US Army Corps of Engineers 404 permit, and State Water Resources Control Board 401 certification and 401 certification Amendment No. 2."

In the Special Provisions, Section 10-1.24, "MAINTAINING TRAFFIC," is revised as attached.

In the Special Provisions, Section 10-1.39, "EARTHWORK," the fourth paragraph is deleted.

In the Special Provisions, Section 10-1.515, "HOT MIX ASPHALT AGGREGATE LIME TREATMENT - SLURRY METHOD," is added as attached.

In the Special Provisions, Section 10-1.52, "JOINTED PLAIN CONCRETE PAVEMENT," subsection "MATERIALS," subsection "Concrete," in the third paragraph, item "3." is revised as follows:

"3. Aggregates shall not be deleterious or potentially deleterious when tested in conformance with ASTM C 1260."

In the Special Provisions, Section 10-1.52, "JOINTED PLAIN CONCRETE PAVEMENT," subsection "MATERIALS," subsection "Tie Bars" is revised as follows:

"Tie bars shall be deformed reinforcing steel bars conforming to the requirements of ASTM Designation: A 615/A 615M, Grade 40 or 60, A 996/A 996M, Grade 50 or 60, or A 706/A 706M. Tie bars shall be epoxy-coated in conformance with the requirements in ASTM Designation: A 934/A 934M 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 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 30 inches long. Epoxy-coated tie bars shall not be bent."

In the Special Provisions, Section 10-1.52, "JOINTED PLAIN CONCRETE PAVEMENT," subsection "MATERIALS," subsection "Dowel Bars," the first paragraph is revised as follows:

"Dowel bars shall be plain round smooth, epoxy-coated steel conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 40 or 60, 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 18 inches 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."

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In the Special Provisions, Section 10-1.52, "JOINTED PLAIN CONCRETE PAVEMENT," subsection "DOWEL PLACEMENT," in the "Dowel bar placement at transverse and longitudinal weakened plane joints" table, the vertical depth is revised as follows:

"(d/2 + 1/2 inch) from pavement surface to top of dowel bar or 5/8 inch below planned placement"

In the Special Provisions, Section 10-1.525, "REPLACE CONCRETE PAVEMENT (RAPID STRENGTH CONCRETE)," is added as attached.

In the Special Provisions, Section 10-1.885, "TRANSITION RAILING (TYPE WB)," is added as attached.

In the Proposal and Contract, the Engineer's Estimate Items 21, 22, 23, 24, 25, 30, 31, 35, 36, 56, 61, 65, 75, 77, 78, 85, 88 and 155 are revised, Items 173, 174, 175 and 176 are added and Item 172 is deleted as attached.

To Proposal and Contract book holders:

Replace pages 4, 5, 6, 7, 10, and 11 of the Engineer's Estimate in the Proposal with the attached revised pages 4, 5, 6, 7, 10, and 11 of the Engineer's Estimate. The revised Engineer's Estimate is to be used in the bid.

Attached is a copy of the Information Handout State Water Resources Control Board - 401 certification Amendment No. 2.

Attached are the department's responses to the contractors' inquiries. The responses to contractors' inquiries, unless incorporated into a formal addendum to the contract, are not a part of the contract and are provided for the contractors convenience only. In some instances, the question and answer may represent a summary of the matters discussed rather than a word-for-word recitation. The availability or use of information provided in the responses to contractors' inquiries is not to be construed in any way as a waiver of the provisions of section 2-1.03 of the Standard Specifications or any other provisions of the contract, the plans, standard specifications or special provisions, nor to excuse the contractor from full compliance with those contract requirements. Bidders are cautioned that subsequent responses or contract addenda may affect or vary a response previously given.

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the NOTICE TO CONTRACTORS section of the Notice to Contractors and Special Provisions.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the proposal.

Submit bids in the Proposal and Contract book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

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This office is sending this addendum by confirmed facsimile GSO overnight mail to Proposal and Contract book holders to ensure that each receives it. A copy of this addendum is available for the contractor's use on the Internet Site:

**[http://www.dot.ca.gov/hq/esc/oe/weekly\\_ads/addendum\\_page.html](http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addendum_page.html)**

If you are not a Proposal and Contract book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

**ORIGINAL SIGNED BY**

REBECCA D. HARNAGEL, Chief  
Office of Plans, Specifications & Estimates  
Division of Engineering Services - Office Engineer

Attachments

#### **10-1.24 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 "Public Safety" and "Portable Changeable Message Sign" of these special provisions and these special provisions.

Attention is directed to "Traffic Plastic Drums" of these special provisions regarding using traffic plastic drums in place of portable delineators, tubular markers, cones, or Type I and II barricades.

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."

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

The Contractor shall maintain access on Route 80 for permit loads during the work shifts. Permit loads are defined as overweight or oversized vehicles that have an approved permit for traveling this route.

The Contractor shall set up traffic control to screen, hold, and then escort the permit loads through the work zone, as directed by the Engineer, when construction operations require narrowing lanes open to public traffic to less than 16 feet wide. This traffic control shall be set up prior to closing a lane.

The designated areas for permit load storage are as follows:

Eastbound, Chain Control Area at Pla-80 PM 53.7

Westbound, Old Agriculture Inspection Station at Nev-80 PM 13.5

The Contractor shall conduct his operations such that no permit load shall be allowed to sit for more than two hours. Within two hours of arrival, the Contractor shall modify or cease construction operations and modify the lane configuration so the permit loads can pass. The Contractor shall escort the permit loads from the permit load storage areas through the construction zone.

During Stage 1, Phase 2A, the westbound off-ramp from Interstate 80 to Donner Lake Road may be closed for a 30-day period. The off-ramp shall be open by 1000 hrs. on the 31st day. This extended closure may only be used once during the contract. The other 3 ramps of the Donner Lake Road interchange shall be open during this closure. Proper detour signing shall also be in place during this extended closure.

During Stage 1, Phase 2B, the westbound on-ramp to Interstate 80 from Donner Lake Road may be closed for a 30-day period. The on-ramp shall be open by 1000 hrs. on the 31st day. This extended closure may only be used once during the contract. The other 3 ramps of the Donner Lake Road interchange shall be open during this closure. Proper detour signing shall also be in place during this extended closure.

During Stage 1, Phase 2A and Phase 2B, Donner Lake Road shall be open during these closures.

During Stage 2, Phase 3B, the eastbound on-ramp from Castle Peak Road may be closed for a 30-day period. The on-ramp shall be open by 1000 hrs. on the 31st day. This extended closure may only be used once during the contract. The other three ramps of the Castle Peak Road interchange shall be open during this closure. Proper detour signing shall also be in place during this extended closure.

During Stage 2, Phase 3B, Castle Peak Road shall be open during this closure.

During Stage 2, Phase 3B, the Donner Safety Rest Area eastbound on-ramp and off-ramp may be closed for a 30-day period. The Rest Area shall be open by 1000 hrs. on the 31st day. This extended closure may only be used once during the contract. Proper detour signing shall also be in place during this extended closure.

During Stage 2, Phase 3B, the eastbound on-ramp from Donner Lake Road and off-ramp to Donner Lake Road may be closed for a 30-day period. The on-ramp and off-ramp shall be open by 1000 hrs. on the 31st day. This extended closure may only be used once during the contract. The other two ramps of the Donner Lake Road interchange shall be open during this closure. Proper detour signing shall also be in place during this extended closure.

During Stage 2, Phase 3B, Donner Lake Road shall be open during this closure.

In Reno Nevada, there is an annual 10-day long event called "Hot August Nights". This event begins on a Friday and ends 10-days later on Sunday. Lane closures and shoulder closures will be restricted during the annual "Hot August Nights" event, during the life of this contract. No lane closures, shoulder closures, or other traffic restrictions will be allowed in the eastbound direction of Interstate 80 on each Friday, Saturday, and Sunday during the event. No lane closures, shoulder closures, or other traffic restrictions will be allowed in the westbound direction of Interstate 80 on each Sunday and Monday of the event and the Monday following the conclusion of the event. Should this requirement delay the controlling operation as specified in Section 8-1.06, "Time of Completion," of the Standard Specifications, the days will be considered a non-working day, except as otherwise noted within these special provisions.

On 2-lane, 2-way roads, under one-way reversing traffic control operations, public traffic may be stopped in one direction for periods not to exceed 10 minutes.

The maximum length of a single stationary lane closure for eastbound I-80 shall be 1.0 mile.

The maximum length of a single stationary lane closure for westbound I-80 shall be 1.5 miles.

For stationary lane closures on a downhill roadway section, the Engineer can approve longer lane closures so that the lane closure shall start at the beginning of the downhill grade.

Not more than 1 stationary lane closure will be allowed at one time in each direction of travel on Interstate 80.

The Contractor shall notify the Engineer and CHP at least 5 working days prior to any traffic control operations required for blasting. The Contractor shall present to the Engineer a traffic control plan in which the Contractor details the sequence of blasting operations and the coordination with reopening of lanes to public traffic, as specified herein.

The Contractor shall coordinate ramp closures and CHP controlled traffic breaks in order to minimize inconvenience to public traffic. During blasting operations, ramp closures and traffic breaks shall be performed simultaneously on both sides of Route 80.

During blasting operations, a portable changeable message sign shall be placed in each direction of travel, as directed by the Engineer. Portable changeable message signs shall be placed a minimum of 5 calendar days prior to blasting operations.

During blasting operations, the Contractor shall close on-ramps using one employee at each ramp with the ramp entrance blocked using a pickup truck. The pickup truck shall be equipped with rotary warning lights, radio and a cellular phone. On-ramps that will require temporary closures during blasting operations are:

- a. In the eastbound direction: Castle Peak Interchange.
- b. In the eastbound direction: Donner Safety Roadside Rest Area.
- c. In both eastbound and westbound directions: Donner Lake Interchange.

During blasting operations, mainline traffic shall not be stopped for periods exceeding 25 minutes.

After each blasting operation, the Contractor shall clean up all debris deposited on the roadway, prior to opening lanes to public traffic.

The Contractor shall attempt only one blasting per day. Blasting and related traffic control shall be restricted to the following times: Tuesdays, Wednesdays and Thursdays between the hours 5:00 a.m. to 9:00 a.m.

