STANDARD SPECIFICATIONS FOR CONSTRUCTION
OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS -2003

DATE: 8/12/2014

THE FOLLOWING SPECIFICATIONS AND SPECIAL PROJECT SPECIFICATIONS APPLY TO ALL ROADS UNLESS SHOWN OTHERWISE ON DRAWINGS

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Preface

Preface_wo_03_15_2004_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

101 - Terms, Format, and Definitions

101.00_nat_us_07_25_2005

101.01_nat_us_02_17_2005

101.01 Meaning of Terms.

Add the following:

Delete all references in FP-03 to Transportation Acquisition Regulations (TAR).

101.03_nat_us_02_17_2005

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

.

Add the following to (b) SI Symbols:

mp	Milepost
ppm	Part Per Million

101.04_nat_us_02_22_2005

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

Contractor--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "purchaser".

Culvert--No definition.

Right-of-Way--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

Adjustment in Contract Price--"Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Change--"Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Design Quantity-- "Design quantity" is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges.* Under these FP specifications this term is replaced by the term "Contract Quantities".

Forest Service--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line--A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road--Temporary construction access built along the route of the project.

Purchaser--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

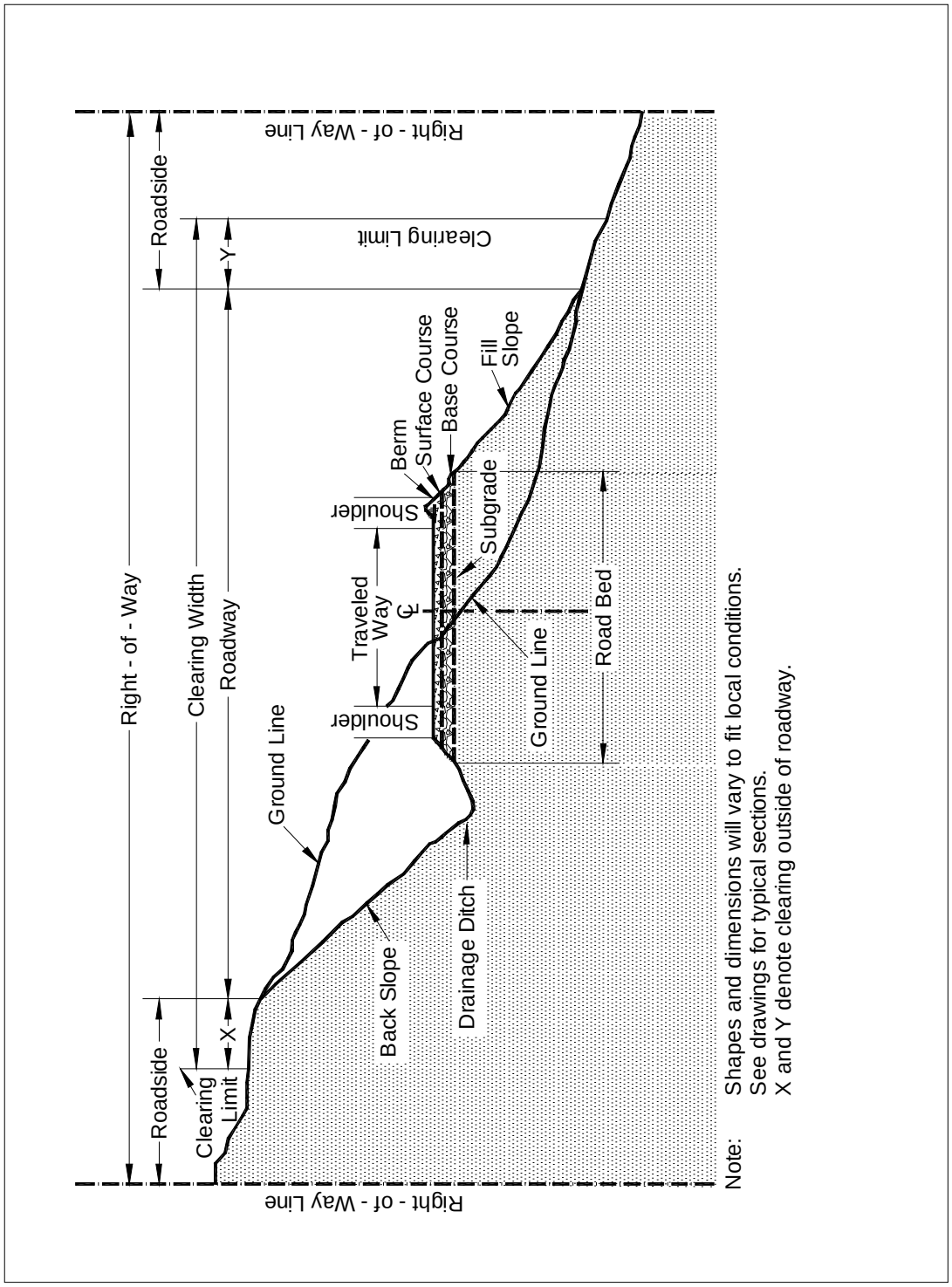
Protected Streamcourse--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.
Utilization Standards--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



102 - Bid, Award, and Execution of Contract

102.00_nat_us_02_16_2005

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

103.00_nat_us_02_16_2005

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_02_17_2005

Deletions

Delete sections 104.01, 104.02, and 104.04.

