

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**HEAVY USE AREA PROTECTION**

**Code 561  
(sq. ft.)**



**DEFINITION**

Used to stabilize a ground surface that is frequently and intensively used by people, animals or vehicles.

**PURPOSES**

- Provide a stable, non-eroding surface for areas frequently used by animals, people or vehicles
- Protect and improve water quality

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to all land uses where a frequently or intensively used area requires treatment to address one or more resource concerns.

**CRITERIA**

Plan and design heavy use areas to comply with Federal, state, and local laws and regulations.

Evaluate and avoid or minimize impact to cultural resources, wetlands and Federal and state protected species to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

**GENERAL CRITERIA APPLICABLE TO ALL PURPOSES**

**Design load.** Base the design load on the type and frequency of traffic, (vehicular, animal, or human) anticipated on the heavy use area.

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

**Foundation.** Evaluate all site foundations to ensure that the presumptive bearing capacity of the soil meets the intended design load and frequency of use.

Where necessary, prepare the foundation by removal and disposal of materials that are not adequate to support the design loads.

Use a base course of gravel, crushed stone or other suitable material, geotextile or a combination of materials on all sites that need increased load bearing strength, drainage, separation of material and soil reinforcement. Refer to Natural Resources Conservation Service (NRCS), National Engineering Handbook (NEH), Part 642 Design Note 24, Guide for Use of Geotextiles, for guidance on geotextile selection.

If there is the potential for ground water contamination from the heavy use area, select another site or provide an impervious barrier. Make provisions to treat contaminated surface runoff from the impervious area.

**Surface treatment.** Select a surface treatment that is stable and appropriate to the purpose of the heavy use area.

Design a geotextile fabric to be installed under all treatment areas where needed to protect the integrity of the treatment materials. Specify the geotextile fabric to meet the minimum requirements for Class IV geotextiles as shown in Table 1 Requirements for Woven Geotextiles or Table 2 Requirements for Nonwoven Geotextiles of NRCS Material Specification 592, Geotextile.

Specify the geotextile fabric to be anchored in the toe trenches of stream crossings and watering ramps. In the upstream toe of stream crossing, specify the fabric to be back-lapped over its own anchored trench. Design a minimum overlap of geotextile panels without sewing to be 18 inches at all joints.

Surface treatments must meet the following requirements according to the material used.

**Concrete.** Design slabs-on-ground subject to distributed stationary loads, light vehicular traffic, or infrequent use by heavy trucks or agricultural equipment in accordance with American Concrete Institute (ACI) *Guide for the Design and Construction of Concrete Parking Lots (ACI 330R)*. Design slabs-on-ground subject to regular or frequent heavy truck or heavy agricultural equipment traffic in accordance with ACI *Guide to Design of Slabs-on-Ground (ACI 360R)*. Design liquid-tight slabs in accordance with ACI *Code Requirements for Environmental Concrete Structures, Slabs-on-Soil (ACI 350, Appendix H)*.

Design concrete structures in accordance with NRCS National Engineering Manual (NEM), Part 536, *Structural Engineering*.

**Bituminous Pavement.** Refer to AASHTO *Guide for Design of Pavement Structures* or the applicable Florida Department of Transportation's specification for design criteria for bituminous concrete paving.

In lieu of a site specific design, for areas that will be subject to light use, pave with a minimum of 4 inches of compacted bituminous concrete over a subgrade of at least 4 inches of well compacted gravel. Use bituminous concrete mixtures commonly used for road paving in the area.

**Other Cementitious Materials.** Cementitious materials such as soil cement, agricultural lime, roller compacted concrete, and coal combustion by-products (flue gas desulfurization sludge and fly ash) can be used to provide a durable, stable surfacing material. Based on the properties of the surface material, develop a site specific mix design with compressive strengths necessary for the expected use and loading on the heavy use area. Select materials that are non-toxic and that have chemical properties that are compatible with the intended use.

**Aggregate.** Design aggregate surfaces for expected wear and intended use. In lieu of a site-specific design for areas that will be subject to light non-vehicular use, install a minimum combined thickness for aggregate surfacing and base course of 6 inches for livestock and 4 inches for other applications.

For other applications, use other appropriate methodology to design aggregate thickness.

**Mulches.** Use a minimum layer thickness of 6 inches for materials such as limestone screenings, asphalt millings, cinders, tanbark, bark mulch, brick chips, or shredded rubber. Mulches are not recommended for livestock or vehicular applications.

