Appendix C

TABLE PURSUANT TO C5.12# - USE OF ROADS BY PURCHASER (*09/2004)*

C5.31# – ROAD MAINTENANCE REQUIREMENTS. (9/04) Contractor shall maintain roads in accordance with the following Contract Road Maintenance Requirements Summary:

CONTRACT ROAD MAINTENANCE REQUIREMENTS SUMMARY TABLE PURSUANT TO C5.31# - ROAD MAINTENANCE REQUIREMENTS (09/04)

Contract Road Maintenance Requirements Summary

Road	Termini		Miles	Applicable Pre-haul Road Maintenance Specifications						
	From	To		T 807	T 808	T 810	T 811	T 812	T 813	T 814
3870000	Forest Boundary	Jct 3870383	7.11			X	X			
3870383	Jct 3870383	Forest Boundary	8.8			X	X			
3724000	Jct 3870000	3724000	4			X	X			
3724050	Jct 3724050	Forest Boundary	1.3			X	X			

Road	Termini		Miles	Applicable During Haul Road Maintenance Specifications						
	From	To		T 802	T 803	T 805	T 808	T 809	T 810	T 811
3870000	Forest Boundary	Jct 3870383	7.11	X						
3870383	Jct 3870383	Forest Boundary	8.8	X						
3724000	Jct 3870000	3724000	4	X						
3724050	Jct 3724050	Forest Boundary	1.3	X						

Road	Termini		Miles	Applicable Post-haul Road Maintenance Specifications						
	From	To		T 802	T 803	T 805	T 808	T 809	T 810	T 811
3870000	Forest Boundary	Jct 3870383	7.11	X						
3870383	Jct 3870383	Forest Boundary	8.8	X						
3724000	Jct 3870000	3724000	4	X						
3724050	Jct 3724050	Forest Boundary	1.3	X						

FOREST SERVICE SPECIFICATIONS FOR MAINTENANCE OF ROADS IN

STEWARDSHIP CONTRACTS

PACIFIC NORTHWEST REGION EM 7730-20

08/2020

ROAD MAINTENANCE SPECIFICATIONS

Spec #	Subject Description	Date
T-801	Vegetation Removal–Roadway	6/3/24
T-802	Vegetation Removal–Roadside	6/3/24
T-803	Pavement Cleaning	6/3/24
T-804	Bridge Deck and Curb Cleaning	6/3/24
T-805	Road Grading	6/3/24
T-806	Slide Removal and Slump Repair	6/3/24
T-807	Surface Repair (Bituminous)	6/3/24
T-808	Surface Repair (Aggregate & Native)	6/3/24
T-809	Dust Abatement	6/3/24
T-810	Ditch Maintenance	6/3/24
T-811	Drainage Structures	6/3/24
T-812	Miscellaneous Structures	6/3/24
T-813	Waterbar	6/3/24
T-814	Closure Devices	6/3/24

PREFACE 03/08

The Pacific Northwest Region of the Forest Service has developed this book for use in the preparation and administration of maintenance requirements included in Timber Sale and Stewardship Contracts.

Included are the Standard Specifications (Sections) that commonly apply in Timber Sale Contracts. Conditions and requirements specific to individual projects are identified in the Supplemental Project Specifications.

Supplemental Project Specifications, which do not change the intent of the parent section, may be approved by the Forests.

This book is available from the Supervisor's Office of any National Forest in Region 6.

Definitions

Wherever the road maintenance specifications use the following terms (figure 1), the user shall interpret the intent and meaning as follows:

Base course. Material used to reinforce subgrade or, as shown on drawings, placed on subgrade to distribute wheel loads. Base course usually consists of aggregate (treated or untreated). It serves as the immediate support for the surface course and may be built directly on subgrade if no subbase is called for. The requirements for building on subgrade are more stringent than for building with a subbase.
Berm. A curb or dike constructed to prevent uncontrolled roadway runoff water from discharging onto fillslope.
Bituminous. Of or containing bitumen.
Borrow. Material taken from designated borrow sites.
Crown, inslope, and outslope. The cross slope of the roadway, which aids in drainage and traffic maneuverability.
Culvert. A conduit or passageway under a road or trail.
Drainage dip. A dip in the roadway that intercepts and diverts surface water runoff. A drainage dip does not block the movement of traffic.
Drainage structure. A manufactured structure that controls the runoff of water from the roadway, including (but not limited to) overside drains, aprons, flumes, down drains, downpipes, and culverts.
Lead-off ditch. A ditch used to transmit water from a drainage structure or drainage dip outlet to the natural drainage area.
Maintenance activity. Items of work leading to the upkeep of a road within the right of way and necessary to sustain the road's anticipated traffic.
Maintenance specifications. Specifications that detail conditions and requirements peculiar to the individual project in addition to requirements identified in the national specifications.
Roadbed. The portion of a road between the intersection of subgrade and side slopes, excluding that portion of the ditch below subgrade. Roadbed consists of suitable native soil. It supports the base course and surface course.
Roadside. A term denoting the area adjoining the outer edge of the roadway.
Roadway. A term denoting the area consisting of the traveled way and shoulders.
Shoulder. That portion of roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and lateral support of base and surface course, if any.
Slide. A concentrated deposit of soil, rock, and other debris from the cut slope, often extending onto the roadway, whether caused by mass land movement or accumulated raveling.
Slump. A localized portion of the roadbed which has slipped or otherwise become lower than that of the adjacent roadbed and constitutes a hazard to traffic.
Subbase. Consists of either compacted granular material (treated or untreated) or a compacted layer of treated soil. It may help protect the base course and surface course from intrusion of fine-grained roadbed soils, damage from frost, and accumulation of water in or below the pavement structure. The pavement structure consists of the subbase, base course, and surface coarse.
Subgrade. Top surface of roadbed upon which subbase, base course, or surface course is constructed. For roads without subbase, base course, or surface course, that portion of roadbed prepared as the finished roadway. **Subgrade** consists of suitable native soil (treated or untreated). It serves as the top of the roadbed where the subbase or base course is constructed.
Surface course. The material placed on the base course or subgrade to enhance traction, distribute concentrated wheel loads and resist abrasion and the effects of climate. Surface course may be referred to as surfacing. **Surface course** consists of an aggregate mixture that may include a binder (plastic fines or bituminous material). It must carry the traffic load, provide a smooth riding surface, and resist skidding and