104.06_nat_us_02_17_2005

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

105 - Control of Material

105.02_nat_us_05_11_2004

105.02 Material Sources.

105.02(a) Government Provided Sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05_nat_us_05_12_2004

105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

106 - Acceptance of Work

106.01_nat_us_03_29_2005

106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

Follow the requirements of FAR Clause 52.246-12 Inspection of Construction.

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer's recommendations or to these specifications, whichever is more strict.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor's results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove and replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted, at no cost to the Government.

(a) Disputing Government test results. **If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:**

(1) Sampling method;
(2) Number of samples;
(3) Sample transport;
(4) Test procedures;
(5) Testing laboratories;
(6) Reporting;
(7) Estimated time and costs; and
(8) Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

(b) Alternatives to removing and replacing non-conforming work. As an alternative to removal and replacement, the Contractor may submit a written request to:

(1) Have the work accepted at a reduced price; or

(2) Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_04_27_2005

107.06 Contractor's Responsibility for Work.

Delete the following:
"except as provided in Subsection 106.07".

107.09_nat_us_05_11_2004

107.09 Legal Relationship of the Parties.

Delete the entire subsection:

107.10_nat_us_02_23_2005

107.10 Environmental Protection.

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

107.02 Protection and Restoration of Property and Landscape

Add the following:
Meet the requirements chapters 10, 11, and 12.2 in their entirety of "Water Quality Management for National Forest System Lands in California Best Management Practices" dated September 2000

108 - Prosecution and Progress

108.00_nat_us_02_16_2005

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.
109.07 Eliminated Work.
109.08 Progress Payments.
109.09 Final Payment.

109.02_nat_us_02_23_2005

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

"(b) Cubic yard" to "**(c) Cubic yard".**

109.02 Measurement Terms and Definitions.

Add the following definition:

(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

151 - Mobilization

151.01_0105_us_02_23_2005

151.01 Description

Add the following at the end of the last sentence:

"Work also includes cleaning of all equipment used at the project site. Clean all construction equipment prior to entry on the project site. Remove all dirt, plant parts and material that may carry noxious weed seeds into the area. Only construction equipment inspected by the Forest Service will be allowed to operate within the project area. Treat subsequent move-ins of equipment the same as the initial move-in. Clean truck beds and dump boxes hauling to the project site prior to entering the work area."

151.03_0116_us_03_30_2005

151.03

<u>Add the following to the first paragraph:</u>

Include all costs associated with the cleaning of equipment in the unit bid price for Mobilization:

<u>Add the following to the beginning of paragraph (a).</u>

If applicable,

152 - Construction Survey And Drafting

07_30_2014

152 Delete.

Delete Section 152 in its entirety and substitute the following:

See Contract Drawings for Construction Staking Details.

155 - Schedules for Construction Contracts

155.00_nat_us_05_11_2004

155 Delete.

Delete Section 155 in its entirety.

201 - Clearing and Grubbing

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

See Drawings for additional information.

201.04_nat_us_02_18_2005

201.04 Clearing.

Add the following:

When marked in advance, remove dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

201.04_nat_us_02_22_2005

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

> (c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.

Add the following:

> (e) Trim branches of remaining trees or shrubs to give a clear height of 16 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.
>
> (f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

201.06_Eldorado 07_2011

201.06 Disposal.

Delete the first sentence of this subsection and substitute the following:

Dispose of merchantable timber designated for removal according to the provisions of the timber sale contract.

Add the following disposal methods:

(e) Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toe line of embankment slopes. Do not permit the top of the windrows to extend above sub grade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(f) Scattering. Scatter construction slash with in Timber Sale unit boundaries without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations. Treat slash with logging unit.

(g) Chip, Grind or Masticate. Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 2 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

Equipment used to masticate roadway prism shall meet the requirements specified in the Timber Sale.

See Drawings for additional information.

(h) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

(i) Decking. Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil.

(j) Removal to designated locations. Remove construction slash to designated locations.

(k) Pile and Burn. Pile construction slash in designated areas. Place and construct piles so that when the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet. Construct 16 foot wide fire line around piles and remove trees and limbs that are with 30 feet of edge of pile.

(l) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below sub grade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

202 - Additional Clearing and Grubbing

202.04_1005_us_05_16_2005

202.04 Selective Clearing.

Add the following:

Dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed are designated for cutting.

