

WEST VIRGINIA DIVISION OF FORESTRY
STATE FOREST STANDARDS
for
LOGGING ROADS AND SKID TRAILS

HAUL ROADS

The objective of these specifications is to provide the construction requirements for haul roads and skid trails which would be constructed by private individuals or concerns on state forest land, under special use, permit or agreement. In most cases, these standards will exceed the silvicultural Best Management Practices outlined under the WV Logging Sediment Control Act of 1992.

LOCATION: All locations shall be approved in advance by the Forester in Charge and construction shall be at the expense of the private individual or concern.

GENERAL: Fit roads to topography, keeping grades as low as possible, especially where uphill hauling is involved.

AVOID: (a) road paralleling a stream without a vegetated strip 100 to 150 feet wide between; (b) steep side hill slopes; (c) heavy cuts and fills; (d) long unbroken grades; (e) sharp curves and switchbacks on grades more than 5%; (f) locations where it may be possible for a stream to break over and flow down the roadbed.

WIDTH: The width of the main haul road shall be a minimum of 12 feet and a maximum of 16 feet with turnouts provided at passing and loading points. Where turnouts are required, additional width will be cleared as designated by the Forester.

TURNOUTS: Turnouts shall have a total width of 21 feet, for a distance not to exceed 60 feet in length. (See turnout plan attached.)

GRADING: Roads may be insloped (Sketch A), crowned (Sketch B) or outsloped (Sketch C). Roads shall be constructed so as to slope outward throughout its entire length if at all possible. In instances such as through cuts, or on sharp curves where outsloping will be impractical and sometimes dangerous, ditches will have to be provided, and cross drainage installed to carry the ditch water across the road.

GRADE: Grades shall be held as low as practicable and the maximum allowable shall not exceed 12%, without the approval of the Forester in Charge.

Clearing

WIDTH: Shall be approximately 13 feet from the centerline of roads (Sketch A). Width may be increased where needed. All timber shall be removed from haul and skid road right-of-way before final excavation begins.

DISPOSAL: Buck and deck all merchantable timber. Lop and scatter tops, brush, and debris outside road clearing. Keep slash and debris from clearing out of fill area and stream bed.

Grading

BACKSLOPES: Construct cut slopes to 1:1 ratio or as steep as the soil formation or material will allow. Under cutting of slopes is prohibited.

DRAINAGE: Install proper gauges aluminum culverts or equivalent where required to carry side streams. Install sufficient broad based gravel dips (Sketch D), or cross drain culverts to control road surface drainage. The following standards shall govern the frequency of broad based dips or cross drains.

ROAD GRADE (PERCENT)	MAXIMUM SPACING (FEET)
2 to 5	300 to 500
6 to 10	200 to 300
11 to 15	100 to 200
16 to 20	100-

Cross drain culverts shall be placed at an angle of at least 30 to 45 degrees to the center line of the road on a grade that is at least 2% steeper than the road grade and they shall be deep enough to prevent overflowing. Installation of all culverts shall be in accordance with the manufacturer's specifications.

DITCHES: Construct ditches where necessary, holding the maximum depth to one foot.

Maintenance

Keep drainage structures open and functioning. Keep road bed graded and crowned. Spread clean three inch (3"), gravel to a depth of 5" and a width of 12' for a distance of 100' on either side of stream crossings and for a distance of 30' in broad-based dips.. Gravel shall be spread on intercepting dips which become subject to washing. Remove slides and grade road surfaces as required to prevent water from running in the wheel tracks. Loose boulders and slide material shall be removed from roadway and side ditches. It may be required to stockpile a quantity of 3" gravel for road maintenance.

Erosion Control Measures

Immediately upon retirement or abandonment of a cutting block or any part thereof, provide for permanent drainage by removing fenders and sections of high outside shoulders. Surface of roads shall be graded to eliminate any wheel ruts. All haul roads, skid trails, and landings shall be treated during the seeding dates and with the lime, fertilizer, and seed mixtures recommended by the Forester in Charge. Fertilizer, seed mixture and mulch shall be applied to the haul road system using "hydro-seeder" equipment or other method approved by the Forester. Acres per mile for roadways and road banks are listed in the State Forest Log Road and Skid Trail Standards.

