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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\_01\_22\_2009

### 101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03\_nat\_us\_06\_16\_2006

### 101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	<u>National Institute of Standards and Technology</u>
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\_03\_29\_2007

### 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.

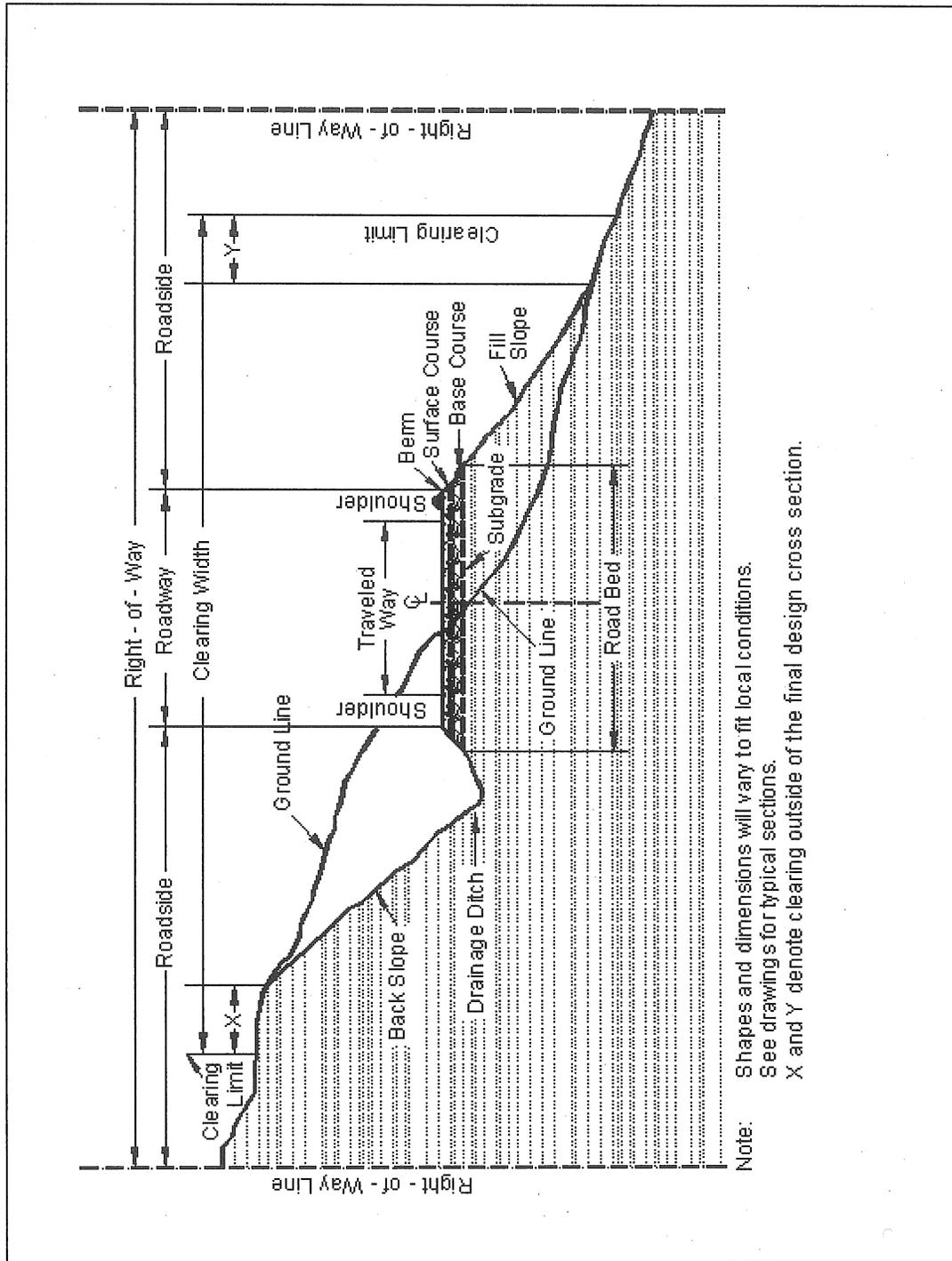
**Road Order**--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

**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.



Note: Shapes and dimensions will vary to fit local conditions.  
 See drawings for typical sections.  
 X and Y denote clearing outside of the final design cross section.

**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\_06\_16\_2006

### 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\_01\_18\_2007

### 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**

106.07\_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\_06\_16\_2006

### 107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

"except as provided in Subsection 106.07".

107.09\_nat\_us\_06\_16\_2006

### 107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10\_nat\_us\_06\_16\_2006

### 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 the 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.

**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\_06\_16\_2006

### 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”.

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.

109.02\_0114\_us\_06\_09\_2008

### 109.02 Measurement Terms and Definitions.

Add the following definition:

**(q) Actual quantity. (AQ)** These quantities are determined from measurements of completed work.

## 151 - Mobilization

151.00\_01\_us\_10\_11\_2006

Delete Section 151 in its entirety and replace with the following.