When marked in advance, remove hazard trees or unstable live trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

202.09_0503_us_02_22_2005

202.09 Measurement.

Delete the second paragraph of this subsection and substitute the following:

Individual removal of trees is the number of trees of the various size designations removed. Measure tree diameters at a height of 12 inches above ground. Do not count trees less than 6 inches in diameter. Size designations are shown in Table 202-1.

Table 202-1. - Size designations for trees removed.

Pay Item Designation	**Size of Least Diameter at Height of 12 inches**	
	Greater Than	**Less Than**
Small	6 inches	24 inches
Medium	24 inches	40 inches
Large	40 inches	-

203 - Removal of Structures and Obstructions

203.01_nat_us_02_25_2005

203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.01_eldo_07_17_06

203.01 Description

Add the following:

Work also includes the removal of dirt and debris and reconstruction of existing catch basins, inlet basins and other drainage features when specified in the Schedule of Items. This work includes. but not limited to, cleaning out metal pipe inlets/outlets in conjunction with the reconstruction of inlets, or, where Shown On The drawings. This work is typically included in Section 303 – Road Reconditioning, otherwise, work is paid separately under this Pay Item.

203.04_nat_us_02_18_2005

203.04 Removing Material.

Replace the fourth and fifth paragraphs with the following:

Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below sub grade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05_nat_us_02_18_2005

203.05 Disposing of Material.

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

204 - Excavation and Embankment

204.00_nat_us_02_26_2007

Replace Section 204 in its entirety with the following:

Description

204.01 This work consists of excavating material and constructing embankments. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) Roadway excavation. All material excavated from within the right-of-way or easement areas, except sub excavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) Sub excavation. Material excavated from below sub grade elevation in cut sections or from below the original ground line in embankment sections. Sub excavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

(3) Borrow excavation. Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;
(2) Constructing roadway embankments;
(3) Benching for side-hill embankments;
(4) Constructing dikes, ramps, mounds, and berms; and
(5) Backfilling sub excavated areas, holes, pits, and other depressions.

(c) Conserved topsoil. Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) Waste. Excess and unsuitable roadway excavation and sub excavation that cannot be used.

Material

204.03 Conform to the following Subsections:

Backfill material	704.03
Select borrow	704.07
Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

(a) General. Do not disturb material and vegetation outside the construction limits.
Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

(b) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches below sub grade within the roadbed limits. Backfill to sub grade with topping or with other suitable material. Compact the material according to Subsection 204.11 When blasting rock, use blasting methods according to Subsection 205.08.

(c) Earth cuts. Scarify earth cuts to 6 inches below sub grade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(d) Pioneer Roads. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

204.07 Sub excavation. Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of

unsuitable material according to Subsection 204.14. Backfill the sub excavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

204.08 Borrow Excavation. Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 Preparing Foundation for Embankment Construction. Prepare foundation for embankment construction as follows:

(a) Embankment less than 4 feet high over natural ground. When designated, remove topsoil and break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) Embankments over an existing asphalt, concrete, or gravel road surface. Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) Embankment across ground not capable of supporting equipment. Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) Embankment on an existing slope steeper than 1V:3H. Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

204.10 Embankment Construction. Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at sub grade centerline. Construct embankments as follows:

(a) General. At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

(c) Individual rock fragments and boulders. Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

(1) Reduce rock to less than 48 inches in the largest dimension.
(2) Distribute rock within the embankment to prevent nesting.
(3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.
(4) Compact each layer according to Subsection 204.11 before placing the next layer.

(d) Embankment outside of roadway prism. Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction.

Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further consolidation. Finish according to Subsection 204.13.

204.12 Ditches. Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

204.13 Sloping, Shaping, and Finishing. Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

(a) Sloping. Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all

slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped slopes. Where required by the contract, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the sub grade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) Finishing. Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2.Ensure that the subgrade is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

For unsurfaced roads, use a vibratory roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.

204.14 Disposal of Unsuitable or Excess Material. Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

204.15 Acceptance.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

Measurement

204.16 Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

(a) Roadway excavation. Measure roadway excavation in its original position as follows:

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;
(b) Rock material excavated and removed from below subgrade in cut sections;
(c) Unsuitable material below sub grade and unsuitable material beneath embankment areas when a pay item for sub excavation is not shown in the bid schedule;
(d) Ditches, except furrow ditches measured under a separate bid item;
(e) Topsoil;
(f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
(g) Loose scattered rocks removed and placed as required within the roadway;
(h) Conserved material taken from stockpiles and used in Section 204 work; and
(i) Slide and slip out material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:

(a) Overburden and other spoil material from borrow sources;
(b) Over breakage from the back slope in rock excavation;
(c) Water or other liquid material;
(d) Material used for purposes other than required;
(e) Roadbed material scarified in place and not removed;
(f) Material excavated when stepping cut slopes;
(g) Material excavated when rounding cut slopes;
(h) Preparing foundations for embankment construction;
(i) Material excavated when benching for embankments;
(j) Slide or slip out material attributable to the Contractor's method of operation;
(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:

(a) Unsuitable material below sub grade in cuts and unsuitable material beneath embankment areas when a pay item for sub excavation is not shown in the bid schedule;
(b) Slide and slip out material not attributable to the Contractor’s method of operations; and
(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.
Do not measure borrow excavation used in place of excess roadway excavation.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:

(a) Roadway embankments;
(b) Material used to backfill sub excavated areas, holes, pits, and other depressions;
(c) Material used to restore obliterated roadbeds to original contours; and
(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:

(a) Preparing foundations for embankment construction;

(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and

(c) Material used to round fill slopes.