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

C43(CA) (FRESH CONCRETE) signs shall be used at the beginning of, and at 500-foot intervals throughout, the pavement slab replacement work area. The signs shall be in place during the entire curing period.

SC6-3(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of an 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 an 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 ramp, but not more than 14 days before the 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 within the right of way.

On Interstate 80, when work vehicles or equipment are parked within 6 feet of a traffic lane, the shoulder area shall be closed as shown on the plans.

On 2-lane, 2-way roads, when work vehicles or equipment are parked on the shoulder within 6 feet 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 25-foot intervals to a point not less than 25 feet 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 48" x 48" 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.

On Interstate 80, a minimum of one paved traffic lane, not less than 11 feet wide, shall be open for use by public traffic in each direction of travel.

On 2-lane, 2-way roads, a minimum of one paved traffic lane, not less than 11 feet wide, shall be open for use by public traffic.

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, 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.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the C43(CA), 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										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	<b>H</b> xx	xx	xx							
x	xx	<b>H</b> xx	xx							
	x	xx	<b>H</b> xx	xx						
	x	xx	xx	<b>H</b> xx						
				x	<b>H</b> xx					
					x	<b>H</b> xx				
						x	<b>H</b> xx	xx		xx
<b>Legends:</b>										
	Refer to lane closure charts									
x	The full width of the traveled way shall be open for use by public traffic after 1400 hrs.									
xx	The full width of the traveled way shall be open for use by public traffic.									
<b>H</b>	Designated Legal Holiday									

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.

In addition to the required openings through falsework, pedestrian facilities shall be provided during pile driving, footing, wall, and other bridge construction operations. At least one walkway shall be available at all times. If the Contractor's operations require the closure of one walkway, then another walkway shall be provided nearby, off the traveled roadway.

Railings shall be constructed of wood, S4S, and shall be painted white. Railings and walkways shall be maintained in good condition. Walkways shall be kept clear of obstructions.

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 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: EASTBOUND PM R5.1 to PM R11.6																									
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
Fridays	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	
Sundays	1	1	1	1	1	1	1	1	1	1												1	1	1	
Legend:																									
1	Provide at least one through freeway lane open in direction of travel																								
	Work permitted within project right of way where shoulder or lane closure is not required.																								
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>MEMORIAL DAY</b> to <b>LABOR DAY (PEAK SEASON)</b></li> <li>2 lanes available</li> </ul>																									

Chart No. 2 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: WESTBOUND PM R9.1 to PM R11.6																									
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
Fridays	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	
Sundays	1	1	1	1	1	1	1	1	1	1												1	1	1	
Legend:																									
1	Provide at least one through freeway lane open in direction of travel																								
	Work permitted within project right of way where shoulder or lane closure is not required.																								
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>MEMORIAL DAY</b> to <b>LABOR DAY (PEAK SEASON)</b></li> <li>2 lanes available</li> </ul>																									

Chart No. 3 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: WESTBOUND PM R5.1 to PM R9.1																									
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	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Fridays	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
Sundays	1	1	1	1	1	1	1	1	1	1												1	1	1	1
Legend:																									
<input type="checkbox"/> 1 Provide at least one through freeway lane open in direction of travel																									
<input type="checkbox"/> 2 Provide at least two through freeway lanes open in direction of travel																									
<input type="checkbox"/> Work permitted within project right of way where shoulder or lane closure is not required.																									
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>MEMORIAL DAY</b> to <b>LABOR DAY (PEAK SEASON)</b></li> <li>3 lanes available</li> </ul>																									

Chart No. 4 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: EASTBOUND PM R5.1 to PM R11.6																									
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
Saturdays	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
Legend:																									
<input type="checkbox"/> 1 Provide at least one through freeway lane open in direction of travel																									
<input type="checkbox"/> Work permitted within project right of way where shoulder or lane closure is not required.																									
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>LABOR DAY</b> to <b>MEMORIAL DAY (OFF-PEAK SEASON)</b></li> <li>2 lanes available</li> </ul>																									

Chart No. 5 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: WESTBOUND PM R11.6/R9.1																									
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
Saturdays	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
Legend:																									
1	Provide at least one through freeway lane open in direction of travel																								
	Work permitted within project right of way where shoulder or lane closure is not required.																								
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>LABOR DAY</b> to <b>MEMORIAL DAY (OFF-PEAK SEASON)</b></li> <li>2 lanes available</li> </ul>																									

Chart No. 6 Freeway/Expressway Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: WESTBOUND PM R9.1/R5.1																									
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	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Tuesdays 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
Saturdays	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
Legend:																									
1	Provide at least one through freeway lane open in direction of travel																								
2	Provide at least two through freeway lanes open in direction of travel																								
	Work permitted within project right of way where shoulder or lane closure is not required.																								
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart is from <b>LABOR DAY</b> to <b>MEMORIAL DAY (OFF-PEAK SEASON)</b></li> <li>3 lanes available</li> </ul>																									

Chart No. 7 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: Castle Peak Road EB on-ramp																									
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																									
C Ramp may be closed completely																									
REMARKS:See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions. This chart to be used for Stage 2 Phase 1B																									

Chart No. 8 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: WB off-ramp and on-ramp to Donner Lake Road																									
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																									
C Ramp may be closed completely																									
REMARKS:See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions. This chart to be used for Stage 1 Phase 2A See Detour Plan DE-1, DE-2, DE-3																									

Chart No. 9 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: EB off-ramp and on-ramp to Donner Lake Road																									
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																									
<input type="checkbox"/> C Ramp may be closed completely																									
REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions. This chart to be used for Stage 1 Phase 2A See Detour Plan DE-4, DE-5																									

Chart No. 10 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: NEVADA										Route: 80										PM: R5.1/R11.6					
Closure Limits: Castle Peak Road EB on-ramp																									
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																									
<input type="checkbox"/> C Ramp may be closed completely																									
<ul style="list-style-type: none"> <li>REMARKS: See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart to be used for Stage 2 Phase 3B</li> <li>See Detour Plan DE-6</li> <li>Ramp only closed for up to 12 hours at a time.</li> <li>Special 30 day closure allowed as specified in the Order of Work</li> </ul>																									

Chart No. 11 Complete Ramp Closure Hours/Ramp Lane Requirements																										
County: NEVADA										Route: 80										PM: R5.1/R11.6						
Closure Limits: WB off-ramp to Donner Lake road and on-ramp from Donner Lake Road																										
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Legend:																										
<table border="1"> <tr> <td>C</td> <td>Ramp may be closed completely</td> </tr> </table>																									C	Ramp may be closed completely
C	Ramp may be closed completely																									
<ul style="list-style-type: none"> <li>REMARKS:See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart to be used for Stage 1 Phase 2A and Phase 2B</li> <li>See Detour Plan DE-1, DE-2, DE-3</li> <li>Ramp only closed for up to 12 hours at a time.</li> <li>Special 30 day closure allowed as specified in the Order of Work</li> </ul>																										

Chart No. 12 Complete Ramp Closure Hours/Ramp Lane Requirements																										
County: NEVADA										Route: 80										PM: R5.1/R11.6						
Closure Limits: EB off-ramp and on-ramp to Donner Lake Road																										
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	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Fridays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Saturdays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Sundays	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Legend:																										
<table border="1"> <tr> <td>C</td> <td>Ramp may be closed completely</td> </tr> </table>																									C	Ramp may be closed completely
C	Ramp may be closed completely																									
<ul style="list-style-type: none"> <li>REMARKS:See Lane Closure Restriction for Designated Legal Holidays table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>This chart to be used for Stage 2 Phase 3B</li> <li>See Detour Plan DE-4, DE-5</li> <li>Ramp only closed for up to 12 hours at a time.</li> <li>Special 30 day closure allowed as specified in the Order of Work</li> </ul>																										

## 10-1.515 HOT MIX ASPHALT AGGREGATE LIME TREATMENT - SLURRY METHOD

### GENERAL

#### Summary

This work includes treating hot mix asphalt (HMA) aggregate with lime using the slurry method and placing it in stockpiles to marinate.

Treat aggregate for HMA Type A with lime slurry.

#### Submittals

Determine the exact lime proportions for fine and coarse virgin aggregate and submit them as part of the proposed job mix formula (JMF) under Section 39, "Hot Mix Asphalt," of the Standard Specifications.

Submit the averaged aggregate quality test results to the Engineer within 24 hours of sampling.

Submit a treatment data log from the slurry proportioning device in the following order:

1. Treatment date
2. Time of day the data is captured
3. Aggregate size being treated
4. Wet aggregate flow rate collected directly from the aggregate weigh belt
5. Moisture content of the aggregate just before treatment, expressed as a percent of the dry aggregate weight
6. Dry aggregate flow rate calculated from the wet aggregate flow rate
7. Lime slurry flow rate measured by the slurry meter
8. Dry lime flow rate calculated from the slurry meter output
9. Approved lime ratio for each aggregate size being treated
10. Actual lime ratio calculated from the aggregate weigh belt and the slurry meter output, expressed as a percent of the dry aggregate weight
11. Calculated difference between the approved lime ratio and the actual lime ratio
12. Dry lime and water proportions at the slurry treatment time

Every day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on one line. The reported data must include data titles at least once per report.

#### Quality Control and Assurance

The quality control plan (QCP) specified in Section 39-2, "Standard," and Section 39-4, "Quality Control / Quality Assurance," of the Standard Specifications must include aggregate quality control sampling and testing during aggregate lime treatment. Perform sampling and testing in compliance with:

#### Aggregate Quality Control During Lime Treatment

Quality Characteristic	Test Method	Minimum sampling and testing frequency
Sand Equivalent	CT 217	Once per 1,000 tons of aggregate treated with lime
Percent of crushed particles	CT 205	As necessary and as designated in the QCP
Los Angeles Rattler	CT 211	
Fine aggregate angularity	AASHTO T 304, Method A	
Flat and elongated particles	ASTM D 4791	

Note: During lime treatment, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Run tests for aggregate quality in triplicate and report test results as the average of 3 tests.

The Engineer orders proportioning operations stopped for any of the following if you:

1. Do not submit the treatment data log.
2. Do not submit the aggregate quality control data.
3. Submit incomplete, untimely, or incorrectly formatted data.
4. Do not take corrective actions.
5. Take late or unsuccessful corrective actions.
6. Do not stop treatment when proportioning tolerances are exceeded.
7. Use malfunctioning or failed proportioning devices.

