

St. Albans Recreation Reserve

Trail Sustainability and Management Plan

**Prepared by Brooke Scatchard and Mariah Keagy
Sinuosity, LLC**

**For
Friends of Northern Lake Champlain on behalf of the
St. Albans Recreation Reserve Steering Committee**

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The St. Albans Recreation Reserve is a unique community recreational resource comprised of the Hard'ack Inc. and Aldis Hill properties in the town of St. Albans. Maintaining and reconstructing the trails to a standard of safety and durability throughout the trail system will enable the large variety of recreational uses to continue while mitigating erosion and the subsequent contribution to water quality degradation in nearby Lake Champlain.

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1. Executive Summary

The St. Albans Recreation Preserve currently consists of lands open to the public owned by both Hard'ack Inc. and Aldis Hill. Six miles of currently used trails exist on the preserve, mostly user created with sections of forest roads incorporated for four season trail use.

This area is nestled in the community of St Albans, which makes it a very valuable resource for the community of St Albans for the opportunities it provides for enjoyment of nature, landscape history and recreation. Despite the area being well loved and ranked as such an important asset for the residents of St. Albans, the few trail reconstruction projects over time have not been able to bring the trails and trail system up to a standard of durability and sustainability for various reasons.

Many of the trails in the St. Albans Recreation Reserve have not been designed for their intended users. Many have sections that are far too steep to be durable for almost any user, and so there are areas of continual and excessive erosion, while other sections are wet and low lying, where trails remain muddy and trail users trample vegetation as they walk around looking for solid footing. Additionally, the un-signed trail system is not user friendly with over 100 current trail junctions, many redundancies and subsequent excessive impacts. Over all, most of these current issues relate back to soil and substrate loss on the hill as it is displaced through erosion, and contributes to sediment loading of the waterways which drain into the St. Albans Bay.

The purpose of this Trail Sustainability and Management Plan is to make recommendations to increase the sustainability of the trails and trail system on the St. Albans Recreation Reserve to both mitigate erosion and subsequent sedimentation of nearby waterways as well as to improve the trail user's experience. The implementation of this plan as it is laid out fully supports the goals and visions of both the Aldis Hill Forest Management Plan and Hard'ack, Inc. in providing for recreation, as well as the protection of cultural and natural features of the properties as is supported by the Aldis Hill Forest Management Plan. It is informed by user surveys and property stakeholders, and completed with the assistance of the St. Albans City School's Renaissance House 7th and 8th graders.

2. Introduction

2.1 St. Albans Recreation Reserve Property Description

The St. Albans Recreation Reserve is comprised of the Aldis Hill Properties (Aldis Hill Playground Kidder and Zurn Properties) and the primary access, parking and trails on the Hard'ack, Inc. property. Goals for management of each property include providing recreation for residents of the area.

The primary management goals in order of importance are to provide recreational opportunities for the citizens of St. Albans, protect cultural resources, maintain and enhance wildlife habitat, maintain and enhance biodiversity, protect water quality, and to improve the timber quality. (pg. 2, Aldis Hill Forest Management Plan)

Hard'ack, Inc.: To provide recreation to Franklin County residents through skiing, snowboarding, sliding, wilderness trails and sports fields A 501(c)(3) Non-Profit Charitable Organization (www.hardack.org)

Together these areas and the trails that are on them are referred to as the St. Albans Recreation Reserve (SARR).

The reserve is located just northeast of the city of St. Albans. It is accessed both from residential areas as well as from Hard'ack, the community ski hill on the east slope of SARR.

The general topography includes an upland region with rocky outcroppings at the heights of land in various locations through the reserve. It is located in the Lake Champlain Biophysical region and has generally loamy soils. Soils range from super saturated to dry and well drained on the heights of land. Various seeps (large and small), seasonal wet areas and drainages, and one identified vernal pool comprise sections of the reserve, while there are no sizable year-round streams located in the reserve. The forest type consists primarily of a variety of Oak, Maple, Ash, Hickory and Hophornbeam in different variations according to growing conditions throughout the property.

2.2 Unique or Noteworthy Natural/Cultural Resources of St. Albans Recreation Reserve

The St. Albans Recreation Reserve has notable cultural and natural features which merit mention in the property's features as both noteworthy and part of the uniqueness of the property to be both conserved and highlighted for both their inherent and educational value.

Wildlife: The Reserve contains a notable wildlife food source provided by Hophornbeam, and provides habitat for migratory songbirds and potential wood frog habitat. The large snags that are present provide valuable habitat for a variety of species.

Biodiversity: The forest types in the St. Albans Recreation Reserve are not considered rare in Vermont, but are considered noteworthy in their infrequent occurrence.

Water quality: While no waterways run throughout the year within SARR, there are many seeps in the reserve. Aldis Hill, as the highpoint in the area, has variable seasonal impacts on the waterways below which feed directly into storm water and therefore the nearby St. Albans bay.

Timber: The Aldis Hill Forest Management Plan notes management of Aldis Hill for timber harvest and forest products, while protecting the natural, cultural and recreational value of the landscape. There are currently no plans for timber harvest.

View sheds: The St. Albans Recreation Reserve provides one of the few vantage points in this part of the state, looking down on the community of St. Albans and the bay area. This vantage is considered a very valuable asset to those who use the area for recreation, which was clearly indicated in the survey.

Cultural Features: There are three cultural features listed in the Aldis Hill Forest Management Plan. 1) A monument to the last wolf shot in Vermont at the height of land on the Kidder property. This monument was originally placed standing but is now lying prone, but kept free of vegetation. 2) A series of rock cairns, walls, and paths created by an unknown individual several years ago along the rock outcrop on the east side of the Aldis Hill property. This spot is a favorite of the many people who frequent the area, as it provides a magical quality to the woodland walk. 3) The Indian steps. This carved stone stairway was constructed under the direction of the Smith family and is where Mrs. Smith is said to have had a shade garden. (Aldis Hill Forest Management Plan)

Legacy/Wolf Trees: These trees scattered throughout sections of the property serve as valuable wildlife habitat, and provide natural landmarks to history of land use of the property. Their growth pattern denotes the growth of trees in open pasture and stand as relics of the connection between past and current landscapes. Additionally, they are beautiful and impressive features with a multitude of educational inroads to forest ecology.



2.3 Trail System

The current trail system on Aldis Hill is a mixture of abandoned road bed and user created trails for various uses. Cross country ski trails on the Hard'ack property were designed and built by Morton Trails in 2003, and are not in need of any immediate improvements and so are not individually mentioned in the inventory (but are included in the map).

More recent mountain bike trails have been created around the property by unofficial permissions and by trail users feeling their recreational interests were unmet. Overall very few sections of trail were intentionally built for long term durability, sustainability, erosion reduction, or even safety concerns in some cases.

These factors combined with a lack of direct management for recreation on the property have precipitated a network with redundancies and excessive junctions. The unmarked trail network is described as “confusing” by many trail users. This plan attempts to alleviate some of the confusion and provide for a larger degree of fluidity of the trail users experience- both of which were indicated as primary interests for trail improvements by trail users.

2.4 Trail Users

Recreation on St. Albans Recreation Reserve is heavy, frequent, and varied. Trail user groups include: hikers, runners, snowshoers, bikers, dog walkers, sledders, x-country skiers, and alpine skiers or snowboards both on the Hard'ack Ski hill and venturing home to the other side of Aldis Hill.

Reoccurring events utilizing the trails include: Weekly running/walking races (sponsored by Ben and Jerry's), events sponsored by St. Albans Recreation: weekly and annual races, year –round birthday parties, Mountain Bike Camps, Weekly Mountain Bike group rides, the Bellows Free Academy Mountain Bike Club, and activities advertised by Hard'ack, Inc.: nature trails, snowshoeing, and biking on the pump track or trails.

A trail user survey was prepared and data collected throughout the community by the St. Albans Middle School Renaissance team and Sinuosity. The results were used to inform the design plan and process (see process and appendix for survey results).

2.5 Current access points and parking

There are currently three areas where the majority of trail users access the SARR trails: Isham Ave., Governor Smith, and Hard'ack. A small number of trail users access the trails from private property. The parking lot at Hard'ack is mainly used by those who live too far from the SARR to access trailheads by bike or foot.

Motorized vehicle encroachment has caused substantial erosion at a private access point in northwest corner of the property. Another less used, private land access is in the low lying seep off of Prospect St.

Currently there is no user information at any entrance, trails are unmarked and trailheads are in need of erosion control measures.

2.6 Access and parking recommendations

The three main access areas on Isham Ave, Governor Smith, and Hard'ack should be retained and improved according to the trailhead features and trail inventory sections of this plan.

Hard'ack is the only access area with public parking and so is the main access for both the majority of trail users and trail users who travel to the trailhead by vehicle.

Currently two unofficial access areas are in wet zones unsuitable for sustainable trails, one of which has had motorized vehicular encroachment which has severely damaged the trails. Please see section on "Trail Closures" for additional information.

All trailheads/access areas should include an informational kiosk which includes maps, trail signage and additional user information (see section on trailhead signage).

