

Tab B – Standard Road Specifications

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SECTION 1. GENERAL

1-1.01 Referenced Specifications. Roads within the County of Mendocino requiring county approvals, and which are required for property access subject to the expectation of public use by residential owners within a subdivision or business open to the general public shall be constructed in accordance with the most recent version of the Standard Specifications of the State of California, Department of Transportation, Division of Highways, which specifications are hereinafter referred to as the State Standard Specifications, and in accordance with the following modifications and revisions, and County of Mendocino Standard Plans.

Whenever in the State Standard Specifications the terms State of California, Department of Transportation, Director or Engineer are used, the following terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

State of California -- County of Mendocino.

Department-- Owner.

Director-- County Director of the Department of Transportation of the County of Mendocino.

Engineer--The Director, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Owner – In the case of County projects, the term Owner means the County of Mendocino Department of Transportation. In the case of private projects, the term owner means the person who is working or having work done under permit or agreement with the County.

These County Standard Road Specifications, the Caltrans Standard Specifications, the County Standard Road Plans, the Caltrans Standard Plans, project plans, special provisions, contract change orders, and all supplementary documents are essential parts of the work, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete work.

Conditions of project approval will be established during the permitting processes including Federal, State, and local agencies. Approved (approved by all necessary agencies) project plans shall govern over County Standard Road Plans; County Standard Road Plans shall govern over Caltrans Standard Plans; County Standard Road Plans, Caltrans Standard Plans, and project plans shall govern over these County Standard Road Specifications; County Standard Road Specifications shall govern over Caltrans Standard Specifications; and the project special provisions shall govern over both these County Standard Road Specifications and the plans.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the special provisions or the plans, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. In the event of any doubt or question arising respecting the true meaning of these Standard Road Specifications, the special provisions or the plans, reference shall be made to

the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings.

The Contractor shall be responsible for completing any necessary conversions from SI (System International, or metric) to US units when using the Caltrans Standard Plans and the Caltrans Standard Specifications. All such conversions shall be a soft conversion in which the SI unit is converted to an exact US equivalent.

Specifications pertaining to the administration of County contracts will be contained in the Special Provisions for the contract.

County Standards shall mean County of Mendocino Standard Road Plans and Specifications. ATSM shall mean American Society for Testing and Materials latest edition of the specifications.

1-1.02 Construction Limitations. The contractor will be expected to conduct operations in a manner that causes minimum damage to the natural vegetation, landscape, fisheries, air quality, water quality, and the environment in general. Care shall be exercised to avoid hazards that may cause injury to persons, animals or property either during working hours or after work hours, which will include dust control, backfilling trenches immediately following pipe laying and temporary fencing as required.

Prior to working in the County right-of-way, the Contractor shall obtain an encroachment permit from the County. Work by County contract does not require an encroachment permit. A copy of the permit shall be kept on site at all times.

The Contractor shall be responsible for obtaining any other necessary permits from the appropriate federal, state, and/or local agencies including but not limited to Air Quality Control, California Department of Fish and Game (CDF&G), North Coast Regional Water Quality Control Board (RWQCB), Army Corps of Engineers (COE), and NOAA Fisheries.

The Contractor shall be responsible for obtaining permission from the property owners for any construction outside of the work site or easements as shown on the plans.

Receptacles for construction debris, including but not limited to oil, cleaning fluids and litter shall be covered. Such debris shall be disposed of in a proper manner. The Contractor's attention is directed to Section 7-1.01, "Laws to be Observed", of the Caltrans Standard Specifications.

Dust control and prohibition of burning of waste construction materials or vegetation will be enforced for all construction activity.

The Contractor shall comply with all local sound control and noise level rules, regulations, and ordinances, which apply to any work performed pursuant to the contract. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

1-1.03 Water for Construction and Dust Control. The Contractor shall be responsible for providing all water necessary for construction and testing.

1-1.04 Protection of Existing Facilities and Property. The Contractor shall notify Underground Service Alert (USA) for marking the locations of existing underground facilities.

The existing underground facilities in the area of work may include telephone, fiber optic, television and electrical cables, gas mains, water mains, sewer pipe and drainage pipe. The various utility companies shall be notified before trenching begins and at such other times as required to protect their facilities. Underground facilities shall be located and exposed ahead of trenching to prevent damage to the facilities, and to determine the depth and character of all facilities that cross or infringe on the trench prism. The Contractor shall immediately notify the Engineer of any facilities found to differ from those shown on the drawings. If damage should occur to the existing facilities, the utility company and the County shall be notified immediately and repairs acceptable to the utility company shall be made at the Contractor's expense.

The locations of the existing facilities are typically compiled from the best information available during design. However, the locations of the underground facilities shown on the drawing are approximate only and should not be taken as final or all-inclusive. The Contractor is cautioned that the drawings may be incomplete and the Contractor shall repair all damage done to existing facilities at his own expense.

Existing facilities shall not be intentionally disturbed and shall be supported and protected against injury and maintained in good operating condition at the expense of the Contractor for the entire duration of the contract.

Any proposed disruption of the existing facilities shall be approved by and coordinated with the Engineer.