traffic wear while keeping water from penetrating into pavement structure.
Traveled way. That portion of roadway, excluding shoulders, used for the movement of traffic.
Turnouts. Short sections of traveled way constructed with additional width to allow for safe passing of traffic.
Waterbar. A constructed feature in the roadbed that intercepts surface runoff and diverts the water off the roadway. A waterbar is not designed to be traversable by traffic.
Water source. A place designated in individual projects for acquiring water for road maintenance purposes.

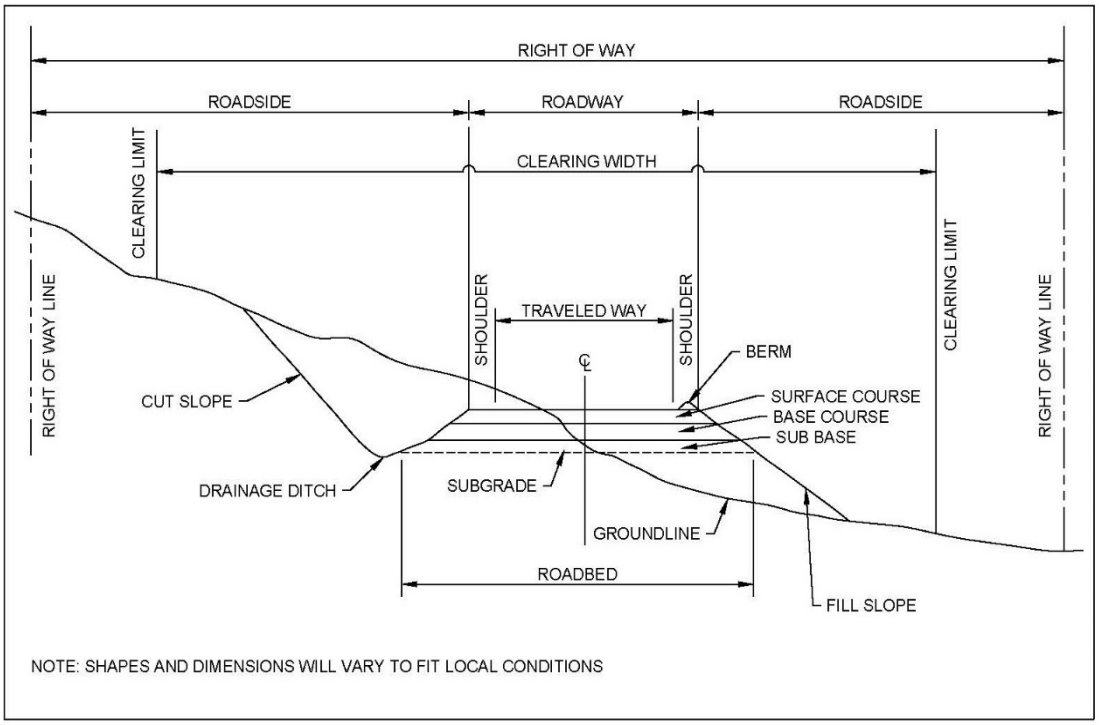

Figure 1—Road structure terms.

Sources:

- National Engineering Roads Drawing Library
  https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/
- Road structures terms
  https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/pdf/G1/C-GROUP_1_G1-1_TYPICAL_SECTION_WITH_DITCH.pdf

T–801 Vegetation Removal—Roadway

801.01 Description

Work consists of removing fallen trees and snags that encroach within 5 feet of the roadway.

801.02 Maintenance Requirements

A. Deck portions of trees that meet utilization standards in A/AT2 along the roadside at locations that do not impair the traveled way or sight distance (agreed to in writing).
B. Limb sub-merchantable material and cut it into lengths for handling. Scatter the material outside ditches and drainages, off the roadway and turnouts, or at staked locations.
C. Do not leave woody debris and slash on the roadway or concentrations that may plug ditches, culverts, or drainage channels.
D. Place residual root wads in an upright position out of the clearing limits.

