United States Department of Agriculture

Natural Resources Conservation Service CONSERVATION PRACTICE STANDARD TRAILS AND WALKWAYS

CODE 575

(ft)

DEFINITION

A trail is a constructed path with a vegetated or earthen surface. A walkway is a constructed path with an artificial surface. A trail/walkway is used to facilitate the movement of animals, people, or off-road vehicles.

PURPOSE

A trail/walkway is used to accomplish one or more of the following purposes:

- Provide or improve animal access to forage, water, working/handling facilities, or shelter
- Facilitate improved grazing efficiency and distribution
- Protect ecologically sensitive, erosive, or potentially erosive sites
- Provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations
- Provide trails/walkways for recreational activities or access to recreation sites

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on all lands where management of animal or human movement is needed.

The practice applies to a trail/walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard (CPS) *Access Road (Code 560)*.

CRITERIA

General Criteria Applicable to All Purposes

Design the trail/walkway to accommodate the planned use and site constraints. Minimize erosion and adverse on-site and off-site impacts to areas such as riparian zones, stream channels, streambanks, or wildlife habitat (e.g. fragmentation or restriction of wildlife

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at https://www.nrcs.usda.gov/ and type FOTG in the search field.

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movement).

Clearing
Design clearing widths and heights to accommodate the safe use of the trail/walkway. Use NRCS Trails and Walkways Design Aid, 210-VI-LAN-04, for guidance, as needed.

Grades
Design trail/walkway grades to safely accommodate the planned use and to reduce the potential for erosion from runoff.

Design the cross-slope (the surface perpendicular to the direction of travel) or crown of the trail/walkway to allow water to drain off without creating erosion.

Side slopes
Design all cuts and fills to have stable slopes that are a minimum of 2 horizontal to 1 vertical. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted if soil conditions warrant and special stabilization measures are installed.

Where possible, avoid areas with geological conditions and soils that are subject to slides. When the area cannot be avoided, treat the area to prevent slides.

Turns
Design turning radii based on the intended use of the trail/walkway.

Water Control
Divert concentrated water flows away from the trail or walkway by installing surface or subsurface drainage measures such as NRCS CPS *Subsurface Drain (Code 606)* or *Diversion (Code 362)*, as needed. Refer to NRCS CPS Access Road (Code 560) when surface cross drains, such as broad-based or rolling dips, are required to control and direct water flow off the trail/walkway surface. Protect the outlets of drainage measures to limit erosion.

Avoid traversing wet soil areas whenever possible. If unavoidable, provide an all-weather surface or elevate the walkway above ponded water or wet soil areas.

Avoid locating the trail/walkway where runoff will flow directly from the trail/walkway into a stream or body of water. To the extent possible, place the trail/walkway along the contour and avoid placement perpendicular to the contour.

Where a trail/walkway crosses a stream, use NRCS CPS *Stream Crossing (Code 578)*. If a drainage feature is typically dry, use NRCS CPS *Structure for Water Control (Code 587)*. At a minimum, design drainage culverts to carry the flow from the 2-year, 24-hour storm event. Use a larger storm event to design the drainage culvert where watershed conditions or anticipated usage warrant a larger structure.

Bridges and Elevated Walkways
Design bridges in accordance with NRCS CPS *Stream Crossing (Code 578)*.

Design walkways in a manner that is consistent with sound engineering principles and adequate for the use and type of walkway. For elevated walkways, use the maximum loading anticipated during normal use plus a safety factor of at least 1.5. For elevated walkways that will only be used for pedestrian traffic, use the AASHTO *Guide Specification for Design of Pedestrian Bridges* for design or State guidelines, whichever is more restrictive.

Design bridges and elevated walkways that will be used for horses or other large livestock for a uniformly applied load of not less than 200 pounds per square foot (psf).

Surfacing
A trail can have a vegetated or unvegetated surface if the soil surface will support the intended use.

If a trail is planted to vegetative cover, protect the vegetation from traffic until it is fully established and capable of withstanding the expected traffic. Establish a vegetative surface in accordance with the criteria in NRCS CPS *Heavy Use Area Protection (Code 561)*.

