

COUNTY OF MONO, DEPARTMENT OF PUBLIC WORKS

TECHNICAL SPECIFICATIONS*JUNE LAKE STREETS REHABILITATION PROJECT**Project No. RPL-5947(047)*

Table of Contents	Page No.
1. DESCRIPTION OF WORK	2
2. MOBILIZATION	2
3. CONTROL OF WORK AND MATERIALS	3
4. EROSION CONTROL	4
5. MAINTAINING TRAFFIC / TRAFFIC CONTROL	5
6. DUST CONTROL	7
7. PROTECTION OF EXISTING FACILITIES	7
8. DEMOLITION	8
9. SAWCUT	8
10. GRIND EXISTING ASPHALT	8
11. PULVERIZATION	9
12. HOT MIX ASPHALT (HMA)	11
13. CRACK TREATMENT	12
14. SLURRY SEAL	14
15. CROSS GUTTER	15
16. RIBBON GUTTER	15
17. AGGREGATE BASE	16
18. ADJUST UTILITY	17
19. SIGNS AND SIGN POSTS	17
20. TRAFFIC STRIPES AND PAVEMENT MARKINGS	18
21. SURVEY MONUMENT	19
22. DRAINAGE INLET	19
23. STORM DRAIN PIPE	20
24. FLARED END SECTION	21
25. GRADED SWALE	21
26. PERVIOUS PAVERS	22
27. CONCRETE HEADWALL	22
28. METAL BEAM GUARD RAIL	22
29. SNOW POLES	23

1. Description of Work

The work to be done generally consists of rehabilitation of approximately 7.8 miles of roads in June Lake including the following:

Full depth grind of existing asphalt concrete pavement, spreading and compaction of pavement grindings, minor grading to improve drainage, placement of three-inches of new asphalt concrete pavement, construction of ribbon gutters and cross gutters and storm drain construction. Also, driveway transitions, culverts, roadway signage, roadway markings, adjust utility covers and other items or details not mentioned above, that are required by the project plans, these specifications, CQA Manual, or Special Provisions shall be performed, placed, constructed, or installed.

For this project, the County will obtain permits from the United States Army Corps of Engineers (USACOE), California Department of Fish and Wildlife (Cal DFW), and the Lahontan Regional Water Quality Control Board (LRWQCB), prior to authorizing the start of work on affected construction. Work shall begin on the storm drainage facilities, culverts, headwalls, inlets, or adjacent to streams, channels, waters of the state, waters of the US, or any other water bodies, permitted areas, riparian areas, or habitat areas after required permits have been established by the authorized agency, and as directed by the engineer. All work performed in these areas must be in conformance with the USACOE, Cal DFW, LRWQCB, federal, state and local requirements and the completed permits.

There may be other items of work not mentioned above that are required by the State Standard Specifications, Latest Edition, or these Technical Specifications. Work performed under these specifications shall conform to the State Standard Specifications (Caltrans, 2010).

2. Mobilization

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site. We anticipate the project to include two mobilizations, along with any demobilization required for a winter suspension.

The contract LUMP SUM price paid for MOBILIZATION shall constitute full compensation for furnishing all labor and materials, including tools, equipment and incidentals, and for performing the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of equipment and materials, creating as-built drawings, and for performing all work required for which separate payment is not otherwise provided as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer. No adjustment will be made to the lump sum price for mobilization due to the requirement of a winter suspension, two mobilizations, or to changes to other items of work or additions to the Contract.

3. Control of Work and Materials

Control of Work and Materials shall conform to the provisions in Section 5, "Control of Work," and Section 6, "Control of Materials" of the State Standard Specifications and these Technical Specifications.

No equipment or construction materials shall be stored or staged within the traveled way. The Contractor shall coordinate with the Owner regarding establishment and operation of storage and staging areas.

In each stage of construction, after completion of the preceding stage, the first order of work shall be the removal of any existing pavement delineation that conflicts with the pavement delineation being used by public traffic, as determined by the Engineer.

24 Hour Contact Number - The Contractor shall assign a project superintendent and an assistant who have the complete authority to make decisions on behalf of the Contractor. The project superintendent or the assistant shall be at the project site at all times during the construction and shall be available and on call 24 hours a day, 7 days per week for the duration of the project. The Contractor shall provide the Engineer and the Mono County Sheriff's Department primary and secondary 24-hour mobile phone numbers for the project superintendent and the assistant. These numbers shall not automatically direct calls to a recorder or other message taking service.

Advance Public Notification – At least 7 days and no more than 14 days prior to beginning any work on the project, the Contractor shall deliver written notice to all adjoining residents, businesses, tenants and other applicable parties listed below. Notice shall be given for general construction activity in an area as well as specific activities that will, in any way, inconvenience residents/property owners/tenants or affect their operations or access to their property. Such notices shall include the expected date for start of construction, a general description of the construction activity to take place, expected duration, and the name, address, and contact number of the Contractor's superintendent and of the Owner's Project Engineer. A follow up notice shall be distributed two days prior to the construction activity. Copies of all notices shall be provided to the Engineer for approval five working days prior to the desired distribution date.