(d) Rounding cut slopes. Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

(e) Waste. Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping over burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) Slope scaling. Measure slope scaling by the cubic yard in the hauling vehicle.

Payment

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-2
Construction Tolerances

	Tolerance Class [a]												
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of

209 - Structure Excavation and Backfill

209.10_nat_us_03_30_2005

209.10 Backfill.

(a) General.

Add the following:
Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at sub grade centerline.
- Installation in a protected stream course.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

On each side of the pipe, excavate an area at least as wide as the diameter of the pipe. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11_nat_us_02_24_2005

209.11 Compacting.

Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

211 ROAD OBLITERATION (6/2012)

Delete this section and substitute the following:

1. DESCRIPTION

When required this work shall consist of closing designated roads to use by all motorized vehicles and returning the roadway to resource production using one or a combination of the following items as specified in the Schedule of Items and as shown in the Drawings: removing drainage structures, seeding, fertilizing, scarification, ripping with wing rippers, outsloping roadbed, earth barricade, rock barricade, waterbars, slashing, and camouflaging road junction.

2. MAINTENANCE REQUIREMENTS

a. Removal of Drainage Structures.

1. All designated drainage structures such as culverts, metal or wooden open top water diverters, and rubber water diverters shall be removed. Dips and waterbars shall not be removed.

2. Culverts 8 inches or less in diameter shall be smashed and buried (covered with a minimum of one foot of compacted native material) in the roadbed, unless disposal sites for specific culverts are designated on an attached map. If disposal sites have been designated the culverts shall be hauled to the designated site or other agreed to location.

3. Dewatering for culvert removal – Contractor shall supply dewatering plan to Contracting Officer for approval 48 hours prior to culvert removal.

4. Culverts over 8 inches in diameter shall be hauled to designated site if Shown in the Drawings, otherwise culverts shall be disposed of off Public lands.

5. Wooden open top water diverters, metal open top water diverters, and rubber water diverters shall be treated the same as culverts 8 inches or less in diameter.

6. Stream channel width after drainage structures have been removed shall be no less than that of existing channel in the vicinity of the inlet and outlet. Stream banks shall be sloped to 3:1 or flatter unless agreed to otherwise. This work is incidental to structure removal. Riprap, when shown in the Drawings, shall be placed to the length and dimension shown in the Drawings.

b. Seeding

1. This work consists of furnishing and placing required seed mix on all areas disturbed under this contract and on any other areas specified. Seeding may not be done until all other ground disturbing work on the road has been completed and accepted. Unless a specific seeding season is listed below, seeding shall be done as soon as other ground disturbing work is accepted.

Seeding season:_____ to _____.

2. The seed shall be applied in the following amounts and mixtures:

See Typicals.

3. Hand operated seeding devices, or other devices approved by the Government, shall be used to apply seed.

c. Fertilizing

See Typicals.

d. Scarification

1. This work shall consist of seedbed preparation on an existing roadbed by scarification.

2. Scarification shall be accomplished by rippers spaced not more than 6 inches apart and/or with heavy duty gang discs.

3. Scarification depth shall not be less the 3 inches or deeper than 12 inches unless otherwise agreed.

e. Ripping With Wing Rippers - (Sub Soiling)

1. This work shall consist of subsoiling an existing roadbed by ripping with a winged ripper as shown in the Drawings or an approved equivalent tool approved by the Contracting Officer.

2. The distance between ripper shanks shall not exceed 36 inches. Each shank shall be equipped with a shoe and wings which have a total width of at least 18 inches.

The design of the shank and wing will be such that the treated soils are slightly lifted and well fractured rather than plowed, mixed or displaced.

3. Ripping shall be accomplished to a minimum depth of 18 inches. The Government may agree to a lesser depth when excessive rock is encountered.

f. Outsloping Roadbed

1. Designated roads or segments of roads shall be outsloped by pulling the fill shoulder towards the cut bank. Excavated material shall be spread over the roadbed forming a minimum outslope equal to the existing road grade percent. The Government may agree to a lesser outslope percent if soil conditions warrant.