If you stop treatment, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

For the aggregate to be treated, determine the moisture content at least once during each 2 hours of treatment. Calculate moisture content under California Test 226 or California Test 370 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

## **MATERIALS**

High-calcium hydrated lime and water must comply with Section 24-1.02, "Materials," of the Standard Specifications.

Before aggregate is treated, it must comply with the aggregate quality specifications in Section 39, "Hot Mix Asphalt," of the Standard Specifications. Do not test treated aggregate for quality control except for gradation. The Engineer does not test treated aggregate for acceptance except for gradation.

The Engineer determines the combined aggregate gradation during HMA production after you have treated aggregate. Treated aggregate must not have lime balls or clods.

## **CONSTRUCTION**

### **General**

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Treat aggregate separate from HMA production.

Do not treat reclaimed asphalt pavement.

Add lime to the aggregate as slurry consisting of mixed dry lime and water at a ratio of 1 part lime to between 2 parts and 3 parts water by weight. The slurry must completely coat the aggregate.

Lime treat and marinate coarse and fine aggregates separately.

Immediately before mixing lime slurry with aggregate, water must not visibly separate from aggregate.

Treat aggregate and stockpile for marination only once.

The lime ratio is the pounds of dry hydrated lime per 100 pounds of dry aggregate expressed as a percent. Water content of slurry or untreated aggregate must not affect the lime ratio.

Lime ratio ranges are:

Aggregate Gradation	Lime Ratio
Coarse	0.4 to 1.0
Fine	1.5 to 2.0
Combined	0.8 to 1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the approved lime ratio when you combine the individual aggregate sizes in the JMF proportions.

If 3 consecutive sets of recorded treatment data indicate deviation more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the day's total treatment in HMA.

If you stop treatment for noncompliance, you must implement corrective action and successfully treat aggregate for a 20-minute period. Notify the Engineer before beginning the 20-minute treatment period.

### **Lime Slurry Proportioning**

Proportion lime and water with a continuous or batch operation.

The device controlling slurry proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by the data set is the amount produced 5 minutes before and 5 minutes after the capture time. For the contract's duration, collected data must be stored by the controller.

### **Proportioning and Mixing Lime Slurry Treated Aggregate**

Treat HMA aggregate by proportioning lime slurry and aggregate by weight in a continuous operation.

Marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.

### **MEASUREMENT AND PAYMENT**

Full compensation for lime slurry treated aggregates shall be considered as included in the contract price paid per ton for HMA as designated in the Engineer's Estimate and no separate payment will be made therefor.

### **10-1.525 REPLACE CONCRETE PAVEMENT (RAPID STRENGTH CONCRETE)**

Replace concrete pavement (Rapid Strength Concrete) shall consist of removing existing portland cement concrete pavement and underlying cement treated base and constructing rapid strength concrete (RSC) pavement as shown on the plans and in conformance with Section 40, "Portland Cement Concrete Pavement," of the Standard Specifications and these special provisions.

#### **DEFINITIONS**

The following definitions shall apply to this section:

1. **EARLY AGE.** – A time less than 10 times the final set time of the concrete.
2. **FINAL SET TIME.** – The elapsed time after initial contact of cement and water, or accelerator, if used, at which a specific penetration resistance of 4,000 pounds per square inch is achieved in conformance with the requirements in ASTM Designation: C 403.
3. **OPENING AGE.** – The age at which the concrete will achieve the specified strength for opening to public or Contractor traffic.

#### **PRE-OPERATION CONFERENCE**

The Contractor and subcontractors involved in construction operations of RSC shall meet with the Engineer at a pre-operation conference, at a mutually agreed time, to discuss methods of accomplishing all phases of the construction operation, contingency planning, and standards of workmanship for the completed item of work.

The Contractor shall provide the facility for the pre-operation conference. The Contractor's superintendent, foremen, subcontractors, field staff, quality control manger, plant personnel including plant supervisors, manager, and operator involved with RSC shall attend the pre-operation conference. The Contractor shall submit a list of participants to the Engineer for approval. The complete listing shall identify each participant's name, employer, title and role in construction of RSC. The pre-operation conference shall be held for no less than 2 hours. Construction operations of RSC shall not begin until the specified personnel have completed the mandatory pre-operation conference.

#### **JUST-IN-TIME TRAINING**

Just-In-Time Training (JITT) shall be mandatory, and consist of a formal joint training class on rapid strength concrete. Construction operations for rapid strength concrete 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 pre-operation conference along with the Engineer's representatives shall attend JITT.

The JITT session will be conducted for not less than 4 hours on rapid strength concrete. The training class may be an extension of the pre-operation conference and shall be conducted at the project field location convenient for both the Contractor's and the Engineer's project staffs. Scheduling and completion of the JITT session shall be completed at least 5 business days prior to the start of construction of rapid strength concrete. 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 rapid strength concrete. The instructor shall not be an employee of the Contractor or a member of the Engineer's field staff. A copy of the syllabus, handouts, and presentation material shall be submitted to the Engineer at least 7 days before the day of the training. Selection of the course instructor, the course content and training site shall be as mutually agreed to by the Contractor and the Engineer. The instructor shall issue a certificate of completion to the participants upon the completion of the class. The certificate shall include the course title, date and location of the class, the name of the participant, instructor's name, location and phone number.

The Contractor's or Engineer's personnel involved with rapid strength concrete operations will not be required to attend JITT if they have completed similar 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 session. The final determination for exclusion of any staff member's participation will be as determined by the Engineer. All attendees of the JITT shall complete, and submit to the Engineer, an evaluation of the training. The course evaluation form will be provided by the Engineer.

It is expressly understood that Just-In-Time Training shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications.

## **REMOVING EXISTING PAVEMENT AND BASE MATERIALS**

Exact limits of concrete pavement to be replaced will be determined by the Engineer.

Existing concrete pavement and underlying base material shall be removed and replaced with base material and RSC pavement within the same work period. In the event existing pavement or base materials are removed and the Contractor is unable to construct, finish, and cure RSC pavement prior to the specified traffic opening time, a temporary roadway structural section shall be constructed.

The outline of concrete pavement to be removed shall be sawed full depth with a power-driven saw except where the pavement is located adjacent to an asphalt concrete shoulder. Saw cuts within concrete pavement slabs shall be cut no more than 2 days prior to concrete pavement slab removal. Saw cuts made in work shifts prior to the actual removal work shift shall not be made parallel or diagonal to the traveled way and shall be cut so that traffic will not dislodge any pieces or segments.

Equipment used to remove concrete pavement within the sawed outline, shall not impact the surface of the concrete to be removed within 18 inches of pavement to remain in place. Pavement and base removal shall be performed without damage to pavement or base to remain in place. Damage to pavement or base to remain in place, shall be repaired or removed and replaced. Repair, or removal and replacement of the damaged pavement and base shall be at the Contractor's expense and will not be measured nor paid for.

Removed materials 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.

The material remaining in place, after removing pavement and base to the required depth, shall be graded to a uniform plane, moisture conditioned, and compacted by methods that will produce a firm and stable base. The finished surface of the remaining material shall not extend above the grade established by the Engineer. Areas that are low as a result of over excavation during base removal shall be filled, at the Contractor's expense, with base replacement material at the time and in the same operation that the base replacement layer is placed.

## **TEMPORARY ROADWAY STRUCTURAL SECTION**

Hot mix asphalt and aggregate base, equal to the quantity of pavement removed during the work shift, shall be provided on site for construction of a temporary roadway structural section where existing pavement is to be replaced. The quantity and location of standby material shall be included in the Contractor's contingency plan in conformance with the requirements of these special provisions. Temporary roadway structural section shall be maintained and later removed as the first order of work when replace concrete pavement (Rapid Strength Concrete) operations resume. The temporary roadway structural section shall consist of 3 1/2-inch thick hot mix asphalt over aggregate base. RSC not conforming to these special provisions for RSC may be used for temporary roadway structural section with the Engineer's approval.

Aggregate base for temporary roadway structural section shall be produced from commercial quality aggregates consisting of broken stone, crushed gravel, natural rough-surfaced gravel, reclaimed concrete and sand, or any combination thereof. Grading of aggregate base shall conform to the 3/4-inch maximum grading specified in Section 26-1.02A, "Class 2 Aggregate Base," of the Standard Specifications.

Hot mix asphalt for temporary roadway structural section shall be produced from commercial quality aggregates and asphalt binder. Grading of aggregate shall conform to the 3/4-inch grading for Type B hot mix asphalt in Section 39-1.02E, "Aggregate," of the Standard Specifications and asphalt binder shall conform to requirements for liquid asphalt MC-800 in Section 93, "Liquid Asphalts," of the Standard Specifications. Amount of asphalt binder to be mixed with the aggregate shall be approximately 0.3 percent less than the optimum bitumen content determined in conformance with the requirements in California Test 367.

Aggregate base and hot mix asphalt for the temporary roadway structural section shall be spread and compacted by methods that will produce a well-compacted, uniform base, with a surface of uniform smoothness, texture and density. Surfaces shall be free from pockets of coarse or fine material. Aggregate base may be spread and compacted in one layer. Hot mix asphalt may be spread and compacted in one layer. Finished surface of hot mix asphalt shall not vary more than 0.05-foot from the lower edge of a 12-foot long straightedge placed parallel with the centerline and shall match the elevation of existing concrete pavement along the joints between the existing pavement and temporary surfacing.

Removed temporary roadway structural section materials 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, except that removed aggregate base may be stockpiled at the project site and reused for construction of temporary roadway structural sections. When no longer required, standby material or stockpiled material for construction of temporary roadway structural sections 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.

## RAPID STRENGTH CONCRETE

### General

Rapid Strength Concrete (RSC) shall be a concrete made with hydraulic cement that develops opening age and 7-day specified modulus of rupture strengths.

Requirements of Sections 40-1.05, "Proportioning," and 90-1.01, "Description," of the Standard Specifications shall not apply.

Combined aggregate grading used in RSC shall be either the 1-1/2-inch maximum grading, or one-inch maximum grading, at the option of the Contractor.

Aggregates shall not be deleterious or potentially deleterious when tested in conformance with ASTM C 1260.

Aggregates shall not be cinder type in nature.

