

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

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

CONDITIONS WHERE PRACTICE APPLIES

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

CRITERIA

General Criteria Applicable to All Purposes

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).

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

Foundation. Evaluate all site foundations for soil moisture, permeability, texture and bearing strength in combination with the design load and anticipated 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 other suitable material and/or geotextile on all sites with a need for 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.

On sites with a porous foundation (high permeability rate), with a need to protect ground water from contamination, provide an impervious barrier.

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

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

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.

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. Compact the surface with a heavy steel wheel roller until the bituminous concrete is thoroughly compacted and roller marks are eliminated.

Design the pavement surface to be a minimum of 18 inches above the high water table. Design all areas to be paved to have a minimum of 6 inches of base course consisting of gravel, crushed stone, or other suitable materials. The material in place may be used as the base course if adequate.

Concrete. Design the thickness and compressive strength of concrete according to the expected loading and use. Design the concrete to be placed over a minimum 6 inch thick layer of granular material. Specify the granular material to be compacted to a density equal to at least 90 percent of the maximum density obtained in compaction tests of the fill performed by Procedure A, ASTM D 1557. For installations where it is necessary to limit the permeability of the concrete, refer to Florida NRCS conservation practice standard Waste Storage Facility, Code 313 and American Concrete Institute, ACI 360R-06, Design of Slabs-on Grade

Other Cementitious Materials. Other cementitious materials such as soil cement, roller compacted concrete, and coal combustion by-products (flue gas desulfurization sludge and fly ash) may be used as surface material to provide a stable surfacing material. Develop site specific mix designs based on properties of the material with compressive strengths necessary for the expected use and loading on the heavy use area.

Aggregate. Design fine or coarse aggregate surfaces with a minimum thickness of 4 inches. If the surface will be compacted, choose a well graded aggregate.

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

Other Treatment. Design surfacing materials such as cinders, tanbark, bark mulch, cypress mulch, brick chips, shredded rubber and/or sawdust to have a minimum layer thickness of 4 inches.

Structures. Design any structures associated with the heavy use area including roofs according to appropriate NRCS standards. Where NRCS standards do not exist, design structures according to the requirements of the particular construction material and accepted engineering practice. Base environmental design loads for buildings associated with heavy use areas on criteria in ASCE 7 – Minimum Design Loads for Buildings and Other Structures: ASCE/SEI 7-05.

Specify all lumber in contact with the ground, litter, manure, or compost to be pressure-treated in accordance with ASTM D 1760. Specify all metal used in the structure to be galvanized or otherwise protected from corrosion.

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 runoff from entering the heavy use area. Shape treatment areas 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 Florida NRCS

conservation practice standard Critical Area Planting, Code 342.

Use vegetative cover to stabilize on areas where traffic can be managed to maintain vegetative cover. Specify vegetative materials used to be grass species or other plant materials that are wear resistant and have fast recovery from heavy use and/or suitable to the site. Specify liming, fertilizing, soil preparation, seeding, mulching, sodding and vegetation management in accordance with to the planned use and appropriate conservation practice standard in the local technical guide.

If vegetation is not appropriate, other method of stabilizing the heavy use area shall be used.

Runoff treatment. Control surface runoff to minimize overland flow onto and through the heavy use area. Do not discharge runoff from the site directly into surface water bodies. Treat runoff from heavy use areas for livestock in accordance with the applicable Florida NRCS conservation practice standards. Treat runoff from other heavy use areas in accordance with local and state criteria.

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, Animal 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 provisions to collect, store, utilize and/or treat manure and contaminated runoff in accordance with the applicable Florida NRCS conservation practice standards. Manage heavy use area protection from animal confinement to minimize the degradation of ground and surface water.

Treatment area. Extend the treated area a minimum of 10 feet outside the limits of facilities such as watering facilities, portable hay rings,

feeding troughs, mineral boxes, or other facilities where concentrated livestock impacts cause resource concerns.

For animal trails and walkways the minimum treatment width shall be 10 feet (cattle only). A width of 15 feet is generally used for cattle/vehicle type walkways. All trails and walkways shall be fenced.