### Description

**151.01** This work consists of moving personnel, equipment, material, and incidentals to the project and performing all work necessary before beginning work at the project site; obtaining of permits, insurance, and bonds. This work also includes washing and treating construction equipment and vehicles necessary for equipment transport to remove seeds, plants, and plant fragments before the equipment is used on Forest Service lands, according to the requirements within.

### Construction Requirements

Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment. Only equipment inspected by the Forest Service will be allowed to operate within the project area. All subsequent move-ins of equipment to the project area will be treated in the same manner as the initial move-in. This requirement does not apply to cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas off the National Forest.

Equipment will be considered free of soil, seed, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment, components or the need for specialized inspection tools is not required.

Notify the CO in writing at least 72 hours before moving any construction equipment onto the national forest. Notification will include an agreed upon location where the equipment will be available for inspection by the Forest Service. Inspection will be required after every cleaning.

Use methods of cleaning and locations for cleaning approved by the CO.

For work at a commercial washing facility, use an approved facility.

New infestations of noxious weeds of concern to Forest Service and identified by either Contractor or Forest Service, in the Project Area or on the haul route, will be promptly reported to the other party. Contractor and Forest Service will agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. A current list of noxious weeds of concern to Forest Service is available at each Forest Service office.

### Measurement

**151.02** Clean equipment prior to moving onto this project. The initial cleaning will not be included in the measurement for payment. Payment for cleaning will only be made if subsequent cleanings are ordered by the CO. Measurement shall be on an "each" basis, meaning one complete cleaning of all equipment required for this contract. Subsequent cleanings necessitated by the Contractor's actions but not directed by the CO will not be included in the measurement for payment.

Measure mobilization according to Subsection 109.02.

### **Payment**

**151.03** The accepted quantity, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 151 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Progress payments for mobilization lump sum will be paid as follows:

**(a)** If applicable, bond premiums will be reimbursed according to FAR Clause 52.232-5 Payments Under Fixed-Price Construction Contracts, after receipt of the evidence of payment.

**(b)** When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.

**(c)** When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.

**(d)** Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance.

Include all costs associated with the initial cleaning of equipment in the unit bid price for Mobilization. Cleaning for subsequent move-ins will not be paid for unless after a suspension ordered by the CO.

## 152 - Construction Survey and Staking

152.00\_01\_us\_10\_11\_2006

Delete Section 152 in its entirety and replace with the following.

### Description

**152.01** This work consists of furnishing qualified personnel and necessary equipment and material to survey, stake, calculate, and record data for the control of work. See FAR Clause 52.236-17 Layout of Work.

Personnel, equipment, and material shall conform to the following:

**(a) Personnel.** Furnish technically qualified survey crews experienced in highway construction survey and staking. Provide personnel capable of performing in a timely and accurate manner. An acceptable crew supervisor shall be on the project whenever surveying/staking is in progress.

Conduct construction staking under the direct supervision of a professional engineer registered for the state in which work is completed.

**(b) Equipment.** Furnish survey instruments and supporting equipment capable of achieving the specified tolerances.

**(c) Material.** Furnish acceptable tools, supplies, and stakes of the type and quality normally used in highway survey work and suitable for the intended use. Furnish stakes and hubs of sufficient length to provide a solid set in the ground with sufficient surface area above ground for necessary legible markings.

Use required stake dimensions and materials. Pre-paint the top 2 inches of all stakes and lath, or mark them with plastic flagging. Use designated colors for paint or flagging. Mark all stakes with a stake pencil that leaves a legible imprint, or with waterproof ink.

Do not use aerosol spray paints in the field. Provide for the safe storage use and clean-up of paint when on National Forest System Lands. Immediately report all spills to the CO, clean-up and disposal of spills and painting waste shall be in accordance with Federal state and local requirements.

Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence. At the conclusion of each road segment, the registered engineer shall affix the state authorized seal and sign all field books and drawings and attest in writing to the satisfactory completion of the project.

**152.02 General.** When indicated on the plans, a preliminary survey line has been established on the ground. The project location line is established by offsets from this preliminary line. Data relating to horizontal and vertical alignment, theoretical slope stake catch points, and other design data will be furnished.

Before beginning construction, notify the CO of any missing initial reference lines, control points, or stakes. Reestablish missing reference, control lines, or stakes as necessary to control subsequent construction staking operations

Perform additional calculations for convenient use of Government-furnished data. Provide immediate notification of apparent errors in the initial staking or in the furnished data.

Preserve all initial reference and control points. After beginning construction, replace all destroyed or disturbed initial reference or control points necessary to the work.

Before surveying or staking, discuss and coordinate the following with the CO:

- (a) Surveying and staking methods;
- (b) Stake marking;
- (c) Grade control for courses of material;
- (d) Referencing;
- (e) Structure control; and
- (f) Any other procedures and controls necessary for the work.

