

**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

- 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.

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. 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 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.

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 North Carolina 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 minimum 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 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. 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. Liming, fertilizing, soil preparation, seeding, mulching, sodding and vegetation management shall be according to 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.

NRCS 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.

Provisions shall be made to collect, store, utilize and/or treat manure accumulations and contaminated runoff in accordance with other NRCS conservation practice standards.

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 (code 380) or Herbaceous Wind Barriers (code 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. Tables 1 - 4 provide recommendations for evaluating the space requirements. 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 and reviewed with the landowner or operator.

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

TABLE 1 – RECOMMENDED SPACE REQUIREMENTS – BEEF CATTLE¹
(Square Feet Per Head)

TYPE OF AREA	COW-CALF	PRE-CONDITIONING	FINISHING 600LB. - MARKET
Feeding Lot:			
Surfaced	60 – 75	40 – 50	50 – 60
Unsurfaced (w/ mounds)	-	150 – 300	250 – 500
Unsurfaced (w/o mounds)	350 – 800	300 – 600	400 – 800
Mound	40 – 50	20 – 25	30 – 35
Open Front Shelter	25 – 30	15 – 20	20 – 25
Shade	-	-	20 – 25
Handling Facilities:			
Total area	60 – 80	40 – 50	50 – 60
Holding pen	20 – 25	12 – 15	15 – 20
Crowding pen	12 – 15	6 – 8	8 – 12

¹Source: Midwest Plan Service, Structures and Environmental Handbook, MWPS –1, June 1987 revision, Planning 511.1

Midwest Plan Service, Structures and Environment Handbook, offers some excellent suggestions for beef cattle planning livestock heavy use areas. The concept of “mounding” which is used extensively on operations in the Western U.S. is discussed in Chapter 511.

TABLE 2 – RECOMMENDED SPACE REQUIREMENTS – DAIRY CATTLE²
(Square Feet Per Head)

TYPE OF AREA	AGE OF DAIRY ANIMALS IN MONTHS				
	3 – 4	5 – 8	9 – 12	13 – 15	16 - 24
Resting Area	20	25	28	32	40
Surfaced Outside Lot	30	35	40	45	50

²Source: Livestock Waste Management Handbook, Volume 1, 1983 CRC Press, Overcash, Humenik, Miner

TABLE 3 – RECOMMENDED SPACE REQUIREMENTS – SHEEP³
(Square Feet Per Head)

TYPE OF AREA	TYPE OF ANIMAL			
	Rams 180 - 300 lbs.	Dry Ewes 150 - 200 lbs.	Ewes with Lambs	Feeder Lambs 30 - 110 lbs.
Soil, Unsurfaced	25 – 40	25 – 40	30 – 50	20 – 30
Surfaced	16	16	20	10

³Source: Midwest Plan Service, Structures and Environment Handbook, MWPS-1, 11th Edition, 1983, Planning 513.1

TABLE 4 – RECOMMENDED SPACE REQUIREMENTS – HORSE⁴
(Square Feet Per Head)

TYPE OF AREA	NUMBER OF HEAD		
	Minimum ⁴	High Density ⁵	Low Density ⁵
Soil, Unsurfaced	500	1000	2500

⁴Source: Hubbard Feeds, Inc.

⁵Source: USDA-NRCS, Utah

**NATURAL RESOURCES CONSERVATION SERVICE
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Documentation

The following documentation shall be recorded as part of the planning and installation of Heavy Use Area Protection measures:

- Purpose of HUAP
- Type of livestock operation
- Number of animals accessing the HUAP
- Average weight of the animals
- Area of the HUAP
- Texture of the foundation soils (from soils investigation)
- Type of surfacing material used
- Thickness of surfacing material
- Manufacturer and grade of geotextile used under the surfacing material
- Statement of the adequacy of runoff management measures
- Statement that the practice meets NRCS standards and any specifications developed for the job
- Statement is to be signed and dated by the person with appropriate job approval authority for the specific installation