1-1.05 Traffic Control. The Contractor shall provide traffic control during all road work according to Section 7-1.08, "Public Convenience"; Section 7-1.09, "Public Safety"; and Chapter 12, "Construction Area Traffic Control Devices" of the Caltrans Standard Specifications. The Contractor shall submit to the Engineer proposed traffic control plans at least 72 hours prior to beginning construction. The Contractor shall have a copy of the approved traffic control plans on site at all times.

Excavation shall be backfilled or covered before leaving the work for the night. All trenching in the travelway shall be plated with non-skid plates or paved (temporary or permanent) before leaving the work for the night. Flasher barricades or illuminated cones shall be placed adjacent to the trench plates if required by the Engineer.

All detours and traffic control shall be between 8:00 a.m. and 5:00 p.m.; unobstructed two-way traffic shall be maintained daily between 5:00 p.m. and 8:00 a.m. Any work within Caltrans right-of-way will require a separate encroachment permit from Caltrans.

Adequate traffic control, flaggers, signing and barricades shall be provided by the Contractor at all times as approved by the Engineer.

If at any time, work continues for more than one working day, advance-warning signs affixed to 4" x 4" wooden posts anchored to the ground shall be used. At no time shall construction signs be attached in any way to power or light poles.

The Contractor shall be responsible for keeping the police, fire department and the local schools informed of obstructions to either private or public roads caused by reason of his operations. The Contractor shall make provisions for the safe passage of pedestrians around the area of work at all times.

1-1.06 Trench Excavation Safety Plans. The Contractor's attention is directed to Section 5-1.02A, "Trench Excavation Safety Plans" of the Caltrans Standard Specifications. For the purposes of this section, "Engineer" shall be defined as the civil engineer in responsible charge of the work.

1-1.07 Clean Up. Attention is directed to Section 4-1.02, "Final Cleaning Up", of the Caltrans Standard Specifications.

Before final inspection of the work, the Contractor shall clean the construction site and all ground occupied in connection with the work, of all rubbish, excess materials, falsework, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition.

Nothing herein shall require the Contractor to remove warning, regulatory, and guide signs prior to formal acceptance by the Engineer.

SECTION 6. CONTROL OF MATERIALS

6-1.01 Relative Compaction. Whenever relative compaction specified in these Standard Road Specifications or the Special Provisions, the relative compaction shall be determined by Test Method No. California 231 or the latest Caltrans test method, except as authorized in advance by the Engineer.

6-1.02 Statistical Testing. Statistical means will not be used for determination of specification compliance. Whenever both individual test results and moving average requirements are specified in these Standard Road Specifications, the moving average requirements shall apply to the individual test results.

SECTION 7. LEGAL RELATIONS AND RESPONSIBILITY

7-1.01G Water Pollution. The following shall apply in addition to Section 7-1.01G of the State Standard Specifications.

Designers shall employ devices or methods that improve storm water quality beyond the initial construction phase of the project such as but not limited to the following: vegetated swales, bio-

retention basins, drainage flow over roadway medians, sidewalk greenway vegetation, etc... subject to pursuant Tab H – Exception Procedures, when determined acceptable in regard to road safety and maintenance.

Filtration of runoff before discharge to a water body may be required pursuant to the standards and conditions established by the appropriate agency(ies). Exact specifications for storm water treatment facilities are beyond the scope of these road standards.

SECTION 16. CLEARING AND GRUBBING

16-1.01 Description. The following shall apply in lieu of Section 16-1.01 of the State Standard Specifications: This work shall consist of removing all objectionable material within the limits shown on the plans and as directed by the Engineer. Clearing and grubbing shall be performed in advance of grading operations and in accordance with the requirements of these Standard Road Specifications.

16-1.02 Preservation of Property. All existing street designation and traffic control signs and posts within the aforementioned limits of work shall be carefully removed, cleaned of excess earth and delivered to the County Corporation Yard, except those required for traffic control as determined by the Engineer.

16-1.03 Construction. The area to be cleared and grubbed shall be the area shown on the plans, unless otherwise specified in the Special Provisions.

All stumps, large roots and other objectionable material shall be removed to a depth of three feet below finished grade in the area between the curbs, and to a depth of twelve inches below finished grade in the area between curb and property line. The resulting spaces shall be backfilled with suitable material placed and compacted in accordance with the applicable provisions of Section 19-6.02 of the State Standard Specifications.

16-1.04 Removal and Disposal of Materials. Burning within the limits of the project will not be allowed. Combustible debris shall be disposed of away from the site of the work. Any and all burning shall be in compliance with all County of Mendocino and Air Quality Management District regulations.

16-1.05 Vegetation Preservation. The Contractor shall comply with all requirements of the tree and vegetation preservation plan (if one is included as part of the improvement plans) and any other requirements at the County of Mendocino Department of Planning and Building Services. Contractor shall remove the minimum amount of vegetation necessary for the work and shall minimize disturbance or damage to vegetation beyond the area that is being cleared or grubbed. See Section 19-1.02 of the County Road Specifications.

All trees to be removed shall be marked in the field. A representative of the County must field review the trees to be removed prior to removal.

SECTION 19. EARTHWORK

19-1.01 General. Earthwork shall conform to the provisions of Section 19 of the State Standard Specifications. Water used to achieve optimum moisture content for required relative compaction must be obtained from a permitted source – not withdrawn from a stream without the necessary permits.