Survey and establish controls within the tolerances shown in Table 152-1.

Prepare field notes in an approved format. Furnish all survey notes at least weekly. All field notes and supporting documentation become the property of the Government upon completion of the work.

Start work only after staking for the affected work is accepted.

The construction survey and staking work may be spot-checked for accuracy, and unacceptable portions of work may be rejected. Resurvey rejected work, and correct work that is not within the tolerances specified in Table 152-1. Acceptance of the construction staking does not relieve the Contractor of responsibility for correcting errors discovered during the work and for bearing all additional costs associated with the error.

Remove and dispose of all flagging, lath, stakes, and other staking material after the project is complete.

**152.03 Survey and Staking Requirements.** Perform all survey, staking, recording of data, and calculations as necessary to construct the project from the initial layout to final completion. Reset stakes as many times as necessary to construct the work.

(a) **Control points.** Relocate initial horizontal and vertical control points in conflict with construction to areas that will not be disturbed by construction operations. Furnish the coordinates and elevations for the relocated points before the initial points are disturbed.

(b) **Roadway cross-sections.** Take roadway cross-sections normal to centerline. When the centerline curve radius is less than or equal to 200 feet, take cross-sections at a maximum centerline spacing of 25 feet. When the centerline curve radius is greater than 200 feet, take cross-sections at a maximum centerline spacing of 80 feet. When the centerline curve radius is greater than 500 feet, take cross-sections at a maximum centerline spacing of 50 feet. Take additional cross-sections at significant breaks in topography and at changes in the typical section. Along each cross-section, measure and record points at breaks in topography, but no further apart than 20 feet. Measure and record points to at least the anticipated slope stake and reference locations. Reduce all cross-section distances to horizontal distances from centerline.

**(c) Slope Stakes and References.** Locate slope stakes on designated portions of the road. Locate the slope stake catch points and use them to establish clearing limits and slope stake references.

Mark slope stakes with the station, the amount of cut or fill, the horizontal distance to centerline, and the slope ratios.

Place slope reference stakes at least 10 feet outside the clearing limit and mark with the offset distance to the slope stake.

Prior to clearing and grubbing operations, move the slope stake outside the clearing limit to the slope reference stake. After clearing and grubbing and before excavation, reset the slope stakes in their original position.

Use the designated method to establish the slope stake catchpoint.

- **Method I—Computed Method.** Use the template information shown in the plans or other Government-provided data to calculate the actual location of the catchpoint. The slope stake “catchpoint distance” provided may be used as a trial location to initiate slope staking. Recatch slope stakes on any section that does not match the staking report within the tolerances established in Table 152-2.
- **Method II—Catchpoint Measurement Method.** Determine the location of slope stake catchpoints by measuring the catchpoint distances shown in the plans or other Government-provided data.

**(d) Clearing and grubbing limits.** Set clearing and grubbing limits on both sides of centerline at roadway cross-section locations.

Establish clearing limits on each side of the location line by measuring the required horizontal or slope distances shown in the stake notes. Mark the clearing limits with flagging or tags on trees to be left standing, or on lath. Make markings intervisible, and no more than 90 feet apart.

After establishing clearing limits, move the location line stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line

**(e) Centerline reestablishment.** Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 feet when the centerline curve radius is less than or equal to 200 feet. When the centerline curve radius is greater than 200 feet, the maximum distance between centerline points is 80 feet.

**(f) Grade finishing stakes.** Set grade finishing stakes, for grade elevations and horizontal alignment, on centerline and on each shoulder at roadway cross-section locations. Set stakes at the top of subgrade and the top of each aggregate course.

Where turnouts are constructed, set stakes on centerline, on each normal shoulder, and on the shoulder of the turnout. In parking areas, set hubs at the center and along the edges of the parking area. Set stakes in all ditches to be paved.

When the centerline curve radius is less than or equal to 200 feet, the maximum centerline spacing for stakes is 25 feet. When the centerline curve radius is greater than 200 feet the maximum centerline spacing for stakes is 80 feet. The maximum transverse spacing between stakes is 20 feet. Use brushes or guard stakes at each stake.

**(g) Culverts.** Stake culverts to fit field conditions, the final locations may differ from the plans. Set a culvert reference stake on the centerline of the culvert 10 feet from each end or beyond the clearing limit, whichever is greater. Record the following on culvert reference stakes:

- (1) Diameter, actual field measured length, and type of culvert.
- (2) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.
- (3) Station of actual point where culvert intersects centerline.

Stake headwall for culverts by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. Perform this work after clearing is completed.

**(h) Bridges.** Set adequate horizontal and vertical control and reference points for all bridge substructure and superstructure components. Establish and reference the bridge chord or the bridge tangent. Also establish and reference the centerline of each pier, bent, and abutment.

