NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

TRAILS AND WALKWAYS

(Ft.)

CODE 568

DEFINITION

A pathway for pedestrian, equestrian, bicycle, and other off-road modes of recreation travel; farm workers; construction/maintenance access; and small walk-behind equipment.

PURPOSE

This practice may be applied as part of a resource management system to support one or more of the following purposes:

- Provide travel ways for recreational activities such as walking, horseback riding, bicycling, cross country skiing, and hiking.
- Provide access to recreation areas.
- Provide safe, environmentally friendly pedestrian access for planting, cultivation, and harvest operations.
- Provide worker access for construction and maintenance operations.

CONDITIONS WHERE PRACTICE APPLIES

On recreational, agricultural, and nonagricultural lands where prepared paths, trails, and walkways are needed for safe, effective, and environmentally friendly movement of people or small walk-behind equipment.

CRITERIA

General Criteria Applicable to All Purposes

All planned work shall comply with federal, state, local, and tribal laws and regulations.

Plan trails or walkways according to the intended purpose as well as to fit the landscape setting where they are installed. Trails or walkways intended for access to agricultural crops must be planned to meet the needs of planting, cultivation, and harvesting processes while protecting soil and water resources.

Trails or walkways intended for recreational purposes must be planned to meet the needs of the recreational activity while protecting soil, water, fishery, and wildlife resources.

Trails and walkways for all purposes must be planned and laid out within the constraints posed by the existing landscape. Configure trails or walkways to minimize adverse on-site and off-site impacts such as accelerated erosion, riparian zone degradation, stream channel and streambank damage, aesthetics degradation, unacceptable damage to wildlife habitat (such as fragmentation), or restriction of wildlife movement.

Design requirements. The basic design requirements for all trails and walkways include tread width, grade, surfacing material, cross-slope grade, clearing widths and heights, and turning radii. These requirements vary based on the type and class of trails or walkways. See Table 1 for the types and classes of trails and walkways covered by this standard. When a trail will have multiple uses, choose one use as the critical design driver to determine the appropriate criteria. Refer to Landscape Architecture Note 4, Trail and Walkway Design Aid, for design procedures for different types of trails and walkways.

Tread widths. Design tread widths to safely accommodate the intended use. The minimum tread width is determined by the type and class of trail.

Table 1–Types and classes of trails

Type	Class*
Recreation Trails	
Hiker/pedestrian	1-5
Pack and saddle	2-4
Bicycle	1-5
All-terrain vehicle (ATV)	2-4
Motorcycle	2-4
Cross-country	2-4
Snowmobile	2-4
Outdoor recreation access route (ORAR)	4-5
Non-Recreation Trails	
Accessible route	3-5
Farm worker	3-4
Pedestrian route	1-5

*Trail classes as defined in Landscape Architecture Note 4:

Trail Class 1: Minimal/Undeveloped Trail

Trail Class 2: Simple/Minor Development Trail

Trail Class 3: Developed/Improved Trail

Trail Class 4: Highly Developed Trail

Trail Class 5: Fully Developed Trail

Grades. Design trail or walkway grades to safely accommodate the planned use and to reduce the potential for erosion from runoff. Grades vary depending upon topography and intended use. The maximum grade is determined by the type and class of trail.

Surfacing. Surfacing materials can range from native soil and rock to durable pavements such as bituminous concrete. If surfacing is required for a firm, stable trail, use surfacing material appropriate for the anticipated traffic and operational conditions. Where aggregate-type material is used, the diameter should not exceed 1 inch.

Cross-slope grades. Design the cross slope (the surface perpendicular to the direction of travel) of trails so that it is steep enough to allow water to drain off without creating erosion or difficulty using trails. The cross-slope grade varies with surface material and trail type.

Clearing. Clearing widths and heights vary with the tread width and use. Design clearing widths to accommodate the safe use of trails or walkways.

Turns. Design turning radii based on the intended use of trails or walkways.

Side slopes. Design cut and fill slopes to be stable for the soil material found on the site.

Drainage. Design drainage measures of sufficient size and at intervals to ensure adequate drainage and prevent downcutting of trails or walkways by flowing water. Ensure that the outlets of drainage facilities are adequately protected to limit erosion.

Avoid traversing wet soil areas whenever possible. If unavoidable, provide an all-weather surfacing to maintain trafficability and elevate the trail surface above ponded water.

For trails or walkways that cross streams, design the crossings to allow for the year-around passage of aquatic organisms in the streams. The stream crossings shall conform to the requirements of Conservation Practice Standard (CPS) 578, Stream Crossing.

