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APPENDIX C

C(T)5.31# – ROAD MAINTENANCE REQUIREMENTS. (9/04) Contractor shall maintain roads in accordance with the following Contract Road Maintenance Requirements Summary:

PRE HAUL												
ROAD	TERMINI		MILES	ROAD MAINTENACE T-SPECIFICATIONS								
	FROM	TO		T-101	T-103	T-108	T-113	T-301	T-506	T-507	T-508	T-619
TBD	0.00	2.0	2.0	C	C	C	C	C	C	C	C	C

DURING HAUL												
ROAD	TERMINI		MILES	ROAD MAINTENACE T-SPECIFICATIONS								
	FROM	TO		T-101	T-103	T-108	T-113	T-301	T-506	T-507	T-508	T-619
TBD	0.00	2.0	2.0	C								
	2.0	4.0	2.0		C							

POST HAUL												
ROAD	TERMINI		MILES	ROAD MAINTENACE T-SPECIFICATIONS								
	FROM	TO		T-101	T-103	T-108	T-113	T-301	T-506	T-507	T-508	T-619
TBD	0.00	2.0	2.0	C								

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	2.0	4.0	2.0		C							

Notes:
C = Contractor Performance Item
O = Optional Contract Line Item
NFSR = National Forest Service Road
CR = County Road
JCT = Junction
MP = Milepost
EOR = End of Road

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ROAD MAINTENANCE T-SPECIFICATIONS FOR STEWARDSHIP CONTRACTS

Contractor shall maintain roads in accordance with the following Contract Road Maintenance Requirements Summary:

Contractor will be responsible for doing all pre, during and post haul road maintenance with no compensation from the Forest Service.

T-SPECIFICATIONS	
T-SPEC NUMBER	**SPECIFICATION TITLE**
T-101	Surface Blading
T-103	Dust Abatement
T-108	Slide Removal and Slump Repair
T-113	Surfacing Repair
T-201	Shoulder Maintenance
T-301	Ditch Cleaning
T-310	Minor Drainage Structures
T-506	Clearing Roadway Vegetation
T-507	Cutting Roadside Vegetation
T-508	Seeding
T-618	Major Drainage Structures
T-619	Miscellaneous Structures
T-710	Traffic Services
T-841	Vegetation Establishment

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SPECIFICATION T-101 SURFACE BLADING

DESCRIPTION

1.1 Surface blading is keeping the native or aggregate surfaced road in a condition to facilitate traffic, minimize additional future maintenance, reduce erosion, and provide proper drainage. It includes maintaining the crown, inslope or outslope of the traveled way and shoulders, drainage dips, leadoff ditches, berms, turnouts, removal of minor slides and slumps, and other irregularities that prevent normal runoff from the road surface.

REQUIREMENTS

3.1 Surface blading shall be performed as often as necessary and to the standards required to facilitate traffic and proper drainage.

3.2 The blading shall be performed in such a manner as to preserve the existing cross section and to conserve surface materials. On gravel surfaced roads, the base must not be disturbed and no surface material may be bladed into the ditch or over the road shoulders. Blading of native surface roads shall be performed so no base material under four (4) inches in the greatest dimension is lost. All ruts, holes, etc., shall be removed by scarifying and/or cutting to the bottom of any surface irregularities. Oversize material brought to the surface in the scarification process shall be removed from the roadway. Surface material which has been displaced to the shoulders, turnouts, outside of curves, etc., shall be brought back so as to leave a uniform depth on the traveled way at completion of blading. Water shall be applied during blading if sufficient moisture is not present to prevent segregation.

3.3 Roadside cutslopes or berms shall not be undercut.

3.4 At intersections, the roadbeds of sideroads shall be graded for a reasonable distance to assure proper blending of the two riding surfaces.

3.5 Drainage dips and leadoff ditches shall be cleaned and continually maintained to conform reasonably to their original constructed lines, grade, and cross section.

3.6 Berms shall be repaired promptly by placing selected material as needed to restore the berm to its original condition.