Areas to be reclaimed and the required seeding materials will be determined after each logging unit is completed.

SKID ROADS AND TRAILS

The location of skid roads shall be selected by the Buyer, subject to approval by the Forester in charge of sale. Skid road intervals shall be approximately 300 feet. Any change in or addition to the agreed upon location must be approved by the Forester in Charge.

AVOID: (a) excessive grades, more than 15%; (b) frequent creek or branch crossings; (c) emptying skid roads or trails directly into stream courses; (d) stream crossings without sufficient dips to prevent streams from following skid roads or trails.

Removable metal culverts, satisfactory to the Forester in Charge, shall be installed to carry water from springs, seeps, or streams.

Water turnouts shall be installed and maintained regularly at least as frequently as indicated in the standards for logging roads.

Erosion Control Measures

Immediately upon a seasonal shut-down or on abandonment of a branch or spur, or at the close of operations, provide for turning water out of skid roads or trails permanently by placing dozer constructed water bars (Sketch E) at approximately the intervals listed in the table below, and the removal of metal culverts and stream obstructions.

GRADE (PERCENT)	APPROXIMATE DISTANCE BETWEEN WATERBARS (FEET)
Less than 10	100
10	80
15	60
20	45
25	40
30	35

Revised July 2001

ACRES PER MILE

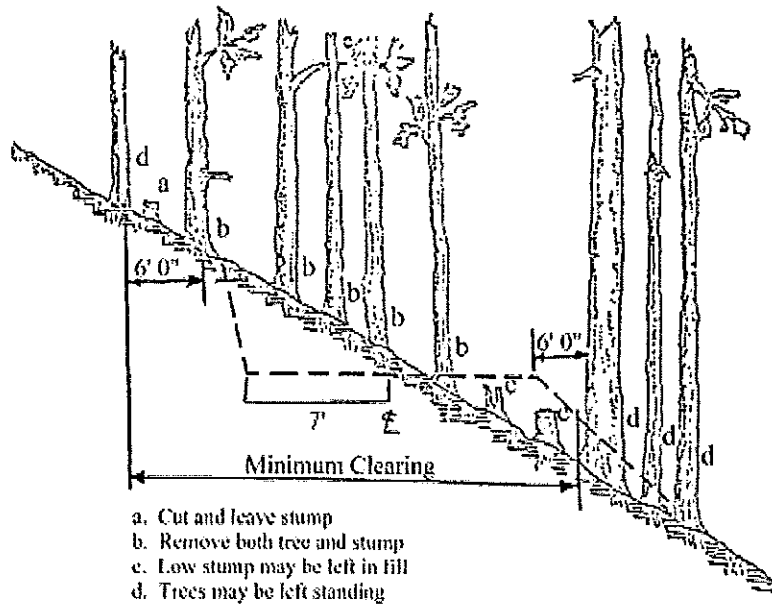
10' wide road - 1.2 acres per mile

12' wide road - 1.5 acres per mile

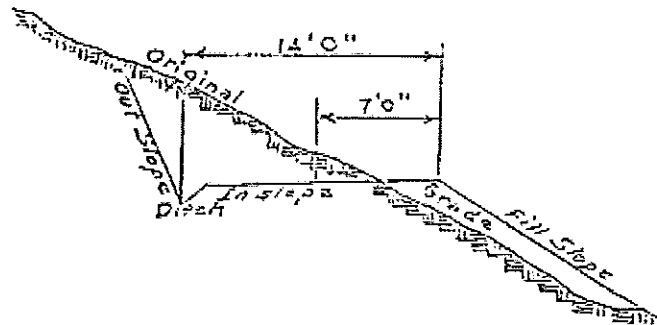
Acres per mile for seeding cut and fill slopes