**Vegetation.** Select vegetation that can withstand the intended use. Establish the vegetation in accordance with the criteria in NRCS CPS Critical Area Planting, Code 342 or the appropriate State reference.

**Other.** Other materials can be used if they will serve the intended purpose and design life.

**Structures.** When a roof is needed to address the resource concern, use NRCS CPS Roofs and Covers, Code 367. For non-waste applications, design structures according to the accepted engineering practice.

**Drainage and erosion control.** Include provision in the design for surface and subsurface drainage, as needed. Include provisions for disposal of runoff without causing erosion or water quality impairment. To the extent possible, prevent surface runoff from entering the heavy use area. Shape treatment areas to prevent ponding of water.

Stabilize all areas disturbed by construction as soon as possible after construction. Refer to the criteria in Florida NRCS conservation practice standard, Critical Area Planting, Code 342 for establishment of vegetation. If vegetation is not appropriate for the site, use the criteria in Florida NRCS conservation practice standard, Mulching, Code 484 to stabilize the disturbed area.

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

Include all areas where surfaces are disturbed by livestock congregation. This includes feeding areas, portable hay rings, water troughs, feeding troughs, mineral boxes and other facilities where livestock concentrations cause resource concerns.

Use Florida NRCS conservation practice standards, Trails and Walkways, Code 575, Critical Area Planting, Code 342, Fence, Code 382, Prescribed Grazing, Code 528A, Filter Strip, Code 393, Stream Crossings, Code 578, and/or Use Exclusion, Code 472, shall be used as companion practices, when needed, to meet the intended purpose of the heavy use area protection. Include heavy use areas that are grazed in the annual grazing plan.

Include other Florida NRCS conservation practice standards to collect, store, utilize, or treat manure and contaminated runoff where contaminated runoff will cause a resource concern.

**Treatment area.** For facilities such as watering troughs, portable hay rings, feeding troughs, mineral boxes, or other facilities where concentrated livestock impacts cause resource concerns, provide heavy use protection for an area that extends outside of the entire perimeter used by the animals for a minimum distance of 10 feet for large animals such as cows, horses, etc. and 6 feet for small ruminants such as goats and sheep that are managed separately from larger animals.

All trails and walkways shall be fenced to keep the livestock within the limits of trails and walkways. Construct the animal trails and walkways in accordance with Florida NRCS conservation standard, Trails and Walkways, Code 575.

**Protection.** Install fencing as necessary to control all animal traffic. Construct fencing in accordance with Florida NRCS conservation practice standard, Fence, Code 382.

#### **Additional Criteria for Areas Utilized for Recreation**

The Americans with Disabilities Act of 1990 (ADA) requires recreation areas that are used by the public to be accessible to people with disabilities. Address accessibility requirements for new construction and when existing facilities are being altered.

### **CONSIDERATIONS**

Heavy use areas can have a significant impact on adjoining land uses. These impacts can be environmental, visual, and cultural. Select a treatment that is compatible with adjoining areas. Consider such things as proximity to neighbors, sensitive areas, and the land use where the stabilization will take place.

Vegetated heavy use areas may need additional materials such as geogrids or other reinforcing techniques or planned periods of rest and recovery to ensure that vegetative stabilization will succeed.

Consider the safety of the users during the design. Avoid slippery surfaces, sharp corners, or surfaces and structures that might entrap users. For heavy use areas used by livestock avoid the use of sharp aggregates that might injure livestock.

For livestock heavy use areas, provide positive drainage to prevent ponding of water. Such wet areas can have adverse effects on animal health and comfort.

Paving or otherwise reducing the permeability of the heavily used area can reduce infiltration and increase surface runoff. Depending on the size of the heavy use area, this can have an impact on the water budget of the surrounding area. Consider the effects to ground and surface water.

Installation of heavy use area protection on muddy sites can improve animal health. Mud transmits bacterial and fungal diseases and provides a breeding ground for flies. Hoof suction makes it difficult for cattle to move around in muddy areas. In addition, mud negates the insulation value of hair coat and the animals must use more energy to keep warm. As temperatures fall, animal bunching may occur, which can reduce or eliminate vegetative cover and lead to erosion and water quality concerns.

When using coarse aggregate for heavy use area protections for livestock, consider using a hoof contact zone or alternative surfacing method over the rock.