3.7 Surface blading of native surface roads also includes ditch cleaning, which shall be done in accordance with T-301, Ditch Cleaning.

3.8 All blading operations shall be properly signed in accordance with **B(T)6.33#** and all applicable State Laws.

SPECIFICATION T-103 DUST ABATEMENT

DESCRIPTION

1.1 Dust abatement consists of road surface preparation and application of materials.

MATERIALS

2.1 Water, bituminous products, lignin sulfonates, chloride products, and other materials may be used for dust abatement. Materials other than water will require approval of the Forest Service and shall meet specifications furnished by the Forest Service.

REQUIREMENTS

3.1 Dust abatement materials shall be applied to the road surface as necessary to control surface loss and provide that vehicles are always intervisible within their stopping sight distance. The average user speed on the road shall be used to determine stopping sight distance. Preparation shall be in accordance with Specification T-101, Surface Blading.

3.2 The rate of application shall be such that the selected material will not run off the surface and cause pollution or unnecessary waste.

3.3 When water is the selected material, it shall be applied as often as necessary to abate dust from all Contractor operations.

a. Dust abatement shall be maintained as needed throughout the duration of operations.

SPECIFICATION T-108 SLIDE REMOVAL AND SLUMP REPAIR

DESCRIPTION

1.1 Slide removal and slump repair consists of all work necessary to restore the road to its original cross section as necessary to facilitate use and provide drainage. This work is such that it cannot be handled by a grader during surface blading and ditch cleaning operations.

Slump repair is the filling with selected material of depressions or washouts in roadway which cannot be routinely filled by a motor grader.

Slide removal and slump repair includes excavation, loading, hauling, placing, and compacting of replacement material and the removal and disposal of waste material. This includes the development of disposal or borrow areas at locations approved by the Forest Service.

REQUIREMENTS

3.1 Contractor shall deposit slide material in an approved manner at designated locations.

Material shall not be disposed of on road fills unless otherwise agreed.

The slope which contributed the slide material shall be reshaped as practicable to reduce future sliding unless otherwise agreed.

3.2 When filling slumps and depressions, select material shall be used, placed in layers, and compacted to conform with or exceed the density of existing subgrade.

Existing aggregate surfacing shall be salvaged and relayed or replaced after slumps have been filled.

Damaged aggregate base, aggregate surfacing, and asphalt surfacing shall be repaired under Specification T-113, Surfacing Repair.

3.3 Following slide removal, roadway shall be shaped so as to reasonably conform to its original subgrade template.

3.4 Slump, waste, and borrow areas shall be seeded as required under T-508.

SPECIFICATION T-113 SURFACING REPAIR

DESCRIPTION

1.1 Surfacing repair is patching potholes or small areas of broken asphalt or imported aggregate surfaces and asphalt dikes. It includes preparing the area to be patched and furnishing and placing all necessary materials, including base, and other work necessary to patch the surfacing, including paved shoulders. Sections requiring repair work shall be limited in area not to exceed **XXXXX** square feet for paved surfaces or **XXXXX** square feet for aggregate surfaces and not more than **XXXXX** areas per mile per year.

MATERIAL

2.1 Materials used for repair of aggregate surfacing shall conform to these specifications:

2.2 Materials used for asphalt patching shall conform to or exceed the requirements of these specifications:

REQUIREMENTS

3.1 Aggregate Surfacing Repair. Aggregate material shall be placed in accordance with the applicable specification used in paragraph 2.1 above. Work under this specification shall be performed in a timely manner to reduce further deterioration of the surface.

3.2 Asphalt Surfacing Repair.

A. Potholes (deep patch). Remove the surface course and base course as deep as necessary to reach firm support; extend horizontally at least six (6) inches into good asphalt surfacing surrounding the cracked area. Make the cut square or rectangular with faces straight and vertical. Prime the bottom and faces using MC70, MC250, MC800, or emulsified asphalt (penetration type). Backfill the hole with asphalt mix and compact. Use 2-inch layers if the hole is more than four (4) inches deep. Compact each layer thoroughly with mechanical tampers or rollers. Compaction shall not be done with equipment wheels without prior approval. The patch when completed and compacted shall be flush with surrounding surface.

