

## **Chapter 1: ACCESS AND HAUL ROADS**

Best management practices should be selected so that soil movement can be minimized. They should be used to reduce the volume and velocity of runoff water. Best management practices can help provide adequate drainage on roadways so that the road surface, side slopes and borrow areas can be stabilized and do not contribute sediment to surface water.

### **LOCATION AND DESIGN**

Avoid locating roads near critically erodible or environmentally sensitive areas such as natural drainages, lakes, ponds, springs, sites with high water tables, floodplains, and wetlands. If roads are located adjacent to water courses, leave an undisturbed vegetated buffer strip between the road and the stream. The recommended width of the buffer strip is 25 feet from a Class II stream and 75 feet from a Class I stream.

Avoid locating roads on steep slopes where shallow, coarse textured soils exist. It is hard to stabilize fills in these regions and the road will be subject to surface erosion and slope failure.

Avoid locating roads in landslide areas, narrow canyons, or in areas where there are tension cracks and high cut banks.

Roads should be located on natural benches, ridges, and rock formations that tend to dip into the slope. In addition, road widths and grades should be kept to a minimum.

Design roads to match natural contours. This should reduce the number and size of cut and fill slopes.

Special geologic factors that should be considered in evaluating slope stability include, resistance of the rock, slope of bedding planes relative to ground slope, ground water conditions, and structural controls.

Erosion problems can be avoided during construction by anticipating and preparing for them in advance. After a site evaluation has been completed, select the most stable route. The road should be designed to accommodate and control anticipated runoff and sediment volume. Determine erosion control needs and incorporate these control measures, in the form of BMP's, into the road design specifications. This will ensure timely application and proper construction of best management practices.

### **CONSTRUCTION**

The effectiveness of a particular best management practice depends on proper design, placement, and timing.

During construction an operator should:

1. Install drainage and sediment collection systems prior to beginning road construction. These structures should be placed adjacent to the proposed route to catch sediment laden runoff or to divert surface water away from the roadway. Refer to the following BMP's:

- |        |                                  |     |                         |
|--------|----------------------------------|-----|-------------------------|
| I.11   | Biotechnical Stabilization       | V.1 | Straw Bale Barriers     |
| III.1  | Diversion Ditch/Dike             | V.2 | Sediment Traps          |
| III.2  | Interceptor Trench               | V.3 | Vegetated Buffer Strip  |
| III.4  | Siltation Berm                   | V.4 | Silt Fence/Filter Fence |
| III.10 | Rolling Dips                     | V.5 | Brush Sediment Barrier  |
| III.11 | Road Sloping                     | V.7 | Slash Filter Windrow    |
| III.12 | Roadway Surface Water Deflectors |     |                         |

2. Re-establish vegetative cover on disturbed land as soon as possible during the construction phase and after it is completed. It is important to revegetate the cut and fill slope as soon as possible after construction is completed to help reduce erosion. Refer to the following BMP's:

- |     |                  |      |                   |
|-----|------------------|------|-------------------|
| I.3 | Mulch-Straw      | II.4 | Broadcast Seeding |
| I.4 | Mulch-Wood Chips | II.8 | Fertilizer Use    |

3. Install drainage facilities in the roadway to protect road work as it is completed. Refer to the following BMP's:

- |       |                           |        |                                  |
|-------|---------------------------|--------|----------------------------------|
| III.3 | Open Top Box Culverts     | III.10 | Rolling Dips                     |
| III.5 | Waterbars                 | III.12 | Roadway Surface Water Deflectors |
| III.6 | Corrugated Metal Culverts |        |                                  |

4. Routinely inspect and clean sediment control structures and minimize the amount of bare soil. Refer to the following BMP's:

- |     |                         |      |                              |
|-----|-------------------------|------|------------------------------|
| I.1 | Matting-Plastic         | II.4 | Broadcast Seeding            |
| I.2 | Erosion Control Blanket | II.3 | General Planting and Seeding |
| I.3 | Mulch-Straw             | II.8 | Fertilizer Use               |
| I.4 | Mulch-Wood Chips        |      |                              |

5. Blend the final construction contours with surrounding topography to maintain natural drainage patterns where possible.

Dust and runoff on roadways can be controlled by placing a layer of crushed rock on the surface of the road. The crushed rock should be at least 3/4 inch in size and layered to a depth of between 2.5 and 3.5 inches (.2 - .3 of a foot). Rock size and depth of placement will depend on the volume of traffic and weight limits of vehicles allowed on the road.

Low impact bridges, referred to as Copeland Crossings, can be used to span streams when roads must traverse waterways. They are designed to be used infrequently for a one to two year period. Copeland Crossings can be constructed of lodgepole that are at least seven inches in diameter at the butt, or any other suitable similar diameter tree. Trees should be cut to a length long enough to span the creek or stream. The cut logs should be placed across the stream (with the ends resting on each bank) with a track hoe or backhoe equipped with a thumb or clamshell attachment. A second layer of shorter length, four inch diameter, logs can be placed on top of the original span, perpendicular to the direction of the placement of the foundation logs. Planks can then be placed on top of the two log layers. Rotten logs or duff should be placed on the roadway for a distance of 25 feet on either side of the approach to the bridge. This will help bring the roadway up to the elevation of the crossing. The weight load of vehicles using the bridge should be considered when logs are being cut and installed.

## **MAINTENANCE**

Road maintenance activities, relative to best management practices, focus on routine cleaning of drainage structures and sediment traps to remove debris and maintain efficiency. Inspection and cleaning operations should follow major storm events. Inspection of revegetated sites should be conducted annually until growth has been established, to determine additional seeding and/or fertilizing needs.

## **ROAD CLOSURE**

Specific procedures for closure are highly variable but all are intended to return the site to as natural a state as possible with minimal soil or drainage disturbance. The road should be recontoured to blend with existing surface water drainages and stabilized with vegetation. Refer to the following BMP's:

- |     |                         |      |                                  |
|-----|-------------------------|------|----------------------------------|
| I.1 | Matting-Plastic         | II.2 | Seedbed Preparation              |
| I.2 | Erosion Control Blanket | II.3 | General Planting and Seeding     |
| I.3 | Mulch-Straw             | II.4 | Broadcast Seeding                |
| I.4 | Mulch-Wood Chips        | II.6 | Vegetative Planting              |
|     |                         | II.8 | Fertilizer Use                   |
|     |                         | II.9 | Maintenance of Revegetated Areas |

If the road is not recontoured, the roadbed should be ripped. Berms should be removed or broken at regular intervals to aid in lateral drainage. Self maintaining drainage systems must be installed and the site must be seeded. Refer to the following BMP's:

- |        |                                  |      |                              |
|--------|----------------------------------|------|------------------------------|
| I.3    | Mulch-Straw                      | II.2 | Seedbed Preparation          |
| I.4    | Mulch-Wood Chips                 | II.3 | General Planting and Seeding |
|        |                                  | II.4 | Broadcast Seeding            |
|        |                                  | II.6 | Vegetative Planting          |
|        |                                  | II.8 | Fertilizer Use               |
| III.5  | Waterbars                        |      |                              |
| III.10 | Rolling Dips                     |      |                              |
| III.12 | Roadway Surface Water Deflectors |      |                              |

If structural features such as bridges and culverts are removed, soil disturbance should be minimized and all debris should be removed from within fifty (50) feet of a drainage to help prevent sedimentation. Fill material should also be removed from below the high water mark and stabilized in a location well away from the stream bank.