2. Any existing ditches at the toe of the cut shall be filled with the material excavated during outsloping.

g. Earth, Log and Rock Barricades

1. Earth barricades shall be constructed in locations specified in accordance with the attached drawings.

2. Multiple log barricades at one site may be specified. Logs shall be a minimum dimension shown in the Drawings.

3. Rock barricades shall be of the minimum size and dimension shown in the Drawings and placed so that motorized vehicles greater than 36 inches cannot pass.

h. Slashing

1. This work shall consist of placing woody material over the roadbed to discourage vehicle traffic.

2. Woody material shall be dead timber and slash removed from an area within thirty five (35) feet of the road shoulders in the vicinity of the areas where it is to be placed. When there is inadequate material to slash road and when directed by the Contracting Officer, Contractor shall fell marked trees adjacent to road. Trees shall be felled diagonally across road.

3. Material shall be placed randomly over the roadbed to give a similar appearance of the surrounding area and may include rocks and other material.

i. Camouflaging Road Junction

1. This work shall consist of manipulating the cut and fill slopes of the designated road so the road template is not obvious. Slashing is included in this section and is incidental to work in this section. One or more of the following methods will be specified:

A. When the designated roadway section is a cut-fill section, excavate the fill slope section and place material against the cut section so the designated road is not obvious. The height of the replaced material shall be equal to the existing cut or a maximum of six (6) feet.

B. When the designated roadway section is a fill section, remove the road fill and place the material as a berm along the road junctioned, creating what appears to be a cut section.

j. Recontouring Cut and Fill Slopes

1. Cut and fill slopes shall be reshaped as nearly as practical to the surrounding hill slope topography. Reshaping of cut and fill slopes shall be prescribed on a site specific basis by the hydrologist where unstable slopes create geologic hazards or excessive erosion.

k. Waterbars

1. Waterbars shall be installed at locations shown in the Drawings or staked on the ground. Unless specified otherwise in the Drawings all waterbars are to be the non-drivable type. See typicals.

l. Transplanting Native Trees

1. This work shall consist of transplanting native trees designated by the Government from areas adjacent to the road to areas designated by the Government on the roadbed. Transplanting will be limited to trees less than 4 inches in diameter. Transplanting must be done with a tree spade or other equipment specifically designed for transplanting trees with minimal damage to the root system. No damage to the tree stem will be permitted. No more than 20 percent of the limbs may be damaged during the transplanting operation. The north side of trees to be transplanted shall be marked before the trees are removed. When the trees are transplanted they shall be oriented with the north side facing north. Transplanting shall be limited to the period from October 15 to May 31 annually. Transplanted trees shall be watered liberally immediately after transplanting.

m. Road Closure

1. This work shall consist of minor grading and shaping of road to ensure drainage. Work also includes to construction of swales, waterbars and barricades where shown in the Drawings or staked on the ground.

n. Swales

1. Swales shall be installed at locations shown in the Drawings or staked on the ground. See typicals.

o. Riprap

1. This work consists of placing riprap at locations specified in the Drawings. Riprap shall conform to requirements in section 251. Sand mass specified in the Table 705-2.

3. MEASUREMENT

Measurement under this Section will be Lump Sum Quantity and includes all work described in the Drawings and listed in the Schedule of Items completed and accepted.

4. PAYMENT

a. The accepted quantity will be paid for at the contract unit price. This payment will be full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

251 - Riprap

251.00_01_us_03_18_2008

251.01 Description

Delete the first sentence and add the following:

This work consists of furnishing, hauling and placing of riprap for bank protection, slope protection, drainage structures, erosion control, stream simulation, and other locations shown on the plans.

251.02 Material.

Add the following:
When shown on the plans stone from the project site may be utilized.

251.07 Acceptance

Delete sampling and testing requirements of Table 251-1 and certification requirements of Subsection 106.03.

251.09 Payment.

Add the following:

The cost of excavation, embankment, haul required for placement of riprap and supply and installation of geotextile cloth is incidental to pay items listed in the bid schedule.

301 - Untreated Aggregate Courses

301 Title Change.

Change the title to: **Section 301 Aggregate Courses**

Delete this Section in its entirety and substitute the following:

Description

301.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, pit-run, screening, or crushing methods, or placing commercially produced aggregate meeting Caltrans specification.

Surface aggregate grading is designated as shown in Table 703-3.

Sub base and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

301.02 Conform to the following Subsections:

Aggregate	703.05
Water	725.01

Construction Requirements

301.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the Contractor's proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

For screened, pit run, or grid-rolled material, furnish material smaller than the maximum size. No gradation other than maximum size will be required for pit run and grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size.

After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at approved locations.

301.04 Mixing and Spreading. Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place the mixture in a layer exceeding 6 inches in compacted thickness or twice the maximum particle size, whichever is less. When more than one layer is necessary, compact each layer according to Subsection 302.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

301.05 Compacting. Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

> **Compaction D**. Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface.

301.06 Construction Tolerance. If grade finishing stakes are required, finish the surface to within ±0.05 feet from staked line and grade elevation.

If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is ½ inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

301.07 Maintenance. Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 302.06.

301.08 Acceptance.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Construction of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are equal to the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.