Cement for RSC shall be hydraulic cement as defined in ASTM Designation: C 219 and shall conform to the following requirements:

Test Description	Test Method	Requirement
Contraction in Air	California Test 527, W/C Ratio = 0.39 ±0.010	0.053 %, max.
Mortar Expansion in Water	ASTM Designation: C 1038	0.04 %, max.
Soluble Chloride*	California Test 422	0.05 %, max.
Soluble Sulfates*	California Test 417	0.30 %, max.
Thermal Stability	California Test 553	60 %, min.
Compressive Strength @ 3 days	ASTM Designation: C 109	2,500 psi

\* Test is to be done on a cube specimen, fabricated in conformance with the requirements in ASTM Designation: C 109, cured at least 14 days and then pulverized to 100% passing the No. 50 sieve.

At least 45 days prior to intended use, the Contractor shall furnish a sample of cement from each lot proposed for use and all admixtures proposed for use in the quantities ordered by the Engineer.

The Contractor shall submit uniformity reports for cement used in RSC to the Cement Laboratory at the Transportation Laboratory. Uniformity reports shall conform to the requirements in ASTM Designation: C 917, except that testing age and water content may be modified to suit the particular material. Uniformity reports shall be submitted at least every 30 days during RSC pavement operations.

Type C accelerating chemical admixtures conforming to the provisions in Section 90-4, "Admixtures," of the Standard Specifications may be used. In addition to the admixtures listed on the Department's current list of approved admixtures, citric acid or borax may be used if requested in writing by the cement manufacturer and a sample is submitted to the Engineer. Chemical admixtures, if used, shall be included in the testing for requirements listed in the table above.

At least 10 days prior to use in the trial slab, the Contractor shall submit a mix design for RSC that shall include the following:

1. Opening age
2. Proposed aggregate gradings
3. Mix proportions of hydraulic cement and aggregate
4. Types and amounts of chemical admixtures
5. Maximum time allowed between batching RSC and placing roadway pavement
6. Range of ambient temperatures over which the mix design is effective (18° F maximum range)
7. Final set time of the concrete
8. Any special instructions or conditions, including but not limited to, water temperature requirements when appropriate

The Contractor shall submit more than one mix design to plan for ambient temperature variations anticipated during placement of the roadway pavement. Each mix shall be designed for a maximum ambient temperature range of 18° F. The Contractor shall develop and furnish modulus of rupture development data for each proposed mix design. Modulus of rupture development data for up to 7 days shall be provided to the Engineer prior to beginning paving operations. Modulus of rupture development data may be developed from laboratory prepared samples. The testing ages for modulus of rupture development data shall include one hour before opening age, opening age, one hour after opening age, 24 hours, 7 days and 28 days.

Concrete pavement penetration requirements in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications shall not apply to RSC.

RSC pavement shall develop a minimum modulus of rupture of as specified in "Pay Factor Adjustment for Low Modulus of Rupture" of these special provisions before opening to public or Contractor traffic. In addition, RSC pavement shall develop a minimum modulus of rupture of 600 pounds per square inch in 7 days after placement. RSC pavement that attains a modulus of rupture of less than specified may be accepted in conformance with "Pay Factor Adjustment for Low Modulus of Rupture" specified herein. Modulus of rupture shall be determined by averaging results from 3 beam specimens tested in conformance with the requirements in California Test 524. Beam specimens may be fabricated using an internal vibrator in conformance with the requirements in ASTM Designation: C 31. No single test shall represent more than the production of that day or 100 cubic yards, whichever is less.

When modulus of rupture at early age is determined using beam specimens, beam specimens shall be cured under atmospheric conditions and at a temperature within 5° F of the pavement. Modulus of rupture at other ages will be determined using beams cured and tested in conformance with California Test 524 except beams will be placed into sand between 5 times and 10 times final set time or 24 hours, whichever is earlier. The Engineer will perform the testing to determine modulus of rupture values of the RSC pavement. The modulus of rupture, as determined above, will be the basis for accepting or rejecting the RSC pavement for modulus of rupture requirements.

### Pay Factor Adjustment for Low Modulus of Rupture

Where planned replacement pavement nominal thickness is less than 10 inches, payment for replace concrete pavement (Rapid Strength Concrete) will be adjusted for low modulus of rupture tests as follows:

1. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of 400 pounds per square inch or greater before the lane is opened to the traffic and 7-day modulus of rupture of 600 pounds per square inch or greater will be paid for at the contract price per cubic yard for replace concrete pavement (Rapid Strength Concrete).
2. Replace concrete pavement (Rapid Strength Concrete) with a 7-day modulus of rupture of less than 500 pounds per square inch will not be paid for, and shall be removed and replaced, at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions.
3. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of 300 pounds per square inch or greater before the lane is opened to traffic and a 7-day modulus of rupture of equal to or greater than 500 pounds per square inch will be paid for at a percentage of the contract price per cubic yard for replace concrete pavement (Rapid Strength Concrete) in conformance with the percentages in the pay table below.
4. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of less than 300 pounds per square inch when the lane is opened to traffic will be rejected and shall be removed and replaced at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions.

Percentage Pay Table

Modulus of Rupture (psi) at opening to traffic	7-Day Modulus of Rupture (psi)		
	Greater than or equal to 600	Less than 600 and greater than or equal to 550	Less than 550 and greater than or equal to 500
Greater than or equal to 400	100%	95%	90%
Less than 400 and greater than or equal to 350	95%	95%	90%
Less than 350 and greater than or equal to 300	80%*	80%*	80%*

\* Any replacement panels that develops one or more transverse cracks within 21 days after placement shall be removed and replaced at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions. A transverse crack is defined as a crack running from one longitudinal edge of the panel to the other.

Where planned replacement pavement nominal thickness is 10 inches or greater, payment for replace concrete pavement (Rapid Strength Concrete) will be adjusted for low modulus of rupture tests as follows:

1. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of 333 pounds per square inch or greater before the lane is opened to the traffic and 7-day modulus of rupture of 600 pounds per square inch or greater will be paid for at the contract price per cubic yard for replace concrete pavement (Rapid Strength Concrete).
2. Replace concrete pavement (Rapid Strength Concrete) with a 7-day modulus of rupture of less than 500 pounds per square inch will not be paid for, and shall be removed and replaced, at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions.
3. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of 260 pounds per square inch or greater before the lane is opened to traffic and a 7-day modulus of rupture of equal to or greater than 500 pounds per square inch will be paid for at a percentage of the contract price per cubic yard for replace concrete pavement (Rapid Strength Concrete) in conformance with the percentages in the pay table below.
4. Replace concrete pavement (Rapid Strength Concrete) with modulus of rupture of less than 260 pounds per square inch when the lane is opened to traffic will be rejected and shall be removed and replaced at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions.

Percentage Pay Table

Modulus of Rupture (psi) at opening to traffic	7-Day Modulus of Rupture (psi)		
	Greater than or equal to 600	Less than 600 and greater than or equal to 550	Less than 550 and greater than or equal to 500
Greater than or equal to 333	100%	95%	90%
Less than 333 and greater than or equal to 290	95%	95%	90%
Less than 290 and greater than or equal to 260	80%*	80%*	80%*

\* Any replacement panels that develops one or more transverse cracks within 21 days after placement shall be removed and replaced at the Contractor's expense with replace concrete pavement (Rapid Strength Concrete) conforming to the requirements of these special provisions. A transverse crack is defined as a crack running from one longitudinal edge of the panel to the other.

The Contractor shall pay to the State adjustments in payment for low modulus of rupture tests in conformance with the requirements specified in the tables in this section. The Department will deduct the amount of the adjustments from moneys due or that may become due, the Contractor under the contract.

### Proportioning

Weighing, measuring and metering devices used for proportioning materials shall conform to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications and these special provisions.

Over and under dials, and other indicators for weighing and measuring systems used in proportioning materials shall be grouped so that the smallest increment for each indicator can be accurately read from the point at which the proportioning operation is controlled for ingredients batched at a central batch plant. In addition, indicators for weighing and measuring cement batched from a remote weighing system shall also be placed so that each indicator can be accurately read from the point at which the proportioning operation is controlled.

Aggregates shall be handled and stored in conformance with the provisions in Section 90-5.01, "Storage of Aggregates," of the Standard Specifications. Liquid admixtures shall be proportioned in conformance with the provisions in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures," of the Standard Specifications.

Weighing equipment shall be insulated against vibration or movement of other operating equipment. When the plant is in operation, the weight of each draft of material shall not vary from the designated weight by more than the tolerances specified herein. Each scale graduation shall be 0.001 of the usable scale capacity.

Aggregate shall be weighed cumulatively and equipment for the weighing of aggregate shall have a zero tolerance of  $\pm 0.5$  percent of the designated total batch weight of the aggregate. Equipment for the separate weighing of the cement shall have a zero tolerance of  $\pm 0.5$  percent of its designated individual batch draft. Equipment for measuring water shall have a zero tolerance of  $\pm 0.5$  percent of its designated weight or volume.

The weight indicated for any individual batch of material shall not vary from the preselected scale setting by more than the following:

Material	Tolerance
Aggregate	±1.0 percent of designated batch weight
Cement	±0.5 percent of designated batch weight
Water	±1.5 percent of designated batch weight or volume

Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement and water as provided in these special provisions. Dry ingredients shall be proportioned by weight. Liquid ingredients shall be proportioned by weight or volume.

At the time of batching, aggregates shall have been dried or drained sufficiently to result in stable moisture content, so that no visible separation of water from aggregate will take place during the proportioning process. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry weight.

If separate supplies of aggregate material of the same size group with different moisture content or specific gravity or surface characteristics affecting workability are available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another supply.

Cement shall be kept separate from the aggregates until released for discharge into the mixer. Cement shall be free of lumps and clods when discharged into the mixer. Fabric containers used for transportation or proportioning of cement shall be clean and free of residue before reuse.

Weigh systems for proportioning aggregate and cement shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and distinct material-weighing device.