3. Trail Management Plan

3.1 Need for a Plan

The trail system in its current state at St. Albans Recreational Reserve is not meeting the management goals of the property due to its nature as user created, generally unmaintained, managed or marked. These factors contribute to other multiple challenges. Foremost are areas of steep fall-line trail which are heavily eroding and causing sedimentation both on site and contributing to sediment loading in nearby waterways and potentially nearby storm water drains during heavy runoff events. The erosion on trails limits the range of abilities that are able to access the unique features provided by this property.

The current trail system is not marked or signed and is challenging to navigate due to excessive trail junctions and trail redundancies. Without this or any other trail user information, public safety and management of the area could be a concern.

3.2 Purpose of the Plan

The primary purpose of this Trail Sustainability and Management Plan is to address the natural resource concerns created by erosion and sedimentation of waterways leading to the St. Albans Bay. As the highest point of this watershed, erosion issues on Aldis hill

contribute to sedimentation loading of waterways and storm water released into St. Albans bay by spring runoff and surface run off during large rain events.

The protection of water quality, wildlife, and other cultural and natural features along with recreational opportunities are the primary goals and vision of the Aldis Hill Property as related in the Aldis Hill Forest Management plan. This plan lays out the steps necessary to mitigate current erosion while protecting the surrounding natural and cultural resources.

In order to do this, this plan was created as a comprehensive inventory of existing trails and their conditions accompanied by a phased plan of recommended improvements to bring each trail up to a standard of safety and sustainability. Other goals of the plan include identification of current trail users and their recreational and safety needs. These recommendations must also be balanced with the protection of the sensitive and rare species throughout the natural area.

The overall outcomes of the improvements focus on increasing trail sustainability while improving the trail user experiences throughout the trail system. This includes: identifying trail tread ways improvements to mitigate sources of trail and trailside erosion, minimizing junctions while maintaining or increasing trail mileage, identifying trail signage locations and trail sign suggestions, identifying areas suitable for varying trail users and ability levels within that user group, and identifying suggested loops to aid in limiting user conflict and improved user experience.

3.3 Planning Team and Process

This plan was created by Brooke Scatchard and Mariah Keagy of Sinuosity, LLC. Brooke specializes in GIS mapping and mountain bike trail construction, layout and design. Mariah's specialties encompass a broad range of multi-use, non-motorized and pedestrian recreation management practices. This plan was completed in coordination with the St. Albans City School's Renaissance House. Sinuosity worked with teachers and students to develop and administer a trail user survey, collect trail erosion data, and being the process of organizing trails by official naming. Much of this work was incorporated in the plan, perhaps most importantly the user survey results which are included at the end of this document and which were incorporated into the trail planning process.



Students Collecting Data

The trail system was systematically assessed by Sinuosity, LLC. over the course of multiple field days. Data was collected for: current class, recommended target class, existing structures, areas of needed trail improvement (based on user safety), existing and

potential erosion (based on user group, use of trail, trail slope and substrate), trail widening, and trail redundancies. A range of recommendations for trail improvements were made and assigned a priority.

This data was collected in coordination with GPS data points to allow for the creation of GIS maps to clearly indicate the location of all data sites on their corresponding trail section. These maps and associated data will assist land managers in the implementation of maintenance and trail improvement projects according to maintenance and reconstruction schedule included in this plan. Costs for labor and supplies are included for each recommended improvement and incorporated in both the maintenance and improvement schedules and the trail inventory for each section

4. Purpose and Goals

4.1 Purpose of Trail System

The St. Albans Recreation Reserve (SARR) serves four season human-powered recreation of varying abilities. Current user groups include: hikers, picnickers, dog walkers, x-country skiing, snowshoeing, mountain biking, trail running, naturalists, and occasional sliders, skiers and snowboarders, commuting home from the Hard'ack community ski hill. Events hosted on the hill include mountain bike and trail running races and group rides, snowshoe tours; school sponsored running and biking teams and clubs, as well as fitness groups. The purpose of the trail system is to support the recreational use of the lands and trails as they provide access to the natural and cultural features of the St. Albans Recreational Reserve.

4.2 Trail System Goals

The goals of the trail system are to allow for human-powered recreational opportunities in a natural setting close to people's homes in the community of St. Albans. Trails are to serve trail users in their variety of differing modes of recreation and abilities, as the terrain allows. Additionally, trails serve as durable paths to the unique natural features and educational opportunities provided by this property. The overall goal is to serve the community interests while maintaining the health of the forest and waterways of both the preserve and surrounding watershed. Recreation is the primary goal of the Hard'ack, Inc. while the additional goals and vision of the Aldis Hill property as designed in the Forest Management plan include the additional values of protecting the natural, cultural and timber resources.

5. Trail Standards and Classification

The trail standards adopted for this property are those used by the USFS within the Trail Management Objectives, with consideration to the user group, current class and desired target class for the user group on each section of trail. Classes are determined by the USFS Trail Condition Assessment Survey Matrix. Classes range from 1-5, with 1 being minimally developed and 5 being fully developed.

Factors considered in the rating of the TMO are slope, protrusions and obstacles within the tread way, width of tread way and trail structures, corridor, and surface material. If one section of trail is rated in a lower class, the entire trail falls into that class. Class stipulations for these variables change with the designed use for the trail.

The St Albans Recreation Reserve currently contains sections of trail ranging from Class 1 to Class 3 for the designed uses of pedestrian, x-country skiing, and bicycle travel. No trail is consistently Class 3 or Class 1. The goal of implementing the SARR Trail Sustainability and Management Plan is to bring all trails up to safe and durable standards and generally in a Class which supports the desired use. The goal is to provide a diversity of trail class experiences within the SARR. Please see the Appendix for reference.

Additional standards used within the classifications of the St Albans Recreation Reserve Trails System are the ratings of Beginner, Intermediate and Advanced where applicable. This rating system is very user friendly and has been added for ease of implementation of the Trail Sustainability and Management Plan. For additional references on trail maintenance, reconstruction and design please see references in the appendix.



View of St. Albans from Lookout

6. Trail Inventory

6.1 Overview

Pedestrian designated includes: trail runners, hikers, dog walkers, snowshoers, and any educational or naturalist foot-travel activities. Bicycle classes include single or double track, and x-country designated Class 1 denotes permitted use without accommodations.

Trails have been organized according to 4 recommended routes: **Main Loop** (Multi-use, beginner bike, recommended direction), **Flow Loop North** (intermediate/advanced bike, directional), **Flow Loop South** (bike/pedestrian, directional, intermediate/advance bike with one bike specific section), and **Nature Hike** (pedestrian specific). Below each recommended route are the constituent trail sections.

Five trails/sections are not included in recommended routes and are listed individually below.

6.2 Main Loop

This directional beginner multi-use loop incorporates all trailheads/access points. It is comprised of all the trailheads/access points, the current main loop with reroutes and incorporates other existing trail sections of similar classes to create a beginner loop.

Targeted Designed Use: Pedestrian/Bike (Beginner-directional)

Recommended Target Class

Pedestrian: 3

Bicycle: 4 (double)

X-Country Ski: 1 un-groomed

Hard'ack Entrance

Current Class for Designed Use

Pedestrian: 3

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Highest use

Current Status: The current trail travels straight up the fall line, and is used by the majority of people who access Hard'ack

Summary of recommended improvements: Realignment of main trail to allow for switchbacks and other trail building techniques to minimize erosion. Total 1490' new trail, creating connections north and south. Check dams will rehab the existing trail.

Current Main Loop

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2 (double)

X-Country Ski: 1

Current Use: Heavy, multi-use

Current Status: Sections of severe erosion and trail widening, all natural surface trail, averaging 6' wide, with sections wider.

Summary of recommended improvements: 1600' proposed new trail re-routes and drainage are the major needs, with short sections of bridging or raising of tread will fill material.

Southern Ridge

Current Class for Designed Use

Pedestrian: 3

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Low

Current Status: Trail follows fall line

Summary of recommended improvements: Re-route and install drainages.

Birdhouse

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: This trail is the best route to start for bikers accesses from Hard'ack, the most popular access point.

Current Status: Maintainable

Summary of recommended improvements: Minor trail corridor widening to accommodate beginner trail users, annual maintenance.

Governor Smith Entrance

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Trailhead without parking, medium use

Current Status: Maintainable

Summary of recommended improvements: This access point will most likely change over time with land ownership. It is considered part of the main recommended beginner loop. There are no recommended trail improvements aside from Kiosk installation/signage.

Isham Entrance

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Trailhead without parking, medium use

Current Status: Excessive protrusions and no suitable drainage options

Summary of recommended improvements: Trailhead improvements and the addition of a section of raised and retained fill to smooth entrance over protruding roots for beginner access.

6.3 Nature Hike

This hiking route links sections of hiking specific areas and features and climbs up to the highest ridge. It has a feeling of remoteness and quiet with small rock outcroppings that allow for quiet areas with a feeling of greater solitude.

Targeted Designed Use: Pedestrian, quiet

Recommended Target Class

Pedestrian: 3

Bicycle: not encouraged

X-Country Ski: 1 un-groomed

Ledge Stairs

Current Class for Designed Use

Pedestrian: 2

Bicycle: not recommended

X-Country Ski: no recommended

Current Use: moderate pedestrian use, trail utilizes historic carved stairs feature.

Current Status: Maintainable

Summary of recommended improvements: None.