Measurement

301.09 Measure the Section 301 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measurement shall be by the ton. Contractor shall provide Engineer proof of quantity delivered and placed by supplying weight tickets.

Payment

302.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 301 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

303 - Road Reconditioning

Delete Section 303 in its entirety and replace with the following.

303.01_0503_eldo_01_10_2007

Description

303.01 Work.

This work consists of reconditioning ditches, shoulders, roadbeds, cattle guards, culvert inlets/outlets, asphalt surfaces, approach road intersections, and aggregate surfaces. Construct out slopes, clean and maintain all roadbed drainage structures when shown on the plans. Work also includes the repair of minor slumps and slides, berm removal and curve widening when it only involves using the existing travel way and shoulders..

Material

303.02 Conform to the following Subsection:

Water 725.01

Construction Requirements

303.03 Ditch Reconditioning. Remove all slide material, sediment, vegetation, and other debris from the existing ditches and culvert inlets and outlets. Reshape ditches and culvert inlets and outlets to achieve positive drainage and a uniform ditch width, depth, and grade. Dispose of waste as shown on the plans.

303.04 Shoulder Reconditioning (Curve Widening). Repair soft and unstable areas according to Subsection 204.07. Remove all slide material, vegetation, and other debris from existing shoulders including shoulders of parking areas, turnouts, berms and other widened areas. Dispose of waste as shown on the plans.

303.05 Roadbed Reconditioning Repair soft and unstable areas according to Subsection 204.07. Remove all organic, deleterious material larger than 6 inches from the top 6 inches of subgrade. Dispose of waste as shown on the plans. Scarify, rip and shape the traveled way and shoulders at locations and to the depth and width designated on the plans. Remove surface irregularities and shape to provide a uniform surface.

Dispose of rock larger than 4 inches brought to the surface during scarification in areas designated on the plans.

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface. Reduce in place or remove rock extending above the finished roadbed surface. Dispose of removed rock in areas designated on the plans.

Compact using the following method as specified:

(a) Compaction A. Operate equipment over the full width.

(b) Compaction B. Operate rollers over the full width of each layer until visual displacement ceases, but not fewer than three complete passes. Use rollers that meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum weight of 6 tons, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

303.06 Aggregate Surface Reconditioning. Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth of the aggregate surface or to a depth of 6 inches, whichever is less, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Subsection 301.05, Subsection 321.05, or Subsection 322.05 as applicable.

303.07 Roadway Reconditioning. Perform all the applicable work described in Subsections 303.03 through 303.06.

Maintain the existing cross slope or crown unless otherwise shown on the plans. Establish a blading pattern that will retain the surfacing on the roadbed and provide a through mixing of the materials within the completed surface width.

Blade and shape the sub grade for both surfaced and unsurfaced roads when moisture content is suitable for compaction.

303.08 Pulverizing. Scarify the surface to the designated depth and width. Pulverize all material to a size one and one half times the maximum sized aggregate or to 1½ inches, whichever is greater. Mix, spread, compact, and finish the material according to Section 301.

303.09 Cattle guards. Remove cattle guard decks. Clean the deck and the area beneath the cattle guard of soil and other material to the bottom of the original foundation over the entire width of the installation. Reinstall the cattle guard deck.

303.10 Acceptance. See Table 303-1 for sampling and testing requirements. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

303.11 Measurement. Measure road reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, station, foot, or square yard. Measure horizontally along centerline of roadway. Measure the square yard area on horizontal plane. Do not measure isolated areas less than 20 square yards.

There shall be no separate measurement for ditch reconditioning, lead off ditches, culvert cleaning, inlet/outlet cleaning, minor slump or slide repair, and shoulder reconditioning. This work shall be considered incidental to Road Reconditioning unless specified otherwise in the Schedule of Items.

Delete Table 303-1 and replace with the following:

Table 303-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Existing Roadway	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 (1)	1 per each mixture or change in material	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density Method E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180(1)	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	1 per 3000 yd^2	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

406 - Asphalt Pavement Patching

Description - Add the following:

406.01 Work. Perform deep patching, skin patching of asphalt surfaces, and patching of asphalt berms. Prepare the area to be patched, and furnish and place all necessary materials.

Materials

406.02 Requirements. Ensure that asphalt materials are of the type and grade SHOWN ON THE DRAWINGS, and that they meet the requirements specified in the following subsections:

Asphalt Cement 702.01
Cutback Asphalt 702.02
Emulsified Asphalt 702.03

Ensure that mixing temperatures meet the requirements specified in Subsection 702.04; that aggregates meet the requirements specified in Subsection 703.07, except for gradation; and that fabric meets the requirements specified in Subsection 714.01.

406.03 Job-Mix Formula. Prior to producing asphalt concrete mixtures, submit in writing a proposed job-mix formula and supporting documentation for each mixture to the CO for use in setting the job-mix formula to be used with the proposed materials.