For batches with a volume of one cubic yard or more, proportioning equipment shall conform to one of the following methods:

1. All ingredients shall be batched at a central batch plant and charged into a mixer truck for transportation to the pour site. Ingredient proportioning shall meet the requirements of Section 90-5, "Proportioning," of the Standard Specifications.
2. All ingredients except the cement shall be batched at a central batch plant and charged into a mixer truck for transportation to a remote located silo and weigh system for the proportioning of the cement. The remote system shall proportion cement for charging the mixer truck.
3. All ingredients except the cement shall be batched at a central batch plant and charged into a mixer truck for transportation to a remote location where pre-weighed, containerized cement shall be added to the mixer truck. The cement pre-weighing operation shall utilize a platform scale. The platform scale shall have a maximum capacity of 2.75 tons with a maximum graduation size of one pound. Cement shall be pre-weighed into a fabric container. The minimum amount of cement to be proportioned into any single container shall be one half of the total amount required for the load of RSC being produced.
4. Cement, water, and aggregate shall be proportioned volumetrically in conformance with these special provisions.

In order to check the accuracy of batch weights, the gross weight and tare weight of truck mixers shall be determined when ordered by the Engineer. The equipment shall be weighed on scales designated by the Engineer.

The Contractor shall install and maintain in operating condition an electrically actuated moisture meter. The meter shall indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched. The meter shall have a sensitivity of 0.5 percent by weight of the fine aggregate.

No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced. Water added to the truck mixer at the job site shall be measured through a meter that conforms to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Aggregate discharged from several bins shall be controlled by gates or by mechanical conveyors. The means of discharge from the bins and from the weigh hopper shall be interlocked so that no more than one bin can discharge at a time, and so that the weigh hopper can not be discharged until the required quantity from each of the bins has been deposited in the weigh hopper.

## **Weighmaster Certificates**

Weighmaster certificates for RSC, regardless of the proportioning method used, shall include all information necessary to trace the manufacturer, and manufacturer's lot number for the cement being used. When proportioned into fabric containers the weighmaster certificates for the cement shall contain date of proportioning, location of proportioning and actual net draft weight of the cement. When proportioned at the pour site from a storage silo the weighmaster certificates shall contain date of proportioning, location of proportioning and the net draft weight of the cement used in the load.

## **Volumetric Proportioning**

When RSC is proportioned by volume, the method shall conform to requirements specified herein.

Aggregates shall be handled and stored in conformance with the provisions in Section 90-5.01, "Storage of Aggregates," of the Standard Specifications. Liquid admixtures shall be proportioned in conformance with the provisions in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures," of the Standard Specifications.

Batch-mixer trucks shall be equipped to proportion cement, water, aggregate and additives by volume. Aggregate feeders shall be connected directly to the drive on the cement vane feeder. The cement feed rate shall be tied directly to the feed rate for the aggregate and other ingredients. Any change in the ratio of cement to aggregate shall be accomplished by changing the gate opening for the aggregate feed. The drive shaft of the aggregate feeder shall be equipped with a revolution counter reading to the nearest full or partial revolution of the aggregate delivery belt.

Aggregate shall be proportioned using a belt feeder operated with an adjustable cutoff gate delineated to the nearest quarter increment. Height of the gate opening shall be readily determinable. Cement shall be proportioned by a method that conforms to the accuracy requirements of these special provisions. Water shall be proportioned by a meter conforming to the provisions in Section 9-1.01, "Measurement and Payment," of the Standard Specifications and these special provisions.

Delivery rate of aggregate and cement per revolution of the aggregate feeder shall be calibrated at appropriate gate settings for each batch-mixer truck used on the project and for each aggregate source. Batch-mixer trucks shall be calibrated at 3 different aggregate gate settings that are commensurate with production needs. Two or more calibration runs shall be required at each of the different aggregate gate openings. The actual weight of material delivered for aggregate proportioning device calibrations shall be determined by a platform scale as specified in these special provisions.

Aggregate belt feeder shall deliver aggregate to the mixer with volumetric consistency so that deviation for any individual aggregate delivery rate check-run shall not exceed 1.0 percent of the mathematical average of all runs for the same gate opening and aggregate type. Each test run shall be at least 1,000 pounds. Fine aggregate used for calibration shall not be reused for device calibration.

At the time of batching, aggregates shall be dried or drained sufficiently to result in stable moisture content, so that no visible separation of water from aggregate takes place during the proportioning process. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry weight.

If separate supplies of aggregate material of the same size group with different moisture content or specific gravity or surface characteristics affecting workability are available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting another supply.

Rotating and reciprocating equipment on batch-mixer trucks shall be covered with metal guards.

The cement proportioning system shall deliver cement to the mixer with a volumetric consistency so that the deviation for any individual delivery rate check-run shall not exceed 1.0 percent of the mathematical average of 3 runs of at least 1,000 pounds each. Cement used for calibration shall not be reused for device calibration.

Water meter accuracy shall be such that, when operating between 50 percent and 100 percent of production capacity, the difference between the indicated weight of water delivered and the actual weight delivered shall not exceed 1.5 percent of the actual weight for each of two individual runs of 300 gallons. The water meter shall be calibrated in conformance with the requirements of California Test 109 and shall be equipped with a resettable totalizer and display the operating rate.

Calibration tests for aggregate, cement and water proportioning devices shall be conducted with a platform scale located at the calibration site. Weighing of test run calibration material shall be performed on a platform scale having a maximum capacity not exceeding 2.75 tons with maximum graduations of one pound. The platform scale shall be error tested within 8 hours of calibration of batch-mixer truck proportioning devices. Error testing shall be performed with test weights conforming to California Test 109 and shall produce a witness scale that is within 2 graduations of the test weight load. The scale shall be available for use at the production site throughout the production period. Equipment needed for the calibration of proportioning systems shall remain available at the production site throughout the production period. A Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished with each delivery of aggregate, cement, and admixtures used for calibration tests and shall be submitted to the Engineer with certified copies of the weight of each delivery. The Certificate of Compliance shall state that the source of materials used for the calibration tests is from the same source as to be used for the planned work. The Certificate of Compliance shall state that the material supplied conforms to the Standard Specifications and these Special Provisions and shall be signed by an authorized representative who shall have the authority to represent and act for the Contractor.

The batch-mixer truck shall be equipped so that an accuracy check can be made prior to the first operation for the project and at any other time as directed by the Engineer. Further calibration of proportioning devices shall be required every 30 days after production begins or when the source or type of any ingredient is changed. A spot calibration shall consist of calibration of the cement proportioning system only. A two run spot re-calibration of the cement proportioning system shall be performed each time 55 tons of cement has passed through the batch-mixer truck. Should the spot re-calibration of the cement proportioning system fall outside the limitations specified herein, a full calibration of the cement proportioning system shall be completed before the resumption of production.

Liquid admixtures shall be proportioned by a meter.

Cement storage shall be located immediately before the cement feeder and shall be equipped with a device that will automatically shut down the power to the cement feeder and aggregate belt feeder when the cement storage level is lowered to a point where less than 20 percent of the total volume is left in storage.

The Contractor shall furnish aggregate moisture determinations, made in conformance with the requirements of California Test 223, at least every 2 hours during proportioning and mixing operations. Moisture determinations shall be recorded and presented to the Engineer at the end of the production shift.

Each aggregate bin shall be equipped with a device that will automatically shut down the power to the cement feeder and the aggregate belt feeder when the aggregate discharge rate is less than 95 percent of the scheduled discharge rate of any bin.

Indicators specified herein shall be in working order prior to commencing proportioning and mixing operations and shall be visible when standing near the batch-mixer truck.

Identifying numbers of batch-mixer trucks shall be at least 3 inches in height, and be located on the front and rear of the vehicles.

Volumetric proportioned RSC shall be mixed in a mechanically operated mixer of adequate size and power for the type of RSC to be placed. Mixers may be of the auger type and shall be operated uniformly at the mixing speed recommended by the manufacturer. Mixers that have an accumulation of hard concrete or mortar shall be removed from service until cleaned. Other types of mixers may be used provided mixing quality will meet the requirements of these special provisions.

Charge or rate of feed to the mixer shall not exceed that which will permit complete mixing of the materials. Dead areas in the mixer, where material does not move or is not sufficiently agitated, shall be corrected by a reduction in the volume of material or by other adjustments. The mixer shall be designed to provide sufficient mixing action and movement to produce properly mixed RSC. Mixing shall continue until a homogeneous mixture is produced at discharge from the mixer. There shall be no lumps or evidence of non-dispersed cement at discharge from the mixer. No water shall be added to the RSC after discharge from the mixer.

Equipment having components made of aluminum or magnesium alloys, which may have contact with plastic concrete during mixing or transporting of RSC, shall not be used.

Uniformity of concrete mixtures will be determined by differences in penetration measurement made in conformance with the requirements in California Test 533. Difference in penetration, determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load, shall not exceed 5/8 inch. The Contractor shall furnish samples of freshly mixed concrete and provide facilities for obtaining the samples. Sampling facilities shall be safe, accessible, clean and produce a sample which is representative of production. Sample devices and sampling methods shall also conform to the requirements of California Test 125.

Ice shall not be used to cool RSC directly. When ice is used to cool water used in the mix, all of the ice shall be melted before entering the mixer.

Cement shall be proportioned and charged into the mixer by means that will result in no losses of cement due to wind, or due to accumulation on equipment, or other conditions which will vary the required quantity of cement.

Each mixer shall have a metal plate or plates, prominently attached, on which the following information is provided:

1. Uses for which the equipment is designed
2. Manufacturer's guaranteed capacity of the mixer in terms of the volume of mixed concrete
3. Speed of rotation of the mixer

Consistency and workability of mixed concrete when discharged at the delivery point shall be suitable for placement and consolidation.

Information generated by volumetric devices will not be used for payment calculations.