**(i) Retaining walls.** Survey and record profile measurements along the face of the proposed wall and 5 feet in front of the wall face. Every 25 feet along the length of the wall and at all major breaks in terrain take cross-sections within the limits designated by the CO. For each cross-section, measure and record points every 25 feet and at all major breaks in terrain. Set adequate references and horizontal and vertical control points.

**(j) Borrow and waste sites.** Perform the work essential for initial layout and measurement of the borrow or waste site. Establish a referenced baseline, site limits, and clearing limits. Survey and record initial and final cross-sections.

**(k) Permanent monuments and markers.** Perform all survey and staking necessary to establish permanent monuments and markers. Set permanent monuments according to Section 621.

**(l) Miscellaneous survey and staking.** Perform all surveying, staking, and recording of data essential for establishing the layout and control of the following, as applicable:

- (1) Approach roads and trails;
- (2) Curb and gutter;
- (3) Guardrail;
- (4) Parking areas;
- (5) Paved waterways;
- (6) Special ditches;
- (7) Turf establishment;
- (8) Utilities;
- (9) Signs, delineators, and object markers; and
- (10) Pavement markings.
- (11) Cattleguards
- (12) Drain Dips
- (13) Erosion Control Measures

**(m) Field Discrepancies.** Immediately notify the CO if a discrepancy is encountered between the plans and field conditions which affect the final road location. Prepare recommendations, in writing, to the CO for adjustments to the design to better fit field conditions. Affix the state authorized seal and sign the recommendation attesting to the adequacy of the adjustment. Ensure that adjustments to the design follow all applicable regulations and are consistent with design standards and criteria. Adjustments shall minimize construction effort, such as clearing and embankment volumes. Gain written approval of the adjusted design from the CO before incorporating such adjustment in the field. Return to the original design as soon as practical.

**Table 152-1 Tolerances for reestablishing centerline, traverse, and elevations.**

Precision Class	Minimum Position Closure	Angular Accuracy ( $\pm$ )	L-Line Tangent Control Points <sup>a</sup> ( $\pm$ )	Vertical Closure <sup>b</sup> ( $\pm$ )
A (Bridges)	1/10,000	2 sets, direct/reverse 10 second rejection limit	N/A	0.02 ft or 0.02ft/1000ft <sup>c</sup>
B	1/5,000	2 sets, direct/reverse 20 second rejection limit	0.1 ft	0.02 ft or 0.02ft/1000ft <sup>c</sup>
C	1/1,000	1 set, direct/reverse 1 minute rejection limit	0.2 ft	0.5ft/1000ft
D	1/300	Foresight and backsight; 15 minute rejection limit	0.4 ft	1.0ft/1000ft
E	1/100	Foresight and backsight; 30 minute rejection limit	0.8 ft	1.0ft/1000ft

a. Accuracy of offset measurement.

b. Determine vertical closures at intervals not to exceed 2000 ft as measured along centerline.

c. Use greater value.

**Table 152-2 Cross section and slope stake tolerances.**

Item	Tolerances				
	A	B	C	D	E
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	(±)2°	(±)3°	(±)3°	(±)5°	(±)5°
Take cross-sections topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed	0.5 ft	1.0 ft	2.0 ft	2.0 ft	3.0 ft
Horizontal and vertical accuracy for cross-sections, in feet or percentage of horizontal distance measured from traverse line.	0.1 ft or 0.4% <sup>a</sup>	0.15 ft or 0.6% <sup>a</sup>	0.2 ft or 1.0% <sup>a</sup>	0.2 ft or 1.0% <sup>a</sup>	0.3 ft or 1.0% <sup>a</sup>
Horizontal and vertical accuracy for slope stake and slope stake references, in feet or percentage of horizontal distance measured from centerline or reference stake.	0.1 ft or 0.4% <sup>a</sup>	0.15 ft or 0.6% <sup>a</sup>	0.2 ft or 1.0% <sup>a</sup>	0.2 ft or 1.0% <sup>a</sup>	0.3 ft or 1.0% <sup>a</sup>
Horizontal and vertical accuracy for clearing limits.	1.0 ft	1.0 ft	1.0 ft	1.5 ft	2.5 ft
a. Use greater value.					

**152.04 Acceptance.** Construction survey and staking will be evaluated under Subsections 106.02 and 106.04.

**Measurement**

**152.05** Measure the Section 152 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

**155 - Schedules for Construction Contracts**

155.00\_nat\_us\_05\_11\_2004

155 Delete.

Delete Section 155 in its entirety.

## 157 - Soil Erosion Control

157.00\_01\_us\_10\_10\_2006

### 157.02 Materials

#### Add the following:

Provide bales, wattles, logs and rolls from a certified noxious weed free source.

### 157.03 General.

#### Delete the first two paragraphs and replace with the following:

Forest Service will submit storm water permits as required by the State with jurisdiction, including payment of necessary fees.