T–802 Vegetation Removal—Roadside

802.01 Description

Work consists of cutting and disposing of vegetation that reduces the operational capability of the road, including compromised visibility of signing, gates, or approach railings on bridges. Work also includes removing vegetation for the purpose of restoring site distance to an acceptable level.

802.02 Maintenance Requirements

A. Remove vegetative matter that reduces sight distance, impedes vehicular travel, or interferes with road maintenance operations (such as surface blading, ditch and culvert cleaning, and bridge deck and curb cleaning) to a maximum height of 6 inches and a minimum of 5 feet outside of the roadway.
B. No need to remove low shrubs and brush which do not restrict sight distance and do not impede road maintenance if the road surface can be adequately maintained without doing so. This is not applicable to bridge sites.
C. For bridge sites, remove roadway vegetation within a minimum of 20 feet from abutments as measured along the center line of the road. Cut vegetation to provide a vertical clearance of 14 feet from the road and bridge surface elevation by trimming any encumbering tree limbs.
D. Do not leave woody debris and slash on the roadway or concentrations which may plug ditches, culverts, or drainage channels.

T–803 Pavement Cleaning

803.01 Description

Work consists of removing loose material from paved traveled ways, paved shoulders, and paved turnouts.

803.02 Maintenance Requirements

A. Clean the surface to the extents of the existing pavement without obstructing surface drainage.
B. Move materials away from the road centerline on double-lane roads.
C. When paved road structure includes aggregate lateral support, pavement cleaning shall leave (as much as practicable) the aggregate in its original form and assure support material is not adversely affected.

803.03 Equipment

A. Equipment shall have the capability of removing all loose material from paved surfaces without damage to the surface. Surface damage includes but is not limited to:
    a. Divots in the paved surface
    b. Peeling of surface material
    c. Cracking or breaking pavement edges
B. Use of hydraulic flushing equipment will not be permitted within a horizontal distance of _____ from a live stream, unless approved by the Forest Service.

T–804 Bridge Deck and Curb Cleaning

804.01 Description

Work consists of cleaning bridge decks and curbs.

804.02 Maintenance Requirements

A. Maintain bridges and associated components as identified on the sale area map or as indicated in table 1.
B. Bridge deck and curbs.
    a. Remove debris and sediment from the bridge deck, running planks, and the top and roadside face of the curbs. Ensure that all scuppers and drainage openings on the bridge are clear and operating as intended.
    b. Do not allow debris and sediment to enter the stream or stream channel.
    c. Haul sediment and other debris to a disposal area designated by the Forest Service in accordance with Section T–806 Slump Removal and Slump Repair.
C. Vegetation removal.
    a. Remove and dispose of vegetation at the bridge in accordance with T–802 Vegetation Removal.

Table 1—Bridge identification

Bridge name	Road number	Milepost
N/A	-	-

T–805 Road Grading

805.01 Description

Work consists of keeping a native or aggregate roadbed in a condition that facilitates traffic and provides proper drainage. It includes maintaining the crown, inslope, outslope or drainage dips of the traveled way; maintaining turnouts and shoulders; repairing berms; and blending approach road intersections.

805.02 Maintenance

A. Road grading shall be performed as often as necessary, per C/CT 5.31, to facilitate safe use and proper drainage.
B. Road grading shall preserve the existing cross-section. Surface irregularities shall be eliminated and the surface left in a free-draining state and to a smoothness needed to facilitate traffic. On aggregate-surfaced roads, thoroughly loosen surfacing material to no less than a 2-inch depth or the depth of defects. Scarification to facilitate cutting to the full depth of potholes or corrugations may be elected but will be considered incidental to blading. Do not scarify to a depth that will cause contamination of the surfacing. Surface material that has been displaced to the shoulders or turnouts shall be returned to the traveled way. A grading pattern shall be established to retain surface material on the roadbed and to provide for a thorough mixing of the materials within the completed surface width.
C. Unless otherwise shown in table 2, compaction of the traveled ways will be accomplished using compaction method A and will commence immediately following blading.
    a. Compaction method A: adjust the moisture content of the material to a content suitable for compaction. Fill the interstices around rock with earth or other fine material, as practical. Operate hauling and spreading equipment uniformly over the full width of each layer until there is no visible evidence of further consolidation.
    b. Compaction method B: operate a 7- to 10-ton pneumatic, steel, or equivalent vibratory roller to cover the full width three times. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material, as practical.
D. Smooth blading may be used as an interim measure on aggregate-surfaced roads to remove loose surfacing material from the wheel paths. Store removed materials in a recoverable windrow until blade processing (as described above) is feasible. Watering is not required for smooth blading. Accomplish smooth blading without distorting the existing cross-slope or crown of the traveled way.
E. Move and store loose surfacing materials on the high side of super-elevated curves and sections with uniform inslope or outslope. In crowned sections, store the material on either or both sides, as elected. Windrow and place stored materials to provide not less than 12 feet of smooth traveled way on one-lane segments, or 20 feet of smooth traveled way on two-lane segments or segments with turnouts. Place holes through windrows for drainage every 500 feet or less to provide drainage.
F. Water, taken from water sources designated on the sale area map, shall be applied during blading if sufficient moisture is not present to cut, mix, or compact the surface material.
G. On native-surfaced roads, material generated under other maintenance specifications may be blended with the surface material being worked. On aggregate surfaced roads this material shall not be blended with surface or base course material unless otherwise agreed.
H. Roadway cut slopes or berms shall not be undercut, nor shall new berms be established unless otherwise agreed.
I. Berms shall be repaired by placing material, as needed to restore the berm, to reasonably blend with existing line, grade, and cross-section.
J. Drainage dips shall be cleaned and maintained to reasonably blend with existing line, grade, and cross-section. Lead-off ditches shall be maintained in accordance with T-810 Ditch Maintenance.
K. Intersecting road junctions that are not closed or restricted from vehicular use shall be bladed to assure proper blending of the two riding surfaces.
L. Rocks or other material remaining on the traveled way after the final pass that are larger than 4 inches