B. Skin Patches. Minor depressions, light ravelling, or surface checking at scattered locations shall be treated by applying a skin patch. Carefully broom the surface of all loose material and apply a tack coat of MC70, MC250, or emulsified asphalt (penetration type) at the rate of 1/10-gallon per square yard. Place asphalt mix, distribute uniformly, and feather edges with asphalt rakes so the patch when compacted shall be flush with the adjoining surface. Roll thoroughly with a portable roller.

3.3 Asphalt Dikes. Asphalt material in the damaged length of dike shall be removed. Clean and repair asphalt foundation as necessary. Level exposed ends of existing dike. Prime all surfaces with bituminous material. Asphalt mix shall be placed and compacted to conform with the shape of the original dike.

3.4 All asphalt material removed from potholes, patches, and dikes shall be disposed of in designated area.

SPECIFICATION T-201 SHOULDER MAINTENANCE

DESCRIPTION

1.1 Shoulder maintenance consists of keeping that portion of roadway adjacent to a paved and/or aggregate surface in a reasonably smooth condition and flush with the pavement and/or aggregate in order to provide lateral support to the surface. It may require blading, furnishing, and placing additional material, application of bituminous material, and any other work incidental to the maintenance of the shoulder.

MATERIALS

2.1 Materials selected for shoulder maintenance shall be similar to the material used in the previous construction or maintenance.

REQUIREMENTS

3.1 Shoulder Blading. Replace material as necessary. Blade and shape the entire width of the shoulder to drain the paved or aggregate surface. The shoulder material shall be moistened if necessary to ensure reasonable compaction and graded flush with the pavement or aggregate edge. The entire shoulder shall be fully compacted.

3.2 Asphalt Stabilized Shoulders. Where shoulder has been previously stabilized with bituminous treatment, reapplication of bituminous material shall be made when 50 percent of the shoulder surface material is no longer held in place by bitumen. Prior to treatment, it may be necessary to replace earth or aggregate material lost or moved since last application.

SPECIFICATION T-301 DITCH CLEANING

DESCRIPTION

1.1 Ditch cleaning is removing and disposing of all slough material from roadside ditches to provide an unobstructed waterway conforming reasonably to previous line, grade, and cross section.

REQUIREMENTS

3.1 Slough Material.

A. Native Surfaced Roads. Slough material from ditch cleaning, if suitable, may be placed and blended into the existing road surface or shoulders or placed in a designed berm during surface blading.

B. Aggregate Surface Roads. Slough material from ditch cleaning shall not be mixed with aggregate surfacing or left on the road surface unless otherwise agreed. Material shall be disposed of in an agreed manner at designated locations.

C. Asphalt Surfaced Roads. Equipment, methods, and timing shall be agreed to before start of ditch cleaning operations so as to protect the asphalt pavement. Material shall be disposed of in an agreed manner at designated locations.

ds, gates, H-braces, fencing, guardrails, structure delineators, signs and other similar structures that have been previously installed to insure the safe and efficient operation of the road.

SPECIFICATION T-310 MINOR DRAINAGE STRUCTURES

DESCRIPTION

1.1 Minor drainage structures are single passages with maximum waterway opening equivalent to a 78-inch round pipe (87- by 63-inch arch) or multiple passages with maximum, single waterway opening equivalent to a 60-inch round pipe (66- by 51-inch arch). They include overside drains. Maintenance is work performed on inlets, outlets, related channels, existing riprap, trash racks, and drop inlets.

MATERIALS

2.1 All materials used in the maintenance of minor drainage structures shall conform by type and specification to the material in the structure being maintained.

REQUIREMENTS

3.1 All minor drainage structures are to be maintained in accordance with these specifications in the spring following any significant runoff and prior to the beginning of winter storms.

3.2 Clear inlet and outlet channels, inlet trash racks, and drop inlets of loose material that could cause plugging or prevent the free flow of water. Debris shall be disposed of in agreed manner at designated locations.