Submit an Erosion Control Plan detailing permanent and temporary control measures to minimize erosion and sedimentation during and after construction in accordance with the plans and storm water permits. Do not modify the type, size, or location of any control or practice without approval. Submit the erosion control plan proposal at least 7 days before operations begin to the CO for approval.

Reflect in the Erosion Control Plan special concerns and measures necessary to protect resources and government improvements. Include:

- (a) The construction activities and sequence of implementation relating to specific erosion control measures.
- (b) The location and type of permanent controls to be implemented during construction.
- (c) The location and type of temporary controls to be implemented during construction.
- (d) For work in stream channels with running water a detailed dewatering plan.
- (e) For work in stream channels without flowing water describe level of ground and vegetative disturbance and measures to reduce potential sediment delivery.
- (f) Description of the monitoring plan.

#### Add the following to the third paragraph:

Upon completion of construction at the site, remove all temporary erosion control devices, dewatering materials and equipment from Government property.

### 157.08 Water Crossings.

#### Add the following:

At any channel crossing where there is running water, dewater by rerouting water flow around the site before and during excavation and embankment operations.

### 157.09 Diversions.

#### Delete the first sentence and replace with the following:

When shown on the plans, construct temporary channels, temporary culverts, or sandbags to divert water around disturbed areas and slopes. Earthen dams are prohibited.

## 201 - Clearing and Grubbing

201.00\_nat\_us\_08\_05\_2009

### 201.02 Material:

Delete Tree wound dressing material reference.

### 201.03 General.

Delete the last sentence.

### 201.04 Clearing.

Delete the last sentence of (d).

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.

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.

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 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.

201.04\_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.

201.06\_nat\_us\_02\_18\_2005

**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.

## 203 - Removal of Structures and Obstructions

203.02\_nat\_us\_02\_18\_2005

### 203.02 Material.

#### Add the following:

Geotextile 714

203.03\_0114\_us\_08\_04\_2005

### 203.03 Salvaging Material

#### Delete paragraphs two and three and add:

Stockpile salvaged material at a location approved by the CO.

203.05\_nat\_us\_02\_24\_2005

### 203.05 Disposing of Material.

#### Add the following:

**(e): Scattering.** Scatter pieces of wood less than 3 inches in diameter and 3 feet in length within the clearing limits. Do not place construction slash in lakes, meadows, streams, or streambeds. Immediately remove construction slash that interferes with drainage structures.

203.05\_nat\_us\_02\_18\_2005

### 203.05 Disposing of Material.

#### Add the following:

**(e) Windrowing Construction Slash.** Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. 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 outside the clearing limits 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.

**(g) Chipping or Grinding.** Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 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.

**(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 Firewood Material.** 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) Piling.** Pile construction slash in designated areas. Place and construct piles so that if 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.

**(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 subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

**(m) Hydrological Sensitive Placement.** Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:

1. Place windrow segments on contours, wrap in type I geotextile.
2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

## 204 - Excavation and Embankment

204.05\_nat\_us\_02\_18\_2005

### 204.05 Conserved Topsoil

Delete the entire paragraph.

204.06\_0114\_us\_07\_06\_2005

### 204.06 Roadway Excavation

Add the following:

- (d) **Drainage Excavation.** Drainage excavation includes construction of side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, rolling drainage dips, surface water deflectors and other minor earth drainage structures as shown on the plans. Compaction for drainage excavation is as shown on the plans.

### 204.11 Compaction

Delete the first paragraph and replace it with the following:

For compaction according to method (a), (b), or (c), use AASHTO T 27 to determine the amount of material retained on a Number. 4 sieve. For compaction methods (d), (e), or (f) no sieve test is required.

Add the following compaction methods:

(d) **Hauling and Spreading Equipment.** Adjust the moisture content to a level suitable for compaction. Compact the material by operating equipment over the full width of the roadway.

(e) **Roller Compaction.** Adjust the moisture content to a level suitable for compaction. 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.

(4) Sheepsfoot, tamping, or grid rollers capable of exerting a force of 250 lbs/inch of width of roller drum.

**(f) Mechanical Tamper.** Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each 6 inch layer with a minimum of three complete passes with a mechanical tamper, approved by the CO.

#### 204.14 Disposal of Unsuitable or Excess Material.

Delete the text of the first paragraph and substitute the following:

Dispose of unsuitable or excess material at designated sites or legally off the project.

#### 204.15 Acceptance

Delete the first paragraph.

204.10\_nat\_us\_03\_02\_2005

#### 204.10 Embankment Construction.

Add the following:

Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline.

(a) General.

Delete the third paragraph and add the following:

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.

204.13\_nat\_us\_03\_02\_2005

#### 204.13 Sloping, Shaping, and Finishing.

(a) Sloping.

Add the following:

Slope rounding is not required on tolerance class D though M roads.

204.13\_0114\_us\_03\_21\_2008

#### 204.13 Sloping, Shaping, and Finishing.

Delete section (d) and add the following:

**(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 with suitable material. Finish roadbeds to the designated tolerance class as shown in table 204-2.