The Contractor shall provide Advance Public Notice and coordinate the work with the following parties.

Mono County Sheriff's Department	760-932-7549
Mono County Fire / Rescue Department	760-387-2955
June Lakes Public Works Department (JLPUD)	760-648-7778

List of Required Submittals:

The Contractor shall provide one 'paper copy', and an 'electronic file' of each of the following submittals to the Engineer:

1. Construction Schedule
2. Storm Water Pollution Prevention Plan (SWPPP)
3. Traffic control plan
4. Aggregate Base Certificate of Compliance
5. Asphalt binder Certificate of Compliance for HMAC, tack coat, slurry coat, chip seal, and micro paving
6. HMA mix design and job-mix formula
7. Culvert Component Certificates of Compliance
8. Concrete mix design
9. Prefabricated Concrete Headwall
10. Storm Drain Inlet
11. Storm Drain Grate
12. Storm Drain Inserts
13. Pavers
14. Signs
15. Sign Posts
16. Snow Poles
17. Striping Paint Certificate of Compliance
18. Thermoplastic Specifications

The Owner reserves the right to require additional submittals from the Contractor that are not specifically identified above. If so requested, the Contractor shall provide the Engineer with one 'paper copy', and an 'electronic file' of any additional submittals.

4. Erosion Control

All erosion control will include all labor, materials, equipment, and incidentals necessary to prepare and adhere to a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the National Pollutant Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002, effective July, 1, 2010. Work shall include furnishing all labor, materials (including fiber rolls, silt fences, geotextiles, etc.), tools, equipment and incidentals, and providing the required BMPs and subsequent removal of BMPs, and for performing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the erosion control system as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

All erosion control work must also be in conformance with the USACOE, Cal DFW, and LRWQCB permits as well as all federal, state and local requirements.

Project Winterization: During periods when the project is shut down for the winter due to snow and or freezing weather the project shall be winterized to protect all disturbed areas to protect against erosion for the winter season and the spring thaw and shall be part of the SWPPP. Materials may include but not be limited to covering all disturbed areas with jute, straw, or other materials. The plan shall consider the County's snow removal operation and have no impact on removal of snow from streets and sidewalks or blocking drainage inlets.

The contract LUMP SUM price paid for "EROSION CONTROL" shall include full compensation for preparation and submittal of SWPPP by a qualified QSD, furnishing all labor, materials (including fiber rolls, silt fences, geotextiles, etc.), tools, equipment and incidentals, and providing the required BMPs and subsequent removal of BMPs, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the erosion control system as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

5. Maintaining Traffic / Traffic Control

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the State Standard Specifications and these Technical Specifications. Nothing in these Technical Specifications shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

The Contractor shall provide a traffic control plan specific for each phase of the project to be reviewed and approved by the Engineer prior to starting work. The proposed traffic control plans shall be prepared and signed by a Professional Traffic Operations Engineer (PTOE) or a Traffic Control Supervisor certified by the American Traffic Safety Services Association (ATSSA), hereinafter designated "TCS". Traffic control shall be completely in place prior to the start of each day's work. At the pre-construction meeting, the traffic control requirements for the project shall be reviewed with the Contractor including all of the Contractor's foremen or supervisors.

The Contractor shall post "No Parking" signs, as necessary, not less than 72 hours in advance of scheduled work that will restrict parking. If the work is not performed during the timeframe indicated on the "No Parking" signs, the work shall be rescheduled with at least five (2) working days advance notice. The Contractor shall leave the street open to traffic until just prior to starting the work, and shall provide all barricades, signs and traffic control necessary to protect the work. The Contractor shall perform all reposting of "No Parking" signs and re-notification occasioned by his failure to meet the posted schedule.

Costs from delays caused by failure of the Contractor to adhere to the approved schedule shall be at the Contractor's sole expense and no additional compensation will be allowed therefor.

A minimum of one paved traffic lane, not less than ten (10) feet wide, shall be open for use by public traffic in each direction of travel except for single direction traffic control with flaggers as approved by the Engineer. Traffic may not be routed over unpaved roadways unless authorized by the Engineer.

Except for temporary interruptions approved by the Engineer, Contractor shall maintain property owner access to their property over both walkways and driveways at all times.

The Contractor shall maintain a safe workplace at all times, including, but not limited to, providing flaggers, safety equipment, barricades, safe pedestrian passage along sidewalks, and maintenance of handicap access throughout the project site where applicable.

The Contractor shall fulfill the requirements of this section 24 hours per day, seven days per week, including holidays, from the time the Notice to Proceed is issued until the project is accepted as complete.

Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed with fluorescent 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 cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a portable sign stand with flags. The sign shall be placed as approved by the Engineer.

Bicycle lanes shall be maintained by the Contractor at all times. Appropriate warning signs designed for bicyclists shall be posted and maintained by the Contractor, as necessary, so that bicyclists can safely traverse the construction zone.

When entering or leaving roadways carrying public traffic, the Contractor's equipment, whether empty or loaded, shall in all cases yield to public traffic.

All excess and unsuitable material resulting from the Contractor's operation shall be removed from the project site before the end of each workday.

