NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

HEAVY USE AREA PROTECTION

(Ac.)
CODE 561

DEFINITION

The stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures.

PURPOSE

This practice may be used as a part of a resource management system to support one or more of the following purposes:

- Reduce soil erosion.
- Improve water quantity and quality.
- Improve air quality.
- Improve aesthetics.
- Improve livestock health.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to urban, agricultural, recreational or other frequently and intensively used areas requiring treatment to address one or more resource concerns.

On winter feeding areas where alternative shelter locations for livestock are needed to prevent livestock from over using riparian areas, woody draws or other wooded areas.

CRITERIA

General Criteria Applicable to All Purposes

All planned work shall comply with Federal, Tribal, state, and local laws and regulations.

Measures shall be taken to limit the generation of particulate matter.

Safety of the users shall be incorporated into the design of the heavy use area protection.

Design Load. The design load will be based on the type of traffic, (vehicular, animal, or human) anticipated on the heavy use area. The minimum design load for areas that support vehicular traffic will be a wheel load of 4000 lbs.

Foundation. All site foundations shall be evaluated for soil moisture, permeability, texture and bearing strength in combination with the design load and anticipated frequency of use.

A base course of gravel, crushed stone, other suitable material and/or geotextile shall be provided on all sites with a need for increased load bearing strength, drainage, separation of material and soil reinforcement. NRCS, National Engineering Handbook (NEH), Parts 642 and 643 and AASHTO M-288 (latest edition) provide guidance in quality specification and geotextile selection.

An impervious barrier shall be provided on sites with a porous foundation (high permeability rate) where there is a need to protect ground water from contamination.

Foundation preparation shall consist of removal and disposal of soil and other material that are not adequate to support the design loads.

Frost action and shrink swell potential of soils shall be evaluated for any hard surface treatments (pavement, concrete, etc.).

Surface Treatment. The surface treatment shall meet the following criteria:

Bituminous Pavement. The thickness of the pavement course, the kind and size of aggregate, the type of proportioning of bituminous materials, and the mixing and placing of these materials shall be in accordance with Idaho Department of Transportation criteria for the expected loading.

Concrete. The quality and thickness of concrete and the spacing and size of reinforcing steel

shall be appropriate for the expected loading.

Other Cementitious Materials. Soil cement, roller compacted concrete, and coal combustion by-products (flue gas desulphurization sludge and fly ash) may be used as surface material if designed and installed to withstand the anticipated loads and surface abrasion.

Aggregate. A fine or coarse aggregate surface shall be a minimum of 2-inches thick.

Other. Surfacing materials, such as cinders, tanbark, bark mulch, brick chips, shredded rubber and/or sawdust, shall have a minimum layer thickness of 2 inches.

Structures. All structures shall be designed according to appropriate NRCS standards and specifications and applicable NRCS Engineering Handbook recommendations.

Sprays and Artificial Mulches. When utilizing sprays of asphalt, oil, plastic, manufactured mulches, and similar materials, the manufacturer's recommendations for application shall be incorporated into the design.

Drainage and Erosion Control. Provision shall be made for surface and subsurface drainage, as needed, and for disposal of runoff without causing erosion or water quality impairment. Provision shall be made to exclude unpolluted run-on water from the treatment area. All treatment areas shall be shaped to prevent ponding of water.

Vegetative Measures. Vegetative measures applied in conjunction with this Standard shall only be used on areas where traffic (duration, timing, etc.) can be managed to maintain vegetative cover. Vegetative materials shall be species that are wear resistant, have fast recovery from heavy use and are suited for the site. Liming, fertilizing, soil preparation, seeding, mulching, sodding and vegetation management shall be in accordance with the planned use and appropriate conservation practice standard in the local technical guide. If vegetation is not appropriate, other measures shall be used to accomplish the intended purpose.

Additional Criteria for Areas Utilized by Livestock

The treated area shall extend an appropriate distance from facilities such as portable hay rings, water troughs, feeding troughs, mineral boxes and other facilities where livestock concentrations cause resource concerns.

The Idaho Field Office Technical Guide (FOTG) Conservation Practice Standards Critical Area Planting (342), Fencing (382), Prescribed Grazing (528), Filter Strip (393), or Use Exclusion (472) shall be used as companion practices when needed to meet the intended purpose of the heavy use area protection.

The Conservation Practice Standard Stream Crossing (578) shall be used to design water gaps and stream crossings for cattle.

Provisions shall be made to collect, store, utilize and/or treat manure accumulations and contaminated runoff in accordance with other Idaho FOTG Conservation Practice Standards, i.e., Waste Storage Facility (313), Waste Treatment Lagoon (359), Waste Treatment Strip (635), etc.

Shelters shall be constructed of wood, metal, fiberglass, other durable materials capable of withstanding the expected site specific environmental conditions.

Shelters shall be located on the windward side of the area to be protected and oriented as close to perpendicular to the prevailing winds as possible.

Fabricated shelters for livestock shall be designed to withstand all anticipated loads including internal and external loads, concentrated surface and impact loads, wind, snow and frost or ice pressure and load combinations in compliance with this standard and applicable local building codes.

Roofed Shelters. Snow and wind loads for roofs shall be no less than those specified in ASAE EP288.5, Agricultural Building Snow and Wind Loads.