Ensure that the subgrade for both surfaced and unsurfaced roads 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.

Use the designated methods to finish the roadbed:

- (1) Method A. Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.
- (2) Method B. Grid roller or approved equal according to Subsection 204.11 (e).
- (3) Method C. For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.
- (4) Method D. Reduce in place or remove and dispose of rocks larger than 4 inches extending above the finished road surface.

Add Table 204-2—Construction Tolerances:

Table 204-2 Construction tolerances.

	Tolerance Class <sup>(a)</sup>												
	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 <sup>(b)</sup> )	+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 the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

204.14\_nat\_us\_03\_02\_2005

**204.14 Disposal of Unsuitable or Excess Material.**

Delete the text of the first paragraph and substitute the following:

Dispose of unsuitable or excess material at designated sites or legally off of the project.

204.16\_0114\_us\_02\_25\_2005

**204.16 Measurement.**

**b) Unclassified borrow, select borrow, and select topping**

Delete first paragraph and add the following:

Measure by the cubic yard in place.

## 209 - Structure Excavation and Backfill

209.11\_0114\_us\_02\_15\_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 6 inch layer with a minimum of three complete passes with a mechanical tamper, approved by the CO. 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.

### 209.12 Acceptance

Add the following:

Compaction methods (A) and (B) do not require sampling and testing.

## 230 - Roadside Brushing

230.00\_0114\_us\_08\_04\_2005

### Description

**230.01 Work.** This work consists of removing all vegetative material including limbs, residual slash, live roadside brush, and small trees within the brushing limits designated on the plans.

### Construction

**230.02 Brushing.** Cut all brush and small trees (6 inches diameter, or less, at the point of cut) inside the brushing limits and outside the roadbed no higher than 4 inches above ground level (6 inches for machine brushing). If rocks or other obstructions are encountered, cut no higher than 6 inches above the obstruction. Limb live trees with a diameter larger than 6 inches to provide a clear height of 14 feet above the road surface.

Cut all brush and trees located on the roadbed as nearly flush to the road surface as possible so stumps will not become a hazard to vehicle tires.

**230.03 Windfalls.** Limb windfalls lying within or across the brushing limits, cut off at the top of the existing cut slope or 5 feet from the shoulder on the fill slope. Dispose of windfall material as slash.

**230.04 Road Junctions.** Do not deposit brushing debris on the roadway of adjoining roads.

**230.05 Slash Treatment.** Scatter slash outside the brushing limits without damaging residual trees. Slash is defined as any material that has a length greater than 36 inches or a diameter greater than 2 inches at any point. Do not deposit material in streams, streambeds, culvert inlets or outlets, drainage ways, or cattle guards.

**230.06 Acceptance.** Roadside brushing will be evaluated under Subsection 106.02.

## Measurement

**230.07 Method.** Measure the Section 230 items listed in the bid schedule according to Subsection 109.02 and the following.

Linear measurements will be horizontal along the road centerline.

Quantities will be the number of miles (or stations) and fractions thereof along the road centerline.

## Payment

**230.08.** The accepted quantities will be paid at the contract price per unit of measurement for the section 230 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 109.05.

## 251 - Riprap

251.00\_01\_us\_10\_11\_2006

### 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, and other features 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 and haul required for placement of riprap is incidental to pay items listed in the bid schedule. No payment will be made under Item 251.

## 303 - Road Reconditioning

303.03\_0114\_us\_08\_04\_2005

### 303.03 Ditch Reconditioning

Delete the last sentence and add the following:

Dispose of waste as shown on the plans.

### 303.04 Shoulder Reconditioning

Delete the last sentence and add the following:

Dispose of waste as shown on the plans.

### 303.05 Roadbed Reconditioning

Delete and add the following:

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 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.

### 303.07 Roadway Reconditioning

Add the following:

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

### 303.09 Acceptance

Delete the first sentence.

### 303.10 Measurement

Delete the first sentence of the third paragraph and replace with:

Measure roadbed reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, by the station, or by the square yard.

## 322 - Minor Aggregate Courses

322.00\_nat\_us\_10\_14\_2011

### Description

**322.01** This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, screening, or crushing methods, or placing pit-run or Government-furnished aggregate.

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

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

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

### Material

**322.02** Conform to the following Subsections:

Aggregate	703.05
Water	725.01

### Construction Requirements

**322.03 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.

Develop, haul, and apply water in accordance to Section 170.

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

No quality requirements or 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.

**322.04 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 in layers exceeding 6 inches in compacted thickness for aggregate base and surface courses or twice the maximum particle size for screened aggregate. When more than one layer is necessary, compact each layer according to Subsection 322.05 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.

**322.05 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 A.** Operating spreading and hauling equipment over the full width of the travelway.

**Compaction B.** Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction C.** 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(a)(1).