All hauling on local roads and streets shall be on routes acceptable to the Engineer. The Contractor shall submit the anticipated haul routes for each work location 2 working days prior to the pre-construction meeting.

The contract LUMP SUM price paid for "CONSTRUCTION TRAFFIC CONTROL" shall include full compensation for furnishing all labor, materials (including signs, arrow boards, barricades and cones), tools, equipment and incidentals, preparing the required traffic control plans, and providing construction and detour signs, flaggers, police support and the installation and subsequent removal of signing, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

6. Dust Control

The Contractor shall perform necessary work to control dust at all times as required by regulation. Full compensation for dust control including that resulting from public traffic shall be considered as included in the prices paid for the various items of work involved, and no separate payment will be made therefor.

7. Protection of Existing Facilities

Existing facilities requiring adjustment include removal and connection to existing storm drainage. All work performed in connection with adjusting existing facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," and Section 4-1.03D "Changes" of the State Standard Specifications and these Technical Specifications.

Existing underground utility lines are not shown on the plans. The Contractor shall be responsible for locating and field verifying the location of all existing utilities and utility features prior to the start of construction activities and protecting all facilities during construction. Engineer shall be notified of utility conflicts. Contractor shall allow 14 days after notification of utility conflicts prior construction of affected work. Damage caused by the Contractor to existing facilities shall be repaired within 24 hours at the sole expense of the Contractor.

The Contractor shall notify and coordinate the work of identifying and marking utility facilities with the respective utility companies. The Contractor is required to call Underground Service Alert (USA) at 811 forty-eight (48) hours in advance of any excavation activity. The Contractor shall submit to the Engineer copies of all USA confirmation numbers including associated documentation.

Existing survey monuments shall be preserved, referenced or replaced pursuant to the requirements of State of California Streets and Highways Code Sections 732.5, 1492.5, and 1810.5 and Business and Professions Code Section 8771 and the following:

The Contractor shall not disturb permanent survey monuments or benchmarks except as shown on the plans and as approved by the Engineer. The Contractor shall

bear the expense of replacing any monuments or benchmarks that may be disturbed without permission. Replacement shall be done only by a registered Land Surveyor in the presence of the Engineer.

Should the Contractor during the course of construction encounter a survey monument or benchmark not shown on the plans, he shall promptly notify the Engineer so that the monument or benchmarks may be referenced accordingly.

Full compensation for preservation of existing survey monuments, except those noted on the plans as requiring replacement and paid for separately, shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

8. Demolition

Demolition shall include all labor, materials, equipment, and incidentals necessary to complete the work as specified to remove and dispose of items otherwise shown on plans but not included in line items of work.

The contract LUMP SUM price paid for "DEMOLITION" including furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved to remove and dispose of or remove and salvage items as shown on the plans which are not otherwise included in these technical specifications, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

9. Sawcut

Work under this item will include all labor, materials, equipment, and incidentals necessary to complete the work as specified to construct sawcut lines where new pavement joins existing pavement, at the limits of removal for gutters and cross gutters, and as shown on the plans.

Full compensation for sawcut shall be considered as included in the prices paid for the various items of work involved, and no separate payment will be made therefor.

10. Grind Existing Asphalt

Grinding shall be in conformance with the State Standard Specifications. Grind Existing Asphalt shall be to depth and in locations as shown on plans. Grindings generated shall be stockpiled at locations as directed by the Engineer.

Contractor shall familiarize himself with the Geotechnical Pavement Design Recommendations prepared by Sierra Geotechnical Services, Inc., on January 31,

2014. This report provides results of coring samples of the existing pavement and subgrade conditions. There is relatively high groundwater in portions of the work.

GRIND EXISTING ASPHALT will be measured by the SQUARE FOOT for the depths and widths specified on the project plans, regardless of the number of passes required.

The contract unit prices paid for "GRIND EXISTING ASPHALT" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all of the work involved to grind existing asphalt, including saw-cutting, constructing, maintaining, removing, and hauling and stockpiling, as shown on the Plans, as specified in these Technical Specifications and as directed by the Engineer.

11. Pulverization

The existing roadway shall be pulverized to the depth shown on the plans and shaped to provide a stable base for asphalt concrete pavement. Unless otherwise directed by the Engineer, pulverized material shall conform to the following requirements:

Sieve Size	Percent Passing (%)
3"	100
2"	95 – 100

If the pulverization of the existing pavement layer does not meet these criteria, a portion of the pulverized material shall be replaced with approved material to ensure compliance with the above, as directed by the Engineer.

PREPARATION OF ROADBED

For road sections which require removal of pulverized material, the grindings shall be kept free of contamination from foreign materials under or adjacent to the roadbed. The grindings shall be hauled to a stockpile location as directed by the County. The remaining grindings left in place together with the native material below shall be scarified to a depth of 6 inches prior to compaction.

Contractor shall familiarize himself with the Geotechnical Pavement Design Recommendations prepared by Sierra Geotechnical Services, Inc., on January 31, 2014. This report provides results of coring samples of the existing pavement and subgrade conditions. There is relatively high groundwater in portions of the work.