Erosion control. Include provisions to control water and wind erosion during construction until such time as vegetation is adequately established. Establish vegetation on disturbed areas along trails or walkways as soon as practicable after construction of a trail reach is completed. If soil, degree of use, shade, climatic conditions, or concentrated water flows will cause loss of vegetation on trails or walkways, then use non-vegetative surface treatments such as mulches or gravel. Refer to NRCS CPS 342, Critical Area Planting, for requirements for preparing the seedbed, seeding, fertilizing, and mulching. Use vegetation adapted to the site or existing vegetation to accomplish the desired purpose. Give preference to native plant species (where compatible with land use and existing plant species) and avoid the use of invasive species.

Bridges and elevated walkways. For bridges and elevated walkways with a span of less than 20 feet, use the maximum loading anticipated during normal use plus a safety factor of at least 1.5.

Design bridges or 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).

For bridges or elevated walkways having a span greater than 20 feet and that will only be used for pedestrian traffic, use the American Association of State Highway Transportation Officials (AASHTO) *Guide Specifications for Design of Pedestrian Bridges* for design.

Bridges or elevated walkways having a span greater than 20 feet shall be designed by a licensed professional engineer.

Design bridges or elevated walkways to allow bankfull flows. For bridges or elevated walkways having a span of less than 20 feet, overtopping of the structure may be allowed, provided that it is designed to withstand the hydraulic forces applied to the structure.

Safety and control. Incorporate use control and the safety of the users into the design of trails or walkways. Where it is appropriate because of the site and intended use, include adequate directional and warning signs, handrails, gates, fencing, and other safety devices. Where needed, provide protection from slides and falling rocks.

Accessibility. The Americans with Disability Act (ADA) of 1990 requires outdoor recreation access routes and some hiker/pedestrian trails to be accessible to people with disabilities. Accessibility requirements need to be addressed 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.
- Compliance would not be feasible due to terrain or the prevailing construction practices.

An accessibility evaluation will be made to determine the required level of accessibility for a trail design. Refer to Landscape Architecture Note 4 for accessible trail design procedures.

CONSIDERATIONS

Trails for agricultural access generally should not exceed a 20% grade, although short sections of 50 feet or less may be up to 50%. Break long, steep grades by the use of switchbacks.

General use pedestrian and equestrian trail and walkway grades should generally not exceed 10%. Grades for other uses may be steeper. Trails for cross-country skiing may be as steep as 50% (for a difficult one); and for hiking, trails may be as steep as 20%.

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

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

Trails 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. On the other hand, some selective cutting or trimming of trees or other vegetation may be necessary to provide and maintain scenic vistas at overlooks. At overlooks, keep this to the minimum needed to provide an unobstructed view of the most prominent features that are present.

When planning trails or walkways, consider the effect on adjoining lands, neighboring residences, utilities, cultural resources, threatened and endangered species, wetlands, important farmlands, environmentally sensitive areas, and areas of special scenic value.

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

In areas that are vulnerable to wind erosion, consider using coarser-textured surfacing materials for trails requiring non-vegetated surface treatment. Coarser-textured materials will have

larger particle sizes that are less easily entrained in the air and will minimize the potential for dust formation.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for trails or walkways according to the requirements of this standard. As a minimum, the plans and specifications must include the following:

- A plan view showing the location of trails or walkways.
- Typical cross sections of trails or walkways showing the width, typical side slopes, and any surfacing needed.
- Details of drainage structures and other appurtenances.
- Revegetation plans if needed.
- Construction specifications that describe in writing the site-specific details for installation of trails or walkways.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be prepared for use by the landowner or operator. The plan shall provide specific instructions for operating and maintaining the trails and walkways to ensure proper function as designed.

The O&M plan sheet can be used. Add site-specific recommendations as needed.

REFERENCES

American Association of State Highway and Transportation Officials. 2007. AASHTO LRFD Bridge Design Specifications, 4th Edition. Washington, DC.

American Association of State Highway and Transportation Officials. 2003. Guide Manual for Condition Evaluation and Load and Resistance Factor Rating of Highway Bridges, 1st Edition and 2005 Interim. 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. 1997. Guide Specification for Design of Pedestrian Bridges, 1st Edition. Washington, DC.

USDA-NRCS. 2009. Trails and Walkways Design Aid. Washington, DC.

USDA-FS. 1999. Trail Construction and Maintenance Notebook, Technology Development Program. Washington, DC.

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

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