After reviewing the proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

Construction

406.04 Deep Patching. Remove surface course and base course materials above the subgrade to a minimum depth of 2 inches, or as necessary to reach firm support. If firm support for a patch is unavailable, notify the CO prior to placing any material.

Trim or mill the edges of the prepared hole to form a vertical face in unfractured asphalt surfacing. Make the prepared hole rectangular in shape, and clean it of all loose material. When the hole is dry, spray the bottom and faces with an emulsified asphalt.

Immediately patch or barricade prepared sites.

Place the asphalt concrete mixture in layers not exceeding 4 inches. Thoroughly compact each layer with hand or mechanical tampers or rollers.

Compact the finished surface with a steel-wheel roller or vibratory plate compactor. For hot asphalt concrete mixtures, compact the mix while it is above 230 °F. Ensure that the compacted patch, upon completion, is approximately 1/8 to ¼ inch above the level of the adjacent pavement. Seal the edges of the completed patch with emulsified asphalt, and blot with fine sand.

When SHOWN ON THE DRAWINGS and DESIGNATED IN THE SCHEDULE OF ITEMS, use a geotextile saturated with rubberized asphalt to strengthen the pothole area. Ensure that the geotextile has a minimum grab strength of 20 pounds. Prepare the surface on which the fabric is placed by digging out and patching as described above, or by cleaning the surface, removing vegetation, and filling all cracks more than ¼ inch wide with an approved crack-filling material. Remove excess crack-filling material.

Place the fabric membrane over the repaired area. Extend the fabric a minimum of 6 inches beyond the repaired or patched area onto sound adjoining pavement. Use a minimum of 2 inches overlap where adjacent fabric panels are needed to cover the repaired area.

406.05 Skin Patches. Prior to skin patching, patch all potholes.

Treat minor depressions, light raveling, or surface checking at scattered locations SHOWN ON THE DRAWINGS or marked on the ground by applying a skin patch.

Prior to skin patching, clean the surface of loose and deleterious material, and spray it with emulsified asphalt at the rate ordered by the CO. Do not place mixture until authorized by the CO.

Uniformly distribute asphalt concrete mixture in layers not to exceed 2 inches compacted depth. Feather the edges of skin patches. When multiple layers are necessary, offset all joints at least 6 inches between layers.

Compact each layer with a 8 to 10-ton steel roller. For hot asphalt concrete mixtures, compact the mix while it is above 230 °F.

Ensure that the completed patch does not have abrupt transitions that could adversely affect the steering of a passenger car traveling across the area. Provide transition tapers for skin patches that are 4 inches per 1/32-inch thickness of patch in the direction on travel.

406.06 Asphalt Berm. Remove damaged segments of berm and bevel exposed ends at approximately 45° from vertical. Clean and patch the berm foundation as necessary. Coat the foundation and joining surfaces with emulsified asphalt. Place and compact asphalt mix to conform with the shape of the undamaged segment.

406.07 Waste Material. Dispose of all materials removed from potholes, patches, and berms in accordance with Subsection 203.05(a).

Measurement

406.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

416.09 Basis. The accepted quantities will be paid for at the contract unit price DESIGNATED IN THE SCHEDULE OF ITEMS.

602 - Culverts and Drains

602.03_nat_us_04_14_2005

602.03 General.

Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.05_1005_us_01_18_2005

Delete the second paragraph and replace with the following.

Join pipe sections together with coupling bands according to AASHTO M 36 or M 196. Limit the use of bell and spigot joints to slopes of 10% or less. Limit the use of bands with projections (dimpled) to slopes of 15% or less.

703 - Aggregate

703.05_nat_us_05_17_2005

Delete 703.05 and replace with the following:

703.05 Sub base, Base, Surface Course, and Screened Aggregate.

(a) Sub base or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	No plastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

(10) Aggregate shall be obtained from an approved source, and certified to contain no more than 0.25 % asbestos to be in compliance with California Health and Safety Code Sections 93105 and 93106.

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

(10) Aggregate shall be obtained from an approved source, and certified to contain no more than 0.25 % asbestos to be in compliance with California Health and Safety Code Sections 93105 and 93106.