Ledge Main/East & West Options

Current Class for Designed Use

Pedestrian: 2

Bicycle: 1/2

X-Country Ski: 1 un-groomed

Current Use: light/medium

Current Status: Sections of erosion exposing excessive bedrock with gullying and widening of thin, decomposed rock soils.

Summary of recommended improvements: The majority of improvements are erosion control features on the southern half of the trail, including wooden stairs.

6.4 Flow Loop South

This is an intermediate recommended bike route with some advanced, bike-specific options with a recommended direction of travel to maximize “flow” and minimize user conflict.

Targeted Designed Use: Pedestrian/Bike (Intermediate/Advanced)

Recommended Target Class

Pedestrian: 3

Bicycle: 2/3

X-Country Ski: 1 un-groomed

Southern Boulders

Current Class for Designed Use

Pedestrian: 3

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Moderate

Current Status: Sections of unsustainable fall-line trail with sections of widening and erosion.

Summary of recommended improvements: 1410’ reroute to a more sustainable alignment with drainage features.

Lower Canyon/Canyon Rim

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: light use

Current Status: short section of severe erosion and alignment in seasonal drainage.

Summary of recommended improvements: 280’ re-route for a more sustainable layout.

J’s Trail

Current Class for Designed Use

Pedestrian: 3

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: popular newer trail

Current Status: maintainable

Summary of recommended improvements: Signage and a short re-route at a technical feature to both warn and allow for a safe and clear route around.

Freeride trail: New (935’)

Targeted Designed Use: Bike (Intermediate with Advanced options)

Recommended Target Class

Pedestrian: not recommended

Bicycle: 1/2

X-Country Ski: 1 un-groomed

Current Use: New Trail to accommodate for the obvious interest in bike specific features and developing newer biking technique.

Current Status: unsafely constructed and designed bike features are causing user safety risks

Summary of recommended improvements: Development of a new directional section of advanced bike trail that incorporates bike specific features designed for skills building. Additional feature design will be needed.

6.4 Flow Loop North

This recommended bike loop incorporates sections of existing trail often used by both biker and runners. There is a recommended direction of travel for the general loop so as to create a fun, fluid route and minimize user conflict

Targeted Designed Use: Ped/Bike (Intermediate)

Recommended Target Class

Pedestrian: 3

Bicycle: 2/3 (single)

X-Country Ski: 1 un-groomed

Lary's Loops

Current Class for Designed Use

Pedestrian: 2

Bicycle: 3 (single)

X-Country Ski: 1 un-groomed

Current Use: Mostly bikers coming down from the ridge and trail runners

Current Status: Maintainable

Summary of recommended improvements: General maintenance and brushing.

Fire Pit Trail

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: provides connectivity for lower/outer bike loops

Current Status: Maintainable

Summary of recommended improvements: General maintenance.

North Loop: Directional, Up (810' new)

Current Class for Designed Use

Pedestrian: 2

Bicycle: 1/2

X-Country Ski: 1 un-groomed

Current Use: High, tight turns with few opportunities for climbing

Current Status: Areas of minor erosion and needs for drainable layout

Summary of recommended improvements: Reroutes and extensions of current route will allow for a sustainable directional loop.

East and West Fork

Current Class for Designed Use

Pedestrian: 2

Bicycle: 3 (single)

X-Country Ski: 1 un-groomed

Current Use: Lighter use

Current Status: some low lying wet areas and minor erosion at junction

Summary of recommended improvements: Install sections of bridging on both Fork trails.

North Loop: Directional, Down

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Targeted Designed Use: Bike (Intermediate/Directional-Down)

Recommended Target Class

Pedestrian: not recommended

Bicycle: 2/3

X-Country Ski: 1 un-groomed

Current Use: Popular bike route

Current Status: Tight and overly steep eroding turns create erosion challenges

Summary of recommended improvements: Re-routes to provide flow include 505' of new trail.

6.5 Individual Trails

Look out cutoff: New

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Targeted Designed Use:

Recommended Target Class

Pedestrian: 3
Bicycle: 3
X-Country Ski: 1 un-groomed

Current Use: This new trail will allow for connectivity between the popular bike route and the lookout.

Summary of recommended improvements: No new trail structures will be needed on this 325' section of trail

Lookout Trail:

Current Class for Designed Use

Pedestrian: 2
Bicycle: 2
X-Country Ski: 1 un-groomed

Targeted Designed Use: Ped/Bike (Beginner)

Recommended Target Class

Pedestrian: 3
Bicycle: 3
X-Country Ski: 1 un-groomed

Current Use: Very high use, as the access point for the main view.

Current Status: Sections of erosion and exposing bedrock.

Summary of recommended improvements: Short re-route to create a cross slope alignment (200') to reduce erosion. A bike rack situated at flat area before the short descent down to the view would discourage bike traffic and alleviate some of the demand on this limited space.

Hobbit's Canyon switchbacks

Current Class for Designed Use

Pedestrian: 2
Bicycle: not recommended
X-Country Ski: not recommended

Targeted Designed Use: pedestrian

Recommended Target Class

Pedestrian: 3
Bicycle: not recommended
X-Country Ski: not recommended

Current Use: lightly used cultural feature of interest (Forest Management Plan)

Current Status: current structures in need of support

Summary of recommended improvements: Maintenance and installation of additional rock stairs and stabilizers on lower portions, with drainage installation at top of steps.

Gollum's Cave

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Targeted Designed Use: Ped/Bike (Intermediate)

Recommended Target Class

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Current Use: Lighter use, mainly bike traffic

Current Status: Short sections of erosion, gullying and a low lying wet area

Summary of recommended improvements: Import fill for low area, improve drainage, and retain trail tread.

Wolf Trail

Current Class for Designed Use

Pedestrian: 2

Bicycle: 2

X-Country Ski: 1 un-groomed

Targeted Designed Use: Ped/Bike (Intermediate/Advanced)

Recommended Target Class

Pedestrian: 3

Bicycle: 2/3

X-Country Ski: 1 un-groomed

Current Use: This is favorite landmark for pedestrians and bikers.

Current Status: minor erosion and tread creep near vernal pool

Summary of recommended improvements: Install rock armoring/raise tread.



6.6 Recommended for Closure

These trails are all recommended for closure for various reasons: trail redundancy, unsustainable layout without more viable options, or not being cost effective to fix for the amount of use.

Sections of trail closures/reroutes that will need additional erosion control structures (check dams) in addition to brushing in of trail corridor include: Reroutes on Main Loop, Reroutes on Southern Boulders, Upper slope of Hard'ack Entrance, Prospect St. trail closure, and highest switchback on the North-Loop re-route of the Flow Loop-North.

1) Prospect St Trail and Access

This trail is at the lowest section of a slope with a high water table and large amounts of seasonal drainage. No suitable reroute has been identified: slope has dispersed seeps with many seasonal streams and wet areas with poorly drained soils. Any possible trail

location in this area would need large amounts of bringing and boardwalk, which is both costly and requires maintenance. This trail is recommended for closure.

However, if the Prospect St. access is of great importance, the projected would require approximately 900' of bridging materials and labor. This amount is not included in the total cost estimate at the end of this plan. Raised tread of imported material and culverts are not recommended due to the amount of unconsolidated spring run-off.

- 2) Scramble: recommended for closure
- 3) Canyon streambed: recommended for closure
- 4) Slimy Ledge: recommended for closure
- 5) Fall Line Rd: recommended for closure

6) Northwest corner trail: recommended for closure.

Note: surface water and seeps, without possibilities for reroutes. Current trail is severely eroded in sections from wet conditions and UTV encroachment. Be sure to close trail thoroughly to protect remainder of trail system and sign if necessary. Relocate recently installed bridge to main loop trail, as necessary.

7. Maintenance and Management Recommended Schedule

7.1 Annual Maintenance

Every trail requires annual maintenance. A well-built trail system, up to standard for the current use, still requires at least one annual maintenance patrol in which blow downs are removed and drainages are cleared of leaf litter and sediment. Additional general maintenance tasks may include light brushing out of trail corridors as well as the closing of new or old bootleg trails using dead and down brush and leaf litter. Ideally the trails are monitored and patrolled for light maintenance needs throughout their popular use seasons, especially after larger wind or rain events. With timely light maintenance, long term trail degradation can be avoided, such as when trail users look for alternative routes around fallen trees, causing undue vegetation trampling and trail widening.

Trail adoption for trail sections can provide ownership and delegate trail system care, and may be a viable option for this property. The only known current maintainers are the Franklin County Mountain Bike Club.

7.2 Maintenance and Reconstruction Schedule Summary (By Phase)

PLEASE REFER TO ENTIRE SCHEDULE IN ATTACHED DOCUMENT

Phase 1-

Labor Cost	Materials Cost	Equip. Cost	Total Cost
\$21,717	\$2,591	\$7,193	\$31,501

Phase 2-

Labor Cost	Materials Cost	Equip. Cost	Total Cost
\$22,722	\$1,883	\$2,387	\$26,991

7.3 Costs Options

Labor- Labor cost and time estimates are based on an average of efficiency/skill level and cost of the labor options available. While use of volunteer labor is recommended for certain projects, others require more skills and training to be constructed efficiently, effectively and to safety and durability specifications.

General recommendations for this project fall under the lines of a hybrid: Volunteer/Professional Trail Contractor. Specifics are included for each section.