Where an all-weather surface is needed, refer to the criteria in NRCS CPS *Heavy Use Area Protection (Code 561)*. Select a surface material for the walkway that is appropriate for the intended use and frequency.

When selecting the surface material for a walkway used by animals, consider the sensitivity of the animals' feet.

Erosion Control
Include provisions to control water and wind erosion during construction. Where possible, establish vegetation on disturbed areas as soon as practicable. Use the criteria in NRCS CPS *Critical Area Planting (Code 342)* or the NRCS State-approved seeding specification. Use vegetation adapted to the site. Give preference to native plant species where compatible with land use and existing plant species.

If soil, shade, or climatic conditions prevent establishment of vegetation, use the criteria in NRCS CPS
Mulching (Code 484) for erosion control.

Safety and Use Control
Incorporate use control and the safety of the users into the design of the trail/walkway. Where needed, install directional and warning signs, handrails, gates, fencing, and other safety devices. Provide protection from slides and falling rocks, as needed.

Additional Criteria Applicable to Provide or Improve Animal Access to Forage, Water, Working/Han- dling Facilities, or Shelter
Construct the trail/walkway wide enough to accommodate the movement of the animals and access by the operator for management and maintenance.

When needed to facilitate movement of animals through a series of paddocks or pastures, design gate openings and trails/walkways for efficient flow of animals.

Use NRCS CPS *Fence (Code 382)* to keep animals confined to the trail or walkway.

Additional Criteria to Facilitate Improve Grazing Efficiency and Distribution
When one of the purposes of a grazing plan is to improve animal distribution or to allow better pasture utilization, a trail/walkway may be needed to facilitate animal movement. Use NRCS CPS *Prescribed Grazing (Code 528)* to plan the grazing system.

Additional Criteria Applicable to Pedestrian or Off-Road Vehicle Access for Agricultural, Construc- tion, Maintenance Operations, or Recreation
Base the design requirements on the type and class of trail or walkway described in NRCS Trails and Walkways Design Aid, 210-VI-LAN-04. When a trail/walkway will have multiple uses, design for the most restrictive criteria. When needed, use NRCS CPS *Access Control (Code*

472) to provide temporary or permanent exclusion from an area.

Width
Design the trail/walkway width to safely accommodate the intended use. The minimum width is determined by the type and class of trail. See the tables in Appendix A in LAN 4 for design parameters.

Accessibility for Recreation
The Americans with Disabilities Act of 1990 (ADA) requires outdoor recreation access routes and some hiker/pedestrian trails to be accessible to people with disabilities. Address accessibility requirements for new construction and when existing facilities are being altered. Compliance with the ADA outdoor recreation guidelines is not required where:

- compliance would cause harm to cultural, historic, religious, or significant natural features;
- compliance would not be feasible due to terrain or the prevailing construction practices.
- compliance would require construction methods or materials that are prohibited by Federal, State or local regulations; or
- compliance would substantially alter the nature of the setting;

Make an accessibility evaluation to determine the required level of accessibility for a trail/walkway design. Refer to NRCS Trails and Design Aid, 210-VI-LAN-04 for accessible trail design procedures.

CONSIDERATIONS

General
When planning the trail/walkway, consider the effect on areas of special scenic value.

To protect water quality, consider the location of the trail/walkway relative to its use and purpose.

Contribute to food safety by channeling animals away from sensitive sites where pathogen transfer might occur.

In areas that are vulnerable to wind erosion, or have frequent dry, loose surfaces that can easily create mechanically-generated particulate matter (i.e., dust), use a surfacing material with a coarse texture for a walkway requiring non- vegetated surface treatment. Coarser materials will have larger particle sizes that are less easily entrained in the air and will minimize the potential for dust formation.

An unvegetated trail can be a prime source of dust emissions resulting in a particulate matter resource concern. Utilize additional conservation practices, such as NRCS CPS *Dust Control on Unpaved Roads and Surfaces (Code 373),* to reduce the potential for generation and transport of particulate matter emissions, if warranted.

A minimum of 25 feet of filter strip should be left between the trail or walkway and watercourse on level areas with two (2) additional feet added for each additional percent of slope increase.

Animal Access
To facilitate maintenance of a walkway, consider putting the fence outside of the surface material.