19-1.02 Protection of Vegetation. The contractor shall comply with all requirements of the tree and vegetation preservation plan (if one is included as part of the improvement plans) and any other requirements of the County of Mendocino Department of Planning and Building Services. When it is necessary to excavate adjacent to existing trees, shrubs or hedges, the Contractor shall use all possible measures to avoid injury to the trees, shrubs or hedges and their roots. Roots or limbs two (2) inches or larger in diameter shall not be cut without the express approval of the Engineer. All roots two (2) inches in diameter and larger left in place shall be wrapped with burlap to prevent scarring and excessive drying. When it is necessary to cut limbs and branches of trees to provide clearance for equipment used in construction, the Contractor shall make pruning cuts just beyond the branch bark ridge. All cuts through two-inch or larger roots and limbs shall be hand-trimmed and cleanly cut before being repaired.

19-1.03 Subgrade Preparation. Subgrade shall be smooth and uniform, and true to the required grade cross-section, and shall be within the tolerance specified in these Standard Road Specifications or as shown on the plans. The Contractor shall repair at his expense any damage to a prepared subgrade caused by his operations or by use of public traffic. No material shall be placed upon the prepared subgrade until the subgrade is in the condition meeting the requirements specified.

Subgrade that does not conform to the above requirements shall be reshaped to conform to the specified tolerances and recompacted, all at the Contractor's expense.

19-1.04 Grade Tolerance. Immediately prior to placing subsequent layers of material thereon, the grading plane shall conform to one of the following.

- A. When aggregate subbase or aggregate base are to be placed on the grading plane, the grading plane shall not vary more than 0.05' above or 0.1' below the grade approved by the Engineer.
- B. When asphalt concrete base is to be placed on the grading plane, the grading plane shall not vary more than 0.05' above or below the grade established by the Engineer.

19-1.05 Unsuitable Material. The following shall apply in lieu of Section 19-02 of the State Standard Specifications: Material below the natural ground surface in embankment areas and basement material below the grading plane in excavation areas that is determined by the Engineer to be unsuitable for the planned use shall be excavated and disposed of or stabilized as directed or approved by the Engineer.

When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

Stabilization of unsuitable material shall comply with the following provisions:

- A. Unsuitable material may be processed in place, may be excavated and placed on the grade or other locations suitable for further processing, or may be partially excavated and partially processed in place. Care must be undertaken to avoid construction debris from falling into the stream channel. Any material that does fall into a stream during construction should be immediately removed in a manner that has minimum impact to the streambed and water quality.
- B. Processing may consist of drying to provide a stable replacement material or mixing with hydrated lime or granular quicklime.
- C. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

19-1.06 Trench Excavation. The Contractor shall perform all excavations of every description and all substances encountered to the depth indicated on the drawings. During excavation, that material suitable for backfilling shall be deposited in an orderly manner a sufficient distance from the banks for the trench to avoid overloading and to prevent slides or cave-ins. All excavated material not required or suitable for backfill shall be removed and disposed of outside the streets right-of-way. The Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and he shall file with the Engineer said permit, together with a written release from the property owner absolving the County from any and all responsibility in connection with the disposal of material on said property. Material shall not be disposed of within any floodway in the County of Mendocino or within the normal channel of any river, creek, stream, ditch, canal, swale or other watercourse and within portions of same as required to efficiently carry the flood flow as determined by the Engineer.

Trenches shall be the necessary width for proper laying of the pipe, and the banks shall be as nearly vertical as practicable. The bottoms of the trenches shall be accurately graded to provide uniform bearing and support for each section of pipe on the prepared pipe bedding at every point along its entire length. Trenches shall be excavated to the depth indicated on the drawings and care shall be taken not to excavate beyond the depth indicated or required.

The Contractor shall at all times furnish, install and maintain sufficient bracing and shoring in trenches to ensure the safety of workmen and to protect and facilitate the work. All such bracing and shoring shall be removed from the trench as backfilling proceeds.

The Contractor shall furnish, install and operate such pumps or other devices as may be necessary for removing water from the trenches during construction.

19-1.07 Structure Backfill. Specifications for pipe bedding, trench backfill and surfacing shall be as shown on *MENDOT STD. NO. A60, "Trench Restoration,"* of the County of Mendocino Standard Road Plans.

Except for structure backfill placed at specific locations described and enumerated in Sec. 19-3.06 of the State Standard Specifications, structure backfill material specifications and compaction requirements shall be as follows:

Structure backfill shall have a Sand Equivalent of not less than twenty (20) and shall conform to the following grading:

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
3"	100
No. 4	35-100
No. 30	20-100

19-1.08 Relative Compaction (95 Percent). The following shall apply in lieu of Sec. 19-5.03 of the State Standard Specifications.

Relative compaction of not less than 95 percent shall be obtained for a minimum depth of twelve (12) inches below the grading plane for the full base width of the planned structural section, whether in excavation or embankment.

Any area of the subgrade determined by the Engineer to be unstable, as evidenced by excessive deflection under the movement of equipment, shall be brought to satisfactory stability by additional rolling, reworking, removal and replacement of unsuitable material, or stabilization with lime, as directed by the Engineer.

Lime-treated materials shall be compacted to not less than 95 percent relative compaction in accordance with the provisions of Section 24, except when lime is used to stabilize unsuitable material as specified in Sec. 19-2.02 of the State Standard Specifications.

