

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSERVATION PRACTICE STANDARD

## HEAVY USE AREA PROTECTION

(Acre)

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.

#### PURPOSES

This practice may be used as a part of a conservation 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.

#### CRITERIA

##### ***General Criteria Applicable to All Purposes***

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

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. Natural Resources Conservation Service (NRCS), National Engineering Handbook (NEH), Parts 642 and 643 (formerly, NEH, Section 20) and AASHTO M-288 (latest edition) provide guidance in quality specification and geotextile selection.

An impervious barrier shall be **installed** on sites with a **permeable** foundation (high permeability rate) **or directly on bedrock**, where there is a need to protect ground water from contamination.

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

**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 Department of Transportation criteria for the expected loading.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

**Concrete.** The quality and thickness of concrete and the spacing and size of reinforcing steel shall be appropriate for the expected loading. [Minimum concrete thickness shall be four inches. When heavy equipment loads are to be resisted and/or where a non-uniform foundation cannot be avoided, an appropriate design procedure incorporating subgrade resistance parameters such as ACI 360 shall be used.](#)

**Other Cementitious Materials.** Soil cement, roller compacted concrete, and coal combustion by-products (flue gas desulfurization 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 2-inches thick. [Aggregate may be clean bank run material. It shall be well graded, free draining, non-friable, durable stone and coarse sand containing no more than 10% fines \(200 sieve\). The maximum particle size shall not exceed two-thirds the thickness of the layer being placed. A properly designed geotextile shall be installed under the gravel surface material before installation.](#)

**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. [A properly designed geotextile shall be installed under these materials.](#)

**Structures.** All structures shall be designed according to appropriate NRCS standards and specifications or 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. [Practices such as diversion, waterways and roof runoff management shall be used to exclude unpolluted run-on water](#)

from the treatment area. All treatment areas shall be shaped to prevent ponding of water.

**Vegetative Measures.** Liming, fertilizing, soil preparation, seeding, mulching, sodding and vegetation management shall be according to [Vermont Construction Specification 52 – Seeding](#). If vegetation is not appropriate, other measures shall be used to accomplish the intended purpose.

#### ***Additional Criteria for Areas Utilized by Livestock***

**AWMS Plan.** [An Agricultural Waste Management System Plan, NRCS Standard 312, shall be developed before a heavy use area protection can be designed for livestock use. The plan shall include decisions by producer to manage animal movement in such a way as to not create another untreated barnyard area.](#)

**Size.** Feedlot or barnyard size will vary depending on the size and weight of the animals that will be using the facility. [A paved area for dairy cattle should range from 35 to 50 square feet per animal. 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.](#)

**Other Practices.** NRCS conservation practice standards Critical Area Planting, Code 342; Fencing, Code 382; Prescribed Grazing, Code 528A; Wastewater Treatment Strip, Code 635; or Use Exclusion, Code 472; [Animal Trails and Walkways, Code 575; Diversion, Code 362; Roof Runoff Management, Code 558](#) shall be used as companion practices, when needed, to meet the intended purpose of the heavy use area protection.

**Waste.** Provisions shall be made to collect, store, utilize and/or treat manure accumulations and contaminated runoff in accordance with NRCS conservation practice standard, Waste Management System, Code 312.

**Concrete.** Concrete shall be installed in accordance to Construction Specification 31 – Concrete. For barnyards and feedlots, the minimum concrete thickness shall be four inches. Where continuous vehicle (weighing in excess of five tons) traffic is anticipated, concrete thickness shall be increased to six inches. W1.4 x W1.4 (10 GA. welded wire fabric) at six inches on center or heavier steel reinforcement shall be installed in the middle of the slab. Fiber mesh reinforcement may be installed in lieu of steel reinforcement only in areas where there is no anticipated heavy equipment traffic. Fiber mesh reinforcement shall be installed in accordance to manufacturer’s recommendations. Concrete slab surface shall be roughened for better traction.

**Curbing.** Curbing shall be installed only in areas necessary to: aid in scraping and removal of manure from the barnyard, to help divert clean water away from barnyard, and/or help divert manure laden runoff to storage or treatment facility. Minimum curb height shall be six inches except at locations where equipment has to cross. In areas where the curbing is used to aid scraping equipment to remove manure, the minimum curb height shall be one foot. Curbing may be constructed of concrete, asphalt, pressure treated wood, earth or other durable material. Curbing shall be designed against scour and over turning forces of manure scraping and handling equipment.

**Walkways.** Walkways to and from feedlots and walkways shall be surfaced or installed in accordance to practice standard 575 - Animals Trails and Walkways.

**Fencing.** Any fencing necessary around feedlots and barnyards to contain livestock or exclude wildlife and people shall be designed and installed in accordance to Practice Standard 382 - Fence.

**Roof Water Management.** To the fullest extent possible all roof water shall be diverted away from agricultural barnyards and feedlots. Roof water management practices shall be installed in accordance to Practice Standard 558 - Roof Runoff Management.

### ***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 practical, 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 manure, oils and chemicals associated with vehicular traffic, and soluble and sediment-attached substances carried by runoff should be considered in selection of companion conservation practices.

If the purpose of the heavy use area protection is improvement of water quality, the heavy use area should be (re)located 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 animals, 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.

#### **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 operator [for the heavy use area protection and any other associated conservation practices](#) and reviewed with the landowner. [The owner shall sign the O&M plan to indicate an understanding of the requirements and commitment to operate and maintain this practice as specified.](#) 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.

#### **REFERENCES**

[Using All-Weather Geotextile Lanes and Pads, Janni, Funk, & Holmes. Midwest Plan Service, AED 45, July 1999.](#)