**Compaction D.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

**Compaction E.** Removed.

**Compaction F.** Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

**Compaction G.** Removed.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

**322.06 Construction Tolerance.** If grade finishing stakes are required, finish the surface to within  $\pm 0.10$  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.

**322.07 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 322.06.

**322.08 Acceptance.** See Table 322-1 or Table 322-2 as applicable, for sampling and testing requirements.

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. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are 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**

**322.09** Measure the Section 322 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

### **Payment**

**322.10** The accepted quantities will be paid at the contract price per unit of measurement for the Section 322 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

**Table 322-1  
Sampling and Testing Requirements**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
Aggregate source quality 703.05	Measured and tested for conformance (106.04 & 105)	LA abrasion (coarse) sulfate soundness loss (Durability index (coarse & fine)) Fractured faces	—	AASHTO T 96  AASHTO T 104  AASHTO T 210  ASTM D 5821	type & source of	Source of material	Yes, when requested	Before using in work
Subbase, Base, and Surface courses	Measured and tested for	Sample	—	AASHTO T 2	2 per day	roadbed after processing or from approved	Yes	48 hours

Table 322-1 (continued)  
Sampling and Testing Requirements

Material or Product	Acceptance (Subsection)	Characteristic	Category	Methods Specific	Sampling Frequency and Source	Point of Sampling	Split Sample	Reporting Time
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method F	—	AASHTO T 99 (1)	"	Source of material	when request	Before using in work
		Moisture-density Method E	—	AASHTO T 180 (1)	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	3 per day	In-place	—	Before placing next layer

**Table 322-2  
Sampling and Testing Requirements**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>
Screened Aggregate	Measured and tested for	Sample	—	AASHTO T 2	2 per day	roadbed after processing or from approved	Yes	48 hours

## 324 - Minor Aggregate, Commercial Source

324.00\_nat\_us\_08\_28\_2008

### Section 324. – MINOR AGGREGATE COURSES – COMMERCIAL SOURCE

#### Description

**324.01** This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by crushing methods.

#### Material

**324.02** Conform to the following Subsections:

Aggregate	703.06
Water	725.01

#### Construction Requirements

**324.03 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.

Develop, haul, and apply water in accordance to Section 170.

Submit aggregate gradations for approval by the CO.

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.

**324.04 Mixing and Spreading.** Mix the aggregate and adjust the moisture content to obtain a uniform mixture with 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. Place the mixture in a maximum compacted layer thickness of 6 inches.

When more than one layer is necessary, compact each layer according to Subsection 324.05 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.

**324.05 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 A.** Operating spreading and hauling equipment over the full width of the travelway.

**Compaction B.** Operate rollers and compact as specified in Subsection 204.11(a)(1).

**Compaction C.** 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(a)(1).

**Compaction D.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

**Compaction E.** Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

**Compaction F.** Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, method C or D.

**Compaction G.** Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

**324.06 Construction Tolerance.** If grade finishing stakes are required, finish the surface to within  $\pm 0.10$  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 1/2 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.

**324.07 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 324.06.

**324.08 Acceptance.** See Table 324-1 for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.03 and 106.04. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.03. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

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

### Measurement

**324.09** Measure the Section 324 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

### Payment

**324.10** The accepted quantities will be paid at the contract price per unit of measurement for the Section 324 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

**Table 324-1  
Sampling and Testing Requirements**

<b>Material or Product</b>	<b>Type of Acceptance (Subsection)</b>	<b>Characteristic</b>	<b>Category</b>	<b>Test Methods Specifications</b>	<b>Sampling Frequency</b>	<b>Point of Sampling</b>	<b>Split Sample</b>	<b>Reporting Time</b>	
Aggregate source quality 703.06	Measured and tested for conformance (106.03 & 105)	LA abrasion (coarse) sulfate soundness loss	—	AASHTO T 96	type & source of	Source of material	Yes, when requested	Before using in work	
		Durability (coarse & fine) index	—	AASHTO T 104	"	"	"	"	
		(coarse & fine) index	—	AASHTO T 210	"	"	"	"	"
		Fractured faces	—	ASTM D 5821	"	"	"	"	"
Subbase, Base, and Surface courses	Measured and tested for	Sample	—	AASHTO T 2	2 per day	roadbed after processing or from approved	Yes	48 hours	

Table 324-1 (continued)  
Sampling and Testing Requirements

Material or Product	Acceptance (Subsecti	Characteristic	Category	Methods Specifica	Sampling Freq	Point of Sampling	Split Sample	Reporting Time
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 (1)	type and source of	Source of material	when request	Before using in work
		Moisture-density Method E	—	R-1 Marshall AASHTO T 180 (1)	"	"	"	"
		Moisture-density Method F	—	R-1 Marshall AASHTO T 310 or other approved procedures	"	"	"	"
		Moisture-density Method G	—		3 per day	In-place	—	Before placing next layer
		In-place density & moisture content	—					

## 602 - Culverts and Drains

602.03\_0114\_us\_08\_04\_2005

### 602.03 General.

Delete second paragraph and add the following:

The lengths and locations of individual pipe "as shown on the plans" are approximate. Do not order pipe until culvert locations are designated on the ground and a written list of the correct lengths is approved by the C.O.