in diameter or are larger than the maximum size of imported surfacing shall be removed. Unless otherwise designated by the Forest Service, the oversized material shall be removed and placed outside the roadway; do not obstruct drainage ways or structures. Placement into streams, lakes, or water courses will not be permitted.

M. Material resulting from work under this specification shall not remain on or in structures, such as culverts, overside drains, cattleguards, ditches, and drainage dips.

N. Material resulting from work under this specification, plus any accumulated debris, shall be removed from bridge decks and the deck drains opened.

Table 2—Compaction requirement

Road number	Beginning milepost	Ending milepost
N/A	-	-

Note: Roads listed in this table require compaction method B, as specified in 806.02-C.

T–806 Slide Removal and Slump Repair

806.01 Description

Work includes excavating, loading, hauling, placing, and compacting waste or replacement material. Work under T–806 is work that cannot be handled by a motor grader during T–805 Road Grading or T–810 Ditch Maintenance.

806.02 Maintenance Requirements

A. Slide material, including soil, rock, and vegetative matter that encroaches into the roadway shall be removed. The slope which contributed the slide material shall be reshaped as practicable to reduce future sliding, as agreed to with the Forest Service. Slide material on the fill slope and below the roadway will not be removed unless needed for slope stability or to protect adjacent resources.
    a. Surface and base courses shall not be excavated during T–806 Slide Removal operations.
    b. Slide material which cannot be used for other beneficial purposes shall be placed at disposal sites shown on the sale area map or designated by the Forest Service. Compact material shall be placed in disposal sites only if required by the Forest Service.
B. Material for slump repair is from agreed upon borrow sites, placed in layers no more than 12-inches thick, and compacted in accordance with T–805 method A or other methods approved by the Forest Service.
    a. Existing aggregate surfacing shall be salvaged when practical and replaced after depressions have been filled.
    b. Damaged aggregate base, aggregate surfacing, and bituminous pavement shall be repaired under T–807 Surface Repair (Bituminous) and T–808 Surfacing Repairs.
    c. Following slide removal, the roadway shall be shaped to reasonably conform to its original cross-section.

T–807 Surface Repair (Bituminous)

807.01 Description

Work consists of bituminous surface repair and includes repairing potholes or small, failed areas within the roadway. Includes preparing the area, furnishing, hauling, and placing all materials, and other work necessary for repairing the bituminous surface within the traveled way.

807.02 Maintenance Requirements

A. Unless otherwise specified, the purchaser is responsible for furnishing all needed material to complete the work (table 3). Bituminous product mix type shall be hot mix, unless otherwise specified.
B. The Forest Service will mark the areas to receive bituminous surface repairs on the road surface before the purchaser performs the work.
C. Soft spots and potholes require the excavation of surface and base course material necessary to reach firm, suitable material. The minimum depth of excavation shall be 2 inches and the maximum depth shall be to the top of the subgrade. The edges of the prepared hole shall be extended to form a vertical face in unfractured asphalt surfacing. Shape shall be generally circular or square, dry, and cleared of all loose material.
D. The prepared hole should be patched immediately or barricaded in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) until patched.
E. The faces of the hole shall be prepared by thoroughly applying emulsified asphalt tack coat.
F. The bituminous mixture shall be placed in layers not to exceed a compacted depth of 2 inches. Each layer shall be compacted thoroughly with hand or mechanical tampers or rollers. Compaction shall not be accomplished using equipment wheels.
G. The completed, compacted patch in the pothole shall be flush, with an allowable tolerance up to ½ inch above the level of the adjacent pavement.
H. Skin patches required for surface sealing shall uniformly distribute the bituminous mixture with feathered edges in even layers.
I. Damaged segments of asphalt berm shall be removed and the exposed ends beveled at 45 degrees from vertical. The berm foundation shall be cleaned and patched as necessary. The foundation and adjoining surfaces shall be prepared by thoroughly applying emulsified asphalt tack coat. Asphalt mix shall be placed and compacted to conform to the shape and alignment of the undamaged segment.
J. Unsuitable material shall be disposed of only at locations designated by the Forest Service or as shown on the sale area map.

Table 3—Material types

Road number	Material type*
N/A	-

*Identify material type: asphalt (hot mix or cold mix), other bituminous materials.