For road sections which do not require removal of pulverized material, the grindings together with the native material below shall be scarified to a depth of 6 inches prior to compaction.

For areas of road where new improvements are beyond the limits of existing pavement, the subgrade shall be prepared according to the geotechnical report.

Operations shall be conducted so as to maintain traffic flow as required under Section 4 "Maintaining Traffic / Traffic Control". The Contractor shall shape and compact the pulverized material and open the street to public traffic at the end of each work day. The contractor must provide clean and straight edges to any existing asphalt which adjoins the project.

The Contractor shall be responsible for all damage to pulverizing machines caused by hitting any hidden objects during pulverizing operations. In addition, the Contractor shall be responsible for the cost of repairing any facility that is damaged by the pulverizing machine. There may be numerous centerline monuments and temporary survey points within the pulverized sections that are not shown on the plans. The Contractor is encouraged to obtain copies of the subdivision maps from Mono County and familiarize himself with the types and locations of such objects.

COMPACTION

At the start of compaction, the percentage of moisture in the pulverized material shall be within 2 percentage points of the optimum moisture content and shall be less than the moisture content which will cause the material to become unstable during compaction and finishing. The optimum moisture content and density shall be determined in the field in accordance with ASTM D1557 on representative samples of the pulverized material obtained from the area being processed at the time compaction begins. The material shall be compacted to a minimum of 95 percent of maximum density in accordance with ASTM D1577.

FINISHING

When the initial compaction is nearing completion, the surface of the material shall be shaped to the required lines, grades, and cross sections. The moisture content of the surface material shall be maintained at not less than the optimum moisture content during finishing operations.

If necessary, the surface shall be lightly scarified and reworked to remove any tire imprints left by equipment. Finishing shall be done in such a manner as to produce a smooth dense surface free of compacting planes, cracks, ridges, or loose material.

PULVERIZATION will be measured by the SQUARE YARD for the depths and widths specified on the project plans, regardless of the number of passes required.

The contract unit prices paid for "Pulverization" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all of the work involved in pulverizing the roadbed, mixing water and re-compacting the material, including saw-cutting, construction of shoulders, constructing, maintaining, removing,

and disposing of temporary asphalt concrete tapers, as shown on the Plans, as specified in these Technical Specifications and as directed by the Engineer.

SHOULDERS

For areas shown on the plans to receive shoulders, pulverized material shall be left in a windrow at each side of the new pavement area to be placed against new paved edge after completion of paving. After pavement is complete pulverized material shall be placed against new pavement edge. The material shall be compacted to a minimum of 95 percent of maximum density in accordance with ASTM D1577. Full compensation for shoulders shall be considered as included in the prices paid for the various items of work involved, and no separate payment will be made therefor.

12. Hot Mix Asphalt (HMA)

Hot Mix Asphalt (HMA) shall be placed according to the details and location shown on the plans. Work under this item shall conform to the provisions in Section 39, "Hot Mix Asphalt" of the 2010 State Standard Specifications and these Technical Specifications.

Hot Mix Asphalt shall include driveway transitions and AC aprons. Driveway transitions and AC aprons shall be 3" thick HMA over 4" compacted base or pulverized asphalt compacted to 95% maximum dry density.

Materials: Hot Mix Asphalt (HMA) shall be Type A using the Standard construction process complying with Section 39, "Hot Mix Asphalt" of the State Standard Specifications. Asphalt binder to be mixed with the aggregate shall conform to the provisions of Section 92, "Asphalts", of the State Standard Specifications and shall be Performance Graded Polymer Modified (PG Polymer Modified) Asphalt Binder PG 64-28 PM. Aggregate for HMA Type A must comply with the 3/4-inch or 1/2-inch grading. Tack Coat shall be asphaltic emulsion in conformance with the provisions of Section 94 "Asphaltic Emulsions" of the State Standard Specifications.

STREET AND ROAD PAVEMENT

Place HMA on adjacent traveled way lanes so that at the end of each work shift, the distance between the ends of HMA layers on adjacent lanes is between 5 feet and 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. Kraft paper or another approved bond breaker may be placed under the conform tapers to facilitate the taper removal when paving operations resume. The joint of the new pavement overlay shall not be located in a wheel path.

Pavement shall conform to existing concrete, asphalt, and other features adjacent to roadways as shown on the plans and/or as directed by Engineer.

Quantities of HMA shall be measured by the TON. Measurement and verification of quantities shall be coordinated with the Engineer.

The contract unit price paid per ton for "HMA" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and doing all work involved in placement of hot mix asphalt concrete, including mix design preparation, and contractor quality control according to State Standard Specification Section 39 "Hot Mix Asphalt", complete in place, as shown on the plans and as specified in these Technical Specifications or as directed by the Engineer.

Full compensation for furnishing and applying tack coat shall be considered as included in the contract price paid per ton of HMA and no separate payment will be made therefor. Full compensation for conforming to existing shall be considered as included in the contract price paid per ton of HMA and no separate payment will be made therefor.