## 625 - Turf Establishment

625.00\_0114\_us\_07\_12\_2007

### 625.03 General.

Delete the first sentence and add the following:

Apply turf establishment to portions of slopes, ditches, waste areas, and other disturbed areas within 14 days after being constructed to template lines unless otherwise specified in writing by the C.O..

### 625.04 Preparing Seedbed.

Delete the second sentence of the first paragraph.

Delete the third paragraph.

### 625.05 Watering

Delete the entire paragraph.

### 625.06 Fertilizing.

Delete the entire subsection and add the following.

Apply fertilizer having a chemical analysis as listed in (c) below by the following methods. Apply seed and fertilizer in one application.

**(a) Dry Method.** Apply the fertilizer with approved power driven seeders, drills, fertilizer spreaders or other mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

**(b) Hydraulic method.** Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed.

**(c) Chemical analysis.** Apply fertilizer at the rate of 240 pounds per acre. Apply fertilizer having the following chemical analysis.

Nutrient	Percent
Nitrogen, N	<u>27</u>
Phosphorus, P <sub>2</sub> O <sub>5</sub>	<u>10</u>
Potassium, K	<u>10</u>

Fertilizer having a different chemical analysis may be used if approved in advance by the CO.

### 625.07 Seeding.

Delete the first sentence and add the following.

Apply seed mix shown in (c) below by the following methods.

**(a) Dry method.**

Delete the third sentence.

Add the following after subsection (b).

**(c) Seed Mix.** In terms of pure live seed, furnish and apply the following kinds and amounts of seed. Obtain the pounds of seed to furnish per acre by dividing the pounds of pure live seed required per acre by the product of the percent purity and percent germination.

Example:  $5 \text{ lbs Pure Live Seed/Acre} = 6.55 \text{ lbs Commercial Seed/Acre}$

$0.90 \times 0.85$  (Purity = 90% and Germination = 85%)

<u>Kind of Seed</u>	<u>Quantity of Pure Live Seed</u> <u>(Lbs/Acre)</u>
1. Annual Rye	18
2. Hard Fescue	6
3. Orchard Grass	<u>6</u>
<b>Total</b>	<b>30</b>

**625.08 Mulching.**

**(b) Hydraulic method.**

Delete the first sentence and add the following.

Apply mulch in a separate application from the seed or in a single application with the seed using hydraulic-type equipment according to Subsection 625.07(b).

**625.09 Protecting and Caring for Seeded Areas.**

Delete the first sentence and add the following.

Protect and care for seeded areas until final acceptance.

**625.11 Measurement**

Delete the second paragraph and add the following.

Measure seeding, fertilizing, and mulching by the acre on the ground surface or by lump sum.

## 650 - Road Closure Devices

650.00\_nat\_us\_06\_28\_2007

### Description

**650.01 Work.** Furnish and install, or install only, road closure devices using fabricated gates and accessories, combination post and rail barriers, concrete barriers, earth mound barriers, and other devices.

### Materials

**650.02 Requirements.** Furnish materials to be used in fabricating gates and barriers. Ensure that all hardware is galvanized in accordance with AASHTO M 232 and meets the requirements of ASTM A 307. Furnish plain or cut washers that are American Standard Washers.

Furnish timber posts, rails, and lumber that meet the requirements of AASHTO M 168. Provide timber of the species and type, and rate of preservative treatment.

Furnish concrete that meets the requirements of Subsection 601.03, method B or C.

Construct earth mound barriers from excavated material adjacent to the barrier location, or from other designated locations.

### Construction

**650.03 Performance.** Place road closure devices at designated locations. Construct all devices to the required dimensions. In assembling gates, perform required welding in accordance with the best modern practice and the applicable requirements of AWS D1.1.

After assembly, clean non-galvanized steel pipe gates and paint them with one coat of zinc-rich primer and two coats of exterior enamel of the required type and color.

Set all posts vertically and embed them to the required depth. Place concrete for embedment against undisturbed earth within an excavation sized to achieve the embedment dimensions. Compact the backfill in 6 inch layers to finished grade.

Furnish and install all signs and/or reflective warning markers accessory to the road closure device.

**650.04 Acceptance.** Construction of road closure devices will be evaluated under Subsections 106.02 and 106.04.

### **Measurement**

**650.05** Measure the items listed in the bid schedule according to Subsection 109.02.

### **Payment**

**650.06** The accepted quantities, measured as provided in Subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 650 pay item listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

## 718 - Traffic Signing and Marking Material

718.05\_nat\_us\_08\_05\_2009

### 718.05 Aluminum Panels

Delete the third paragraph and replace with the following:

Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.