**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. Typical uses are animal concentration areas such as barnyards, feedlots, and exercise lots, and compost facilities with improved surfaces.

The heavy use area shall be part of a planned conservation system.

The practice does not apply to stacking of manure or other agricultural wastes. Waste Storage Facility (313) or Waste Utilization (633), applies to these situations.

## CRITERIA

### General Criteria Applicable to All Purposes

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

**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.

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

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 or soil reinforcement. Natural Resources Conservation Service (NRCS) National Engineering Handbook (NEH), Parts 642 and 643 (formerly, NEH, Section 20), Penn Dot 408 and AASHTO M-288 (latest edition) provide guidance in quality specification and geotextile selection.

Where there is a need to protect ground water from contamination an impervious barrier shall be provided on sites with a porous foundation (permeability greater than 6.0 in/hr). Extra care shall be taken in areas of karst geology, in special protection watersheds (High Quality and Exceptional Value), and Nutrient Impaired watersheds.

**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 PA 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 as per Slabs on Grade, Waste Storage Facility (313).

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. Aggregate shall be Driving Surface Aggregate (DSA) unless the designer determines that a different material or gradation will withstand anticipated surface use and surface abrasion. The thickness shall be adequate to withstand anticipated design loads, operation, and maintenance. Minimum aggregate thickness shall be 4", however, less may be used as a surface topping.

Sprays and Artificial Mulches. When utilizing sprays of asphalt, oil, plastic, manufactured mulches, and similar materials, follow the manufacturer's recommendations for design requirements.

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. Such treatments shall be limited to areas that do not receive frequent or intensive livestock or equipment traffic.

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

**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 treated area. All treated areas shall be shaped to prevent ponding of water.

**Vegetative Measures.** Where appropriate, stabilize all areas disturbed by construction with vegetation as soon as possible after construction. Refer to Conservation Practice Standard, Critical Area Planting (342). If vegetation is not appropriate for the site, use other measures such as surface treatment, wastewater treatment strips, filter areas, or vegetative buffer areas to stabilize the area.

**Additional Criteria for Livestock Areas**

Planned concentrated livestock areas, as a part of a grazing system, shall be included in the overall waste management system plan (or CNMP) component of the conservation plan. All grass areas of the concentrated livestock heavy use areas shall meet the criteria for Prescribed Grazing (528).

The heavy use area shall be an appropriate size to accommodate the type, size and number of livestock and meet the operator's needs and purposes of the practice. Sizing guidelines in FOTG Section III (ACA Exhibit 1) can be used as a guide. In all cases a non-vegetated heavy use area shall be kept as small as possible.

Runoff from roofs and other upslope areas shall be diverted away from the heavy use area to the fullest extent possible.

Conservation practice standards Critical Area Planting (342); Fencing (382); Wastewater Treatment Strip (635): Constructed Wetland (656); Use Exclusion (472); Animal Trails and Walkways (575); Diversions (362); Waste Storage Facility (313), Prescribed Grazing (528), and Roof Runoff Structure (558) or others shall be used as companion practices, when needed to meet the following criteria and the intended purpose of the heavy use area protection.

Paved Surface Treatment Areas.

These paved treated areas include asphalt, concrete, other cementitious materials, aggregates, or other similar inorganic materials. These are permanent sites or sites that are used on a reoccurring or regular basis throughout the year or used from year to year.

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

The use of non-cementitious surface treatment shall be limited to low intensity animal use applications. If open, clean aggregate surfaces are used; provide at least one foot of compacted soil between the open, clean aggregate and bedrock or the seasonal high water table.

Provisions shall be made to collect, store, utilize and/or treat manure accumulations and contaminated runoff in accordance with other NRCS conservation practice standards. Manure must be collected on a regular basis. Runoff shall be directed to a Waste Storage Facility (313), a Wastewater Treatment Strip (635), Waste Treatment (629), or a Constructed Wetland (656).

Unpaved Surface Treatment Areas

Under the following special conditions an unpaved surface may be used for a concentrated livestock area when associated with an adjacent vegetative grass buffer area:

- Use unpaved concentrated livestock area site no more than 150 days in a year
- Use the same unpaved concentrated livestock area site no more than once every 4 years, unless soil tests phosphorus levels show that more frequent use is possible
- Provide a 150' flow length vegetative buffer located down-slope from the unpaved concentrated livestock area and the same width on the contour as the unpaved concentrated livestock area. In lieu of the 150', Pa 635 and Design Guide 5 may be used to design a specific flow length.
- Ensure that runoff leaves the unpaved concentrated livestock area site and enters the vegetative buffer as sheet flow, not concentrated flow. Protect the buffer from damage from livestock.
- Locate the unpaved concentrated livestock area site on average land slopes between 1% and 8% and locate the vegetative buffer area on average land slope between 1% and 15%.
- Locate the unpaved concentrated livestock area outside of natural or constructed drainage-ways, at least 100' from neighboring property lines, wells, springs, wetlands, karst basin intake areas, and ponds, etc.
- Locate the vegetative buffer area outside of natural or constructed drainage-ways, at least 50' from neighboring property lines, streams, 100-yr floodplains, wells, springs, wetlands, karst basin intake areas, and ponds, etc.
- The seasonal high water table must be no closer than 18" from the ground surface for the unpaved concentrated livestock area and 1' from the ground surface for the vegetative buffer area
- Locate the unpaved concentrated livestock area at least 100' from down-slope subsurface drain lines
- Locate the unpaved concentrated livestock area and vegetative buffer area on soils with a permeability of less than 6 "/hr in the upper 40 inches of the soil profile
- Locate on soils with convex slopes. Maintain positive slopes within the unpaved concentrated livestock area.
- Accumulated manure and feed must be removed from the unpaved concentrated livestock area after use and vegetation established for the next growing season.
- Limit each unpaved concentrated livestock areas to maximum 50 AU and 1 acre in size.
- Dimension the unpaved concentrated livestock area with a maximum flow length to width ratio of 1L to 2 W.

