Chapter 7
OTHER CONSIDERATIONS

Aesthetics

Public support and cooperation is very important in implementing and maintaining practices and techniques that preserve roadways and enhance overall environmental conditions. The way things "look" is most often the way the public perceives how well things are being done. Care should be taken in design and construction to blend structures and practices with the natural surroundings or to compliment the natural surroundings in a unique and appealing way.

Roadside Debris

Trash and natural occurring materials which are out of place and/or are a detriment to the roadway system are often found along unpaved roads. Many unpaved roads exist in low-traffic, sparsely populated areas which attract illegal dumping and do not get wide-spread public attention when maintenance needs arise. This truly creates an eye-sore, but more importantly, it leads directly and indirectly to damage and degradation of the roadway system and to pollutants in the environment.

Manmade Material

One of the most repugnant eye-sore and detriments are manmade items from bottles and car parts to household appliances and car bodies, and more. Many times these items are dumped along roadways in ditches or other drainage paths which inhibit or redirect runoff which in turn erodes and/or weakens the roadway system.

Promptly haul away or properly bury this material on site (if permitted by law). If left, dumped debris will encourage more dumping and will eventually have a negative effect on the roadway, its drainage system, the environment, and public perception. Beautify and/or barricade the dump site. Aesthetic barricades mixed with other adornments, such as wild flowers, etc., will discourage some illegal dumping.

Natural Material

Often tree limbs, stumps, leaves, grass, rocks, and other natural materials from other locations are dumped along unpaved roads in ditches or other drainage paths. This too inhibits or redirects runoff which in turn erodes and/or weakens the roadway system.

Promptly haul away or properly bury wood and plant material on site (if permitted by law), or, use it in constructive maintenance practices along the roadway. Earth and stone materials can also be spread, buried on site, and/or used in constructive maintenance practices along the roadway. As with man made materials, if left unchecked, dumped wood, plant materials, earth, and stone will encourage more dumping and will eventually have a negative effect on the roadway, environment, and public perception. Dry, woody materials along the roadside can be a fire hazard also.

Roadside Vegetation Management

Proper maintenance of roadside vegetation will enhance and protect the roadway system, improve traffic safety, and improve public perceptions and attitudes. Thinning tree canopies over and alongside unpaved roads and removal of select trees will hasten drying and encourage grasses and smaller plants. Be careful not to remove mature trees unless absolutely necessary. Also, be careful not to grade or excavate too close to trees. A safe distance is outside the canopy drip line. Inside this distance can damage or kill the tree. Be careful not to cut or expose tree roots if possible. Cutting or exposing tree roots may cause a hazard by making the tree more easily uprooted. When roots are exposed, cover them as quickly as possible or cut them cleanly below the soil surface to prevent disease or other damage. Tree limbs broken during maintenance should be pruned close to the main trunk or branch.

Retaining Walls and Headwalls

These structures provide good protection from erosive forces and lend a neat appearance to other structures such as culverts, bridges, and steep slopes. Inspect and protect walls when performing road and ditch maintenance. Place and compact soil in and around scoured areas of walls and use excavated materials to bolster the strength and stability of walls when performing maintenance. Consider installing stone or concrete headwalls where culverts or bridges are experiencing scour due to turbulence or high velocities.

Beavers

Impoundments constructed by these animals are a great resource for filtering sediments and other pollutants from surface waters, but are a potential threat to roadways and their drainage systems. Dams constructed immediately upstream of a roadway may pose a flooding threat in heavy storms which may break the dam sending excess water onto the roadway. Dams constructed below the structure may inhibit runoff from properly flowing away from the roadway, causing runoff to back onto the roadway. This can cause weakening of the roadway, plugging of culverts with debris, and inappropriate diversion of runoff. Frequent maintenance checks in beaver prone areas can prevent severe damage by taking timely, corrective measures. Anti-beaver devices may be used to discourage beavers from plugging culverts or make them leave the immediate area.

RESOURCE LIST

The following agencies and organizations may be able to provide assistance with road maintenance, erosion control, and sedimentation problems within unpaved roadways and associated natural waterways:

County Engineer's Office
Phone: See local phone directory

National Association of County Engineers
Phone: (515)684-6928

USDA Natural Resources Conservation Service
Phone: See local phone directory

Alabama Forestry Commission
Phone: See local phone directory

Resource Conservation and
Development Councils
Phone: See local phone directory

US Forestry Service
Phone: See local phone directory

Federal Highway Administration
Phone: (202)347-7267

US Fish and Wildlife Service
Phone: (850)769-0552

Erosion Control Task Force
(334)271-7700

GLOSSARY

Aggregate - any of various loose, particulate materials such as sand, gravel, or pebbles.