3.3 If outlet riprap was originally placed to dissipate water energy, it shall be maintained in good condition including the replacement of riprap if necessary.

4.1 Make whatever minor repairs are necessary to ensure the proper functioning of the head walls, aprons, inlet assemblies, overside drains, riprap, trash racks, and other facilities related to the drainage structure.

SPECIFICATION T-506 CLEARING ROADWAY VEGETATION

DESCRIPTION

1.1 This work consists of cutting and disposing of all vegetative growth including trees from the road surface that reduces the operational capability of the road. Vegetation removal is required if the growth of the vegetation during the contract period causes unacceptable reduction of sight distance and operation capability.

REQUIREMENTS

3.1 Vegetative matter on the road surface which reduces sight distance, impedes vehicular travel, or interferes with road maintenance operations such as surface blading and ditch and culvert cleaning shall be removed. Downed timber meeting utilization standards shall be cut in appropriate lengths and decked along the roadside in locations where the traveled way or sight distance will not be impaired.

3.2 Low shrubs and brush which do not restrict sight distance, do not impede road maintenance, and reduce erosion need not be removed if the road surface can be adequately maintained without doing so. Vegetation and nonmerchantable timber removed shall be disposed of by scattering, chipping, hauling to designated disposal areas, or as otherwise agreed upon.

SPECIFICATION T-507 CUTTING ROADSIDE VEGETATION

DESCRIPTION

1.1 This work consists of cutting and disposing of all vegetative growth, including trees from within the roadway that reduce sight distance and operational capability of the road. Vegetation removal is required if the growth of the vegetation during the contract period causes unacceptable reduction of sight distance and operation capability.

REQUIREMENTS

3.1 Vegetative matter within the roadway which reduces sight distance, impedes vehicular travel, or interferes with road maintenance operations such as surface blading and ditch and culvert cleaning shall be removed. Downed timber meeting utilization standards shall be cut in appropriate lengths and decked along the roadside in locations where the traveled way or sight distance will not be impaired.

3.2 Low shrubs and brush which do not restrict sight distance, do not impede road maintenance, and reduce erosion shall not be removed. Vegetation removed shall be disposed of by scattering, chipping, hauling to designated disposal areas, or as otherwise agreed upon.

SPECIFICATION T-508 SEEDING

DESCRIPTION

1.1 Seeding is the application of seed and fertilizer to areas where vegetation has been disturbed as a result of slides, slumps, disposal of materials, and other Contractor operations in connection with road maintenance.

REQUIREMENTS

3.1 Contractor shall provide and apply the required kinds and amounts of seed and fertilizer in accordance with the requirements in C(T)6.601#.

3.2 Surfaces of areas to be treated shall be in a loose and roughened condition favorable to the retention and germination of seed.

SPECIFICATION T-618 MAJOR DRAINAGE STRUCTURES

DESCRIPTION

1.1 Major drainage structures are culverts, bridges, and other structures with a minimum waterway opening equivalent to an 84-inch round pipe (95- by 67-inch arch) or multiple passages where the smallest single waterway opening is 66 inches (73- by 55-inch arch). All low water structures are major drainage structures.

Maintenance of these structures includes cleaning inlets, outlets, and related channels, trash racks, delineators, object markers, rails, timber or asphalt running surfaces, bridge inspections, and other work incidental to maintenance of the structure.

MATERIALS

2.1 All materials used in the maintenance of large drainage structures shall conform by type and specification to the material in the structure being maintained.

REQUIREMENTS

3.1 All major drainage structures and related channels except stream channels shall be maintained as early as possible in the spring following any significant runoff and prior to the beginning of winter storms.

3.2 The items listed below shall be accomplished within the scope of bridge maintenance and where applicable to the maintenance of other large drainage structures.

A. Ditch Cleaning, T-301, and Surface Blading, T-101, shall be performed to direct drainage away from the approaches to the structure.

B. Trash racks shall be cleaned, and any logs or drift lodged against piers and abutments shall be removed without causing damage to the structure. Vegetative debris removed shall be treated as agreed.