Percent Side Slope	10' Wide Road	12' Wide Road
0 - 10	.3	.3
10 - 20	.4	.5
20 - 30	.8	.9
30 - 40	1.3	1.6
40 - 50	2.2	2.6
50 - 60	4.2	5.1
60 - 70	5.4	6.5
70 - 80	10.3	12.7

CLEARING FOR CUT AND FILL ROAD



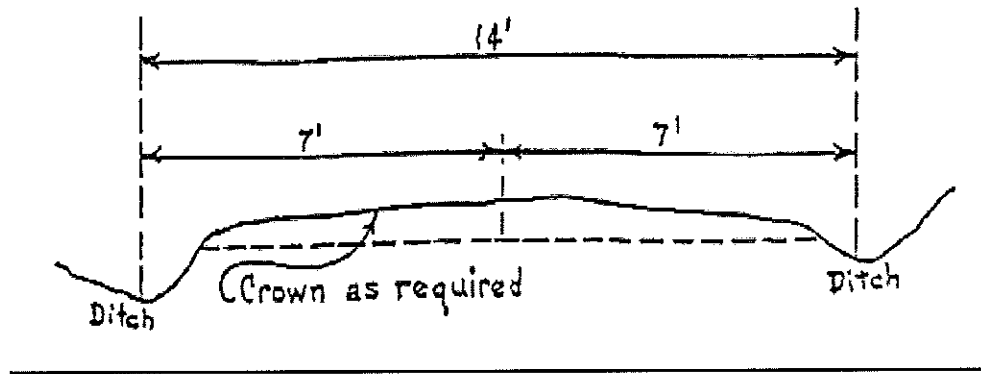
GRADING INSLOPE ROAD



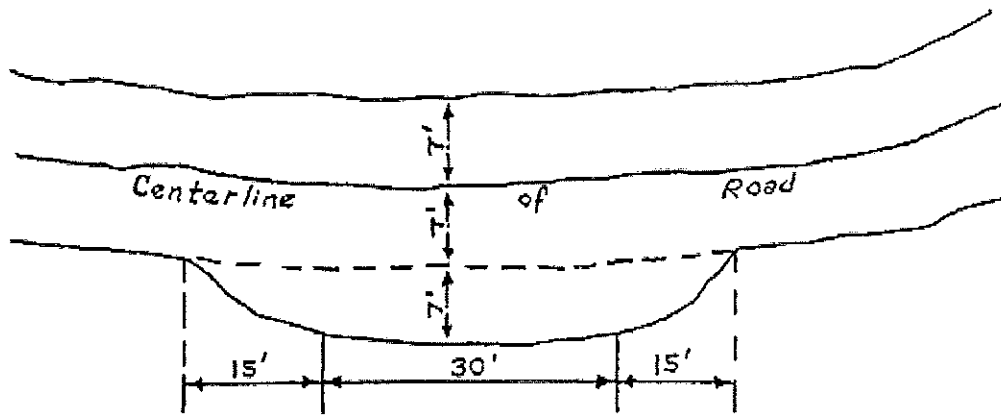
1. Construct the road so that hauling will be on solid ground, not fill.
2. Inslope from fill to cut shall have a fall of not less than $1/4''$ and not more than $3/8''$ per foot.
3. Drainage water shall be carried across the road to fill slopes by intercepting dips or culverts, as required by Forester.