Fence Shelters. Shelters designed for both wind and drifting snow should be constructed in a semicircle or 90 degree V shape with a solid face to divert drifting snow around the ends of the barrier.

Straight solid (non porous) fence shelters are not suited for areas with drifting snow unless upwind snow trapping measures are installed i.e., shelterbelts, snow fences, etc.

The shelter length should be 10 - 15 times the shelter height for straight shelters. The length of

each wing of a V shelter should be 7 - 10 times the shelter height.

The wind speed will typically be reduced 60-80% in the protected area behind the shelter. The protected area can be estimated by the following formulas:

Straight Wall $A = 4.25\ Ls\ H$

90^0 V Wall $A = (0.5\ Lw^2) + ([2Lw^2]^{0.5}(4.25H)$

Where: A = Protected Area (Ft^2)

Ls = Length of Straight Shelter (Ft)

Lw = Wing Length (Ft)

H = Height of Shelter (Ft)

Fence panels shall be a minimum of 1" by 6" nominal size lumber or 28 gauge galvanized corrugated steel or similarly durable material. Boards or panels shall be attached on the livestock side of the fence. A horizontal rub rail shall be on the windward side when livestock have access to both sides.

Wood members installed in contact with the ground shall be pressure treated.

Straight line porous fence shelters shall be mounted approximately 12 inches above the ground or ground cover height to reduce eddy currents (whirlwinds) and allow the wind to move snow downwind of the protected area, where used for snow protection.

Porous shelters must have approximately 80% solid and 20% open surface. Spacing between boards 1" X 10" – 2 inches apart, 1" X 8" – 1-3/4 inches apart, 1" X 6" – 1-1/2 inches apart.

In areas with variable wind directions, semicircular and 90 degree V shaped shelters provide the best protection. The V or closed end should point in the direction of the winter and early spring prevailing winds.

Additional Criteria for Areas Utilized for Recreation

The treated area shall be conducive to the overall recreation area and aesthetically blend with the general landscape and surroundings.

Plants, landscaping timbers, traffic control measures, wooden walkways, etc. shall be evaluated for effectiveness, aesthetics and accessibility as covered by the Americans with Disabilities Act.

CONSIDERATIONS

When stabilizing heavily used areas, consider adjoining land uses and the proximity to residences, utilities, cultural resource areas, wetlands or other environmentally sensitive areas, and areas of special scenic value.

For heavy use areas conducive to protection by vegetation, consideration must be given to the effect(s) of treading and/or miring. The vegetative species selected should tolerate and persist under heavy use conditions. If practicable, consider increasing the size of the area and/or establishing a rest/non-use period to allow plant recovery and increase vigor.

Heavy use area protection effects on the water budget, especially on volumes and rates of runoff, infiltration, and transpiration due to the installation of less pervious surfaces, should be considered in the selection of surfacing materials.

The transport of sediments, nutrients, bacteria, organic matter from animal manures; oils, chemicals and particulate matter associated with vehicular traffic; and soluble and sediment-attached substances carried by runoff should be considered in selection of companion conservation practices.

Consider using additional air quality conservation practices such as Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603) to impede transport of particulate matter between the source (i.e., heavy use area) and nearby sensitive areas.

If the purpose of the heavy use area protection is improvement of water quality, the heavy use area should be relocated as far away from the waterbody or watercourse as possible. Any work in and/or discharges near streams, wetlands or waterbodies may require a permit from the US Army Corps of Engineers, state water quality (permitting) authority, or local authority.

The size of heavy use areas utilized by livestock is dependent on the landowner's operation including type and number of animal, confinement periods, and/or the intended use. The size of treatment areas can range from 30 square feet per animal in partial-confinement to 400 square feet per animal in total confinement

to 4000 or more square feet for animal exercise areas. Heavy use protection areas should be kept as small as practicable.

When surface treatments such as bark mulch, wood-fiber or other non-durable materials are used for short-term livestock containment areas, consideration should be given to vegetation of the affected area with a cover crop.

For areas with aggregate surfaces that will be frequently scraped, consideration should be given to the use of concrete or cementitious materials to lessen the recurring cost of aggregate replacement.

It is recommended that other buildings, cattle yard areas, feed storage, etc. should be located about 185 feet beyond and downwind from a wind shelter to avoid snow accumulation in those areas. Wind velocities increase 10-20 percent and higher when going around the end of a shelter.

PLANS AND SPECIFICATIONS

Plans and specifications for heavy use area protection shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Plans and specifications shall include construction plans, drawings, job sheets or other similar documents. These documents shall specify the requirements for installing the practice, including the kind, amount and quality of materials to be used.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be prepared for and reviewed with the landowner or operator. The plan shall specify that the treated areas and associated practices are inspected annually and after significant storm events to identify repair and maintenance needs.

The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

For livestock operations, the O&M plan for heavy use areas may be included as a part of the overall waste management plan. Periodic removal and management of manure accumulations will be addressed in the O&M plan.

Fabricated shelters must be inspected periodically and any damaged panels, roofs, etc. will be repaired or replaced to maintain proper function of the facility. Repair and upkeep may include replacement of broken damaged wood slats, fiberglass or corrugated metal panels.

Conservation practices should be implemented that limit particulate matter emission into long-term maintenance plans.