Materials-Material costs may vary. Cost estimates are given at current costs from local suppliers. Each material was chosen for its ability to be both durable and cost effective and all are standard industry building materials.

Supply Donations and Grants- Donations from local hardware store, individuals or businesses may be available for hardware for structures.

7.4 Partnerships/Stakeholders

The following have been identified as stakeholders or partners for this project.

- Friends of Northern Lake Champlain (FNLC)
- City of St. Albans (City)
- Hard'ack Inc.
- Aldis Hill Trust
- Walk & Bike St. Albans (WBSA)
- Franklin County Mountain Bike Club (FCMBC)
- Vermont Youth Conservation Corps (VYCC)
- St. Albans City School (SACS)

Partnerships and ownership may be strengthened with this project by individual trail user groups that are supported by an organization adopting sections of trail to both fundraise for reconstruction, as well as to provide the annual general maintenance. Others not mentioned above could include the Bellows Falls Academy (BFA) in their use of the trails for running and biking.

7.5 Community Involvement

Community involvement with recreation in this area is strong with the Hard'ack ski hill; continuing to leverage community support will be an important part of the success of this project. All community work days and trail "adoption" programs strengthen this, organized by the groups listed above who currently use the trail system on a regular basis.

8. Trail Signage Plan

8.1 Trailhead Recommended Features

The trailhead is a prime opportunity where people are often looking for information and moving slowly enough to read signs, therefore it provides a key opportunity for trail user education. It is advisable to install a trailhead kiosk to both mark the beginning of the trail as well as draw trail users to an area of official information, such as: Leave No Trace principles, trail map and descriptions, and permitted uses. A variety of opportunities to share education information could be presented in this area. Formats could include: a posted flyer highlighting natural and cultural landmarks, a scavenger hunt of features and landmarks, a naturalists brochure or informational sheet for trail users to take with them and use during their travels. Possible partners in development of these resources may include nearby schools or college students majoring in environmental education.

Other pertinent information could include any other regulations or trail user guidelines for respectful sharing of multi-use trails.

Costs for kiosk construction are variable, depending on labor and materials. Designs and estimated material costs for two different designs shared by the Appalachian Trail Conservancy and National Park Service will be included in the Appendix. Costs for supplies vary from \$500-\$2,000, depending on design, and can often be a great project for volunteers.

8.2 Trail Signage and Marking

Placement: Trails should be signed at all junctions. Signposts are recommended, which can be securely placed in clear visibility at all trail junctions. Using appropriately placed trees can save costs, but care should be taken not to completely tighten fasteners. Signs should be affixed with screws or lag bolts.

Materials: Trail markers should be of metal or plastic for longevity and affixed with small lag bolts to help prevent theft. Costs and suppliers are listed below.

Signage Costs

(Please see accompanying map for on-site placement)

Three types of signs are recommended for different applications: color-coded arrows at junctions to designate suggested routes and directions of travel, designated trail users, and specific trail names for trails apart from recommended routes.

Recommended bike routes should be marked with color-coded arrows to designate suggested direction of travel. Individual trail signs that denote specific trail users (pedestrian or bike only) should mark all junctions with that trail. For example, all junctions with the Nature Hike should have a small placard with a pedestrian/hiker icon at the entrance.

List of signs types and numbers needed (please see signage map for locations)

Colored Route Indicator/Arrow (trailblazer, plastic): Color Coded Arrows, different colors for each recommended multi-use route.

Designated Trail User (aluminum, custom): Hike/Walker Icon, Bike Icon

Named Trail (engraved): for trails not as part of recommended routes

Sign Cost Estimate:

Type of Sign	Number	Cost Each	Total Cost	Supplier
Colored Route Indicator/Arrow (trailblazer, plastic)	155	\$.78	\$120.90	http://www.vosssigns.com/products/
Designated Trail User (aluminum, custom)	5	\$2.11	\$10.55	http://www.vosssigns.com/products/
Named Trail (engraved)	18	\$10.85	\$195.30	http://www.gordonstamp.com/
Totals			\$326.75	

9. Preparation for Construction Phase

9.1 Preparation for Construction Phase

Funding Sources: Various funding strategies can be used to support the construction phase of this project. Considering the size of the project, a funding strategy that employs multiple means will most likely be needed.

Public fundraising campaigns can work in multiple ways to publicize and gain support for a project, as well as raise funds to support it. Possible fundraising ideas could include an event where the public “votes with their dollars” for their favorite trails names from the ones provided by the 7th and 8th graders. This list is included in the appendix.

Fundraising events could be sponsored by the various groups that use the trails, such as the weekly races, etc. Additional funding might even be raised through trail adoption by local businesses.

Trails and Recreation Grants

Vermont Recreation Trails Grants

Contact: 802.241.3690 or sherry.winnie@state.vt.us

Recreational Trails Program funding would also fit this project, with deadlines for applications in 2015. Grant amounts: reimbursed, 20:80 match, \$20,000 maximum.

<http://www.vtfpr.org/recgrant/trgrant.cfm>

Land and Water Conservation Fund

Contact: 802-249-1230 or jessica.savage@state.vt.us

Land and Water Conservation Funding are administered by Forest Parks and Recreation staff in the state of Vermont. With the recent release of the VT SCORP, the next funding cycle will be available in fall of 2014, though the date is currently not available.

Vermont Watershed Grants

802.241.3769 or rick.hopkins@state.vt.us

Implementation funding is available for amounts up to \$15,000. See website for further details. http://www.anr.state.vt.us/dec/waterq/lakes/htm/lp_watershedgrants.htm

VTrans Enhancements Program

802.828.0583 or curtis.johnson@state.vt.us. Maybe not the best for funding for this project. <http://vtransengineering.vermont.gov/sections/ltf/transportationalalternatives>

The National Park Service Rivers and Trails Program

Contact: 802.457.3368 x 21 or jennifer_waite@nps.gov. Deadline August 1st
<http://www.nps.gov/orgs/rtca/apply.htm>

People for Bikes

Funds portions of bike related projects up to \$10,000.
<http://www.peopleforbikes.org/pages/grant-guidelines>

Permits: There are no obvious triggers for permitting related to the implementation of this plan on the SARR.

Act 250: The area of disturbance will be within the bounds of acceptability in order to avoid enacting Act 250 permitting.

Wetlands: No section of trail disturbs wetlands or passes within the border of a designated wetland.

Historic Preservation: There are no indications of the need for historic preservation review as no section of trail or proposed trail within this plan pass nearby old foundations or lower riverbank areas.

9.2 Education

Trail Users

Trail user education is imperative for a sustainable trail system. This can happen through trailhead posting, community trail work days, and information campaigns targeted towards the groups which regularly use the area. Please see “kiosk” section on advisable information to post at trailheads.

Natural/Cultural History

The property highlights numerous natural and cultural history features for which there is a fair bit of interest. Opportunities to compile information to share with the trail users could take a variety of forms: brochures, trailhead signage, trail side plaques, trailside markers corresponding with maps/handouts, online scavenger hunts, etc. In order to incorporate this, it is advised to either work with local schools or students from nearby colleges to develop and design this content.

It will be imperative that the community and stakeholders are involved as the project moves forward. While education about appropriate trail use is mandatory, it will work best paired with opportunities to educate trail users about the unique features and ecology of the St. Albans Recreation Reserve. It is advised that trail user education be paired with opportunities for interpretative education to aid in instilling a respect for the unique ecological landscape that exists alongside the public recreational opportunities.

10. Summary of Recommendations

Most of the current trail conditions in need of mitigation include areas of erosion, muddy areas with active and increasing widening, trailside vegetation trampling, and areas where safety is a concern due to disrepair or incomplete trail construction. Improvements have been prioritized and split into two phases of implementation, taking into account the amount of trail use, the sensitivity of the trailside area affected, and sensitivity to accommodating a variety of user groups for a variety of trail experiences.

Recommended improvements consist mainly of: 1) raising low lying areas with either boardwalk or imported crushed stone fill material, 2) mitigating erosion by re-routing steep alignments onto terrain with a less steep slope, 3) installing drainage to prevent further future erosion, 4) increasing safety and enjoyable user experiences by having marked routes with fewer trail junctions, 5) and closing redundant trails to allow for natural re-vegetation.

11. Appendix

11.1 Survey Results

103 Responses over a 2 week period of time.

Q: On a typical visit, how often do you take advantage of the following activities at Hard'ack/Aldis Hill?

Bike

Never	56	54%
Sometimes	21	20%
Often	16	16%
Always	10	10%

Cross-Country Ski

Never	72	70%
Sometimes	23	22%
Often	5	5%
Always	3	3%

Hike

Never	9	9%
Sometimes	29	28%
Often	48	47%
Always	17	17%

Snowshoe

Never	46	45%
Sometimes	40	39%
Often	13	13%
Always	4	4%

Walk

Never	7	7%
Sometimes	35	34%
Often	45	44%
Always	16	16%

Bring a pet

Never	51	50%
Sometimes	21	20%
Often	15	15%
Always	16	16%

Q: How frequently do you visit the Hard'ack/Aldis Hill trail system?