The device that controls the proportioning of cement, aggregate and water shall produce a log of production data. The log of production data shall consist of a series of snapshots captured at 15-minute intervals throughout the period of daily production. Each snapshot of production data shall be a register of production activity at that time and not a summation of the data over the preceding 15 minutes. The amount of material represented by each snapshot shall be the amount produced in the period of time from 7.5 minutes before to 7.5 minutes after the capture time. The daily log shall be submitted to the Engineer, in electronic or printed media, at the end of each production shift or as requested by the Engineer, and shall include the following:

1. Weight of cement per revolution count
2. Weight of each aggregate size per revolution count
3. Gate openings for each aggregate size being used
4. Weight of water added to the concrete per revolution count
5. Moisture content of each aggregate size being used
6. Individual volume of all other admixtures per revolution count
7. Time of day
8. Day of week
9. Production start and stop times
10. Batch-mixer truck identification
11. Name of supplier
12. Specific type, size, or designation of concrete being produced
13. Source of the individual aggregate sizes being used
14. Source, brand and type of cement being used
15. Source, brand and type of individual admixtures being used
16. Name and signature of operator

Required report items may be input by hand into a pre-printed form or captured and printed by the proportioning device. Electronic media containing recorded production data shall be presented in a tab delimited format on a 3.5-inch diskette with a capacity of at least 1.4 megabytes. Each snapshot of the continuous production shall be followed by a line-feed carriage-return with allowances for sufficient fields to satisfy the amount of data required by these specifications. The reported data shall be in the above order and shall include data titles at least once per report.

#### **Replacement Base Layer**

Base materials removed shall be replaced with replacement base layer. Replacement base layer shall consist of rapid strength concrete and shall be placed in a separate and distinct operation from that of replacing concrete pavement.

Replacement base layer shall be finished to the grade of the original base layer. The surface shall not be textured and shall be finished to a smooth surface, free of mortar ridges and other projections. The finished surface shall be free from voids and porous areas.

#### **Bond Breaker**

Bond breaker shall be placed between replacement pavement and existing lean concrete base, cement treated base or new base replacement layer. Bond breaker shall be one of the following:

1. Curing paper conforming to the requirements in ASTM Designation: C 171, white.
2. Polyethylene film conforming to the requirements in ASTM Designation: C 171, except that the minimum thickness shall be 6 mils, white opaque.
3. Paving asphalt, Grade PG 64-10, conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.
4. Pigmented curing compound conforming to the requirements in ASTM Designation: C 309, Type 2, Class A, containing a minimum of 22 percent nonvolatile vehicles consisting of at least 50 percent paraffin wax.

When curing paper or polyethylene film is used, material shall be placed in a wrinkle free manner. Adjacent sheets shall be overlapped a minimum of 6 inches.

When curing compound or paving asphalt is used, all foreign and loose materials remaining from slab removal shall be removed prior to application.

When paving asphalt is used, no water shall be added before applying asphalt to the surface of the base. The paving asphalt shall be applied in one even application at a rate of 0.02-gallon to 0.10-gallon per square yard over the entire base surface area. Concrete pavement shall not be placed until the paving asphalt has cured.

When curing compound is used, the curing compound shall be applied in two separate applications. Each application shall be applied evenly at a rate of 0.07-gallon to 0.11-gallon per square yard over the entire base surface area.

### **Spreading, Compacting and Shaping**

Metal or wood side forms may be used. Wood side forms shall not be less than 1-1/2 inches thick. Side forms shall be of sufficient rigidity, both in the form and in the connection with adjoining forms, that movement will not occur under the force from subgrading and paving equipment or from the pressure of concrete.

Side forms shall remain in place until the pavement edge no longer requires the protection of forms. Side forms shall be thoroughly cleaned and oiled prior to each use.

Consolidation of RSC shall be by means of high-frequency internal vibrators after the RSC is deposited on the subgrade. Vibrating shall be done in a manner to assure uniform consolidation adjacent to forms and across the full paving width. RSC shall be placed as nearly as possible in its final position and use of vibrators for extensive shifting of the weight of RSC will not be permitted.

RSC shall be spread and shaped by suitable powered finishing machines and supplemented by hand finishing as necessary. Methods of spreading, shaping and consolidating that result in segregation, voids or rock pockets shall be discontinued. The Contractor shall use methods that will produce dense homogeneous pavement conforming to the required cross section.

After the RSC has been mixed and placed, no additional water shall be added to the surface to facilitate finishing. Surface finishing additives, when used, shall be as recommended by the manufacturer of the cement and shall be approved by the Engineer prior to use.

### **Joints**

Prior to placing concrete against existing concrete, a 1/4-inch thick commercial quality polyethylene flexible foam expansion joint filler shall be placed across the original transverse and longitudinal joint faces and extend the full depth of the excavation. The top of the joint filler shall be placed flush with the top of pavement. Joint filler shall be secured to the joint face of the existing pavement by a method that will hold the joint filler in place during the placement of concrete.

Transverse weakened plane joints in pavement widenings shall be constructed to match the spacing and skew of the weakened plane joints in the adjacent existing pavement. Where the existing transverse weakened plane joint spacing in an adjacent lane exceeds 15 feet, an additional transverse weakened plane joint shall be constructed midway between the existing joints. The provisions in the second and third paragraphs in Section 40-1.08B, "Weakened Plane Joints," and the third paragraph in Section 40-1.08B(1), "Sawing Method," of the Standard Specifications shall not apply. Sawing of weakened plane joints shall be completed within 2 hours of completion of final finishing. Minimum depth of cut for weakened plane joints shall be 4 inches.

### **Replacement Tie Bars**

Tie bars shall be installed at longitudinal joints where existing tie bars were sawn through. Locations of new tie bars shall be placed as directed by the Engineer.

Tie bars shall be deformed reinforcing steel bars conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 40 or 60 and shall be epoxy-coated in conformance with the provisions in Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications, except that references made to ASTM Designation: D 3963/D 3963M shall be deemed to mean ASTM Designation: A 934/A 934M . Tie bars shall not be bent.

Tie bars shall not be used at joints where RSC and asphalt concrete pavements join.

Tie bars shall be installed at longitudinal joints by drilling and bonding with epoxy. Epoxy shall be a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V, Grade 3 (Non-Sagging). The class used shall be dependent on the internal temperature of the existing hardened concrete at the time of tie bar installation as follows: Class A for below 40° F, Class B for 40° F to 60° F, and Class C for above 60° F. Epoxy 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. 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. 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. 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 epoxy has cured a minimum time as specified by the manufacturer. Tie bars that are improperly bonded, as determined by the Engineer, will be rejected. If rejected, new holes shall be drilled adjacent to the rejected holes, as directed by the Engineer, and new tie bars shall be placed and securely bonded to the concrete. Work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.

### **Final Finishing**

Tests to determine coefficient of friction of the final textured surface will be made only if the Engineer determines by visual inspection that the final texturing may not have produced a surface having the specified coefficient of friction. Any tests to determine the coefficient of friction will be made after the pavement is opened to public traffic, but not later than 5 days after concrete placement. Pavement areas having a coefficient of friction as determined in conformance with the requirements in California Test 342 of less than 0.30 shall be grooved in conformance with the provisions in Section 42-1.02, "Construction," of the Standard Specifications. Grooving shall be performed prior to the installation of any required edge drains adjacent to the areas to be grooved.

Transverse straightedge and longitudinal straightedge requirements will not apply to the pavement surface within 12 inches of the existing concrete pavement except as required in these special provisions. Longitudinal straightedge requirements in Section 40-1.10, "Final Finishing," of the Standard Specifications, shall be applied at transverse contact joints with existing concrete pavement where the straightedge is to be placed with the midpoint coincident with the joints. Pavement not meeting this straightedge requirement shall be corrected within 48 hours by grinding or other methods as approved by the Engineer.

Profiles of the completed pavement surface specified in Section 40-1.10, "Final Finishing," of the Standard Specifications will not be required. The Profile Index requirements in Section 40-1.10, "Final Finishing," of the Standard Specifications shall not apply.

### **Curing Method**

The curing method for replacement pavement shall be as recommended by the manufacturer of the cement and as approved by the Engineer.

## **QUALITY CONTROL PROGRAM**

### **General**

The Contractor shall establish, provide and maintain a quality control program that will provide assurance to the Engineer that all materials and completed construction conform to the contract requirements specified herein.

At least 20 days prior to the placement of the trial slab the Contractor shall submit to the Engineer for approval a written Quality Control Plan (QCP) that shall be used to ensure the quality of the product and the work. At the request of the Engineer or Contractor, the Contractor and Quality Control Managers (QCMs) shall meet with the Engineer to discuss the QCP. The Engineer will have 15 days to approve the QCP. Should the Engineer fail to complete the review of the QCP within the time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the QCP, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

If in the judgement of the Engineer, the Contractor has not implemented or is not complying with the approved QCP, production and placement shall be suspended. Production and placement shall not resume until approved by the Engineer.

### **Quality Control Plan**

The Contractor shall provide a QCP that describes the procedures that the Contractor will use to control the production process, to determine when changes to the production process are needed, and to propose procedures for implementing changes for replacement pavement operations. The QCP shall also include an outline for the placement and testing of the trial slab.

Replacement pavement production and placement shall not begin until the QCP has been approved by the Engineer. Approval of the QCP will be based on the inclusion of all required information. Approval of the QCP does not imply any warranty by the Engineer that adherence to the QCP will result in replacement pavement that complies with these specifications. It shall remain the responsibility of the Contractor to demonstrate this compliance.

The QCP shall include the names and qualifications of the lead QCM and the assistant QCM. The lead QCM shall be responsible for the administration of the QCP. The lead QCM shall have current American Concrete Institute (ACI) certification as "Concrete Field Testing Technician-Grade I" and "Concrete Laboratory Testing Technician-Grade II." The assistant QCM shall have current ACI certification as "Concrete Field Testing Technician-Grade I" and either "Concrete Laboratory Testing Technician-Grade I" or "Concrete Laboratory Testing Technician-Grade II." All sampling, inspection and test reports shall be reviewed and signed by the QCM responsible for the production period involved prior to submittal to the Engineer. At least one QCM shall be present for each stage of mix design, trial slab construction, during production and construction of replacement pavement and for all meetings between the Contractor and Engineer relating to production, placement or testing of replacement pavement. The QCMs shall not be members of production or paving crews, inspectors or testers on the project during production or placement of replacement pavement. QCMs shall have no duties other than those referenced in these special provisions during the production and placement of replacement pavement.

The QCP shall include an outline of the production, transportation and placement of the replacement pavement. The QCP shall include a contingency plan for correcting situations if there is a problem in production, transportation or placement. The Contractor shall have equipment and personnel present to meet the requirements of the contingency plan. The QCP shall contain provisions for determining when placement of the replacement pavement will be suspended and temporary roadway will be substituted.

The QCP shall include the names of quality control personnel to be used and an outline of sampling, testing to be performed during and after construction of replacement pavement. At the time of submission of the QCP, quality control samplers and testers must be Caltrans qualified by the Department through the Independent Assurance Program (IAP) for the sampling and testing for which they will be responsible.