Agradation - The building up or collection of materials on a surface over time, specifically here, the build-up of sediment within a stream or channel.

Articulated bucket - An excavating bucket hinged and jointed at the end of an operating arm. The operating arm is usually hinged and jointed also to afford the flexibility of movement similar to the human arm and hand.

Backhoe - a hydraulic excavating machine consisting of a tractor having an attached hinged boom, with a bucket with movable jaws on the end of the boom.

Backfill - the material used to fill or refill an excavation or to create an embankment, or the act of placing this material.

Batter - the angle of the front of a retaining structure with respect to a vertical plane.

Bench - a horizontal or near horizontal surface or step in a slope.

Berm - a narrow shelf or flat area that breaks the continuity of a slope.

Binder - a material for holding loose material together, as in a macadamized road.

Blading - utilizing an earthmoving blade to move loose surface material from high spots and roadsides to fill and smooth surface irregularities to restore the crown of an unpaved road without cutting into the crust. Also referred to as dragging. Often incorrectly referred to as "grading".

Brush layering - live branch cuttings laid in a crisscross fashion on benches between successive lifts of soil.

Channel - a natural stream or excavated ditch that conveys water.

Cohesion - the intermolecular attraction holding particles together in mass.

GLOSSARY (cont.)

Crib structure - a hollow structure constructed of mutually perpendicular, interlocking beams or elements.

Crust - The compacted, durable, virtually impermeable layer of an unpaved road which usually lies at or just below the road surface.

Culvert - usually a factory assembled round-shaped conduit connected together with couplers or bands; it differs from a bridge in that it is usually constructed entirely below the road surface.

Degradation - the wearing down of a surface by erosion and/or the breakdown of surface materials by the erosive forces of weather and traffic.

Detention structure - a basin or pond used in managing storm water runoff through temporary holding and controlled release of storm water.

Detention dam - a dam constructed for the purpose of temporary storage of stream flow or surface runoff and for releasing the stored water at controlled rates.

Disk harrow - an agricultural implement with spike like teeth or upright disks, drawn chiefly over plowed land to level it, break up clods, root up weeds, etc.

Ditch front slope - the side slope of a ditch adjacent to the roadway.

Ditch back slope - the side slope of a ditch opposite the roadway.

Ditch line - the top edge of a ditch's side slope where runoff falls into the ditch channel.

Diversion - a channel often with supporting dike on the lower side constructed across or at the bottom of a slope for the purpose of intercepting surface runoff to minimize erosion or to prevent excess runoff from flowing onto lower lying areas.

Diversion dam - a barrier built to divert part or all of the water from a stream into a different course.

GLOSSARY (cont.)

Dragging - utilizing an earthmoving blade to move loose surface material from high spots and roadsides to fill and smooth surface irregularities to restore the crown of an unpaved road without cutting into the crust. Also referred to as blading.

Embankment - a structure of soil, aggregate, or rock material constructed above the natural ground surface.

Energy dissipater - a device used to reduce the energy of flowing water.

Erosion - the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep; detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

Filter strip - a long vegetative planting area used to retard or collect sediment for the protection of watercourses, diversions, drainage basins or adjacent properties.

Fish habitat - resources and conditions essential for the production of fish including sufficient water quality and quantity, spawning, nursery, rearing and food supply areas - all of which fish depend on directly or indirectly for their processes.

Gabion - a patented woven wire basket filled with rocks of such size that they do not pass through the openings in the basket; individual baskets are stacked in place like building blocks and filled with rock to form erosion resistant structures.

Geotextile - synthetic polyethylene fibers manufactured in a woven or loose non-woven pattern to form a blanket-like product. Also called geo-fabric.

Grading - the cutting through, redistribution, and re-compacting of the road crust, and/or adding new road fill material to obtain the desired roadway shape and profile. This term often incorrectly used when referring to blading.

Habitat - the environment in which the life needs of a plant or animal are supplied.

Headwall/Header - structure built at the inlet of a culvert to protect the inlet from erosion.

GLOSSARY (cont.)

Hydroseeding - sowing of seed by distribution in a stream of water propelled through a hose.

Jointplanting - the insertion of live branch cuttings between openings of rocks, blocks, or other inert materials into the natural ground.

Live crib wall - a hollow, structural wall formed out of mutually perpendicular and interlocking members, usually timber, in which live branch cuttings are inserted through the front face of the wall into the crib fill and/or natural soil behind the wall.

Live branch cuttings - living, freshly cut branches of woody shrub and tree species that propagate from cuttings embedded in the soil.