Spring

0-1 hours per week	12	12%
1-2 hours per week	50	49%
2-3 hours per week	15	15%
3-5 hours per week	17	17%
5-8 hours per week	6	6%
8+ hours per week	3	3%

Fall

0-1 hours per week	7	7%
1-2 hours per week	40	39%
2-3 hours per week	25	24%
3-5 hours per week	17	17%
5-8 hours per week	10	10%
8+ hours per week	4	4%

Summer

0-1 hours per week	8	8%
1-2 hours per week	38	37%
2-3 hours per week	19	18%
3-5 hours per week	21	20%
5-8 hours per week	12	12%
8+ hours per week	5	5%

Winter

0-1 hours per week	18	17%
1-2 hours per week	51	50%
2-3 hours per week	11	11%
3-5 hours per week	10	10%
5-8 hours per week	9	9%
8+ hours per week	4	4%

How do you access the Hard'ack/Aldis Hill trail system?

Hard'ack	74	46%		
Isham Street	39	24%		
Governor Smith Street	38	23%		
Private Property (Owned by you/given you permission)	9	6%		
Other	2	1%		

How do you arrive at the trail system?

Walk	53	36%
Drive	61	41%
Bike	24	16%
Other	10	7%

11.3 References

Appalachian Trail Conservancy. Planning a Trailhead Kiosk, 2012. A Revision to Planning a Trailhead Bulletin Board (1998). Available at: <http://www.appalachiantrail.org/docs/default-document-library/trailhead-kiosks-2012-update-to-th-bulletinboards.pdf>

Birkby, Robert C. *Lightly on the Land: The Student Conservation Association Trail-Building and Maintenance Manual*. Seattle, WA: The Mountaineers, 2005. ISBN 0-89886-848-3. 344 pp. Available at 800-553-4453.

Davies, Mary, Hesselbarth, Woody, Vachowski, Brian. *Trail Construction and Maintenance Notebook - 2007 Edition*. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center, 2007.
http://www.fhwa.dot.gov/environment/recreational_trails/publications/fs_publications/07232806/

International Mountain Bike Association. *Trail Solutions: IMBA's guide to building sweet singletrack*. Boulder, CO: IMBA, 2004. ISBN 0-9755023-0-1.

Jeswald, P. *How to Build Paths, Steps and Footbridges*. North Adams, MA: Storey Publishing, 2005. ISBN 1-58017-487-6.

Parker, Troy Scott. 2004. *Natural surface trails by design: physical and human design essentials of sustainable, enjoyable trails*. ISBN: 0-9755872-0. Natureshape LLC.
(<http://www.natureshape.com>)

Staff of AMC's Trails Department. *AMC's Complete Guide to Trail Building & Maintenance: Proven techniques, safety guidelines, equipment tips, 4th ed.* Boston, MA: Appalachian Mountain Club Books, 2008. ISBN 978-1-934028-16-2.

Steinholz, Robert T.; Vachowski, Brian. "Wetland Trail Design and Construction 2007 Edition." 0723 2804. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center, 2007. 90 p.

<http://www.fhwa.dot.gov/environment/rectrails/trailpub.htm>.

U.S. Department of Agriculture Forest Service. 1996. *Forest Service National trail drawings and specifications*. EM-7720-103. Washington, DC: U.S. Department of Agriculture Forest Service.

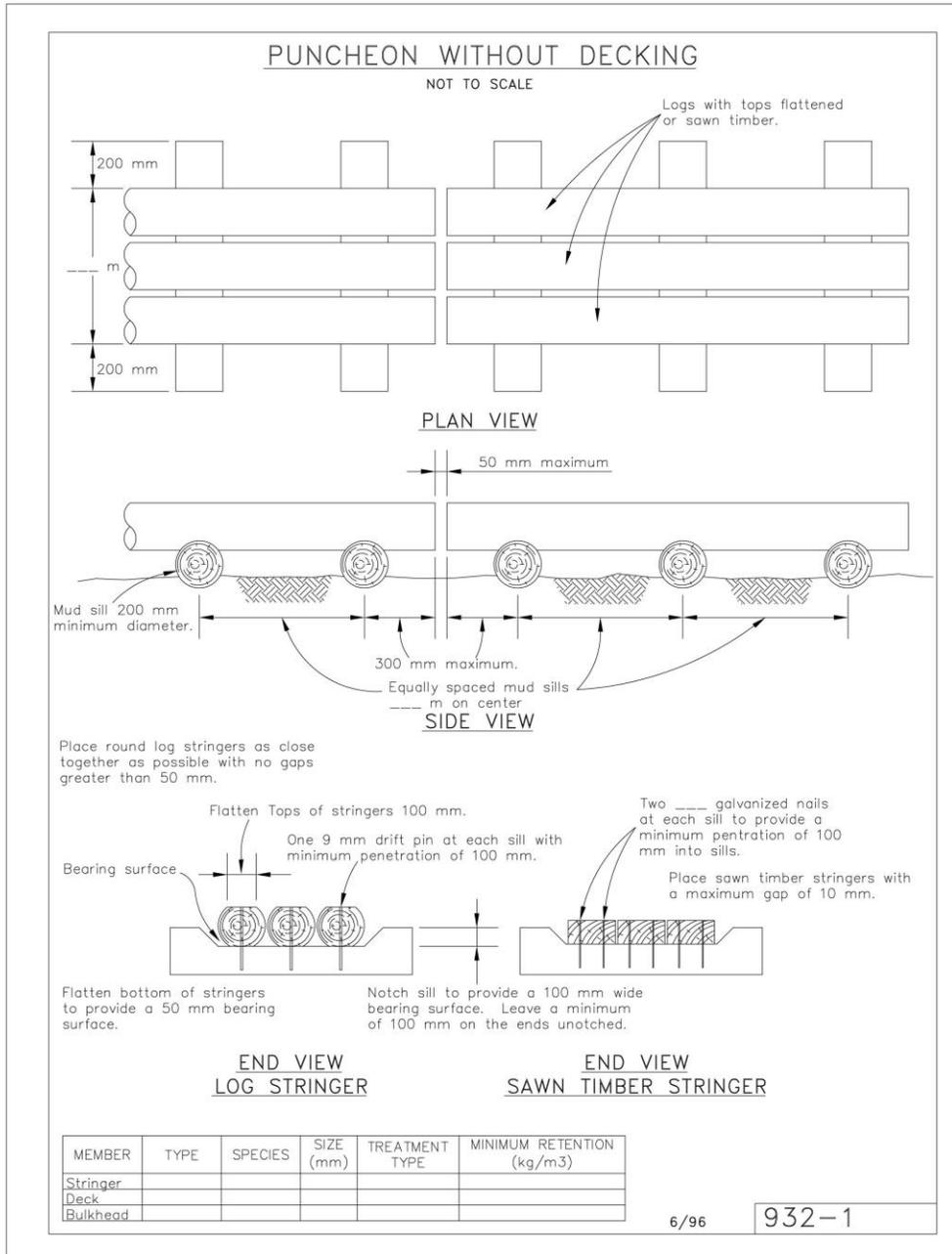
<http://www.fs.fed.us/.ftproot/pub/acad/dev/trails/trails.htm>

"Vermont Trails and Greenways Manual." Prepared by the Vermont Trails and Greenways Council, September 2005. 78 p. <http://www.vermonttrailsandgreenways.org/resources/manual>