Relative compaction of not less than 95 percent shall be obtained for embankment under bridge and retaining wall footings without pile foundations within the limits established by incline planes sloping 1.5:1 out and down from lines one foot outside the bottom edges of the footing.

19-1.09 Relative Compaction 90 percent. The following shall apply in lieu of Sec. 19-5.04 of the State Standard Specifications.

Relative compaction of not less than 90 percent shall be obtained in all materials in embankment except as specified herein to be 95 percent. Material placed in accordance with the provisions of Sec. 19 2.02, "Unsuitable Materials," of the State Standard Specifications shall be compacted to not less than 90 percent relative compaction.

19-1.10 Excess Material. Excess trench material shall be removed promptly and disposed of elsewhere by the Contractor at his own expense. The Contractor shall not dump material on any private property without the permission of the owner thereof.

19-1.11 Samples for Approval. Representative samples of all material to be imported shall be sufficiently in advance of installation operations for testing and approval of the Engineer. All costs

associated with testing shall be paid by the Contractor. Imported material shall not be installed until it has been so approved.

Tests will be made in accordance with the following standards:

1. Grading--ASTM C114 and C136
2. Plasticity Index--ASTM D424
3. Sand Equivalent Value--Test Method No. Calif. 217 (CALTRANS)

SECTION 24. LIME TREATMENT

24-1.01 Description. The following shall apply in lieu of Sec. 24-1.01 of the State Standard Specifications.

This work consists of stabilizing basement soil, mixing in place material, lime and water, and spreading and compacting the mixture to the lines, grades and dimensions shown on the plans and as specified in these Standard Road Specifications and the Special Provisions.

Where designated by the Engineer, basement soil below the planned lime-treated subgrade shall be stabilized in the following manner:

The material shall be excavated to the lines and grades specified by the Engineer and spread in a uniform layer over another portion of the grade.

Dry lime in the amount specified by the Engineer shall be spread and mixed into the material as provided in Sec. 24-1.04, "Mixing" of the State Standards. The material shall then be used to backfill the original excavation in six-inch compacted layers. Each layer below a plane twelve inches below the grading plane shall be compacted to not less than 90 percent relative compaction. Each successive six-inch layer up to the bottom of the planned lime-treated subgrade shall be compacted to not less than 92 percent relative compaction.

24-1.02 Materials. When permitted by the Engineer in writing, and when accompanied by an adequate safety program to be proposed by the Contractor, granular quicklime conforming to the specifications of ATSM Designation C51 may be used in lieu of commercial hydrated lime. Hydrated lime shall be used only when permitted by the Engineer in writing.

When sampled by the Engineer at the point of delivery, the sample of quicklime shall contain not less than 90 percent calcium oxide (CaO), as determined by ATSM: C25-67.

When granular quicklime is used, initial mixing shall continue until the quicklime is uniformly distributed throughout the material. Water shall be added as required to provide sufficient moisture for hydration. The mixture shall be cured for not less than sixteen hours prior to final mixing.

The Contractor shall provide a grade checker to ensure mixing to the full depth as specified. Water shall be added during the final mixing operations until the water content of the mixture is approximately two percent about the test optimum moisture content.

24-1.03 Spreading and Compacting. Lime-treated material shall be compacted to not less than 95 percent, as determined by Test Method No. California 216 and 231. The sample of lime-treated soil used for determining the maximum wet density shall be obtained from the test site at the time of testing.

24-1.04 Curing. The curing seal requirement may be waived at the discretion of the Engineer when it can be shown that placement of a subsequent layer of aggregate base or asphalt concrete can proceed within 24 hours after the completion of final rolling.

SECTION 25. AGGREGATE SUBBASES

25-1.01 Description. Aggregate Subbase shall be Class 4.

25-1.02 Materials. Aggregate Subbase--Class 4 shall have a minimum sand equivalent of twenty-one (21), a minimum R value of fifty (50) and shall conform to the following gradings:

<u>Sieve Size</u>	<u>Percent Passing</u>
3"	100
1-1/2"	90-100
3/4"	50-90
#4	25-55
#200	2-11

The material retained on the #4 screen shall consist of 100 percent crushed particles.

Representative samples of all material to be imported shall be supplied sufficiently in advance of installation operations for testing and approval of the Engineer. All costs associated with testing shall be paid by the Contractor. Tests for sieve analysis, R-value, sand equivalent and relative compaction shall be per Caltrans Standards.

25-1.03 Grade Tolerance. The subgrade to receive aggregate subbase, immediately prior to spreading, shall not vary more than 0.05-foot above or 0.1-foot below the grade established by the Engineer.

25-1.04 Compacting. The surface of finished aggregate subbase shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate subbase under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate subbase does not meet this requirement.

SECTION 26. AGGREGATE BASES

26-1.01 Description. Aggregate Base shall be Class 2, and the combined aggregate shall conform to either of the gradings specified in Sec. 26-1.02A of the State Standard Specifications, "Class 2 Aggregate Base."

26-1.02 Class 2 Aggregate Base. Quality Requirements: The minimum sand equivalent value shall be not less than 22 for any individual test with an operating range of twenty-five (25) minimum, as defined by Section 26-1.02A of the State Standard Specifications. The resistance (R-value) shall not be less than seventy-eight (78) for any individual test. The durability index shall not be less than thirty-five (35) for any individual test. The durability index may be lowered to twenty-five (25) to accommodate local sources with prior written approval by the Engineer.