C. Debris shall be removed from the bridge deck, and deck drains shall be opened.

1. Loose bolts and nuts shall be tightened.

SPECIFICATION T-619 MISCELLANEOUS STRUCTURES

DESCRIPTION

1.1 Maintenance of miscellaneous structures include the maintenance of retaining walls, guard rails, cattleguards, fences, gates, and any other similar structures that have been previously installed to insure the safe and efficient operation of the road.

MATERIALS

2.1 Any materials needed in the maintenance of miscellaneous structures shall be similar in type and quality to he material in the structure being maintained.

REQUIREMENTS

3.1 Guard Rails. Anchors shall be tightened.

3.2 Cattleguards. Tie-in fences shall be sound and secured to the wings. Loose rails shall be welded or bolted back in place. Material deposited into the cattleguard well during operations shall be removed. Drainage into and out of cattleguards shall be maintained.

3.3 Fences. Wire fences shall be tightened if loose. Broken strands of wire or wood railings shall be replaced.

3.4 Gates. Gates shall be properly signed, kept in good repair and made to swing easily. Hinges or latches shall be repaired if not operating properly. Hinges shall be oiled.

SPECIFICATION T-710 TRAFFIC SERVICES

DESCRIPTION

1.1 Traffic service maintenance includes the maintenance of traffic-related regulatory, warning, and directional signs as well as devices such as roadside delineators or markers. It also includes restriping paved surfaces.

MATERIALS

2.1 All sign faces shall be retroflective sheeting. Signposts shall be treated. Materials for delineators and markers shall be similar to those in the devices being replaced unless in conflict with the Manual on Uniform Traffic Control Devices. Pavement striping shall be retroflective and meet the material requirements of specification as shown below:

REQUIREMENTS

3.1 A minimum area six (6) feet in diameter around any traffic sign or device shall be kept free of weeds, brush, and limbs. Greater dimensions may be necessary depending on viewing direction.

3.2 Defaced signs shall be repaired using materials in accordance with the Manual on Uniform Traffic Control Devices.

3.3 All traffic control signs and devices that are replaced shall be installed in accordance with the Manual on Uniform Traffic Control Devices.

3.4 All pavement striping shall conform to attached specifications. Pavement striping shall be required when the existing striping is not readily visible both by day and night.

SPECIFICATION T-841 VEGETATION ESTABLISHMENT

DESCRIPTION

1.1 This work consists of applying seed, fertilizer, mulch, and plantings, singularly or in specified combinations to roadways and disposal areas. Work area may be limited to designated portions of the roadway and roadside or include treatment of the entire area bounded by the outer limits of the roadsides.

MATERIALS AND APPLICATION RATES

2.1 Contractor shall provide and apply the materials including seed, plantings, mulch, and fertilizer listed in the specifications attached.

2.2 Seed shall be provided in accordance with the requirements in C(T)6.601#. Mulch shall be certified to be free of noxious weed seeds on the current "All States Noxious Weeds List".

MAINTENANCE REQUIREMENTS

3.1 Schedule

A. The designated treatment shall be scheduled to commence upon completion of other work under this contract.

B. The treatment shall not be applied when the ground is frozen or excessively dry. Application shall be terminated during periods when there is too much wind to allow consistent treatment rates and control of the treatment area to the designated limits.

3.2 Surface Treatment

A. When shown in the specifications, portions of the roadbed not previously disturbed and left loose shall be scarified to a minimum depth of four (4) inches unless bedrock is encountered at a lesser depth.

B. Required mulch materials shall be applied in accordance with the specifications attached.

C. Required plantings shall be in accordance with the specifications attached and as located on the Contract Area Map.

LOGGING AND MAINTENANCE OPERATIONS SIGNING STANDARDS

All signs must be manufactured & installed as specified in the latest version of the FHWA "**Manual on Uniform Traffic Control Devices**" (MUTCD) and the FS publication "**Standards for Forest Service Signs & Posters**"(EM 7100-15).