T–808 Surface Repair (Aggregate/Native)

808.01 Description

Work consists of repairing potholes, minor washouts, and soft areas on aggregate- or native-surfaced roads. Includes preparing the area; removing unsuitable material; furnishing, hauling, and placing all materials; and other work necessary to make the repair and blend into the adjacent surface section to provide a uniform cross section.

808.02 Maintenance Requirements

Table 4 identifies material sources.

Prepare the area as approved by the Forest Service. Soft spots on native- or aggregate-surfaced roads shall be repaired by placing the imported material on top of the soft spot in layers until a firm surface is produced, as evident by no surface deflection under normal operating loads. Repair material shall be uniformly distributed in layers not to exceed 6 inches compacted depth. Ensure adequate moisture. Material placement shall not cause surface irregularities and shall preserve the existing cross section. Unsuitable material shall be disposed of at locations designated by the Forest Service or shown on the sale area map.

Material provided shall be certified weed-free.

Table 4—Specified material sources

Road number	Material type*	Source**	Gradation
All aggregate surfaced roads	Aggregate	Commercial	Up to 100 Cubic Yards of 1” Minus Spot Rock

* Identify material type: aggregate, pit run, etc.

** Identify source of material: Government-furnished or commercial source

T–809 Dust Abatement

809.01 Description

Work consists of preparing the traveled way and furnishing and applying materials to abate dust.

809.02 Material

A. A dust abatement plan must be agreed on before hauling on roads that require dust abatement, as shown in C/CT5.31#. The plan must include the type of dust abatement material to use, the rates of application, and the frequency of applications. Table 5 shows special requirements for dust abatement that the dust abatement plan should include.
B. The sale area map designates the locations of approved water sources. The Forest Service may approve alternate water sources.
C. Dust abatement materials shall meet the following requirements:
    a. Magnesium chloride liquid—ASTM D 1298, Type S, 28 percent min. by mass, specific gravity 1.29 to 1.33
    b. Calcium chloride liquid—AASHTO M 144, Type L, 35 percent min. by mass
    c. Calcium chloride flake—AASHTO M 144, Type S Grades 1, 2, or 3, Class A
    d. Lignosulfonate liquid—Dry solids 50 percent, specific gravity 1.20 min. (ASTM D1475), pH (ASTM E70 3.0 to 8.0)
D. Certification of magnesium or calcium chloride brine, calcium chloride flake, and lignosulfonate liquid shall be in accordance with the concentrations listed above.

809.03 Maintenance Requirements

A. Dust abatement materials shall be applied to the road surface as necessary to control road surface loss, provide for road user safety, and minimize damage to adjacent resources.
B. The traveled way shall be prepared and finished in accordance with the manufacturer’s requirements or recommendations.

C. Dust abatement materials other than water shall be applied within tolerances specified by the manufacturer.
D. Dust abatement materials shall not be applied when it is raining. Lignosulfonate and magnesium chloride shall be applied when the atmospheric temperature is 40 °F or above.
E. The designated water sources may require some work before use. Such work may include cleaning ponded areas, installing temporary weirs or sandbags, pump installation, or other items appropriate to the purchaser's operations. Water source preparation requires contracting officer approval before use.

Table 5—Dust abatement application rate

Road number	Material type*	Application rate (pounds/tons/gallons) per __**

* Identify material type; water, magnesium chloride, lignosulfonate, etc.
** Identify application rate; gallons per mile, pounds per mile, etc.

T–810 Ditch Maintenance

810.01 Description

Work consists of routine maintenance to provide unobstructed drainage for various types of ditches.

810.02 Maintenance Requirements

A. Maintain existing ditches by removing rock, soil, wood, and other materials to provide unobstructed flow.
B. Do not undercut backslopes during ditch maintenance operations.
C. Remove suitable material up to 4 inches in greatest dimension from the ditches and blend it into the existing native road surface and shoulder or place it in a designated berm.
D. Do not blend material from ditch cleaning operations into aggregate surfaced roads. Do not blade material across bituminous surfaced roads, unless approved in writing by the Forest Service.
E. Dispose of excess material which cannot be used for other beneficial purposes at disposal sites shown on the sale area map or at sites designated by the Forest Service. Material placed in disposal sites does not require compaction, unless required by the Forest Service.
F. Remove limbs and wood chunks that exceed 12 inches in length or 3 inches in diameter from ditches and place outside the roadway.
G. Clean paved surfaces of all materials resulting from ditch maintenance work.
H. Shape lead-off ditches to drain away from the traveled way.

T–811 Drainage Structures

811.01 Description

Work consists of maintaining drainage structures such as culverts, armored crossings, surface water deflectors, inlet and outlet channels, related ditches, existing riprap, trash racks, and drop inlets. This includes overside drains and cattleguards that function as drainage structures.