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate – Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

(1) Gradation	Table 703-16
(2) Plastic Index, AASHTO T 90	Less than 9
(3) Los Angeles abrasion, AASHTO T 96	55% max.
(4) Free from organic matter and lumps or balls of clay.	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

Table 703-2
Target Value Ranges for Subbase and Base Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 – 100	100	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
3/4 inch			64 – 94 (6)	86 – 100 (6)	100
1/2 inch	45 – 59 (7)				
3/8 inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	28 – 42 (6)	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	9 – 17 (4)			12 – 26 (4)	12 – 26 (4)
No. 200	4.0 – 8.0 (3)	4.0 – 12.0 (4)	4.0 –7.0 (3)	4.0 – 7.0 (3)	4.0 – 7.0 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

Table 703-3
Target Value Ranges for Surface Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100(			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			100
1/2 inch					71 – 91 (6)	
3/8 inch	56-68 (6)	70 – 80 (6)	80 – 92 (6)	51 – 71 (6)		71 – 90 (6)
No. 4	43-53 (7)	51 – 63 (7)	58 – 70 (7)	36 – 53 (7)	43 – 60 (7)	50 – 68 (7)
No. 8				26 – 40 (6)	30 – 46 (6)	34 – 51 (6)
No. 16	23-32 (6)	28 – 39 (6)	28 – 40 (6)			
No. 30	15-23 (5)	19 – 27 (5)	16 – 26 (5)			
No. 40				14 – 25 (5)	16 – 28 (5)	19 – 30 (5)
No. 200	10.0-16.0 (4)	10.0 – 16.0 (4)	9.0 – 14.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)

( ) The value in the parentheses is the allowable deviation (±) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

Table 703-16

Gradation Requirements for Screened Aggregate

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	**M**	**N**	**O**	**P**	**Q**	**R**
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

Aggregate shall be obtained from an approved source, and certified to contain no more than 0.25 % asbestos to be in compliance with California Health and Safety Code Sections 93105 and 93106.

703.06_nat_us_03_02_2005

703.10(e) Flakiness Index.

Delete and replace with the following:

Flakiness Index, FLH T 508 30% max.

703.10(i) Adherent Coating.

Add the following:

Adherent coating on the aggregate, FLH T 512 0.5% max.

703.07_nat_us_03_02_2005

Table 703-2 Correction

Include the following substitution

In Table 703-2, delete the “436 – 74 (6)” percent by mass passing for grading E (base) No. 4 sieve size and substitute “36 – 74 (6).”

Table 703-2 Correction

Include the following substitution

In Table 703-2, delete the “436 – 74 (6)” percent by mass passing for grading E (base) No. 4 sieve size and substitute “36 – 74 (6).”

703.10_nat_us_03_02_2005

Delete Table 703-7 and substitute the following:

Table 703-7 Target Value Ranges

Table 703-7
Target Value Ranges for
Single and Multiple Course Surface Treatment Aggregate Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 & T 11)					
	Grading Designation					
	A	B	C	D	E	F
1½ inch	100(1)					
1 inch	90-100(3)	100(1)				
¾ inch	0-35(5)	90-100(3)	100(1)			
½ inch	0-8(3)	0-35(5)	90-100(3)	100(1)		
⅜ inch	—	0-12(3)	0-35(5)	85-100(3)	100(1)	100(1)
No. 4	—	—	0-12(3)	0-35(5)	85-100(3)	85-100(1)
No. 8	—	—	—	0-8(3)	0-23(4)	—
No. 200	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-10(1)

(1) Statistical procedures do not apply.
( ) The value in the parentheses is the allowable deviation (±) from the target values.

705.02_ us_03_18_2008

705.02 Riprap Rock.

Delete Table 705-1 and replace it with the following:

Gradation Requirements for Riprap

Class	Percent of Rock by Mass	Mass (pounds)	Approximate Min. Dimension [b,c] (inches)
1	20	22 to 33	6 to 8
	30	11 to 22	5 to 6
	40	1.1 to 11	2 to 5
	10[a]	0 to 1.1	0 to 2
2	20	55 to 110	8 to 10
	30	22 to 55	6 to 8
	40	2.2 to 22	3 to 6
	10[a]	0 to 2.2	0 to 3
3	20	220 to 330	14 to 16
	30	110 to 220	10 to 14
	40	11 to 110	5 to10
	10[a]	0 to11	0 to 5
4	20	550 to 770	18 to 20
	30	220 to 570	14 to 18
	40	22 to 220	6 to 14
	10[a]	0 to 22	0 to 6
4a	20	770 to1353	20 to 24
	30	330 to 770	16 to 20
	40	33 to 330	7 to16
	10[a]	0 to 33	0 to 7
5	20	1540 to 2200	26 to 28
	30	770 to 1540	20 to 26
	40	55 to 1100	8 to 20
	10[a]	0 to 55	0 to 8
6	20	1870 to 3520	28 to 34
	30	1100 to 1870	22 to 28
	40	110 to 1100	10 to 22
	10[a]	0 to 110	0 to 10
7	20	4400 to 5940	35 to 39
	30	2200 to 4400	28 to 35
	40	220 to 2200	14 to 28
	10[a]	0 to 220	0 to 14
8	20	7000 to 10000	42 to 47
	30	4000 to 7000	35 to 42
	40	400 to 4000	16 to 35
	10[a]	0 to 400	0 to 16

a) Furnish spall and rock fragments graded to provide a stable dense mass.

b) The volume of a rock with these cubic dimensions has a mass approximately equal to the specified rock mass.

c) Furnish rock with breadth and thickness at least one-third its length.