SIGN STANDARDS

SHAPE & COLOR: Generally, signs for logging and maintenance operations are considered temporary traffic control (TTC) and are either diamond-shaped or rectangular. All signs shall have a black legend and border on an orange retroreflective background unless shown otherwise. Hand-painted, homemade signs are not legal. Fluorescent paint is not reflectorized.

SUBSTRATE: Sign substrate material may be High Density Overlay (HDO) Plywood, Aluminum, Fiberglass Reinforced Plastic, Corrugated Plastic or Roll-up Fabrics.

SIGN SIZE: Sign size is a factor of speed and MUTCD & FS standards. Where conditions of speed, volume, or special hazard require greater visibility or emphasis, larger signs should be used. Minimum sizes for the most common signs can be found in Figure 4: Table 4-1. Refer to the EM 7100-15 and MUTCD for additional sign sizes.

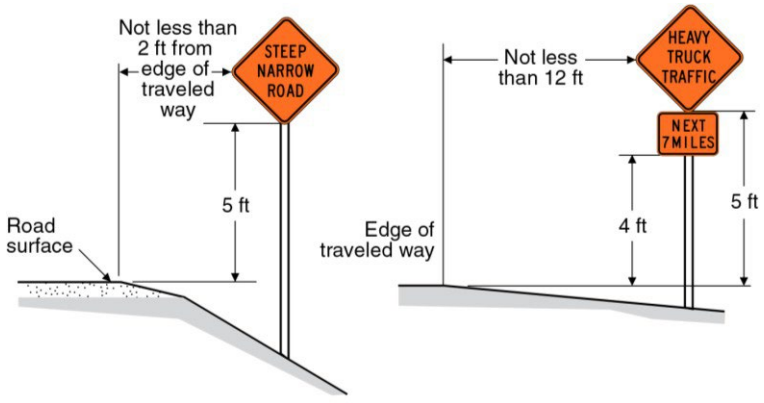
LEGEND: All lettering shall be minimum Series "C" alphabet, conforming to Standard Alphabets for Highway Signs. Letter size is also a function of speed - use letter size and word messages as specified in MUTCD and EM- 7100-15.

SIGN PLACEMENT

Signs are to be installed in locations as agreed to in the Traffic Control Plan. All signs are to be removed, covered, or folded when operations are not in progress or the sign message is not applicable. Signs should generally be located on the right-hand side of the roadway. When special emphasis is needed, signs may be placed on both the left and right sides of the road. Sign message shall be clearly visible to road users, mounted on posts or portable sign stands.

Figure 1: Lateral offset and mounting height for warning signs on rural roads.

SIGN LOCATION



Signs must be located 100-500 feet prior to the temporary traffic control activity based on speed, (both ends of a through road) to warn traffic and allow for adequate perception and reaction time of the driver as listed in Figure 2: Table 4A.1 (EM7100-15). Minimum spacing will be agreed to in writing by the Sale Administrator or Engineering Representative.

Figure 2: Table 4A.1 Recommended Spacing of Advance Warning Signs

SIGN SUPPORTS

Table 4A.1—Recommended spacing of advance warning signs

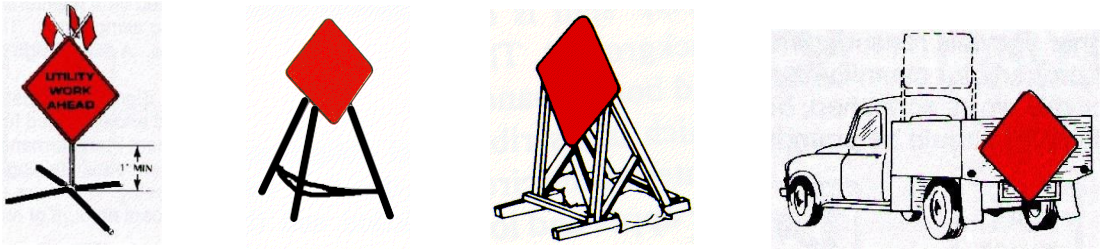
Speed limit or prevailing approach speed (mph)	Distance from the TTC activity area to the first sign and between subsequent signs in a series (feet)
25 or less	100
30 to 45	350
45 to 50	500

Refer to the MUTCD, chapter 6C for State and county highways and speeds greater than 50 mph.

