

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

HEAVY USE AREA PROTECTION

(sq. ft.)

CODE 561

DEFINITION

Heavy Use Area Protection is used to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles.

PURPOSE

Heavy Use Area Protection is used:

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

General Criteria for 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.

Foundation. Evaluate the site foundation 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, 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, Part 642; Design Note 24, Guide for Use of Geotextiles; or other State-approved reference for 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. Surface treatments must meet the following requirements according to the material used.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [Field Office Technical Guide](#).

**NRCS, Georgia
October 2016**

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 Concrete Pavement. Refer to AASHTO Guide for Design of Pavement Structures or the applicable State highway department'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 desulphurization 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 Agricultural Engineering Note 4, *Earth and Aggregate Surfacing Design Guide*, or other appropriate methodology to design aggregate thickness.

Mulches. Use a minimum layer thickness of 6 inches for materials such as limestone screenings, 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 GA 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. Select materials that are non-toxic and that have chemical and physical properties that are compatible with the intended use.

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

Drainage and Erosion Control. Include provisions 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 water from entering the heavy use area.

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

Additional Criteria for Livestock Heavy Use Areas

Include other practices to collect, store, utilize, or treat manure and contaminated runoff where contaminated runoff will cause a resource concern.

Additional Criteria for Recreation Areas

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 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.

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.

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.

To reduce the potential for air quality problems from particulate matter associated with a heavy use area, consider the use of GA NRCS CPS *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.

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 the plans and specifications shall include:

1. A plan view showing the location and extent of the practice. Include the location and distances to adjacent features and known utilities.
2. Typical section(s) showing the type and required thickness of paving or stabilization materials.
3. A grading plan, as needed.
4. Where appropriate, plans for required structural details.
5. Method and materials used to stabilize areas disturbed by construction.
6. Construction specifications with site specific installation requirements.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance (O&M) plan and review with the operator prior to practice installation. The minimum requirements to be addressed in the O&M plan are:

1. Periodic inspections – annually and 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, as needed.
4. For vegetated heavy use areas, restrict use as needed to protect the stand and to allow vegetative recovery.

COMMON ASSOCIATED PRACTICES

MITIGATING PRACTICES:

GA NRCS Conservation Practice Standard, Diversion (362)
GA NRCS Conservation Practice Standard, Filter Strip (393)
GA NRCS Conservation Practice Standard, Vegetated Treatment Area (635)
GA NRCS Conservation Practice Standard, Access Control (472)
GA NRCS Conservation Practice Standard, Fence (382)
GA NRCS Conservation Practice Standard, Roofs and Covers (367)
GA NRCS Conservation Practice Standard, Waste Storage Facility (313)
GA NRCS Conservation Practice Standard, Prescribed Grazing (528)
GA NRCS Conservation Practice Standard, Watering Facility (614)

REFERENCES

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

Korcak, R. F. 1998. Agricultural Uses of Coal Combustion Byproducts. P. 103-119. *In* Wright, R. J., et al (eds.) Agricultural Uses of Municipal, Animal and Industrial Byproducts. USDA-ARS, Conservation Research Report 44.

USDA-Natural Resources Conservation Service. 2014. Agricultural Engineering Note 4, *Earth and Aggregate Surfacing Design Guide*, Washington, DC.

NATURAL RESOURCES CONSERVATION SERVICE

GEORGIA

OPERATION AND MAINTENANCE REQUIREMENTS

HEAVY USE AREA

CODE 561

Land Owner/Operator_____

County_____ SWCD_____ Farm/Tract No. _____

Prepared By_____ Date_____

OPERATION AND MAINTENANCE ITEMS

Properly protected, operated, and maintained heavy use area(s) can be an asset to the property. This practice was designed and installed to stabilize the area identified in the plan. Estimated life span of this installation is at least _____ years. The life of the practices can be assured and usually increased by developing and carrying out a systematic operation and maintenance program.