811.02 Maintenance Requirements

A. Drainage structures and related items shall be cleared of all foreign material that has been deposited above the bottom of the structure and all vegetative growth that interferes with the flow pattern.
B. Culvert inlets and outlets shall be cleaned a minimum of 3 feet, as measured along the invert, unless otherwise directed by the Forest Service.
    a. Recondition culvert inlets and outlets by field methods such as jacking out or cutting away damaged metal that obstructs water flow. Treat cut metal edges with a zinc-rich coating, according to AASHTO M 36 and ASTM A849.
    b. Clean catch basins by removing the material within the basin floor to conform to the original grade from the invert and shape the basin to reasonably match the original catch basin cutslope.
    c. Clean the inlet channel transition from the drainage ditch to the catch basin and outlet ditches a minimum of 10 feet, or a sufficient distance to allow free drainage of water.
C. Ditches shall be cleaned to conform to previous line, grade, and cross section for positive drainage.
D. Drainage dip maintenance consists of cleaning existing dips on native- and aggregate-surfaced roads. Drainage dips shall be shaped to a depth and width to provide positive drainage and to reasonably conform to the original lines, grades, and cross sections, unless otherwise agreed upon. Lead-off ditches shall be cleaned a minimum of 10 feet from the drainage dip.
E. Riprap shall be maintained in good condition, including the replacement of riprap, if necessary, to previous line, grade, and cross section.
F. Headwalls, aprons, inlet assemblies, overside drains, riprap, geotextiles, trash racks, and other facilities related to the drainage structure shall be maintained to ensure proper function.
G. Material removed, if suitable, may be blended into existing native road surfaces or shoulders. On aggregate surface roads, care must be taken to ensure the material is not mixed into the existing aggregate. Haul unsuitable material to a disposal area designated by the Forest Service in accordance with Section T–806, or as otherwise agreed. Side casting into streams, lakes, or watercourses is not permitted.

T–812 Miscellaneous Structures

812.01 Description

Work consists of maintaining miscellaneous structures—including cattleguards, gates, and other similar, previously installed structures—to ensure safe and efficient operation of the road.

812.03 Maintenance Requirements

A. Cattleguards.
    a. Loose rail or wing elements shall be straightened and welded or bolted back in place.
    b. Excess material carried into the cattleguard shall be removed when drainage is blocked or when it reaches 6 inches from the bottom of the cattleguard frame. Drainage into and from the cattleguard shall be kept open according to T–811 Drainage Structures.

B. Gates.
    a. Gates shall be kept in good repair and made to swing easily. Hinges or latches shall be repaired if not operating properly and hinges shall be oiled. Vegetation and debris shall be removed from within the swinging radius according to T–802 Vegetation Removal—Roadside.
    b. Loose wire gate ends and internal stays shall be maintained in good condition. Gate wire shall be maintained as necessary to ensure proper operation of the gate both as a vehicular passageway and as a barrier to cattle movement.

C. Other miscellaneous structures shall be maintained as needed to ensure safe and efficient operation of the road.

T–813 Waterbar

813.01 Description

Work consists of restoring waterbars in the roadbed.

813.02 Maintenance Requirements

A. Waterbars shall be restored in accordance with figure 2.
B. All material excavated shall be used in the restoration of the waterbar. Berm material shall be compacted by operating heavy equipment over the entire length and width of the berm.
C. Waterbars may need to be restored between seasons of use and then removed when haul is resumed. Waterbar restoration may also be required when use of a road is complete.
D. Waterbar restorations shall be as agreed upon in the purchaser's plan of operations (B/BT6.311) or as directed by the Forest Service.

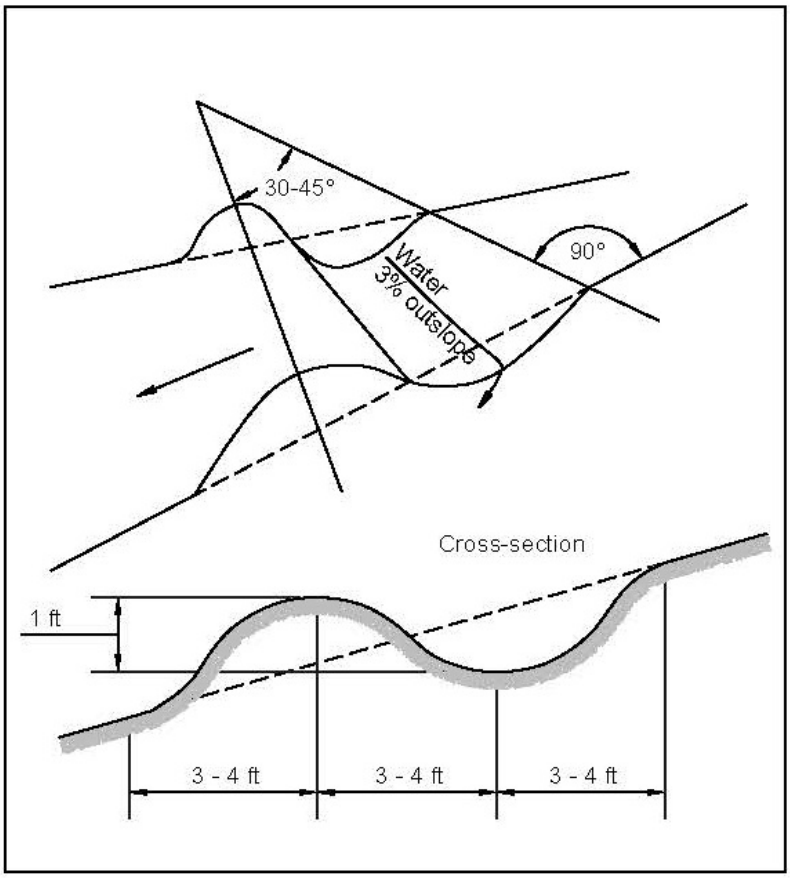

Figure 2—A waterbar (typical).