26-1.03 Compacting. The surface of the finished aggregate base shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate base under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate base does not meet this requirement.

26-1.04 Shoulder Backing. This work shall consist of constructing shoulder backing adjacent to the edge of the new surfacing in accordance with the details shown on the plans and these Standard Road Specifications.

The material for shoulder backing shall consist of Class 2 Aggregate Base meeting all quality requirements of Section 26-1.02 of these Standard Road Specifications.

The areas where shoulder backing is to be constructed shall be cleared of all weeds, grass and debris. Removed weeds and grass shall be disposed of outside the highway right-of-way in accordance with the provisions in Section 7-1.13 of the State Standard Specifications.

Shoulder backing material shall be watered and rolled to form a smooth, firmly compacted surface. Watering shall conform to the provisions in Section 17, "Watering," of the Caltrans Standard Specifications.

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

Shoulder backing construction shall be completed along the edges of any portion of new surfacing within five days after completion of that portion of the new surfacing. Until such time as the Contractor is able to complete shoulder backing along any portion of new surfacing, he shall furnish and place portable delineators and C31 "Low Shoulder" signs off of and adjacent to the new surfacing. A portable delineator and a C31 sign shall be placed at the beginning of the drop-off in the direction of travel on the adjacent lane, and at the following maximum intervals along the drop-off:

C31 signs--2,000 feet
Portable Delineators:
 on tangents--500 feet
 on curves--200 feet

The portable delineators and C31 signs shall be maintained in place at each location until shoulder backing operations are completed at that location. Portable delineators and signs shall conform to the requirements in Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications, except that the base material for the signs shall not be plywood and the signs may be set on temporary portable supports or in barricades.

SECTION 37. BITUMINOUS SEALS (CHIP SEALS)

37-1.01 Description. Where used in the Road Standards, "Double Chip Seal" shall meet the requirements for a double bituminous seal coat in Section 37-1, "Seal Coats" of the Caltrans Standard Specifications. Double chip seal shall consist of an application of asphaltic emulsion followed with an application of screenings, and another application of asphaltic emulsion followed by another application of screenings.

37-1.02 Materials. Liquid asphalt prime coat shall conform to the requirements of Section 93, "Liquid Asphalts" of the Caltrans Standard Specifications. Liquid asphalt prime coat shall be SC-250. The following screening sizes may be used: 1st Application: 3/18" x No. 6; 2nd Application: 5/16" x No. 8.

Asphaltic emulsion shall conform to the requirements of Section 94, "Asphaltic Emulsions" of the Caltrans Standard Specifications. Asphaltic emulsion used for double chip seal shall be CRS-1.

SECTION 39. ASPHALT CONCRETE

39-1.01 Description. A minimum of two weeks prior to the placement of any asphalt concrete, the Contractor shall notify the Engineer of which asphalt plant will be used to supply the mix. For any job, asphalt concrete shall be supplied from a single plant.

39-1.02 Asphalts. Asphalt binder to be mixed with aggregate for asphalt concrete surface, leveling, or open graded courses shall be AR-4000 grade paving asphalt.

Asphalt binder to be mixed with aggregate for asphalt concrete base shall be AR-8000 grade paving asphalt.

39-1.03 Aggregate. The aggregate grading of the various types of asphalt concrete shall conform to one of the following as directed by the Engineer:

Surface Course	Type A—1/2" Maximum, Medium or Coarse, or 3/4" Maximum, Coarse
Leveling Course	Type A—3/4" Maximum, Coarse
Asphalt Concrete Base	Type A or B—3/4" Maximum, Medium
Open Graded	3/8" Maximum

39-1.04 Grade Tolerance. The subgrade to receive asphalt concrete or asphalt concrete base immediately prior to applying prime coat shall not vary more than 0.05-foot above or below the grade established by the Engineer.

39-1.05 Prime Coat and Tack Coat. Prime coat shall consist of either SC-70 or MC-70 grade liquid asphalt as directed by the Engineer and shall be furnished and applied in accordance with the provisions in Section 93, "Liquid Asphalts" of the Caltrans Standard Specifications. Application shall be made when the surface is dry or but slightly damp, and when the air temperature in the shade is above fifty (50) degrees Fahrenheit, unless otherwise permitted by the Engineer. When approved by the Engineer, additional thickness of asphalt concrete (A.C.) may be substituted for the prime coat. An additional 0.04 foot would be required if the design thickness of A.C. is less than 0.25 foot and an additional 0.02 foot if the design thickness of A.C. is 0.25 foot or greater.

Following application of the prime coat, at least twenty-four (24) hours shall elapse before placing asphalt concrete. Any excess asphalt primer shall be blotted up with sand and removed from the grade.

Tack coat shall be diluted SS1 or CSS1, or undiluted RS-1 or CRS-1 type asphalt emulsion.

39-1.06 Haul Vehicles. Prior to loading asphalt concrete, the bed of the haul vehicle shall be clean and free from all soil, sand, gravel and other deleterious substances.

All haul vehicles shall be equipped with tarps that are in working order. Tarps shall be used on haul vehicles unless prior approval is obtained from the Engineer.