This practice will require periodic maintenance and may also require operational items to maintain satisfactory performance. Your operation and maintenance program requirements include:

- Treatment areas and associated practices shall be inspected annually and after significant storm events to identify repair and maintenance needs. All surfaces, structures, pipes, drains, and associated appurtenances will be repaired promptly.
- Maintain vigorous growth of vegetative coverings. This includes reseeding, liming, fertilization and application of herbicides when necessary. Apply supplemental nutrients as needed to maintain the desired species composition and stand density. Control undesired weed species, especially state-listed noxious weeds.
- Maintain hardened surfaces in good condition, which includes periodic grading and addition of surface material when necessary. Prevent surface ponding by localized grading or addition of surface materials to remove depressions. Repair of surfaces shall be made with material compatible with original construction materials.
- Remove debris or blockages from associated roads, lots, drainage ditches, drop inlets, culverts, waterways and/or storm water outlets. Maintain pathway drainage capacities.
- Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.
- Immediately repair any vandalism, vehicular, or livestock damage to surfaces, structures, earthfills, side slopes, drainage facilities, water ways, storm water outlets, or other appurtenances.

Quality Assurance Plan (QAP)

Landowner/Project: _____ **Engineering Job Class^{1/}:** _____
Service Center: _____ **County:** _____
Conservation Practice(s) & Engineering Job Class Included in this Job: Heavy Use Area, Code 561
QAP Prepared By: _____ **Job Approved By:** _____
Est. Construction Start Date: _____ **Est. # Site Visits:** _____ **Est. # QA Hours:** _____

^{1/}The engineering job class for a given job will is based on the most restrictive element or conservation practice included in the job.

Certification Statements

I certify that the items, intensity, and inspection requirements listed in Table 1 is adequate quality assurance (QA) for this project.

Approver of Engineering Plans (Signature) *Date*

I certify that _____ has the experience necessary to perform the construction inspection for the items shown in Table 1 and has the qualifications as shown in Table 2 for this project. I support this individual as the construction inspector and will allow the individual adequate staff time to perform the QA inspection for this project.

Line Supervisor (Signature) *Date*

I certify that I have reviewed the engineering plans and specifications and fully understand the QA requirements of the subject project. I will contact the Project Approver if I have any questions or concerns regarding the QA activities and will notify and obtain approval from the Project Approver if there is need to make any changes to the plans and/or specification during construction.

QA Inspector (Signature) *Date*

Quality Assurance Plan (QAP)

Table 1 - Items to be Inspected and Verified

Items ^{2/}	Intensity ^{3/}	Inspection Requirements ^{4/}
Preconstruction Meeting	NA	Meet with landowner and contractor, discuss project, sign and date documents; provide all applicable documents including drawings and specifications.
Permits	NA	Verify that the landowner has obtained all required permits prior to construction.
Utility Notification	NA	Verify that landowner has contacted utility companies prior to construction for underground utility location.
Pollution Control	P/F	Inspect to verify that pollution control measures are install as per the plans and specification and/or as required by the permits.
Clearing and Grubbing	P/F	Limited inspection will be required on clearing and grubbing. The limits for clearing and grubbing will be staked and inspections will be required to verify that the item was completed in accordance with the plans and specifications.
Excavation	P/F	Verify that the subgrade is properly excavated to the neat lines and grades as specified in the engineering plans and specifications.
Earthfill	C	Verify that foundation and all earthfill is of the quality and moisture content specified and compacted to the degree as specified and placed to the neat lines and grades as shown on the plans and specifications.
Gravel	P/F	Verify that gravel is of the quality and moisture content specified and cut to the grade as specified and placed as shown on the plans and specifications.
Concrete	P/F	Verify that the concrete is of the Class as specified and placed to the neat lines and grades as shown on the plans. Check reinforcing steel prior to pouring the concrete to ensure it is on the type, size and spacing as shown on the drawings. Verify that the concrete is cured properly in accordance with the specifications.
Structural Components	P	Verify that the concrete slabs, walls support structures roofs & covers are of the quality specified and constructed to the neat lines and grades as specified in the construction plans and specifications. Obtain certification of truss from a Georgia registered professional engineer prior to installation.
Spoil Disposal	P	Verify that all spoil material is disposed of at the location and manner shown on the plans or stated in the specifications.
Vegetative Measures	P/F	Verify that disturbed areas are stabilized and vegetated during and after construction. Verify the type, quality, and quantity of seed mixture.
Quantity Computation	P/F	Perform quantity computations for payment purposes as per the payment schedule and specifications. Quantity computations shall be recorded on standard NRCS forms or NRCS-ENG-523A and <u>checked</u> and <u>initialed</u> by a second person.
Photographs	P	Take photographs of the site, before, during and after construction.
As-built Drawings	P	Keep drawings current during construction and prepare as-built drawings within 14 days of final construction.
Survey Notes	P	All construction checks taken including periodic elevation checks shall be recorded on loose leaf survey notes (form ENG 28, 29) or in a bound survey field book.