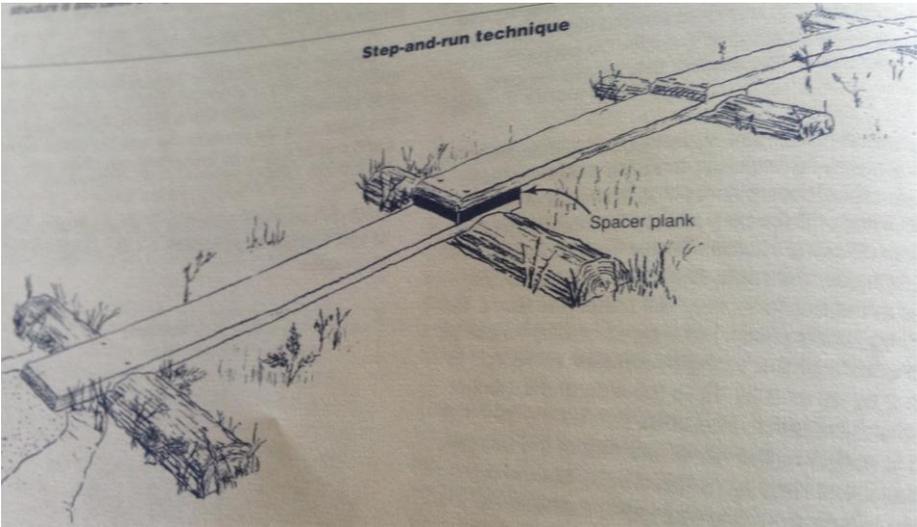
11.4 Recommended Structures

Bog Bridging/Puncheon

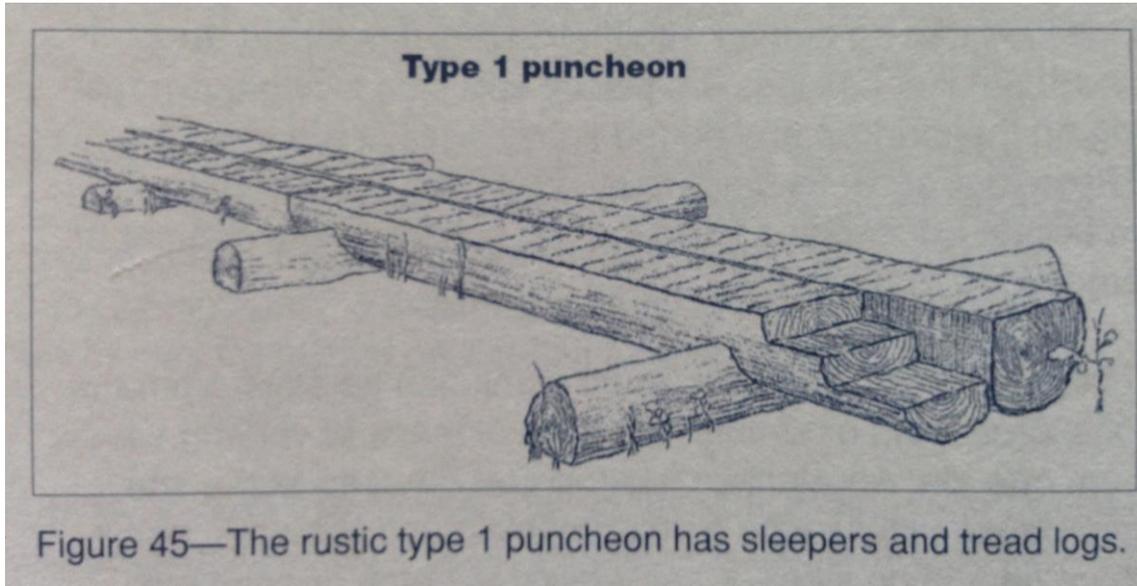
Design specifics: Overhangs at the end of the stringers should not exceed 6 inches. Spikes must exceed over 2 inches beyond the depth of the stringer in to the sill log and be off-set in their placement so as to minimize the risk of splitting. Tread should total 24" minimum.



Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftproot/pub/acad/dev/trails/trails.htm>



Single Stringer Dimensional Step Bog Bridge
Source: Steinholtz and Vaschow, 2007



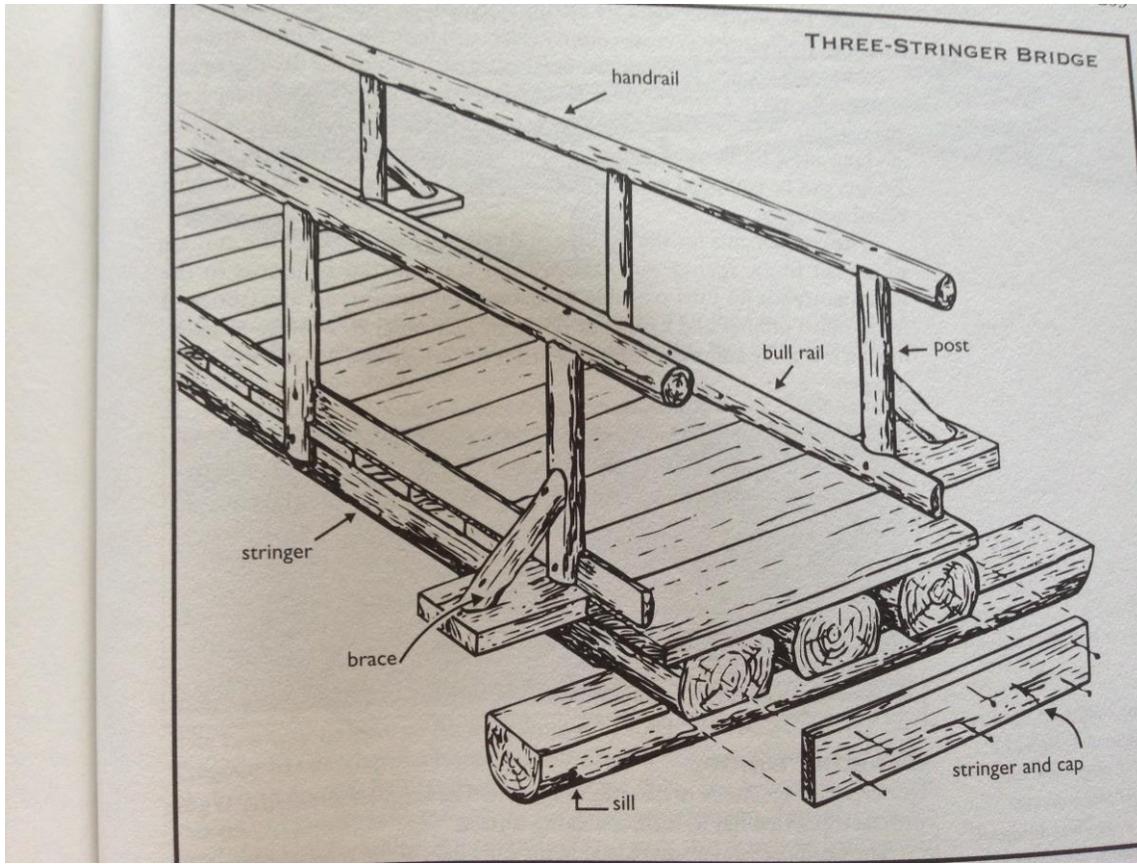
2 Stringer Bog Bridge using Native Timbers
Source: Steinholtz and Vaschow, 2007

Foot bridges

Designs may vary greatly. Builder should choose a suitable design, utilizing as much native timber from on site as skill level will allow.



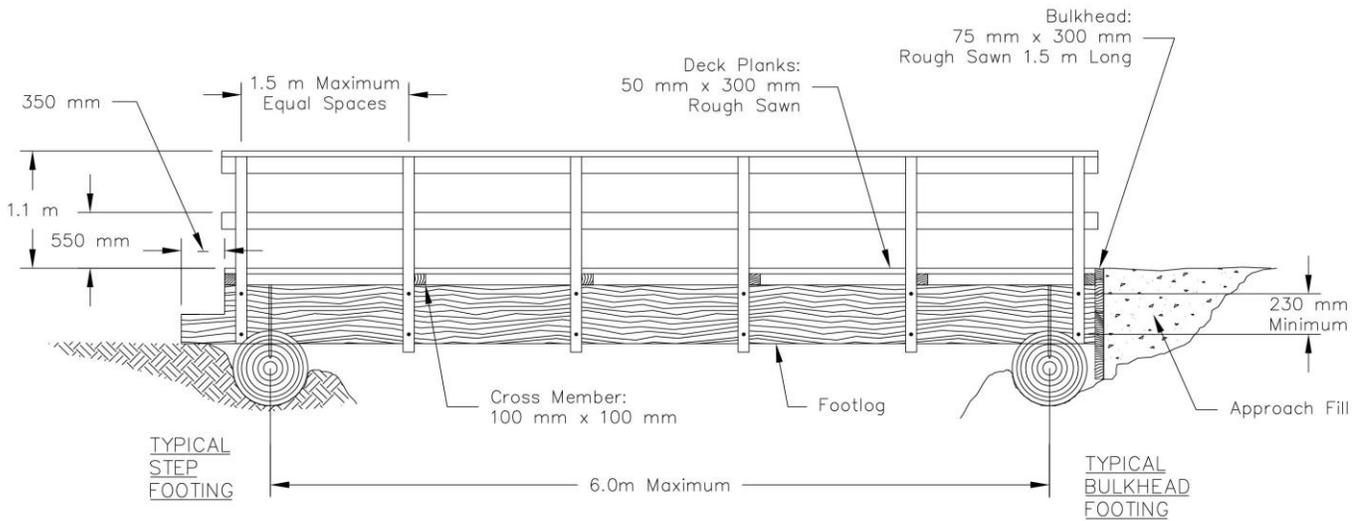
LaPlatte River Trail- Shelburne, VT (Built by Sinuosity)



Design using a majority of native timber
Source: Birkby, 1996

FOOT LOG TRAIL BRIDGE WITH 2 HANDRAILS

NOT TO SCALE



SIDE VIEW

Notes:

- This drawing applies to all species except aspen, cottonwood and cedar.
- Dap log a maximum of 70 mm for rail posts and cross members.
- Pre-drill holes for lag screws and insert by turning with a wrench. Do not drive with a hammer.
- Peel all Logs.