When spraying diesel or other parting agents in the bed of the haul vehicle, the minimum amount necessary to moisten the surface shall be used. In no instance will the parting agent be allowed to accumulate in the bed of the vehicle.

39-1.07 Spreading Equipment. The asphalt concrete shall be deposited from the haul vehicle into the hopper of the paving machine.

The practice of depositing the material on the roadbed in a windrow and subsequently using a pick-up machine to deposit the material in the hopper of the asphalt paver will not be allowed.

39-1.08 Compacting Equipment. Compaction rollers shall be either two-axle steel-tired rollers, pneumatic-tired rollers or approved double-drum vibratory rollers. Steel-tired static compaction rollers shall weigh not less than twelve (12) tons.

Double-drum vibratory rollers shall be operated at a maximum speed of 135-feet per minute (approximately 1.5 mph). Double-drum vibratory rollers shall have a minimum frequency of 2400 VPM and the amplitude shall be field-adjustable.

All pneumatic-tired rollers shall be equipped with an approved windskirt unless otherwise permitted by the Engineer. Pneumatic-tired rollers used for compaction of asphalt concrete base shall be so equipped that the air pressure in all tires may be regulated uniformly by the operator while the roller is in motion.

Finish rollers shall be two-axle steel-tired tandem rollers weighing not less than eight tons.

39-1.09 General Requirements. Asphalt concrete shall not be placed on any roadbed until all utility construction beneath the roadbed has been completed, sewer and water lines have been tested and water lines chlorinated. The surface course of asphalt concrete shall not be placed until final utility connections have been made unless otherwise permitted by Engineer.

Asphalt concrete shall not be placed less than thirty (30) minutes before sunset, as established by weather bureau, except as otherwise authorized the Engineer.

Asphalt concrete or asphalt concrete base shall not be placed during rainy weather or on a wet surface. Asphalt concrete shall not be placed when the atmospheric temperature is below fifty (50) degrees Fahrenheit or conditions indicate it will drop below fifty (50) degrees Fahrenheit before the material can be satisfactorily compacted. Asphalt concrete base shall not be placed when the atmospheric temperature is below forty (40) degrees Fahrenheit or conditions indicate it will drop below forty (40) degrees Fahrenheit before the material can be satisfactorily compacted. Material that cannot be placed in compliance with these requirements shall be rejected.

The compacted thickness of asphalt concrete layers shall be per Section 36-6.01, "Spreading and Compacting General Requirements", unless otherwise authorized by the Engineer.

39-1.10 Compacting. The temperature of the asphalt concrete shall be per Section 36-6.01, “Spreading and Compacting General Requirements”, unless otherwise authorized by the Engineer. Unless lower temperatures are specified by the Engineer, all mixtures shall be spread and the first coverage of initial or breakdown compaction shall be performed when the temperature of the mixture is not less than 200 degrees F at mid-depth. Additional rolling equipment shall be required or the rate of spread shall be reduced to permit compliance with this requirement.

A. Asphalt concrete surface course and leveling courses.

1. Equipment required

If production in any one hour exceeds the limits set forth below, the Contractor shall cease his paving operation until additional rolling equipment has arrived on the project.

a. 125 tons per hour or more.

The Contractor will be required to furnish a minimum of two approved double-drum vibratory rollers and one eight-ton tandem finish roller for each roller.

A pneumatic roller may be substituted for one of the vibratory rollers if approved by the Engineer.

b. 50-125 tons per hour.

The required minimum rolling equipment specified above may be reduced to one approved double-drum vibratory roller and one eight-ton tandem roller for each asphalt paver, with a separate operator for each roller when the compacted thickness is not less than 0.17'.

c. 50 tons per hour or less, at any location.

The required minimum rolling equipment specified above may be reduced to one approved double-drum vibratory roller, weighing not less than 12 tons, for each paving machine.

2. Compaction requirements.

Compaction rolling shall consist of a minimum of four complete vibratory coverages with an approved double-drum vibratory roller.

Finish rolling shall consist of one or more coverages with an eight-ton tandem roller immediately following completion of compaction rolling.

B. Asphalt Concrete Base.

1. Equipment required.

The Contractor shall be required to furnish one approved double-drum vibratory roller and a minimum of one pneumatic-tired roller, with a separate operator for each roller.

An approved double-drum vibratory roller may be substituted for the pneumatic-tired roller specified above.

2. Compaction requirements.

Compaction rolling shall consist of the following: a minimum of two complete vibratory coverages with an approved double-drum vibratory roller and two complete coverages with a pneumatic-tired roller. The order of rolling shall be specified by the Engineer.

Final rolling shall consist of one coverage with the vibrating units turned off.

Approval of vibratory rollers: The Engineer may approve initial use of a double-drum vibratory roller not previously approved on the basis of tests by other agencies or other information provided by the Contractor.

Approval for subsequent use of the roller shall be based on cores taken from test sections designated by the Engineer and compacted with different numbers of coverages.

Test sections shall be compacted under the following conditions:

1. Asphalt concrete temperature at mid-depth shall be between 270 and 280 degrees Fahrenheit at the beginning of rolling. Rolling shall not continue after the mix temperature has dropped to 200 degrees Fahrenheit. The compacted thickness shall be between 2 inches and 3.5 inches.
2. The Contractor or manufacturer's representative shall specify the operating conditions of frequency and amplitude.