Source:

- The National Engineering Roads Drawing Library https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/
- Water Bar—Driveable-G3-3 https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/pdf/G3/C-GROUP_3_G3-3_WATER_BAR-DRIVEABLE.pdf
- Note: The drawing here has a minor modification from the original.

T–814 Closure Devices

814.01 Description

Work consists of furnishing, installing, or removing barriers to facilitate road closures. Gates are not included.

814.02 Maintenance Requirements

A. Barriers shall be removed or installed in accordance with table 6, or as otherwise provided by the Forest Service.
B. Earthen barriers shall be installed such that excavation areas drain, ditch lines do not impede flow, and as indicated in figure 3.
C. Other barrier types shall be installed as directed by the Forest Service.
D. The sale area map or stakes on the ground show the location of barriers to be removed or installed. Table 6 also identifies this information. Installation or removal may occur as often as road use is terminated or resumed.

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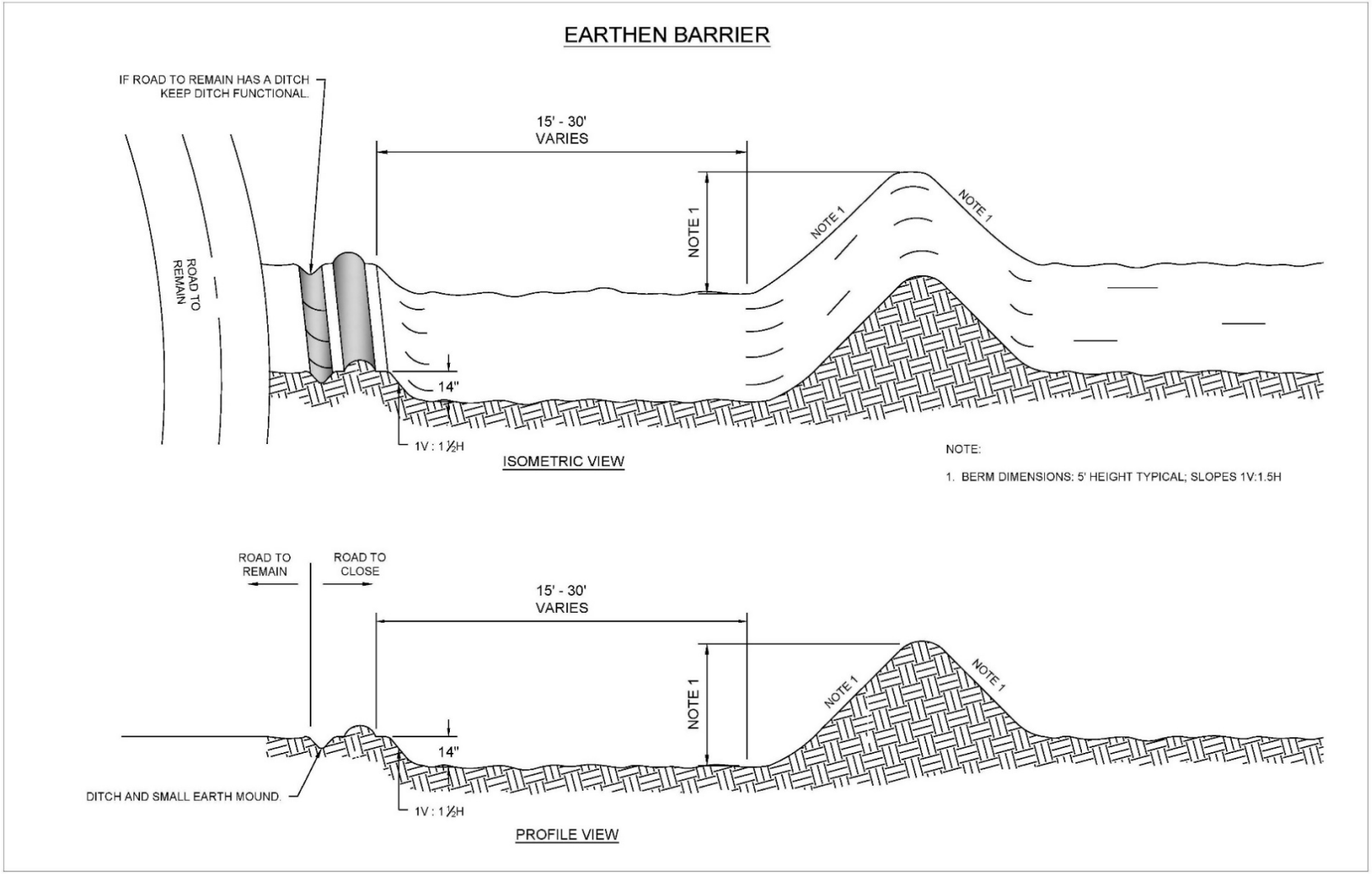

Figure 3—An earthen barrier.