^{2/} Include items that require quality assurance.

^{3/} Intensity of inspection: NA – Not Applicable, C – Continuous, P – Periodic, F– Final. The inspector shall immediately notify the approver of the job if continuous inspection is required and cannot be performed with available staff.

^{4/} Inspection requirements shall be to the degree necessary to certify that the project is installed in accordance with the plans and specifications.

Quality Assurance Plan (QAP)**Table 2 – Required QA Qualifications for Construction Inspector**

QA Qualifications
1. Appropriate EJAA for the engineering job class for construction of the conservation practices to be installed.
2. Knowledgeable of the following references: a) National Engineering Manual (NEM) Part 512 – Construction b) National Engineering Handbook, Part 645, Construction Inspection

STATEMENT OF WORK
Heavy Use Area Protection (561)
Georgia

These deliverables apply to this individual practice. For deliverables for other planned practices, refer to those specific Statements of Work.

Licensure

Georgia Code Title 43, Professions and Businesses, Chapter 15, Professional Engineers and Land Surveyors, regulates the practice of engineering in Georgia and provides the definition of engineering in Chapter 15 §2(11). Technical assistance for this engineering conservation practice may be considered the practice of engineering and subject to licensure requirements of Georgia Code Chapter 15. It is the responsibility of the individual providing technical assistance to determine and verify whether this practice is subject to Georgia Code Chapter 15.

DESIGN

Deliverables:

1. Design documentation that demonstrates that the criteria in the NRCS conservation practice standard have been met and are compatible with other planned and applied practices. Include:
 - a. Identification of client needs, documentation of discussion with client, and a recommended method of resolution.
 - b. Practice purpose(s) as identified in the conservation plan.
 - c. Location of planned practice installation shown on a farm or ranch plan map.
 - d. List of required permits to be obtained by the client.
 - e. Impacts on adjacent properties and structures.
 - f. Certification of compliance with NRCS national and state utility safety policy (NEM Part 503 - Safety, Subpart A - Engineering Activities Affecting Utilities, 503.0 through 503.6).
 - a. Practice standard criteria-related computations and analyses to develop plans and specifications including but not limited to:
 - i. Type of traffic, design load, site foundation
 - ii. Surface treatment, including vegetation measures
 - iii. User safety
 - iv. Additional requirements for livestock and recreation areas
2. Written plans and specifications, including sketches and drawings, that adequately describe the requirements to install the practice and to obtain necessary permits.
3. Design Report as appropriate (NEM Part 511 - Design, Subpart B - Documentation, 511.10 and 511.11).
4. Quality Assurance Plan (NEM Part 512 - Construction, Subpart D - Quality Assurance Activities, 512.30 through 512.33).
5. Operation and Maintenance Plan.
6. Certification that the design meets NRCS standards and specifications and is in compliance with applicable laws and regulations (NEM Part 505 - Non-NRCS Engineering Services, Subpart A - Introduction, 505.0 and 505.3)

INSTALLATION

Deliverables

1. Pre-installation conference with client and contractor.
2. Verification that client has obtained required permits.
3. Staking and layout according to plans and specifications including applicable layout notes.
4. Installation inspection.
 - a. Actual materials used (NEM Part 512 - Construction, Subpart C – Evaluation of Construction Materials, 512.20 through 512.23; Subpart D - Quality Assurance Activities, 512.33).
 - b. Inspection records
 - c. Document compliance with Quality Assurance Plan.
5. Facilitate and implement required design modifications with client and original designer.
6. Advise client/NRCS on compliance issues with all federal, state, tribal, and local laws, regulations and NRCS policies during installation.

**STATEMENT OF WORK
Heavy Use Area Protection (561)
Georgia**

CHECK OUT

Deliverables

1. As-Built documentation.
 - a. Extent of practice units applied
 - b. "Red-line" drawings (NEM Part 512, Construction, Subpart F – As-builts, 512.50 through 512.52)
 - c. Final quantities
2. Certification that the installation meets NRCS standards and specifications and is in compliance with permits (NEM Part 505 – Non-NRCS Engineering Services, Subpart A - Introduction, 505.3).
3. Progress reporting.

REFERENCES

- NRCS Field Office Technical Guide (eFOTG), Section IV, Conservation Practice Standard – Heavy Use Area Protection, 561
- NRCS National Engineering Manual (NEM).
- NRCS National Environmental Compliance Handbook
- NRCS Cultural Resources Handbook