DRIVEWAY TRANSITIONS

Driveway transitions will include all work necessary to provide pavement connection from street to existing facilities. Work will include sawcut of existing pavement or other materials as directed by engineer. Existing materials and facilities to remain shall be protected in place. Contractor shall match existing concrete, pavers, and other driveway materials. Adjacent yard features shall be protected in place.

Quantities of HMA DRIVEWAY TRANSITION will be measured by the SQUARE FOOT of driveway transition in place and accepted by the Engineer. The contract unit price paid per square foot for "HMA DRIVEWAY TRANSITION" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for performing all the work involved in demolishing existing driveway and constructing HMA driveways including traffic control, sawcutting, sub-grade preparation, providing and placing aggregate base, furnishing and placing HMA, furnishing and applying tack coat and all other area restoration as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer.

Asphalt concrete used for driveway transitions will not be measured separately. Full compensation for asphalt concrete will be considered as included in the contract unit prices paid for HMA DRIVEWAY TRANSITION listed in the bid schedule and no additional compensation will be made therefor.

13. Crack Treatment

Crack Treatment shall be placed according to the details and location shown on the plans. Work under this item shall conform to the provisions in Section 37, "Bituminous Seals" of the 2010 State Standard Specifications and these Technical Specifications.

Work under this item will include all labor, materials, equipment, and incidentals necessary to prepare and treat cracks on roads receiving preventative maintenance, including sealing of cracks with hot poured asphalt sealant compound and filling of cracks with polymerized slurry seal.

All cracks are to be cleared of debris and plant materials. **Remove old excess crack fill material from the pavement surface.** Immediately prior to placing the sealant compound or filling material, all cracks shall be cleaned and dried using a hot compressed air lance. The cracks shall be treated with hot compressed air until the pavement in the groove is darkened but not charred or burned.

The work of cleaning and sealing cracks in hot mix asphalt pavement shall include preparation of the crack sealant or crack filler, cleaning the cracks, and the placing of the crack sealant or crack filling compound.

Crack sealant meeting the specification for Nuvo CS Formulation B, as produced by Maxwell Products Incorporated, shall be utilized for sealing all cracks measuring $\frac{1}{4}$ inches to $\frac{3}{4}$ inches in width. For cracks larger than $\frac{3}{4}$ inches, the material utilized for crack filling shall conform to polymerized slurry seal. The polymerized slurry seal shall utilize PMCQS1h emulsion. Aggregate for polymerized slurry seal shall meet the gradation for Type II aggregate.

The heating kettle for joint sealant compound shall be a double boiler oil heat transfer type, with built in agitator and equipped with thermometers to measure the temperature of both heat transfer oil and the sealing compound. The heating kettle shall have automatic thermometric controls which will prevent overheating of the sealant.

The sealant applicator shall be a pressure feed melter application. **Pour pots shall not be used.** The air compressed air lance shall be equipped with oil and moisture filters and have an air supply of 100 CFM or greater. The hot compressed air lance shall have a discharge air temperature greater than 2550°F and an air volume greater than 150 CFM.

The sealant compound shall be melted slowly with constant agitation until it is in a lump-free, free-flowing state, within the temperature range recommended by the manufacturer for application. Heating above the manufacturer's recommended range for application is not permitted.

The sealant compound or filling material shall be placed within two minutes of the hot lance treatment by a hose and wand fitted with proper size from a low pressure pump connected to the heating kettle. The tip of the wand shall be placed to the bottom of the crack to ensure uniform application. The cracks are to be sealed or filled so that upon cooling, the sealant compound or filling material is just ($<1/4$ "") below the adjacent pavement surface. If after the initial placement, the material subsides below the pavement surface, then additional material shall be applied. Sealant compound

damaged by construction traffic or the Contractor's operation shall be replaced by the Contractor at the Contractor's expense.

A "U" shaped squeegee shall be used to apply sealant compound or filling material. At the contractor's option the squeegee may be incorporated with the application wand or as a separate operation. Immediately screed the joint sealant to the elevation of the existing surface. Use a "U" shaped squeegee to ensure that a 4-inch wide band is centered on the finished sealed crack creating a flush finish. Sufficient time shall be allowed for the cooling of the sealant before any vehicular traffic is allowed to resume.

Areas exhibiting adhesion failure, damage, missed areas, foreign objects in the sealant, or other problems that can accelerate failure shall be resealed at no additional cost to the owner. If settlement occurs beyond 0.250 inches, the contractor shall apply an additional layer(s) of sealant to bring the material flush to the surface prior to application of the Cape Seal.

Pavement surface temperature shall be 40°F (4°C) and rising to ensure adequate adhesion. When applying sealant compound or filler material, assure the pavement surface to be dry and free of dew. Operations shall be discontinued during inclement weather.

Quantities of Crack Treatment shall be measured by the LANE-MILE. A lane-mile consists of a paved lane and any adjacent shoulders.

The contract unit price paid per lane-mile for "CRACK TREATMENT" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and doing all work involved in constructing Crack Treatment complete in place, as shown on the plans and as specified in these Technical Specifications or as directed by the Engineer.