The basis for approval shall be the attainment of 97 percent relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97 percent relative compaction.

The mix will be sampled during paving of the test sections, and the test maximum density will be the average density of specimens compacted in accordance with California Test 304. The in-place density for each test section shall be the average of three core densities. Relative density will be the ratio of in-place density to test maximum density.

39-1.11 Pavement Reinforcing Fabric. Those areas to receive the reinforcing fabric will be marked in the field and shall consist of the following materials and shall be applied in accordance with those procedures outlined below:

The fabric and placement of fabric shall conform to the provisions of Section 88 of the Caltrans Standard Specifications and these Standard Road Specifications.

Prior to placing the fabric, the existing pavement to receive the fabric shall be cleaned of all materials such as, but not limited to, leaves, sand, dirt, gravel, water and vegetation.

Placement of the fabric shall be made only under the following conditions:

1. The ambient air temperature is above fifty (50) degrees Fahrenheit and rising.
2. The pavement is dry and the pavement temperature is above forty (40) degrees Fahrenheit and rising.

The surface area to receive the fabric shall be sprayed with steam-refined paving asphalt type AR-4000 at the rate of 0.22 - 0.28 gallons per square yard. The Contractor's attention is directed to Section 92-1.04, "Applying", of the Caltrans Standard Specifications. The exact rate of application shall be as approved by the Engineer. The asphalt shall be sprayed with a suitably metered truck and the truck must have been recently calibrated by test method California No. 399A. The temperature of the asphalt binder must be spread between 290 degrees F. and 365 degrees F.

The width of asphalt application will be the fabric width plus 4 inches. Paving asphalt shall be applied no farther in advance of the fabric than the distance the Contractor can maintain free of traffic. The paving operation shall closely follow fabric placement and no more fabric than can be covered up with the hot mix that working day shall be placed.

The fabric shall overlap two - six inches at all joints. No joints shall be lapped with more than two layers of fabric. Transverse joints shall be shingled in the direction of the paving to prevent edge pickup by the paver.

The fabric shall be placed on the asphaltic binder with a minimum of wrinkles and broomed or squeegeed to remove any bubbles prior to the binder cooling. The equipment for placing the fabric shall be mechanized and capable of handling full rolls of material and shall be capable of laying the fabric without forming excessive wrinkles and/or folds. As directed by the Engineer, if folds or wrinkles ½ inch in height or greater exist, the fabric shall be slit and allowed to lay flat. Brooming will maximize fabric contact with the pavement surface. The equipment used to place the fabric is subject to approval by the Engineer.

At all utility covers which could be covered with fabric, the fabric shall be neatly cut around the cover to allow for raising the cover to finished grade.

Turning of the paving machine or other vehicles should be gradual and shall be kept to a minimum to avoid damage to the membrane. Should equipment tires stick to the fabric during pavement operations, small quantities of asphaltic concrete shall be broadcast ahead to prevent sticking.

SECTION 51. STORM DRAIN STRUCTURES

51-1.01 General. Storm drain structures shall be constructed in conformance with the County of Mendocino Standard Road Plans and as shown on the plans.

SECTION 63. CAST-IN-PLACE CONCRETE PIPE

63-1.01 Description. Cast-in-place concrete pipe shall conform to Section 63 of the State Standard Specifications

63-1.02 Materials. Consistency of the concrete shall be determined in accordance with ASTM C-143. Maximum slump shall be two inches.

63-1.03 Structures. Where shown on the plans, inlet and outlet structures shall be constructed or installed in connection with cast-in-place concrete pipe. Where such structures are constructed or installed, the ends of pipes shall be placed flush or cut off flush with the structure face, unless otherwise directed by the Engineer.

A starter section shall be used at the beginning of each run of cast-in-place concrete pipe, and a closing section shall be used where a run cannot be completed because of lack of clearance ahead in the trench. Starter sections shall be six feet in length and of the same inside diameter as the cast-in-place concrete pipe. Manhole bases may be formed by opening and troweling the cast-in-place concrete pipe on continuous runs.

Storm drain manholes shall be standard four or five foot diameter precast manholes as detailed in the Standard Road Plans. Storm drain manhole barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Standard Road Plans. Concrete for cast-in-place catch basins shall be Class B. Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the State Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section of curb and gutter or sidewalk shall be removed and replaced in accordance with County Road Standard Plans and as approved by the Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

63-1.04 Curing and Protection of Concrete and Backfill. The following shall apply in lieu of Section 63-1.06 and Section 63-1.07 of the State Standard Specifications.

Backfill shall be placed in accordance with *MENDOT STD. NO. A60*, "Trench Restoration" of the County of Mendocino Standard Road Plans, except that the pipe bedding specifications shall not apply.

Curing and protecting concrete shall comply with the following requirements:

When Type E trench backfill is designated, the cast-in-place concrete pipe shall be cured by placing backfill material to an approximate depth of one foot over the top of the pipe.

When either Type A, B, C or D backfill is designated the concrete shall be cured by placing trench backfill complying with the specifications contained in Standard 300 to an approximate depth of 0.5-foot following application of either a waterproof membrane or a pigmented curing compound as provided in Section 90-7, "Curing Concrete" of the State Standard Specifications.