Conservation practice standards Critical Area Planting (342); Wastewater Treatment Strip (635): Constructed Wetland (656); Diversions (362); Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629) or others shall be used as companion practices, when needed to meet the following criteria and the intended purpose of the heavy use area protection.

**Additional Criteria for Managing Seepage and Runoff from Silage Leachate**

This standard covers the collection, storage, and treatment of silage leachate, but does not include new construction or repair of the silage storage structure or cover.

Use source control to reduce leachate volume and solids loading to the filter area. Ensure that ground water and surface water do not enter the silage. Premature harvest could increase leachate volume. Protect the silage with a tight fitting cover. Cut the silage face with a clean, safe, leading cut slope. Prevent water runoff from silage covers from contaminating feed. Regularly clean or sweep waste feed off of the concrete pad and dispose properly.

Uncontrolled flows thru cracks in the floor of the silage storage area shall be collected for storage or treatment or otherwise prevented.

Control the runoff flow from the staging area pad by using storage or spreading on a grass treatment area. Use low-flow collection devices, dilution, storage, or other acceptable methods to control fermentation flow to maintain vigorous vegetation in the grass treatment area. Spreading the runoff on a grass treatment area may be used if the following conditions are met:

- The fermentation flows have been controlled and prevented from burning the grass in the treatment area.
- Control all water that comes in contact with the feed.
- Use a holding basin (with a dewatering style outlet) and screen box with riser to capture runoff and trap feed solids. Size the basin to detain 50% of the runoff of a 2-yr 15-min storm (cu ft volume equal to 5% of the sq ft lot size).
- Provide 1 acre of grass treatment area for each one acre of bunk silo storage, with a flow length to width ratio of 1L to 2W.
- Maintain a minimum distance of 100' from surface water, 100-yr floodplain, wetlands, sinkholes, etc. as measured from the bottom of the grass treatment area.
- Provide sheet flow for the runoff entering the grass treatment area.

For sites that do not meet the above listed criteria, refer to the Pennsylvania NRCS conservation practice standard for Waste Storage Facility, (313), a Wastewater Treatment Strip (635), Waste Treatment (629), or a Constructed Wetland (656).

**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, safety, and also 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.

The use of properly designed and constructed earthen animal mounds (see reference) could provide stabilization of unpaved concentrated livestock areas when lot slope or soil type prevent proper drainage. Ensure that runoff from earthen mounds enters the vegetative buffer as sheet flow, not concentrated flow.

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.

Heavy use areas may be intensely used by animals, people or both. Consider the safety of the users both human and animal during the design. Avoid slippery surfaces, sharp corners or surfaces and structures that might entrap users.

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

Consider using additional conservation practices to impede seepage from silage bags from reaching nearby sensitive areas. Select appropriate locations for silage bags. Locate silage bags to avoid ponding of surface water. Regularly remove waste feed from silage bag staging 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. Concentrated livestock 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 surfaces that will be frequently scraped, consideration should be given to the use of concrete to lessen the recurring cost of aggregate replacement.

For vegetated areas associated with livestock heavy use areas, give consideration to paddock management, including frequency of rotation to assure maintenance of vegetation, avoidance of soil compaction, prevention of excess nutrient accumulation by limiting the duration, and limiting the use of paddocks while soils are wet.

Use soil test recommendations to determine lime and fertilizer applications for the establishment of vegetation.

To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Conservation Practice Standards Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603) to mitigate offsite effects.

**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 detail the level of repairs needed to maintain the effectiveness and useful life of the practice. For livestock operations, O&M plan for heavy use areas shall be included as a part of the overall waste management plan.

Where applicable, the O&M plan shall include provisions to limit particulate matter emissions from heavy use areas.

For gravel paved surface treatment areas and other non-concrete surfaces, the regular repair, placement, and compaction of the non-concrete surface materials shall be addressed.

The plan shall specify that treated non-livestock areas and associated practices are to be inspected at least annually and after significant storm events to identify repair and maintenance needs.

Unpaved concentrated livestock areas and associated practices shall be inspected at least semi-annually and after significant storm events. Periodic removal and management of

manure accumulations will be addressed in the O&M plan.

For silage leachate and runoff control sites the O&M plan shall be developed consistent with the purposes of the practice, intended life of the components, safety requirements, and the criteria for the design. At a minimum, the plan shall include:

- Handling and disposal practices for waste feed.
- Handling and disposal practices for snow associated with the feed storage area.
- Frequency for cleaning the floor of accumulated feed.
- Intervals for removing accumulated solids from the system components.
- Proper treatment and disposal practices for leachate and contaminated runoff.
- Schedule of inspections.

For vegetated areas associated with livestock heavy use areas, O&M inspections are an ongoing part of paddock management. The O&M plan shall include guidance on paddock management.

Other items to include are:

- Soil test the paddocks every other year and apply amendments as recommended.
- Spot seed, as needed, to maintain a dense sod.
- Mow as needed to control undesirable vegetation.
- Remove forage and growth material as frequent as possible to maintain acceptable soil nutrient levels.

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