Live fascines - bound, elongated sausage-like bundles of live cut branches that are placed in shallow trenches, partly covered with soil, and staked in place to arrest erosion.

Live stake - cuttings from branches which will root and sprout when tamped or inserted into the earth.

Moldboard - an iron plate attached to a plow share which turns over the earth. The blade of a bulldozer or motorgrader.

Motorgrader - a long wheel-base tractor with a long adjustable moldboard blade mounted underneath, forward of the driver's seat, used to construct and smooth flat surfaces especially in building and maintaining roadways.

Mulch - a natural or artificial layer of plant residue or other materials covering the land surface which conserves moisture, holds soil in place, aids in establishing plant cover, and minimizes temperature fluctuations.

Permeability - the capacity of a porous rock or sediment to permit the flow of fluids through its pore spaces.

Plunge pool - a device used to dissipate the energy of flowing water that may be constructed or made by the action of flowing. These facilities may be protected by various lining materials.

GLOSSARY (cont.)

Pollutant - dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, chemical wastes, biological materials, radio-active materials, heat, wrecked or discarded equipment, rock, sand, dust and industrial, municipal, and agricultural waste discharged into water or air.

Professional engineer - someone educated and trained with experience in the science of engineering, has passed certification examinations, and is certified by a professional licensing board or organization to practice engineering.

Retention structure - a natural or artificial basin that functions similar to a detention structure except that it may maintain a permanent water supply.

Revetment - a retaining wall or other support for a trench wall or embankment. Usually a stone (riprap) facing, but can be concrete, brick, wood, etc.

Riparian Buffer - a strip of undisturbed vegetation between sensitive areas such as rivers, streams, wetlands, ponds, etc., and areas of land disturbance and/or fallow (bare) ground such as unpaved roads, construction sites, etc.

Riprap - broken rock, cobbles or boulders placed on earth surfaces, such as the face of a dam or the bank of a stream, for protection against the action of water (waves).

Road crown - convex section or outline of the road surface.

Rock apron - erosion protection placed at or below stream bed elevation in an area of high velocity flow such a culvert outlet.

Runoff - the portion of the precipitation on a drainage area that is discharged from the area in stream channels.

Scarify - to abrade, scratch, or modify the surface; for example, to break the surface of a road with a narrow-bladed implement.

Sediment - solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity or ice and has come to rest on the earth's surface either above or below sea level.

GLOSSARY (cont.)

Sensitive Aquatic Environment Crossing - A roadway crossing of a wetland or waterway where special road and/or culvert design is required, by law, to protect, maintain and/or accommodate the environment and migratory habits of certain or numerous aquatic fauna.

Sheet flow - water, usually storm runoff, flowing in a thin layer over the ground surface.

Slope - the degree of deviation of a surface from horizontal, measured in a numerical ratio, percent, or degrees; expressed as a ratio or percentage, the first number is the horizontal distance (run) and the second is the vertical distance (rise), as 2:1, 50 percent or 30 degrees.

Soil bioengineering - use of live, woody vegetative cuttings to repair slope failures and increase slope stability, often combined with inert structures and materials.

Sub-base - the drainage layer of a road between the surface and the existing ground.

Surface water - all water the surface of which is exposed to the atmosphere.

Swale - an elongated depression in the land surface that is at least seasonally wet, is usually vegetated, and is normally without flowing water. Swales conduct storm water into primary drainage channels and provide some groundwater recharge.

Tail Ditch - See "Turn-out".

Tamp - to force in or down by repeated, rather light, strokes.

Ten-year frequency storm - maximum quantity of water flow per second expected at a particular water crossing, on a statistical average, once every ten years; it has a 10 percent probability of occurring in any given year.

GLOSSARY (cont.)

Terrace - an embankment or combination of an embankment and channel across a slope to control erosion by diverting or storing surface runoff instead of permitting it to flow uninterrupted down the slope.

Toe of a slope - base of a slope.

Tracking - the process of running a tracked vehicle such as a bulldozer over an earthen area. A common practice is to run a dozer up and down a constructed, dressed slope before and/or after seeding and mulching.

Turn-out - intermittent discharge point in a ditch (most usually a road ditch) where the ditch channel is diverted from its normal profile and tapered out onto an area suitable for the discharge of the ditch water.

Underdrain - a drain placed beneath the surface of a road.

Vegetated structures - a structure in which living plant materials, cuttings, or transplants have been integrated into the structure.

Water quality - a term used to describe the chemical, physical and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Watershed - the area contained within a divide above a specified point on a stream or lake. Often times called drainage areas, drainage basin or a catchment area.

Wetland - land that has a wet and spongy soil, as a marsh, swamp or bog.

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