Hand spraying of the curing compound will be permitted. During the period following the placement of the concrete, the ends of the pipeline shall be covered with suitable material to maintain a humid condition within the pipe for a minimum of seven days.

Initial backfill placement shall be made immediately after the concrete has hardened sufficiently to prevent injury to the pipe during backfill operations. When Type E backfill is designated, only soft, damp and loose material shall be used for the initial placement of backfill.

The concrete pipe shall be protected as provided in Section 90-8, "Protecting Concrete" of the State Standard Specifications.

After the pipeline has been completed, but not prior to seven days following the placement of the concrete, the Contractor shall backfill the pipe trench in accordance with the requirements of *MENDOT STD. NO. A60*.

In all cases, the Contractor shall be responsible for correcting any damage to cast-in-place concrete pipe caused by premature or excessive loading prior to the end of a seven day curing period.

SECTION 64. PLASTIC STORM DRAIN

64-1.01 Description. Plastic storm drain pipe (ADS N-12) shall conform to the provisions of Section 64, "Plastic Pipe" of the Caltrans Standard Specifications. Plastic pipe shall be Type S corrugated polyethylene pipe with a smooth inner lining and corrugated outer wall.

64-1.02 Placing. Excavation and backfill shall be as shown on *MENDOT STD NO. A60*, "Trench Restoration" of the County of Mendocino Standard Road Plans.

No pipe shall be laid which is damaged or which, in the opinion of the Engineer, is unsuitable for use.

SECTION 65. REINFORCED CONCRETE PIPE

65-1.01 Description. Reinforced concrete pipe shall be either Class III, Class IV, or Class V, as shown on the plans and shall conform to the provisions of ASTM C-76.

65-1.02 Earthwork. Excavation and backfill shall be as shown on *MENDOT STD. NO. A60*, "Trench Restoration" of the County of Mendocino Standard Road Plans.

65-1.03 Structures. Storm drain manholes shall be standard four or five foot diameter precast manholes as detailed in the Standard Road Plans. Storm drain manholes barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Standard Road Plans. Concrete for cast-in-place catch basins shall be Class B. Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the Caltrans Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section to be removed and replaced in accordance with County Road Standards and as approved by the Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

65-1.04 Laying Culvert Pipe. No pipe shall be laid which is cracked, checked, spalled, or damaged and which in the opinion of the Engineer is unsuitable for use.

SECTION 66. CORRUGATED METAL PIPE

66-1.01 Description. Corrugated metal pipe shall conform to the provisions of Section 66-3, "Corrugated Steel Pipe" of the Caltrans Standard Specifications. Corrugated metal pipe shall not be used in the road right-of-way, except for driveway culverts, cross culverts and creek outlets.

66-1.02 Placing. Excavation and backfill shall be as shown on *MENDOT STD. NO. A60*, "Trench Restoration" of the County of Mendocino Standard Road Plans.

No pipe shall be laid which is damaged or which, in the opinion of the Engineer is unsuitable for use.

SECTION 73. CONCRETE CURB, GUTTER AND SIDEWALK

73-1.01 Description. Concrete curb, gutter and sidewalks shall conform to Section 73 of the Caltrans Standard Specifications. The following shall apply in lieu of Section 73-1.01.

This work shall consist of constructing curbs, sidewalks, gutter, depressions, island paving, and driveways of the form and dimensions shown on the plans, and as specified in these Standard Road Specifications and the Special Provisions. The concrete shall contain not less than six sacks of cement per cubic yard. Maximum slump of the concrete shall be four (4) inches, as determined in accordance with ASTM C-143.

Reinforcement shall conform to the provisions in Section 52, "Reinforcement" of the Caltrans Standard Specifications.

73-1.02 Subgrade Preparation. The subgrade shall be constructed true to grade and cross section, as shown in the plans or directed by the Engineer. It shall be watered and thoroughly compacted, and unsuitable material removed and replaced, to provide a stable grade with above optimum moisture content for a minimum depth of 0.5-foot.

Base material under curb and gutter and sidewalk shall comply with the provisions of Section 26, "Aggregate Bases" of these Standard Road Specifications and shall be a minimum of four (4) inches in compacted thickness.

The completed subgrade shall be tested for grade and cross section by means of a template supported on the side forms, and shall not project into the planned concrete cross section at any point. The subgrade and forms shall be wet immediately in advance of placing concrete.

73-1.03 Concrete Curb, Gutter, and Sidewalk Construction. Concrete curb, gutter, and sidewalk shall be constructed in conformance with *MENDOT STD. NO. A40*, "Curb, Gutter, and Sidewalk" and as shown on the plans.

SECTION 81. MONUMENTS

81-1.01 General. The following shall apply in lieu of Section 81 of the State Standard Specifications.

This work shall consist of furnishing and installing cast-in-place survey monuments at the locations shown on the plans and in accordance with *MENDOT STD. NO. A30*, "Survey Monument - Road" of the County of Mendocino Standard Road Plans.

The exact location of the monuments will be established by the civil engineer or surveyor in responsible charge of the work, and upon completion, the monuments will be checked and the center point stamped by said civil engineer or surveyor.

Standard County brass markers shall be furnished by the Contractor. They shall be placed in survey monuments before the concrete block has acquired its initial set and shall be firmly bedded in the concrete. The concrete block shall be so located that when the marker is installed, the reference point will fall within a one-inch circle in the center of the marker.