To reduce the negative water quality impact of heavy use areas, consider locating them as far as possible from waterbodies or water courses. In some cases, this may require relocating the heavily used area rather than just armoring an area that is already in use.

To the extent possible, maintain a 2 foot separation distance between the bottom of the surface material and the seasonal high water table or bedrock.

Surface erosion can be a problem on large heavy use areas that do not use a hard surface such as concrete. In these cases the designer may need to include measures on the area that reduce the flow length of runoff to reduce erosion problems.

To reduce the potential for air quality problems from particulate matter associated with a heavy use area, consider the use of Florida NRCS conservation practice standards, Windbreak/Shelterbelt Establishment, Code 380, Herbaceous Wind Barriers, Code 603, Dust Control from Animal Activity on Open Lot Surfaces, Code 375, or Dust Control on Unpaved Roads and Surfaces, Code 373 to control dust from heavy use areas.

Consider ways to reduce the size of the heavy use area as much as possible. This may require changes in how the livestock are managed but in the long run may result in less maintenance and a more efficient operation.

For areas that will need to be cleaned frequently by scraping, loose aggregate or other non-cementitious materials may not be the best choice. Consider a more durable surface such as concrete.

Consider using concrete around livestock watering troughs or tanks in lieu of gravel.

## **PLANS AND SPECIFICATIONS**

Prepare plans and specifications for Heavy Use Area Protection that describe the requirements for installing the practice according to this standard. As a minimum include in the plans and specifications the following:

1. A plan view showing the location and extent of the practice. Include the location and distances to adjacent features and known utilities.
2. Lengths and width of area to be treated.
3. Typical section(s) showing the type and required thickness of paving or stabilization materials including any base course requirement or reinforcement if concrete is used.
4. Cut and fill slopes where applicable.
5. Drainage areas and structure requirements.

6. A grading plan, as needed.
7. Where appropriate, plans for required structural details.
8. Method and materials used to stabilize areas disturbed by construction.
9. Construction specifications with site specific installation requirements.
10. Location of utilities and notification requirements.

### **OPERATION AND MAINTENANCE**

Prepare an operation and maintenance (O&M) plan for the operator. The O&M plan shall include, but not limited to, the following items as applicable.

1. Inspect the heavy use area periodically and immediately following significant rainfall events and immediately repair any damages.
2. Scrape surface as needed to remove excess manure and/or sediment and dispose of it an agronomic manner.
3. Maintain surfaces in good condition, which includes periodic grading and addition of surface material where and when necessary. Prevent surface ponding by localized grading or addition of surface materials to remove depressions. Road base-course rock may be required to stabilize the road foundation. Remove unstable materials and rebuild heavy use area using stable material.
4. Maintain suitable vegetative cover, mulches, and other covering installed for erosion protection. Maintain adjacent grass filter areas to their designed dimensions. Limit traffic with fencing or barriers, where needed.
5. Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.
6. Immediately repair any vandalism, vehicular or livestock damage.
7. Inspect areas surrounding the HUA after each major runoff event and repair promptly as needed.
8. Control livestock access to water courses in or around the HUA.

### **REFERENCES**

Americans with Disabilities Act of 1990

AASHTO guide for Design of Pavement Structures

American Concrete Institute. 2006. Design of Slabs-on-Ground. ACI Standard 360R-06. Farmington Hills, MI.

Florida NRCS Conservation Practice Standards

Critical Area Planting, Code 342

Dust Control from Animal Activity on Open Lot Surfaces, Code 373

Fence, Code 382

Filter Strip, Code 393

Herbaceous Wind Barriers, Code 603

Manure Transfer, Code 634

Mulching, Code 484

Prescribed Grazing, Code 528A

Roofs and Covers, Code 367

Stream Crossings, Code 578

Trails and Walkways, Code 575

Use Exclusion, Code 472

Windbreak/Shelterbelt Establishment, Code 380

**General Manual (GM)**

Title 420-Part 401;

Title 450-Part 401,

Title 190-Parts 410.22 and 410.26

**National Cultural Resources Procedures Handbook (NCRPH)**

**National Food Security Act Manual (NFSAM)**

**National Environmental Compliance Handbook (NECH)**

**National Engineering Handbook (NEH), Part 642**

Material Specification 592, Geotextile

**National Engineering Manual (NEM), Part 563, Structural Engineering**

**National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6**