POSTS: Signs are to be mounted on separate posts. Supplemental signs such as Speed Advisory plates are to be mounted on the same post as the primary sign. ***Do not mount signs on trees or other signs.*** Posts may be wood, metal, carsonite or similar material and must meet breakaway standards if within the clear zone. Wood posts that are 4 inches by 4 inches or have a cross-sectional area of 24 square inches or smaller are considered to meet breakaway standards when installed in normal soil conditions.

TEMPORARY/PORTABLE SUPPORTS: Portable supports may be used for short-term, short-duration, and mobile conditions. MUTCD defines this time period as one work shift, 12 hours or less. All portable supports must meet MUTCD standards, including breakaway. These must be a minimum of 1 foot above the road surface or more if visibility requires it.

Figure 3: Examples of Temporary/Portable Supports



SIGN SIZES

Sign sizes are dependent on speed of the road and road type as shown in Figure 4: Table 4-1 (EM7100-15) of which a portion of the table is shown below. Larger signs may be used whenever necessary for greater legibility or emphasis.

Figure 4: Table 4-1 Temporary Traffic Control Sign Sizes

Table 4-1—Temporary Traffic Control sign sizes by road type

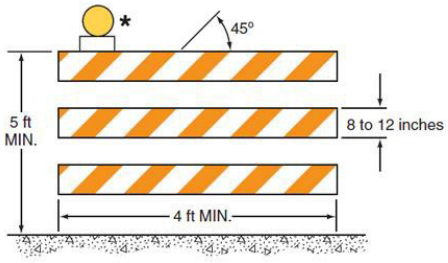
Message or Symbol	Sign code or series	Conventional road sign sizes (inches)	Low-volume roads	
			Typical sign sizes (inches) = or >35 mph	Minimum sign sizes (inches) <35 mph
REGULATORY				
TRAFFIC CONTROL POINT	EM-3	30 x 24	30 x 24	30 x 24
WARNING				
LOGGING OPERATIONS	FW11-10a	36 x 36	36 x 36	30 x 30
LOG TRUCKS	FW11-10b	36 x 36	36 x 36	30 x 30
LOG TRUCKS ENTERING ROAD	FW11-10c	36 x 36	36 x 36	30 x 30
HEAVY TRUCK TRAFFIC	FW11-10d	36 x 36	36 x 36	30 x 30

BARRICADES

Type 3 barricades are used to close or partially close roads for TTC activities. Type 3 barricades are a minimum length of 48 inches with 6 stripes. Traffic control signs may be installed on Type 3 barricades. Refer to the MUTCD, section 6F.03. Typical signs installed on these barricades include:

- ROAD CLOSED, AREA CLOSED
- ROAD CLOSED TO THRU TRAFFIC
- LOCAL TRAFFIC ONLY
- DETOUR
- ONE WAY

Type 3 Barricade



*warning light optional

TYPICAL SIGNS

The signs below are not a complete listing of signs that may be needed. The use of specific signs and their locations will be agreed to in writing by the Sale Administrator or Engineering Representative. Sign numbers are from MUTCD. An 'F' before the sign number indicates a Forest Service sign and the last number indicates sign size, generally in the horizontal direction. The sign sizes in the signs below are for low- volume roads with a speed of less than 35 mph. Larger signs may be used whenever necessary for greater legibility or emphasis.

Figure 5: Typical signs that meet the intent of Timber Sale Contract Provision B(T)6.33, Safety

FW11-10a-30 FW11-10b-30 FW11-10d-30 FW11-10c-30

W22-1-36

W22-3-30

W20-1-30

W21-3-30

FR5-11-c 42

W7-3a-24*

W13-1P-18**

W16-2P-24*

* Specify Distance

** Specify Speed