14. Slurry Seal

All loose cover material shall be removed by brooming prior to application of the subsequent slurry seal. Apply polymerized slurry seal in accordance with Section 37-3 "Slurry Seal and Micro-Surfacing" of the Standard Specifications. The polymerized slurry seal shall utilize PMCQS1h emulsion. Aggregate shall meet the gradation for Type II aggregate.

Quantities for SLURRY SEAL will be measured by the SQUARE YARD. The contract unit price paid per SQUARE YARD for "SLURRY SEAL" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and doing all work involved in constructing slurry seal, including mix design, and contractor quality control according to State Standard Specification Sections complete in place, as shown on the plans and as specified in these Technical Specifications or as directed by the Engineer.

15. Cross Gutter

Cross gutter shall be constructed as shown on the plans and as directed by the Engineer. The term “cross gutter” shall be used interchangeably with “concrete swale”. Cross gutter does not include spandrel. Cross gutter shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer. Cross gutter shall be 6” Portland Cement Concrete placed over 6” of aggregate base compacted to 95% maximum dry density.

Portland Cement Concrete shall conform to the requirements of Section 90-10, “Minor Concrete” and Section 73, “Concrete Curbs and Sidewalks” of the State Standard Specifications and these Technical Specifications. Aggregate base shall conform to the provisions in Section 26, “Aggregate Bases” of the State Standard Specifications and these Technical Specifications.

Concrete shall be Class 1 concrete with a minimum 56-day compressive strength of 5,000 psi. Fibermesh fiber additive or approved equal shall be added for all concrete with an exposed wearing surface. Cement for all concrete in the project shall be Type II Portland cement. The maximum water cement ratio shall be 0.45. All concrete shall have an air entrainment between four (4) percent and six (6) percent. (+0.1%) Coarse aggregate for concrete shall be 1-inch minimum.

Quantities of CROSS GUTTER will be measured by the SQUARE FOOT of cross gutter in place and accepted by the Engineer.

The contract unit price paid per square foot for “CROSS GUTTER” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing cross gutter including sub-grade preparation, providing and placing aggregate base, providing and placing Portland cement concrete and reinforcement, and for removal and disposal of existing Cross Gutter where existing, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer.

16. Ribbon Gutter

Ribbon gutter shall be constructed as shown on the plans and as directed by the Engineer. Ribbon gutter shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer. Ribbon gutter shall be 6” Portland Cement Concrete placed over 6” of aggregate base compacted to 95% maximum dry density. Portland Cement Concrete shall conform to the requirements of Section 90-10, “Minor Concrete” and Section 73, “Concrete Curbs and Sidewalks” of the State Standard Specifications and these Technical Specifications. Aggregate base shall conform to the provisions in Section 26, “Aggregate Bases” of the State Standard Specifications and these Technical Specifications.

Portland Cement Concrete shall conform to the requirements of Section 90-10, "Minor Concrete" and Section 73, "Concrete Curbs and Sidewalks" of the State Standard Specifications and these Technical Specifications. Aggregate base shall conform to the provisions in Section 26, "Aggregate Bases" of the State Standard Specifications and these Technical Specifications.

Concrete shall be Class 1 concrete with a minimum 56-day compressive strength of 5,000 psi. Fibermesh fiber additive or approved equal shall be added for all concrete with an exposed wearing surface. Cement for all concrete in the project shall be Type II Portland cement. The maximum water cement ratio shall be 0.45. All concrete shall have an air entrainment between four (4) percent and six (6) percent. (+0.1%) Coarse aggregate for concrete shall be 1-inch minimum.

Ribbon Gutter elevations will be set by County Surveyor, to match final asphalt grades, outer edge of RIBBON GUTTER may vary in height in locations as directed by engineer. Work by contractor shall include minor grading as necessary to match new edge of ribbon gutter.

Quantities of RIBBON GUTTER will be measured by the LINEAR FOOT of ribbon gutter in place and accepted by the Engineer.

The contract unit price paid per linear foot for "RIBBON GUTTER" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing ribbon gutter including sawcutting, sub-grade preparation, providing and placing aggregate base, providing and placing Portland cement concrete and reinforcement, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer.

Minor grading as necessary to match grade adjacent to ribbon gutter shall be included in the contract unit price per linear foot of RIBBON GUTTER, and no additional payment will be made thereof.

17. Aggregate Base

Aggregate base for sidewalks, cross gutters, curbs, spandrels and curb and gutters shall be installed according to the details and location shown on the plans. Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases" of the State Standard Specifications and these Technical Specifications.

The grading of the material shall conform to the 3/4-inch maximum, specified in Section 26-1.02A, "Class 2 Aggregate Base," of the State Standard Specifications.

Aggregate base shall be spread in accordance with the provisions of Section 26-1.04, "Spreading" and Section 26-1.05, "Compaction," of the State Standard Specifications. Spreading and compacting shall be performed by methods that will

produce a uniform base, firmly compacted and free from pockets of coarse or fine material. No spreading operation shall begin until the physical characteristics of aggregate base have been approved by the Engineer.

Aggregate base, regardless of its use, shall be compacted to 95% (ninety-five percent) relative compaction as determined by ASTM D 6938. Tests shall be performed every 300 linear feet placed.