Before production and placement begins, the Contractor, QCMs and Engineer shall have a meeting with all production, transportation, placement, inspection, sampling and testing personnel to familiarize them with the requirements of the project. Items to be discussed include the production, transportation and placement processes for replacement pavement; contingency plan; and sampling and testing. The Contractor shall provide the facility for this meeting. The meeting date and location will be approved by the Engineer. Attendance at this meeting is mandatory for key personnel including the project manager, QCMs, production plant manager, plant inspector, all concrete delivery truck drivers, paving superintendent, paving foreman, paving machine operator, and all inspectors, samplers and testers. All meeting attendees shall sign in at the meeting. Production and placement operations shall not begin unless the above key personnel have attended the mandatory meeting.

### **Quality Control Inspection, Sampling and Testing**

The Contractor shall perform quality control inspection, sampling and testing to ensure that replacement pavement production and placement conform to the provisions specified herein.

The Contractor shall provide the required sampling, testing and inspection during all phases of replacement pavement production and placement. The Contractor shall provide a minimum of two business days notice to the Engineer, so the Engineer can witness all sampling and testing. The Engineer shall be given unrestricted access to the Contractor's quality control inspectors, samplers, testers and laboratories. During the production and placement period, the Contractor shall provide results of all testing to the Engineer within 15 minutes of completion of testing. The Contractor shall record all inspection, sampling and testing on forms approved by the Engineer. The Contractor shall provide written results of all inspection and testing to the Engineer within 48 hours of completion of each shift of paving and within 24 hours for all 7-day strength tests.

The Contractor shall provide a testing laboratory with adequate equipment and personnel for the performance of the quality control tests. This laboratory shall be located at a location approved by the Engineer and so that prompt testing requirements will be achieved. All sampling and testing equipment shall be maintained in proper working condition. Sampling shall be performed in conformance with the requirements of California Test 125. The QCP shall include a list the equipment to be used including date of last calibration, the names and certifications of sampling and testing personnel, and the location of the laboratory and testing equipment during and after paving operations.

Testing laboratories, testing equipment, and sampling and testing personnel shall conform to the requirements of the Department's IAP.

### **Trial Slab and Process Control Testing**

Prior to construction of RSC pavement, the Contractor shall construct one or more trial slabs under conditions similar to those that will exist during pavement replacement, for each mix design, to show that personnel, equipment, and mixing, placing, curing, and sawing techniques will produce a concrete pavement conforming to these special provisions in the anticipated time period under similar atmospheric and temperature conditions as pavement construction and to establish the correlation described below. During production and placement, the Contractor shall conform to the requirements of these special provisions and to the procedure outlined in the QCP to ensure that mixing, transporting, placing, finishing, curing and sawing techniques and that personnel and equipment to be used will produce replacement pavement conforming to these special provisions.

A trial slab shall be constructed using the approved mix design, admixtures and conditions for batching. During construction of trial slab, the Contractor shall demonstrate placement at the minimum and maximum times allowed from batching to placement. RSC pavement within the roadway shall not proceed until a trial slab meeting the requirements of these special provisions has been constructed.

The minimum trial slab dimensions shall be 10' x 20' and shall be 9 inches thick where planned replacement pavement nominal thickness is less than 9 inches. The trial slab thickness shall be 10 inches where planned replacement pavement nominal thickness is 10 inches or greater. Where there are planned slab replacements with greater and less than 10 inches thickness then two trial slabs shall be required one at 9 inches thick and one at 10 inches thick. Trial slabs shall be placed near the project site at a location mutually acceptable to the Engineer and the Contractor except slabs shall not be placed on the roadway or within the project limits.

During trial slab construction, the Contractor shall sample and split the aggregate for gradings, cleanness value, and sand equivalent testing with the Engineer, at the Contractor's cost. Both sets of test results of these samples shall conform to the provisions in Section 90-2.02, "Aggregates," of the Standard Specifications. If test results do not conform to the requirements, the trial slab will be rejected.

During trial slab construction and within 20 minutes of RSC delivery, beams shall be fabricated in conformance with the requirements in California Test 524. Beams shall be used to determine early age and 7-day modulus of rupture values. Beams fabricated for early age testing shall be cured so that the monitored temperature in the beams and the trial slab are within 5° F at all times. Internal temperatures of the trial slab and early age beams shall be monitored and recorded at minimum time intervals of 5 minutes by installing thermocouples and or thermistors connected to strip-chart recorders or digital data loggers. Temperature recording devices shall be accurate to within  $\pm 2^{\circ}$  F. Internal temperature readings shall be measured at one inch from the top and one inch from the bottom, no closer than 3 inches from any edge of the concrete elements, until the early age testing is completed. Beams fabricated for 7-day testing shall be cured in conformance with the requirements in California Test 524, except beams shall be placed into sand at between 5 and 10 times the final set time or 24 hours, whichever is earlier. Testing shall be performed by the Contractor and witnessed by the Engineer. At the Engineer's request, the Contractor shall produce samples for the Engineer to test. Strength results from beams shall be the basis for determining whether RSC pavement operations may proceed. Trial slabs 9 inches thick shall have an early age modulus of rupture of not less than 400 pounds per square inch and a 7-day modulus of rupture of not less than 600 pounds per square inch. Trial slabs 10 inches thick shall have an early age modulus of rupture of not less than 333 pounds per square inch and a 7-day modulus of rupture of not less than 600 pounds per square inch. Beams failing early age or 7-day modulus of rupture requirements shall be cause for the rejection of the trial slab.

When proposed by the Contractor, in writing, and approved by the Engineer, ASTM Designation: C 805 or C 900 shall be used to estimate the modulus of rupture of the pavement at early ages. The selected test method shall be used to determine modulus of rupture until 7 days after the Contractor notifies the Engineer of withdrawal of the proposal or 7 days after the Engineer notifies the Contractor of withdrawal of approval, in writing. During trial slab curing, correlation testing shall be performed to determine the relation between the modulus of rupture and ASTM Designation: C 805 or C 900 performed on the trial slab. The correlation shall be established by testing at 4 or more time intervals. At a minimum, tests shall be performed one hour before and one hour after the opening age and two others within 15 minutes of the opening age. Modulus of rupture estimates shall be calculated with either a linear, exponential or logarithmic, least squares best-fit equation, whichever provides the best correlation coefficient.

The Contractor shall state in detail the intended location and time; procedure for production, placement and finishing of RSC pavement; sampling, sample curing and sample transportation; testing and reporting of test results for the trial slab in the QCP.

### **Process Control and Quality Control Testing**

The Contractor shall provide continuous process control and quality control sampling and testing throughout production and placement of replacement pavement.

During production of RSC for replacement pavement operations, the Contractor shall sample and test aggregates at least once every 650 cubic yards of RSC produced but not less than once per placement shift. Aggregates shall be tested for conformance with gradations, cleanness value and sand equivalent requirements.

During placement of RSC pavement, the Contractor shall fabricate specimens and test for modulus of rupture within the first 30 cubic yards, within the final truckload and at least once every 130 cubic yards.

During placement of RSC, the Contractor shall sample and test for yield, penetration, air content and unit weight at least once in every 650 cubic yards RSC produced but not less than twice per placement shift.

At the Engineer's request, the Contractor shall provide split samples and fabricate beams for the Engineer to test. The cost of sampling, fabricating and transporting extra samples will be paid for as extra work in conformance with the provisions in Section 4-1.03D, "Extra Work," of the Standard Specifications. When, in the opinion of the Engineer, RSC fails to conform to the mix design requirements or the requirements of these special provisions, the Contractor shall provide samples and testing at the direction of the Engineer. If the material fails to meet requirements of these special provisions, cost of sampling and testing shall be at the Contractor's expense. If the material meets the requirements of these special provisions, the cost of sampling and testing will be paid for as extra work in conformance with the provisions in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Beams used for determining early age modulus of rupture shall be cured under the same conditions as the pavement until one hour prior to testing. Beams fabricated for the 7-day test shall be cured in conformance with California Test 524 as modified in these special provisions. Modulus of rupture test results will be used for accepting or rejecting the replacement pavement and pay factor adjustment for low modulus of rupture.

Materials resulting from the construction of the trial slab, test specimens, temporary roadway structural section, and all rejected replacement pavement shall become the property of the Contractor and 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.

### **REPLACE EXISTING PAVEMENT DELINEATION**

Whenever existing pavement delineation is removed, obliterated or damaged due to the work involved in replacing concrete pavement, the Contractor shall replace the delineation in conformance with the requirements of these special provisions.

### **MEASUREMENT AND PAYMENT**

Replace concrete pavement (Rapid Strength Concrete) will be measured and paid for in the same manner specified for concrete pavement in Sections 40-1.13, "Measurement," and 40-1.14, "Payment," of the Standard Specifications, and these special provisions.

Replace concrete pavement (Rapid Strength Concrete) payments will be subject to the pay factor values listed in "Pay Factor Adjustment for Low Modulus of Rupture" of these special provisions.

Full compensation for the pre-operation conference, including furnishing the facility to hold the pre-operation conference in, shall be considered as included in the contract prices paid for the item involving RSC and no additional compensation will be made therefor.

Costs for providing JITT will be made in conformance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications, except no markups shall be added, and the Contractor will be paid for one half of the JITT cost. 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.

The provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications shall not apply.

Full compensation for removing and disposing of existing concrete pavement and underlying base, constructing trial slabs, furnishing and placing bond breaker, furnishing and disposing of standby materials for temporary roadway structural section, constructing, maintaining, removing, and disposing of temporary roadway structural section, and quality control program, shall be considered as included in the contract price paid per cubic yard for replace concrete pavement (Rapid Strength Concrete), and no additional compensation will be allowed therefor.

The contract unit price paid for tie bar (drill and bond) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in placing epoxy-coated tie bars, drilling holes and bonding tie bars with epoxy resin, or furnishing and placing threaded dowel splice couplers, in concrete pavement complete in place, including properly aligning tie bars as shown on the plans, as specified in the Standard Specifications, and these special provisions, and as directed by the Engineer.