Source:

- The National Engineering Roads Drawing Library https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/
- Earthen Barrier-G3-4 https://fsweb.sdtdc.wo.fs.fed.us/programs/eng/natlib/drawings/pdf/G3/C-GROUP_3_G3-4_EARTHEN_BARRIER.pdf
- Note: Note: The drawing here has a minor modification from the original.

TRAFFIC CONTROL PLAN AND SPECIFICATIONS PURSUANT TO B(T)6.33 SAFETY

Unless otherwise agreed, the following measures are required to provide adequate warning of hazards for users of roads and trails adjacent to Purchaser/Contractors's Operations.

Part I. Signing and Other Warning Methods:

(a) Signs. The following signs are required when Purchaser/Contractors's Operations are in progress adjacent to or on Forest Service controlled roads and trails:

MINIMUM LETTER SIZE AND LEGEND	MINIMUM SIZE AND SHAPE	WHEN AND WHERE REQUIRED
1. LOGGING OPERATIONS (4" letters)	30" x 30"(diamond)	Min. 100 ft. outside of any work areas, on roads listed in C(T)5.31# and trails listed in Part II.
2. NEXT <> MILES (4" letters)	24" x 18" (rectangle)	To be used as a supplemental plaque mounted below "Logging Operations" where work area is continuous.
3. FOR LOGGING USE ONLY (4" letters)	30" x 30"(diamond)	Required where roads listed in C(T)5.31# and Temporary Roads intersect with C(T)5.31# roads. Install a cross ditch to discourage use when sign is covered or removed for extended periods.
4. LOG TRUCKS or HEAVY TRUCK TRAFFIC (4" letters)	30" x 30"(diamond)	At critical intersections on roads listed in C(T)5.31# when traffic is heavy or otherwise exceeds volumes stated in Part II below. Remove or cover when the sign is not applicable.
5. END LOGGING OPERATIONS (4" letters)	30" x 30"(diamond)	Use in conjunction with "Logging Operations/Next <> Miles" and "Logging Operations."
6. TREE FELLING AHEAD (4" letters)	30" x 30"(diamond)	Required 200 feet in advance of danger area where timber is being felled adjacent to all roads, including Temporary Roads, and trails.
7. ROAD MACHINERY AHEAD (4" letters)	30" x 30"(diamond)	Required at least 200 feet in advance of road maintenance operations on roads listed in Schedule C(T)5.31#.

All signs shall meet requirements as specified in Parts 1 and 6 of the Manual of Uniform Traffic Control Devices (MUTCD).

Sign borders and lettering shall be black. Borders are 7/8 inch wide, inset 5/8 inch from outside edge of sign. All sign backgrounds shall be orange, except that signs that need to be seen both day and night shall be retroreflective orange or illuminated.

Signs shall be installed on posts or on temporary supports complying with MUTCD standards. Post-mounted signs shall have a 5 foot minimum height above road surface, except that the "NEXT <> MILES" supplemental plaque, when used in conjunction with the "LOGGING OPERATIONS" sign, shall be a minimum of 4 feet above road surface.

All signs are to be removed or covered when operations are interrupted for seasonal nonuse or other extended periods.

TRAFFIC CONTROL PLAN AND SPECIFICATIONS – B(T)6.33 Safety (continued)

Purchaser/Contractor shall furnish flag personnel meeting the requirements of Chapter 6E of the MUTCD and advance warning signs when cable or helicopter logging above roads or trails, felling adjacent to roads or trails, where logs being bucked may roll into roads or trails, and in areas where fallout from blasting may occur. Except as identifed in Part II, Purchaser/Contractor may temporarily block roads listed in C(T)5.31# and Temporary Roads in lieu of furnishing flag personnel. On roads controlled by other jurisdictional authorities, Purchaser/Contractor shall receive approval from that authority for Purchaser/Contractors's safety measures and traffic control plans before commencement of operations.

(b) Barricades. On roads listed in C(T)5.31#, if Purchaser/Contractors's Operations cause the traveled way or road shoulders to be constricted overnight, or longer, by such obstructions as decked logs, parked equipment, or piled slash, Purchaser/Contractor shall place barricades on both sides of the encroaching obstruction to safely channel traffic around such obstructions. Barricades shall remain in place until the obstruction is removed.

Barricades shall be Type II and meet specifications in MUTCD, Part 6. Barricades must be at least 3 feet high. Rails must be at least 2 feet long. Striping shall be alternating orange and white, sloping at a 45 degree angle, and reflectorized. For rails 2 feet to 3 feet long, striping shall be 4 inches wide. For rails longer than 3 feet, striping shall be 6 inches wide. Two rails, 8-12 inches in width, must face each direction.

Barricades shall be equipped with warning lights which shall be Type A low intensity flashing and shall be maintained so as to be capable of being visible on a clear night from a distance of 3,000 feet.

(c) Other Traffic Control Methods. The posting of CB channel signs may be authorized.

On roads listed in C(T)5.31#, Purchaser/Contractor may be authorized to install temporary gates, barricades (except cables), or natural barriers. The devices must be installed with the necessary hazard markers, be reasonably passable by Forest Service, and be removed prior to acceptance of the subdivision being served by the road.

Part II. Specific Requirements:

Purchaser/Contractor and Forest Service agree to the above stated requirements of the Traffic Control Plan:

Name	Name
Title	Title
Date	Date