Full compensation for aggregate base shall be considered as included in the prices paid for the various items of work involved, and no separate payment will be made therefor.

18. Adjust Utility

Adjust Utility shall be constructed as shown on the plans and as directed by the Engineer. Adjust Utility shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer. Adjust Utility shall include concrete collar. Concrete collar shall be 6" Portland Cement Concrete placed over 6" of aggregate base compacted to 95% maximum dry density. Portland Cement Concrete shall conform to the requirements of Section 90-10, "Minor Concrete" and Section 73, "Concrete Curbs and Sidewalks" of the State Standard Specifications and these Technical Specifications.

Quantities of ADJUST UTILITY will be measured by EACH of Adjust Utility in place and accepted by the Engineer.

The contract unit price paid per each for "ADJUST UTILITY" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in raising or lowering utility lid to finished grade and constructing concrete collar including saw-cutting, providing and placing Portland cement concrete and reinforcement, as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer.

19. Signs and Sign Posts

Signs and Sign Posts shall conform to Section 56-4, "Roadside Signs" of the State Standard Specifications and the 2009 MUTCD.

Stop Signs shall be 30" single sheet aluminum and shall have Type III retro-reflective sheeting.

Street Name signs shall be 6" tall single sheet aluminum with white lettering on brown background and shall have Type III retroreflective sheeting. Lettering on Street Name signs should be composed of initial upper-case letters of 4 inches in height and

lower-case letters of 3 inches in height. Refer to Street Name Sign List as provided by Engineer during construction for spelling and quantities of Street Name signs.

Quantities of SIGN – INSTALL NEW will be measured by the EACH from actual count. One or more sign panels mounted on a single post will be counted as a single unit.

The contract unit price paid per EACH for SIGN – INSTALL NEW shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removing existing sign, furnishing and installing traffic signs and sign posts, complete in place, including the installation of sign panels as shown on the plans, as specified in the State Standard Specifications and these Technical Specifications and as directed by the Engineer.

20. Traffic Stripes and Pavement Markings

This work shall consist of application of traffic stripes and pavement markings, including applying paint, glass beads and thermoplastic material. All traffic striping and pavement markings damaged by the Contractor's operations shall be replaced in kind. Approximate locations of all new pavement markings are shown on the plans. Prior to installation, the Contractor shall lay out marking locations for review and approval by the Engineer. Any markings installed by the Contractor that the Engineer has not pre-approved, and that the Engineer determines are installed improperly or in the wrong locations, shall be removed and replaced to the satisfaction of the Engineer at the Contractor's sole expense.

Equipment, mixing, surface preparation, application, and tolerances for furnishing and applying traffic striping and pavement markings shall conform to Section 84, "Traffic Stripes and Pavement Markings" of the State Standard Specifications and these Technical Specifications.

Materials: Paint type shall be Waterborne traffic line in accordance with Section 84-3 of the State Standard Specifications and shall be applied in two (2) coats. At least 48 hours shall elapse between application of a bituminous seal coat and permanent pavement marking. Thermoplastic traffic stripes and pavement markings shall be in accordance with Section 84-2 of the State Standard Specifications.

Quantities of THERMOPLASTIC STOP BAR will be measured by the LINEAR FOOT.

Quantities of THERMOPLASTIC STOP MARKING will be measured each.

Quantities of PAINTED TRAFFIC STRIPES will be measured by the LINEAR FOOT.

The contract unit price for “THERMOPLASTIC STOP BAR”, “THERMOPLASTIC STOP MARKING”, and “PAINTED TRAFFIC STRIPES” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in applying pavement markings and traffic stripes including establishing alignment and layout work complete and in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

21. Survey Monument

Survey Monuments shall include setting temporary ties outside the limits of road construction before the monument is disturbed and/or removed, setting straddlers on the asphalt to locate the monument well, saw-cutting asphalt, constructing the monument well, and setting and punching the metal marker disk in the monument well. A licensed Professional Land Surveyor shall be required to tie out original monument, set straddlers and re-set the monument.

Survey Monument shall conform to Section 81, “Monuments” of the State Standard Specifications. Survey Monument shall be Type D, Alternative No. 1.

Quantities of SURVEY MONUMENT will be measured each.

The contract unit price for “SURVEY MONUMENT” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in constructing survey monument including tie-out of monument, setting of straddlers, saw-cutting asphalt, forming and placing concrete, constructing monument well and placing and punching metal marker disk complete and in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

22. Drainage Inlet

Drainage Inlet shall be constructed as shown on the plans and as directed by the Engineer, and shall include the grate, the connector pipe along with connections to the culvert and to the inlet, inlet hood, and inlet trash screen. Drainage Inlet shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer. Drainage Inlet shall include inlet depression where shown on the plans. Inlet depression shall be 6” Portland Cement Concrete placed over 6” of aggregate base compacted to 95% maximum dry density. Portland Cement Concrete shall conform to the requirements of Section 90-10, “Minor Concrete” of the State Standard Specifications and these Technical Specifications.