Member	Species	Treatment Type	Minimum Retention (kg/m ³)
Rail			
Bulkhead			
Deck Plank			

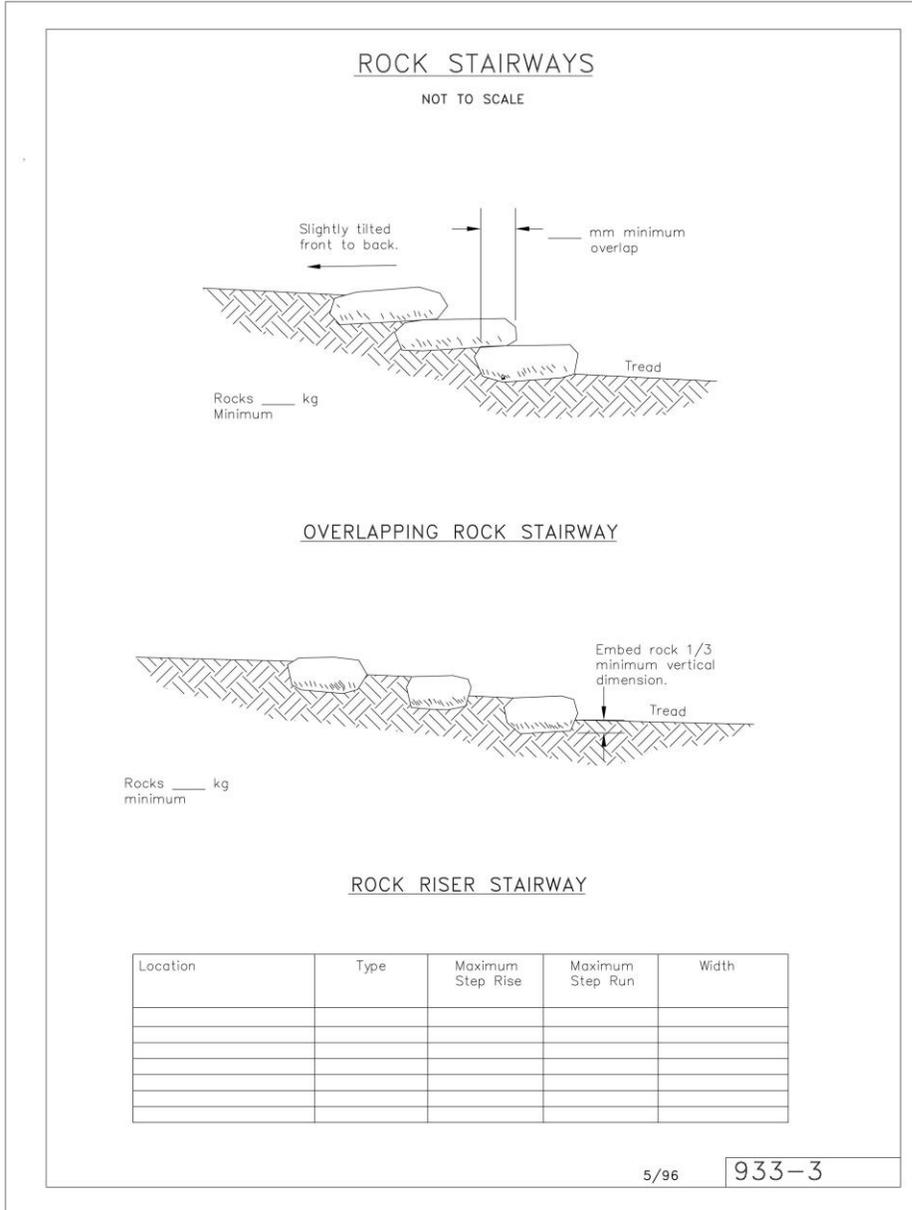
3/97

931-10

Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Rock Steps

Design Specifications: In addition to all rocks being of appropriate size for the applications as well as placed in such a way that erosion or freeze thaw will not cause instability over time, edge rocks need to be placed on both sides of the rock stairs, having firm and high contact on the stair rocks.

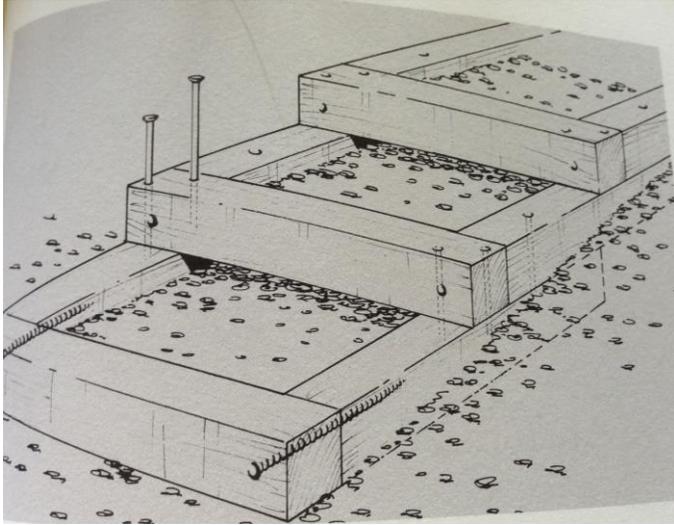


Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Wooden Stairs (Box Steps)

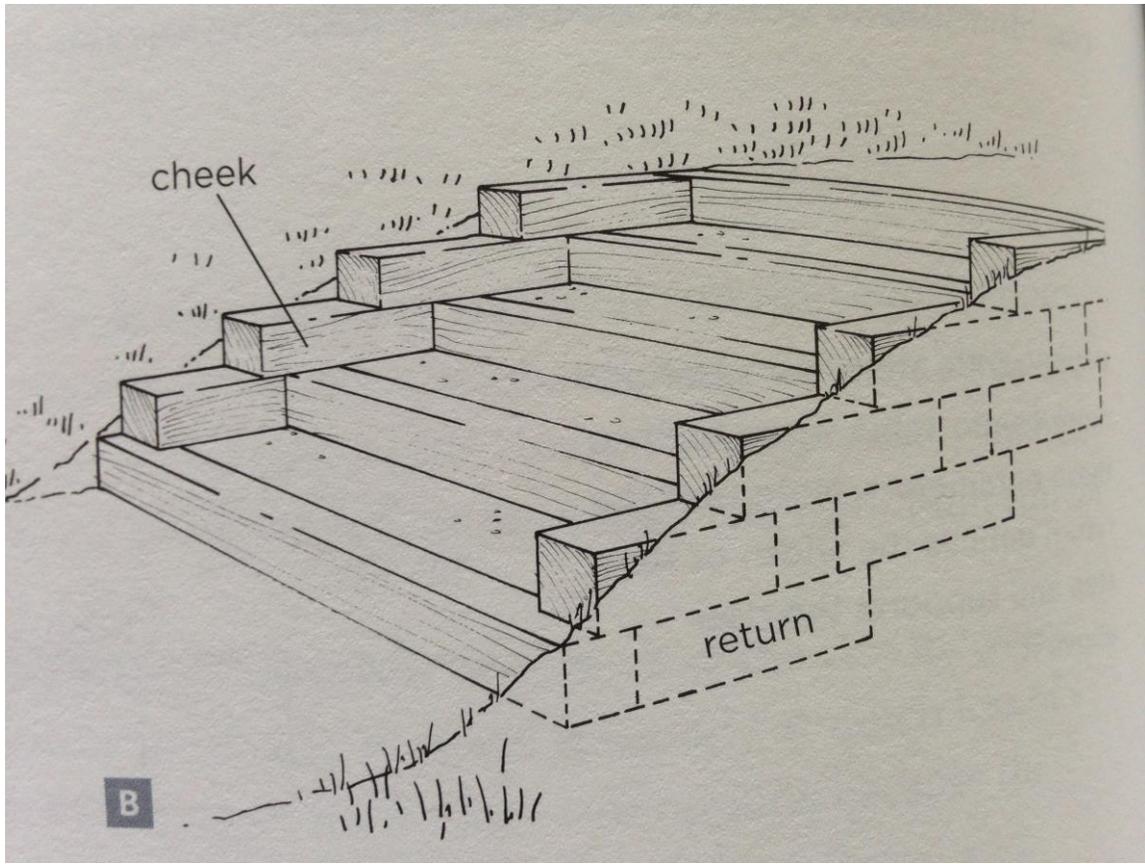
Design Specifications: Stairs must adequately retain fill material on all sides. Fill material should be slightly mounded so as to allow for shedding of water.