Pedestrian and Off-Road Vehicle Access
A trail/walkway for agricultural access generally should not exceed a 15% grade, although short sections of 50 feet or less may be up to 50%. Break long, steep grades by the use of switch backs. The grades of general use pedestrian and equestrian trail/walkway should generally not exceed 10%. Grades for other uses may be steeper, such as cross-country skiing, which may be as steep as 50% for difficult trails.
Hiking trails may be as steep as 20%.

For a recreational trail that starts from a roadway, adequate parking for users may need to be provided as part of the design.

A trail/walkway for agricultural purposes may need to incorporate staging areas where equipment, supplies or harvested crops can be stockpiled.

Consider saving and maintaining key trees and other vegetation that have scenic value, provide shade, reduce erosion and runoff, provide habitat for fish and wildlife, or add to the visual quality of the area.
Some selective cutting or trimming of trees or other vegetation may be necessary to provide and maintain scenic vistas at overlooks. At overlooks, keep tree removal or trimming to the minimum needed to provide an unobstructed view of the most salient features present.

Grazing
Use this practice when it is necessary to stabilize an existing critically eroding area created by livestock traffic that cannot be solved through rearrangement of fencing, drinking water locations, rotational grazing, livestock exclusion, or other practices; OR when concentrating animal trailways is required in order to protect sensitive resources such as wetlands, streams/creeks, or steep areas.

PLANS AND SPECIFICATIONS

Provide plans and specifications that describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include:

- A plan view showing the location of the trail/walkway and any other associated features.

- Typical cross-sections for each reach of the trail/walkway showing the width, typical side slopes and any surfacing needed.
- Profile for each reach.
- Details of water control structures and other appurtenances.
- Erosion protection measures.
- Material quantities.
- Construction specifications.
- Fencing, as needed.
- Safety features, as needed.
- Expected application types, amounts, and frequency of dust suppressants, if needed.

OPERATION AND MAINTENANCE

Prepare a written Operation and Maintenance (O&M) plan for each site. As a minimum, the plan must include the following:

- A schedule for inspections at least annually and after significant runoff events. The inspections must include drainage structures, trail/walkway surfaces, vegetation, fencing, bridges and elevated walkways, and safety features, as appropriate.
    - For bridges and elevated walkways that are open or accessible to the public, conduct inspections in accordance with AASHTO Guide Manual for Bridge Element Inspection.
- Maintenance activities:
    - Removal of sediment from water control features.
    - Repair of eroded areas or damaged surface materials.
    - Grading and shaping of the trail/walkway to maintain design grades and dimensions.
    - Application of dust control measures, as needed.
    - Repair of safety or control features, as required.
    - Re-seeding of areas where vegetation has been damaged or destroyed.
    - Periodic removal and management of manure accumulations, as needed.

For multiple adjacent vegetated animal trails, include a rotation plan to allow for recovery of vegetation and for improvement of traffic- supporting conditions.

REFERENCES

These references were current at the time the CPS was developed. Use more recent editions, if available.

United States Department of Agriculture, Forest Service. 2007. Trail Construction and Maintenance Notebook. Washington, DC.

USDA-NRCS. 2003. National Range and Pasture Handbook, Revision 1. Washington, DC.

Wood, Gene. 2007. Recreational horse trails in rural and wildland areas: design, construction and maintenance. Clemson University.

American Association of State Highway and Transportation Officials. 2010. AASHTO Load and Resistance Factor Rating Bridge Design Specifications, 5th Edition. Washington, DC.

American Association of State Highway and Transportation Officials. 2011. Guide Manual for Bridge Element Inspection. 1st edition. Washington, DC.

American Association of State Highway and Transportation Officials. 2002. Standard Specifications for Highway Bridges, 17th Edition. Washington, DC.

American Association of State Highway and Transportation Officials. 2009. Guide Specification for Design of Pedestrian Bridges, 2nd Edition. Washington, DC.

USDA - NRCS. 2009. LAN Architecture Note 4. Trails and Walkways Design Aid.

Washington, DC. USDA - FS. 1991. Trails Management Handbook. Washington, DC.

USDI-NPS. 1996. Handbook for Trail Design, Construction and Maintenance. Washington, DC.