

**NATURAL RESOURCES CONSERVATION SERVICE**  
**CONSERVATION PRACTICE STANDARD**  
**TRAILS AND WALKWAYS**  
**(Ft.)**

**CODE 575**

**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 conservation practice standard, Access Road (560).

**CRITERIA**

**General Criteria Applicable to All Purposes**

**Laws, Rules and Regulations.** Trails and walkways shall be planned, designed, and installed to meet all federal, state, local, and tribal laws and regulations.

All planned work shall comply with all federal, state, and local laws and permit conditions and

requirements. The landowner shall obtain all necessary permits prior to construction or any land clearing activities.

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 movement).

Cultural resources, threatened or endangered species, wetlands, streambanks, floodways or other ecologically sensitive areas, and areas of special scenic value will be protected through the proper design and placement of trail(s) or walkway(s).

Trails or walkways shall be designed and constructed with consideration of site soil characteristics.

**Clearing.** Design clearing widths and heights to accommodate the safe use of the trail and/or walkway. Use NRCS LAN Architecture Note 4, 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.

In flat areas provide some grade on the trail or crown the surface to promote drainage.

**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 conservation practice standard, Subsurface Drain (606) or Diversion (362), as needed. Surface cross drains, such as broad-based or rolling dips, may be used to control and direct water flow off the trail/walkway surface. Use the chart in conservation practice standard, Access Road (560) for maximum spacing requirements. 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 or shallow water body, use conservation practice standard, Stream Crossing (578). If a drainage feature is typically dry, use conservation practice standard, Structure for Water Control (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 conservation practice standard, Stream Crossing (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.

Bridges and elevated walkways having a span greater than twenty feet shall be designed by a Registered Professional Engineer.

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 conservation practice standard, Critical Area Planting (342).

Where an all-weather surface is needed, refer to the criteria in conservation practice standard, Heavy Use Area Protection (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. *Bituminous pavement is not an acceptable surface treatment for trails utilized by livestock.*

**Erosion Control.** Include provisions to control water and wind erosion during *construction refer to conservation practice standard, Stormwater Runoff Control (570)*. Where possible, establish vegetation on disturbed areas as soon as practicable. Use the criteria in conservation practice standard, Critical Area Planting (342) or the NRCS State-approved seeding specification. Use vegetation adapted to the site.

Use vegetation adapted to the site that will accomplish the desired purpose. Preference shall be given to native plant species in order to reduce the introduction of invasive species; and minimize the economic, ecological, and human health impacts that invasive species may cause. If native plant materials are not adaptable or proven effective for the planned use, then non-native species may be used. Refer to the Field Office Technical Guide, Section II, Invasive Plant Species for plant materials identified as invasive species.

If soil, shade, or climatic conditions prevent establishment of vegetation, use the criteria in conservation practice standard, Mulching (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/Handling 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.

Where fencing is needed to keep animals confined to the trail or walkway, use conservation practice standard, Fence (382).

**Additional Criteria to Facilitate Improved 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 conservation practice standard, Prescribed Grazing (528) to plan the grazing system.

**Additional Criteria Applicable to Pedestrian or Off-Road Vehicle Access for Agricultural, Construction, Maintenance Operations, or Recreation**

Base the design requirements on the type and class of trail or walkway described in NRCS LAN Architecture Note 4, 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 conservation practice standard, Access Control (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 NRCS LAN Architecture Note 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 substantially alter the nature of the setting;

- compliance would require construction methods or materials that are prohibited by Federal, State or local regulations; or
- compliance would not be feasible due to terrain or the prevailing construction practices.

Make an accessibility evaluation to determine the required level of accessibility for a trail/walkway design. Refer to NRCS LAN Architecture Note 4, Trails and Walkways Design Aid, 210-VI-LAN-04 for accessible trail design procedures.

**CONSIDERATIONS**

Consider the potential effects of installation and operation of animal trails or walkways on the cultural, archeological, historic, and economic resources.

When planning the trail/walkway, evaluate the effects on adjoin lands, neighboring residences, utilities, threatened and endangered species, wetlands, important farmlands, environmentally sensitive areas of special scenic value.

To protect water quality, consider the location of the trail/walkway relative to its use and purpose. Avoid locating trails and walkways where runoff will flow directly from the trail or walkway into a stream or body of water. This is a greater concern where the trail or walkway will be used by animals that will drop manure on the trail.

For areas of high livestock concentration, such as around ponds, tanks, troughs, or other feeding areas, use conservation practice standard, Heavy Use Area Protection (561).

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 conservation practice standard, Dust Control on Unpaved Roads and Surfaces (373), to reduce the potential for generation and transport of particulate matter emissions, if warranted.

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.

**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.

General use pedestrian and equestrian trail/walkway grades should 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.

## PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Support data documentation requirements are as follows:

- Inventory and evaluation records
  - Assistance notes or special report
- Survey notes, where applicable
  - Design survey
  - Construction layout survey
  - Construction check survey
- Design records
  - Physical data, functional requirements, and site constraints, where applicable
  - Soils/subsurface investigation report, where applicable
- Design and quantity calculations
- Construction drawings/specifications with:
  - Location map
  - “Designed by” and “Checked by” names or initials
  - Approval signature

- Job class designation
- Initials from preconstruction conference
- A plan view showing the location of the trail/walkway.
- Typical cross-sections for each reach of the trail/walkway showing the width, typical side slopes and any surfacing needed.
- Details of water control structures and other appurtenances.
- Erosion protection measures.
- Material quantities.
- Fencing, as needed.
- Safety features, as needed.
- Expected application types, amounts, and frequency of dust suppressants, if needed.
- As-built notes
- Construction inspection records
  - Assistance notes or separate inspection records
  - Construction approval signature
- Record of any variances approved, where applicable

Record of approvals of in-field changes affecting function and/or job class, where applicable.

## OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.

## REFERENCES

These references were current at the time the conservation practice standard 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.

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

American Association of State Highway and Transportation Officials. 2011. Guide Manual for Bridge Element Inspection. 1<sup>st</sup> edition. 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. 2002. Standard Specifications for Highway Bridges, 17<sup>th</sup> 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.