Drainage Inlet and Grate shall conform to Section 70, “Miscellaneous Drainage Facilities” of the State Standard Specifications.

Drainage inserts, including inlet hood and inlet trash screen shall be installed in each drainage inlet as noted on the plans, and as directed by the engineer. The drainage inlet hood and trash screen shall be as manufactured by “Best Management Products, Inc.” or pre-approved equal.

Inlet hood shall be constructed of glass reinforced resin composite with ISO gel coat exterior finish with a minimum 0.125” laminate thickness. Hood shall be equipped with watertight access port, mounting flange and an anti-siphon vent. Size and position of hood shall be per manufacturer’s recommendations and as directed by engineer. The surface of the structure where hood is mounted shall be finished smooth and free of loose material. Hood shall be attached to structure wall with 3/8” stainless steel bolts and oil-resistant gasket as supplied by hood manufacturer.

Inlet trash screen shall be 304 non-magnetic stainless steel (minimum standard)

The connector pipe and connection shall conform to the requirements of Section 23, Storm Drain Pipe, and the State Standard Specifications.

Concrete shall conform to Section 15 – Ribbon Gutter, and the State Standard Specifications.

Quantities of “DRAINAGE INLET” will be measured each.

The contract unit price for “DRAINAGE INLET” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in installing and constructing Drainage Inlet and Inlet Depression in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer. Materials for this item as part of the contract unit price per each shall include inlet, grate, hood, filter, 10” HDPE connector pipe, pipe connections, concrete inlet depression, and all other materials required for the installation of each inlet.

23. Storm Drain Pipe

Storm Drain Pipe shall be constructed as shown on the plans and as directed by the Engineer. Storm Drain Pipe shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer. For the purpose of these specifications Culverts are considered Storm Drain Pipe.

Storm Drain Pipe shall be plastic with smooth interior and shall conform to Section 64 “Plastic Pipe” of the State Standard Specifications. Storm Drain Pipe with a nominal diameter of 27” shall be PVC sewer pipe per ASTM F679 with a pipe stiffness of 46 psi.

Storm Drain Pipe – 12” Slotted Drain shall be corrugated metal pipe in conformance with State Standard Specification 66-2, State Standard Plan D88, and as directed by Engineer.

Quantities of “STORM DRAIN PIPE” will be measured by the LINEAR FOOT of Storm Drain pipe in place and accepted by the Engineer.

The contract unit price for each size of “STORM DRAIN PIPE” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all of the work involved in installing Storm Drain Pipe in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

24. Flared End Section

Flared End Section shall be constructed as shown on the plans and as directed by the Engineer. Flared End Section shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer.

Flared End Section shall be plastic and shall conform to Section 64 “Plastic Pipe” of the State Standard Specifications.

Quantities of “FLARED END SECTION” will be measured by EACH and accepted by the Engineer.

The contract unit price for “FLARED END SECTION” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all of the work involved in installing Flared End Section in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

25. Graded Swale

Graded Swale shall be constructed as shown on the plans and as directed by the Engineer. Graded Swale shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer.

Quantities of “GRADED SWALE” will be measured by the LINEAR FOOT of Graded Swale in place and accepted by the Engineer.

The contract unit price for “GRADED SWALE” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in installing Graded Swale in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

26. Pervious Pavers

Pervious Pavers shall be constructed as shown on the plans and as directed by the Engineer. Pervious Pavers shall conform to details shown on the plans, except as modified to fit actual field conditions and as directed by the Engineer.

Quantities of "PERVIOUS PAVERS" will be measured by the SQUARE FOOT of Pervious Pavers in place and accepted by the Engineer.

The contract unit price for "PERVIOUS PAVERS" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in installing Pervious Pavers in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

27. Concrete Headwall

Concrete Headwall shall be constructed as shown on the plans and as directed by the Engineer. Concrete Headwall shall conform to Caltrans Standard Plan D89, except as modified to fit actual field conditions and as directed by the Engineer. Concrete Headwall may be precast.

Quantities of "CONCRETE HEADWALL" will be measured by EACH of Concrete Headwall in place and accepted by the Engineer.

The contract unit price for "CONCRETE HEADWALL" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in installing Concrete Headwall in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

28. Metal Beam Guard Rail

Metal Beam Guard Rail shall be constructed as shown on the plans and as directed by the Engineer. Metal Beam Guard Rail shall conform to the plans, except as modified to fit actual field conditions and as directed by the Engineer.

Quantities of "Metal Beam Guard Rail" will be measured by LINEAR FEET of Metal Beam Guard Rail in place and accepted by the Engineer.

The contract unit price for "Metal Beam Guard Rail" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all of the work involved in installing Metal Beam Guard Rail in place, as shown on the Plans, as specified in the State Standard Specifications and these Technical Specifications, and as directed by the Engineer.

29. Snow Poles

Snow Poles shall be “U Channel 10’ Snow Pole” or approved equal.

Snow pole placement shall be as directed by Engineer. The contractor shall give the engineer 48 hours’ notice to mark the location of Snow Poles prior to installation of snow poles.

The contract unit price for “Snow Poles” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing Snow Poles in place, as directed by the Engineer.