Sketch A

GRADING CROWNED HAUL ROAD

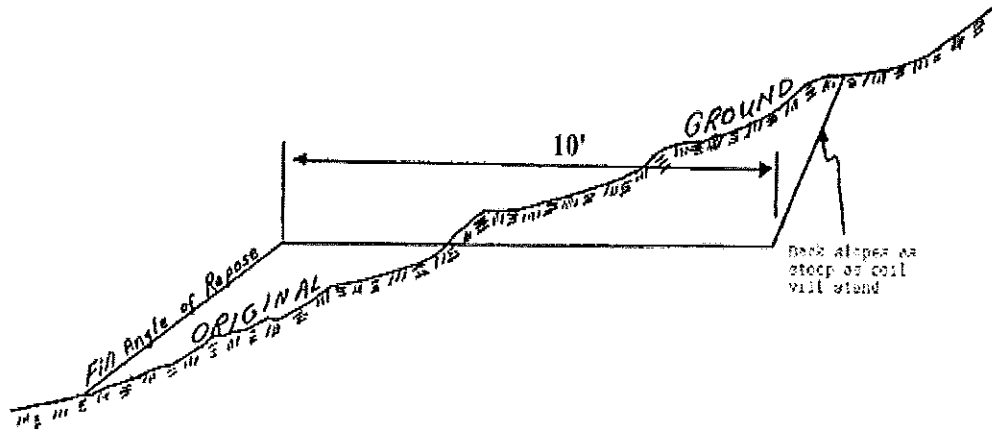


TURNOUT FOR HAUL ROAD



Sketch B

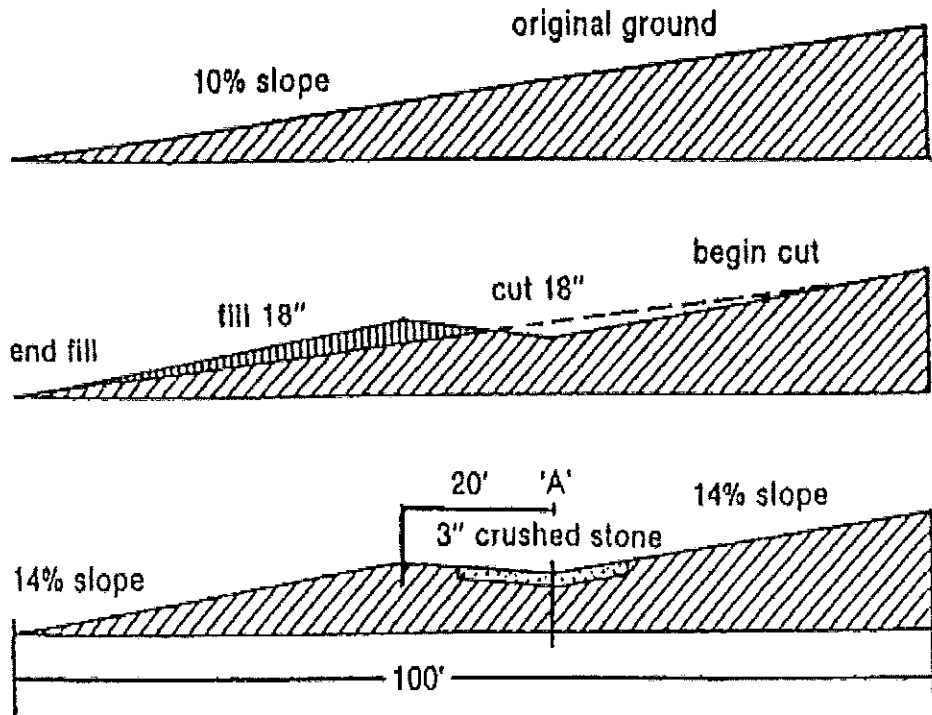
TYPICAL OUTSLOPE
SECTION



Outsloping is beveling the entire width of the road toward the fill bank to divert the water from the road surface. Outslope only enough to divert the water - generally about 1/4 inch and not more than 3/8 inch to the foot. If the slope is apparent to the eye, it is ordinarily too great.