If calibration of volumetric batch-trucks is performed more than 100 miles from the project limits, additional inspection expenses will be sustained by the State. Whereas it is and will be impracticable and extremely difficult to ascertain and determine the actual increase in these expenses, it is agreed that payment to the Contractor for replace concrete pavement (Rapid Strength Concrete) will be reduced \$1,000.

#### **10-1.885 TRANSITION RAILING (TYPE WB)**

Transition railing (Type WB) shall be furnished and installed in conformance with details shown on the plans, the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

The 10-gage rail elements shall conform to the requirements of Class B, Type 1 three beam guard railing as shown in AASHTO Designation: M 180. End caps shall conform to the requirements of Class A, Type 1 three beam guard railing as shown in AASHTO Designation: M 180.

Surplus excavated material remaining after the transitional railing (Type WB) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid for transition railing (Type WB) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing transition railing (Type WB), complete in place, including drilling holes for wood posts, driving posts, backfill, and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**ENGINEER'S ESTIMATE**  
**03-0A6334**

21 (S)	120151	TEMPORARY TRAFFIC STRIPE (TAPE)	LF	42,200		
22 (S)	120152	TEMPORARY PAVEMENT MARKING (TAPE)	SQFT	510		
23 (S)	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	413,000		
24 (S)	120165	CHANNELIZER (SURFACE MOUNTED)	EA	12		
25 (S)	120199	TRAFFIC PLASTIC DRUM	EA	1,430		
26 (S)	120200	FLASHING BEACON (PORTABLE)	EA	4		
27 (S)	121140	TEMPORARY METAL BEAM GUARD RAILING	LF	75		
28 (S)	014116	TEMPORARY ALTERNATIVE FLARED TERMINAL SYSTEM	EA	2		
29 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	LS	LUMP SUM	LUMP SUM	
30 (S)	129000	TEMPORARY RAILING (TYPE K)	LF	138,000		
31 (S)	129100	TEMPORARY CRASH CUSHION MODULE	EA	70		
32	150206	ABANDON CULVERT	EA	2		
33 (S)	150662	REMOVE METAL BEAM GUARD RAILING	LF	37,000		
34	150668	REMOVE FLARED END SECTION	EA	22		
35 (S)	150710	REMOVE TRAFFIC STRIPE	LF	98,200		
36 (S)	014117	REMOVE TEMPORARY TRAFFIC STRIPE (PAINT)	LF	210,000		
37	150742	REMOVE ROADSIDE SIGN	EA	56		
38	150760	REMOVE SIGN STRUCTURE	EA	1		
39	150805	REMOVE CULVERT	LF	190		
40	150820	REMOVE INLET	EA	5		

## ENGINEER'S ESTIMATE

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41	150823	REMOVE DOWNDRAIN	EA	10		
42	150870	REMOVE CONCRETE DECK SURFACE	SQFT	21,710		
43	152037	RELAY ENTRANCE TAPER AND PIPE DOWNDRAIN	EA	9		
44	152320	RESET ROADSIDE SIGN	EA	7		
45	152390	RELOCATE ROADSIDE SIGN	EA	12		
46	152394	RELOCATE SIGN STRUCTURE	EA	2		
47	014118	MODIFY SIGN STRUCTURE (SAFETY CABLE RETROFIT)	EA	2		
48	014119	16" PLASTIC PIPELINER	LF	91		
49	014120	22" PLASTIC PIPELINER	LF	1,100		
50	014121	28" PLASTIC PIPELINER	LF	700		
51	014122	34" PLASTIC PIPELINER	LF	130		
52	014123	24" CURED-IN-PLACE PIPE LINER	LF	2,100		
53	014124	30" CURED-IN-PLACE PIPE LINER	LF	1,590		
54	014125	42" CURED-IN-PLACE PIPE LINER	LF	310		
55	014126	48" CURED-IN-PLACE PIPE LINER	LF	210		
56 (S)	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	8,010		
57 (F)	153225	PREPARE CONCRETE BRIDGE DECK SURFACE	SQFT	21,710		
58	157561	BRIDGE REMOVAL (PORTION), LOCATION A	LS	LUMP SUM	LUMP SUM	
59	157562	BRIDGE REMOVAL (PORTION), LOCATION B	LS	LUMP SUM	LUMP SUM	
60	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	

**ENGINEER'S ESTIMATE****03-0A6334**

61	190101	ROADWAY EXCAVATION	CY	164,000		
62 (S)	190110	LEAD COMPLIANCE PLAN	LS	LUMP SUM	LUMP SUM	
63	193114	SAND BACKFILL	CY	15		
64	194001	DITCH EXCAVATION	CY	450		
65	198001	IMPORTED BORROW	CY	4,520		
66 (S)	200001	HIGHWAY PLANTING	LS	LUMP SUM	LUMP SUM	
67	200101	IMPORTED TOPSOIL	CY	2,440		
68	014127	BOULDER PLACEMENT	LS	LUMP SUM	LUMP SUM	
69	014128	LOG PLACEMENT	EA	11		
70	014129	CLAY LAYER	SQYD	2,300		
71 (S)	203017	EROSION CONTROL (HYDRAULIC MATRIX)	SQYD	29,800		
72 (S)	203026	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	12		
73 (S)	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM	LUMP SUM	
74 (S)	208000	IRRIGATION SYSTEM	LS	LUMP SUM	LUMP SUM	
75	260201	CLASS 2 AGGREGATE BASE	CY	25,200		
76	260210	AGGREGATE BASE (APPROACH SLAB)	CY	28		
77	280000	LEAN CONCRETE BASE	CY	33,100		
78	390132	HOT MIX ASPHALT (TYPE A)	TON	47,700		
79	393003	GEOSYNTHETIC PAVEMENT INTERLAYER	SQYD	3,520		
80	394053	SHOULDER RUMBLE STRIP (HMA,GROUND-IN INDENTATIONS)	STA	510		

## ENGINEER'S ESTIMATE

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81	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	570		
82	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	50,600		
83	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	15,200		
84	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	3,270		
85	401000	CONCRETE PAVEMENT	CY	72,200		
86	401082	SHOULDER RUMBLE STRIP (PCC, GROUND-IN INDENTATIONS)	STA	450		
87	404092	SEAL PAVEMENT JOINT	LF	178,000		
88	404094	SEAL LONGITUDINAL ISOLATION JOINT	LF	72,800		
89 (S)	420201	GRIND EXISTING CONCRETE PAVEMENT	SQYD	14,900		
90	510087	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE R)	CY	282		
91 (F)	510409	CLASS 1 CONCRETE (MINOR STRUCTURE)	CY	389		
92 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	228		
93	510510	MINOR CONCRETE (INVERT PAVING)	CY	33		
94	511118	CLEAN EXPANSION JOINT	LF	224		
95	515041	FURNISH POLYESTER CONCRETE OVERLAY	CF	2,430		
96 (F)	515042	PLACE POLYESTER CONCRETE OVERLAY	SQFT	29,230		
97 (F)	519078	SNOWPLOW DEFLECTOR	EA	87		
98 (S)	519081	JOINT SEAL (MR 1/2")	LF	225		
99 (S)	519088	JOINT SEAL (MR 1")	LF	224		
100 (F)	560218	FURNISH SIGN STRUCTURE (TRUSS)	LB	43,468		

## ENGINEER'S ESTIMATE

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141	721011	ROCK SLOPE PROTECTION (BACKING NO. 2, METHOD B)	CY	390		
142	721012	ROCK SLOPE PROTECTION (BACKING NO. 3, METHOD B)	CY	180		
143	721501	CONCRETE (CONCRETED-ROCK SLOPE PROTECTION)	CY	1,460		
144	721507	CONCRETED-ROCK SLOPE PROTECTION (1/4 TON, METHOD A)	CY	3,690		
145	722020	GABION	CY	1,190		
146	014138	GEOMEMBRANE	SQYD	1,670		
147	729010	ROCK SLOPE PROTECTION FABRIC	SQYD	11,700		
148	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	910		
149 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	LB	87,633		
150 (S-F)	750498	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	LB	8,080		
151	014139	CONCRETE BARRIER DELINEATOR (16-INCH)	EA	23		
152	820108	DELINEATOR (CLASS 2)	EA	800		
153	014140	HIGHWAY POST MARKER	EA	10		
154	820151	OBJECT MARKER (TYPE L-1)	EA	38		
155 (S)	832012	METAL BEAM GUARD RAILING (7' WOOD POST)	LF	33,900		
156 (S)	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	19		
157 (S)	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	21		
158 (S)	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	33		
159	839703	CONCRETE BARRIER (TYPE 60C)	LF	3,050		
160 (S)	840582	4" TWO-COMPONENT PAINT TRAFFIC STRIPE	LF	5,160		

## ENGINEER'S ESTIMATE

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161 (S)	014141	4" TWO-COMPONENT PAINT TRAFFIC STRIPE (RECESSED)	LF	145,000		
162 (S)	014142	8" TWO-COMPONENT PAINT TRAFFIC STRIPE (RECESSED)	LF	5,340		
163 (S)	014143	4" TWO-COMPONENT PAINT TRAFFIC STRIPE (RECESSED, BROKEN 17-7)	LF	490		
164 (S)	014144	4" TWO-COMPONENT PAINT TRAFFIC STRIPE (RECESSED, BROKEN 36-12)	LF	103,000		
165 (S)	014145	8" TWO-COMPONENT PAINT TRAFFIC STRIPE (RECESSED, BROKEN 12-3)	LF	1,320		
166 (S)	840661	TWO-COMPONENT PAINT PAVEMENT MARKING	SQFT	580		
167 (S)	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	
168 (S)	860460	LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
169 (S)	014146	TEMPORARY LIGHTING FACILITIES	LS	LUMP SUM	LUMP SUM	
170 (S)	860889	MODIFY TRAFFIC MONITORING STATION	LS	LUMP SUM	LUMP SUM	
171 (S)	014147	MODIFY ROADSIDE WEATHER INFORMATION	LS	LUMP SUM	LUMP SUM	
172		BLANK				
173	401108	REPLACE CONCRETE PAVEMENT (RAPID STRENGTH CONCRETE)	CY	1620		
174	406003	TIE BAR (DRILL AND BOND)	EA	1270		
175 (S)	839541	TRANSITION RAILING (TYPE WB)	EA	8		
176	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

**TOTAL BID: \_\_\_\_\_**