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

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

Heavy use area in recreation areas that are accessible to the public must meet the requirements of the Americans with Disabilities Act.

CONSIDERATIONS

Heavy use areas can have a significant impact on adjoining land uses. These impacts can be environmental, visual, and cultural. Care should be taken when selecting the type of treatment to ensure that it is compatible with adjoining areas. Consider such things as proximity to neighbors, sensitive areas and the land use where the stabilization will take place. Stabilization techniques used in a cattle feeding area may not be appropriate for a recreation area.

By its very nature, a heavy use area will be subject to intensive use. If vegetation will be part of the stabilization technique, consider the durability of the vegetation. Choose plant species that can withstand the expected use. Additional techniques such as geogrids, other reinforcing techniques or planned periods of rest and recovery may need to be employed to ensure that vegetative stabilization will succeed.

Heavy use areas will 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. For heavy use areas used by livestock avoid the use of sharp aggregates that might injure livestock hooves.

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

Heavy use area protection often involves paving or otherwise reducing the permeability of the heavily used area. This 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. During the planning and design, consider the effects to ground and surface water.

Heavy use areas are places where animals, people or vehicles are concentrated. The resulting manure, sediments, bacteria, petroleum products and trash that might accumulate on the heavy use area can result in degraded runoff water quality. During planning and design consider how these pollutants will be handled to reduce offsite impacts.

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.

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 heavy use areas, consider the use of NRCS Conservation Practice Standards Windbreak/Shelterbelt Establishment (380), Herbaceous Wind Barriers (603) or the use of palliative treatments such as lignosulfonate, synthetic polymers, organic oils, or chloride compounds to control dust from bare heavy use areas.

Heavy use areas for livestock can vary widely in size depending on how the operator manages his livestock. Because heavy use areas can be expensive to construct and maintain, a significant consideration should be 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.

When surface treatments such as bark mulch, wood-fiber or other non-durable materials are used for short-term livestock containment areas, consider vegetating the affected area with a cover crop.

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.

Byproducts from coal fired power plants such as fly ash and sludge from scrubbers can vary significantly. Therefore, their toxicity and cementation characteristics should be known to ensure they are compatible with the intended use.

Where heavy use areas are vegetated for protection, consider the number of animals and time confined. Consider sizing the area so that the selected vegetation can be maintained in vigorous condition and not destroyed by animal traffic. Account the amount of waste deposited on the vegetated heavy use areas in the nutrient management plan.

This practice may affect surface and groundwater caused by introduction of fertilizer for vegetated areas, and oils and chemicals associated with concrete and asphalt placement and other construction activities.

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.
2. Where appropriate, cross-sections showing the type and required thickness of stabilization materials.
3. Where appropriate, plans for required structural details.
4. Where appropriate, vegetation establishment requirements.
5. Construction specifications that describe in writing site specific installation requirements for the heavy use area protection.

6. Location of utilities and notification requirements.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance (O&M) plan for the operator. The minimum requirements to be addressed in the O&M plan are:

1. Periodic inspections, especially immediately following significant rainfall events.
2. Prompt repair or replacement of damaged components especially surfaces that are subjected to wear or erosion.
3. For livestock heavy use areas include requirements for the regular removal and management of manure.
4. Where vegetation is specified, periodic mowing, fertilization and control of vegetation.

REFERENCES

Americans with Disabilities Act
ASCE/SEI 7-05
ASCE 7 – Minimum Design Loads for Buildings
and Other Structures: ASCE/SEI 7-05
ASTM D 1557, D 1760

AASHTO guide for Design of Pavement
Structures
Florida NRCS Conservation Practice Standards
Access Control, Code 472
Animal Trails and Walkways, Code 575
Critical Area Planting, Code 342
Fence, Code 382
Filter Strip, Code 393
Herbaceous Wind Barriers, Code 603
Manure Transfer, Code 634
Prescribed Grazing, Code 528A
Stream Crossings, Code 578
Vegetated Treatment Area, Code 635
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 Planning Procedures Handbook
(NPPH) Florida Supplements to Parts 600.1
and 600.6
NRCS, 1991, Guide for the Use of Geotextiles,
Design Note Number 24. Washington, DC