Sketch C

BROAD-BASED DRAINAGE DIP



Cross section 'A'

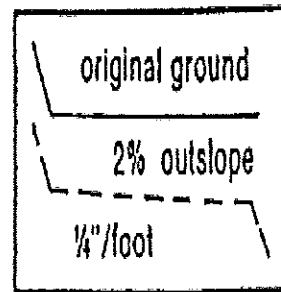
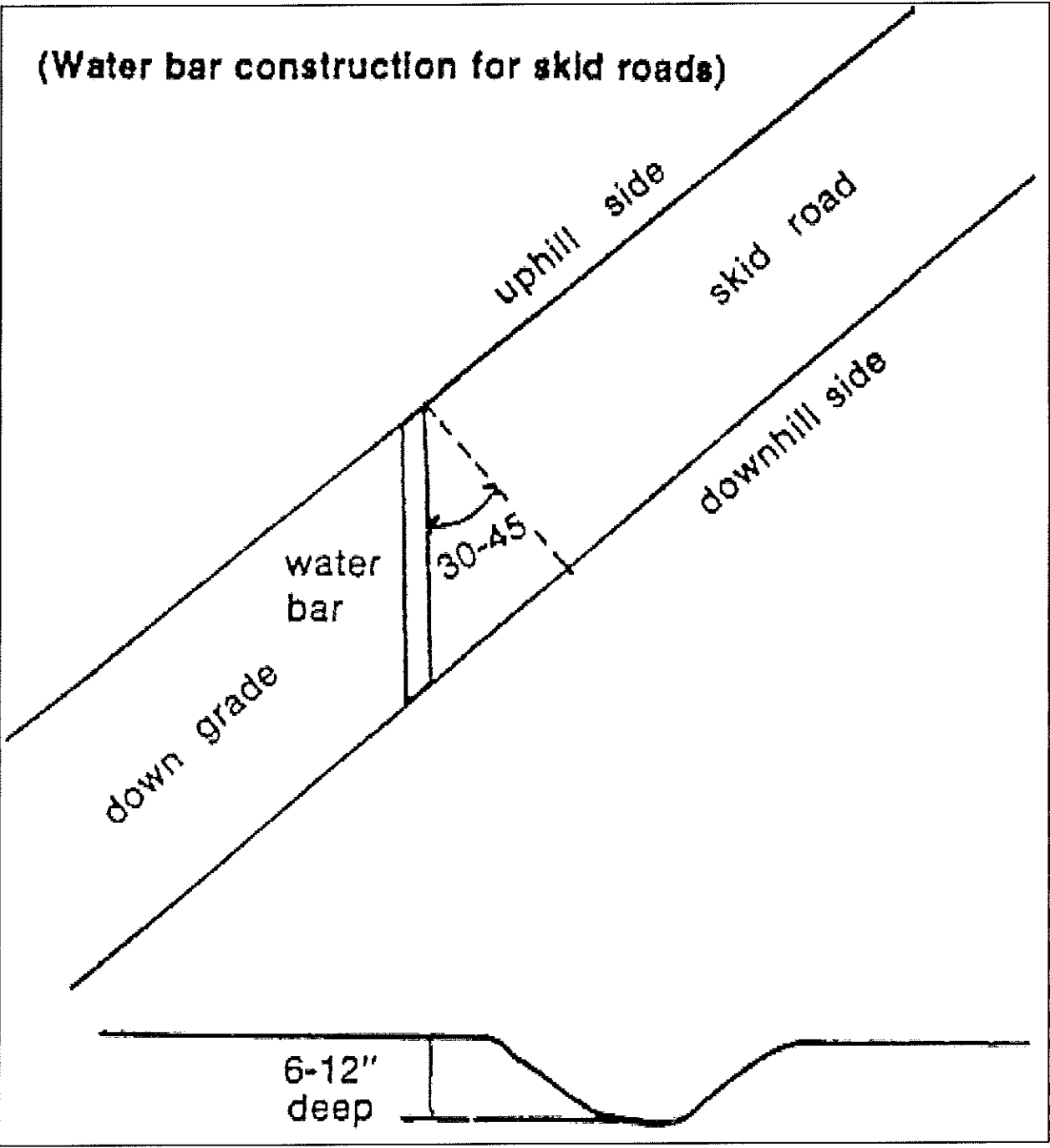


Diagram showing how to properly construct a broad-based drainage dip. Approximately 20 tons of 3" gravel is required per dip.

Sketch D



Sketch E