Source: Jeswald, 2005

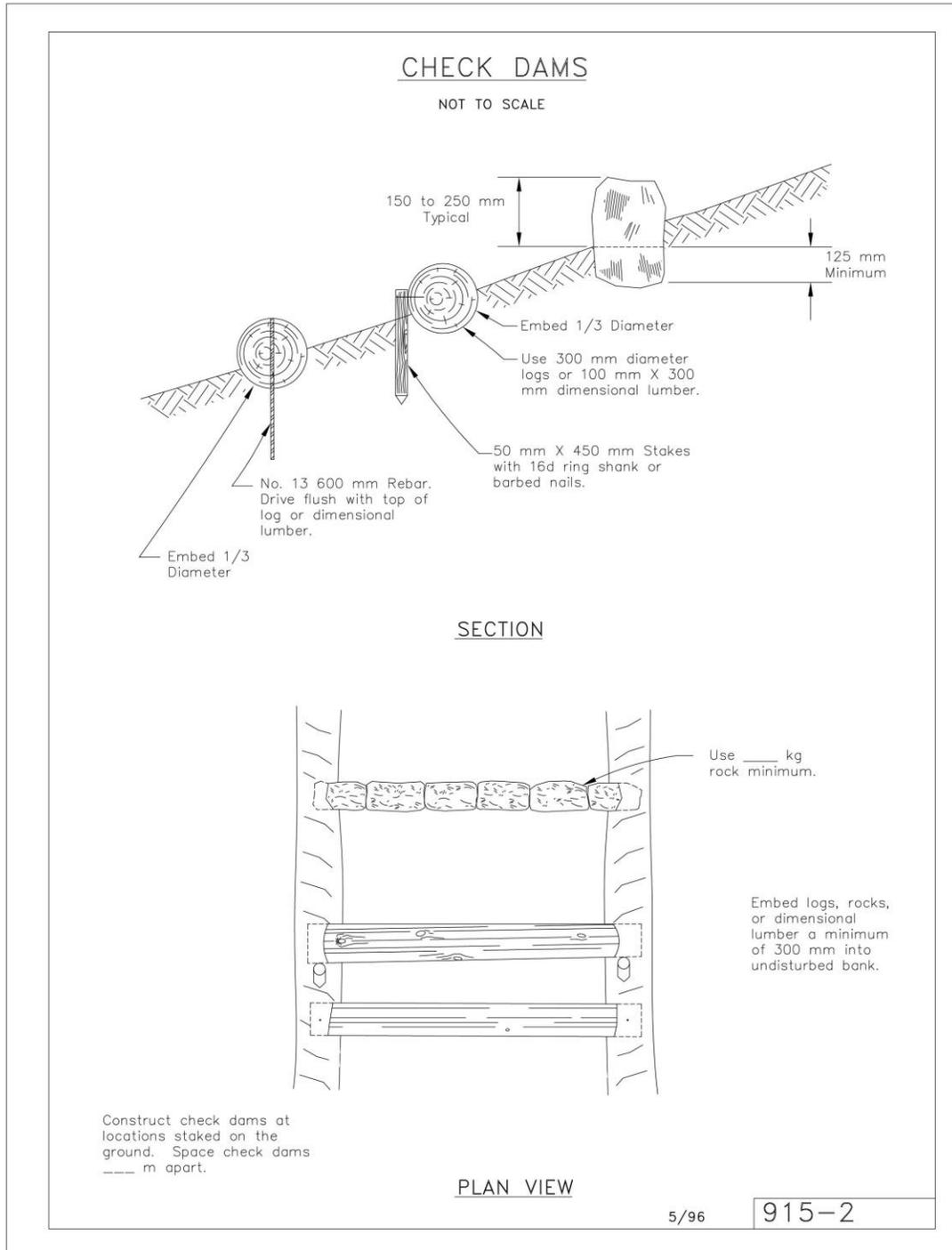
Photo: Clark Pond Trail, South
Portland, ME- Built by AMC 2009



Source: Jeswald, 2005

Check Dams

Design Specifications: Must be set firmly in the ground, exactly perpendicular to the flow of water and the direction that trail travels. Additionally, they must be set exactly level so as to create slowed sheet flow of water.

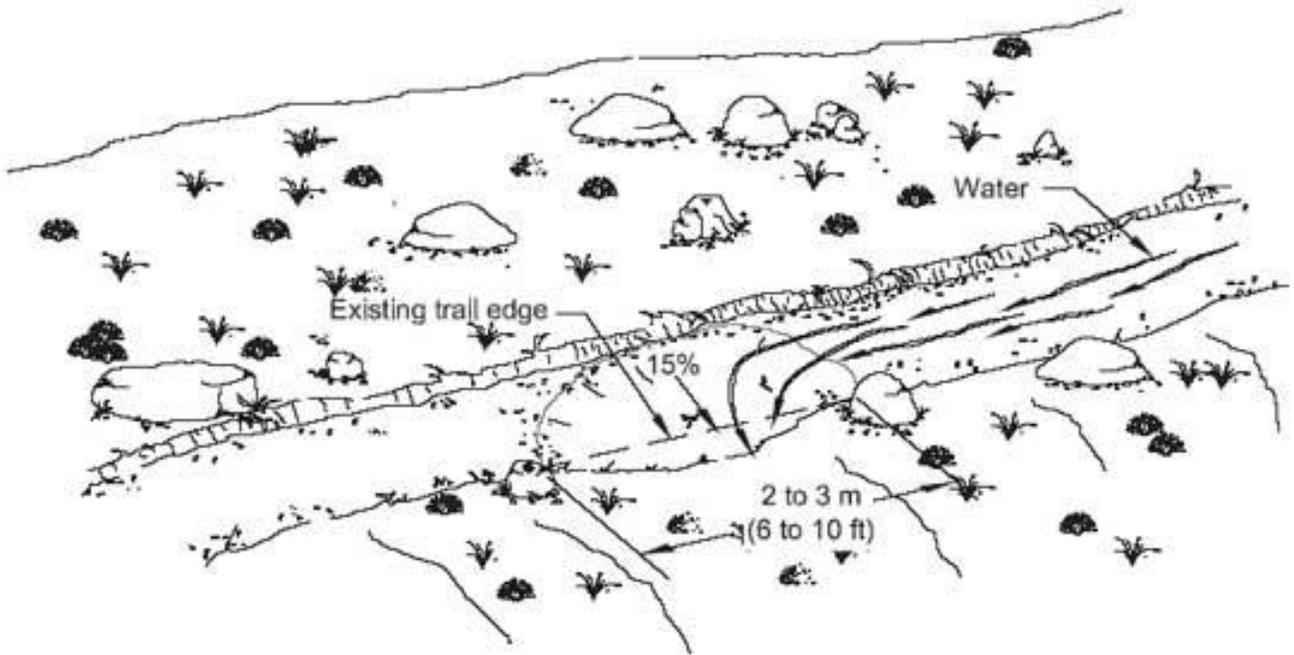


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<http://www.fs.fed.us/.ftproot/pub/acad/dev/trails/trails.htm>

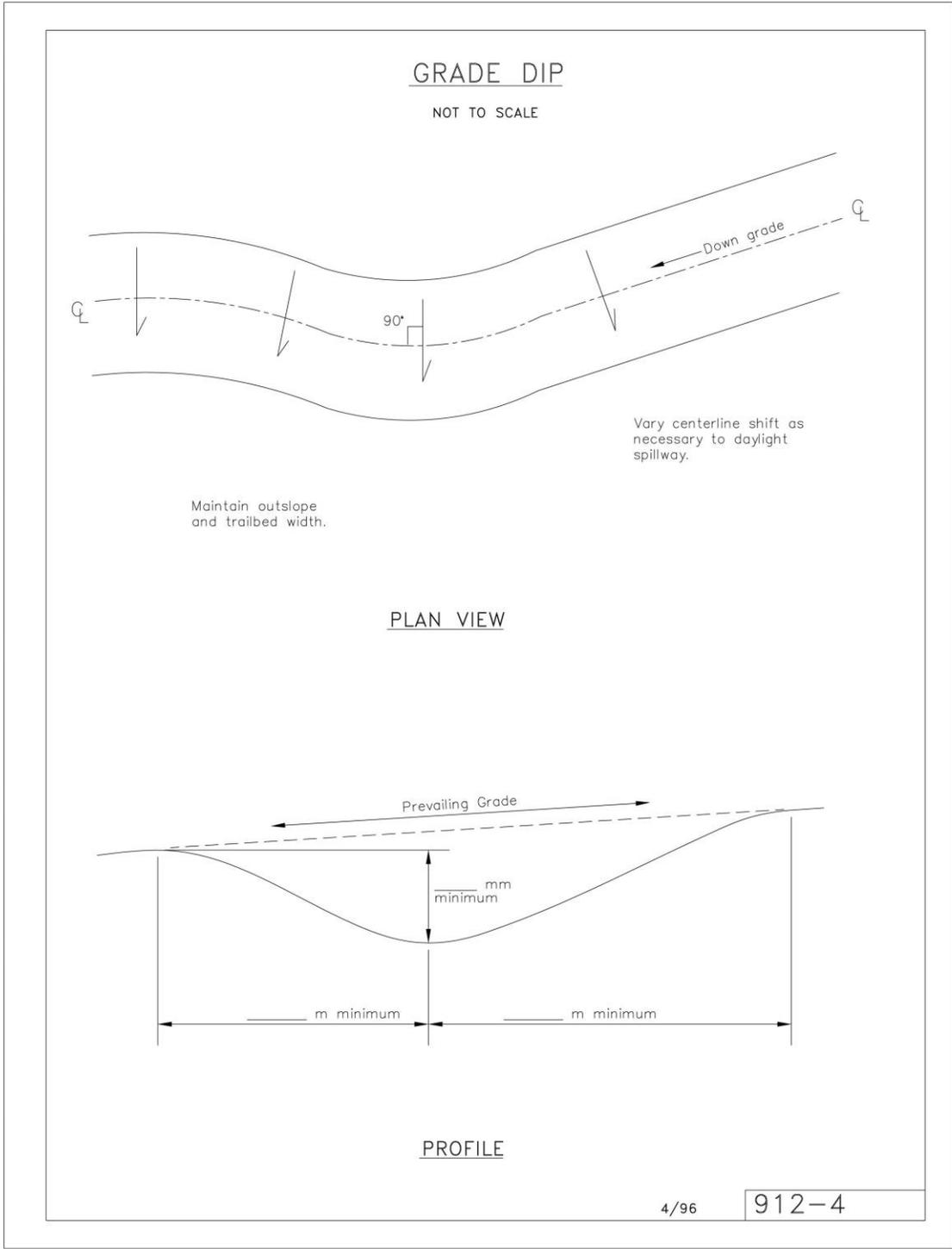
Drainages

Design Specifications: Drainages should be made of soil, unless they are requiring armoring. Follow guidelines specified for various natural drainage features during new trail construction i.e. grade reversals, grade dips, knicks etc.

Knick

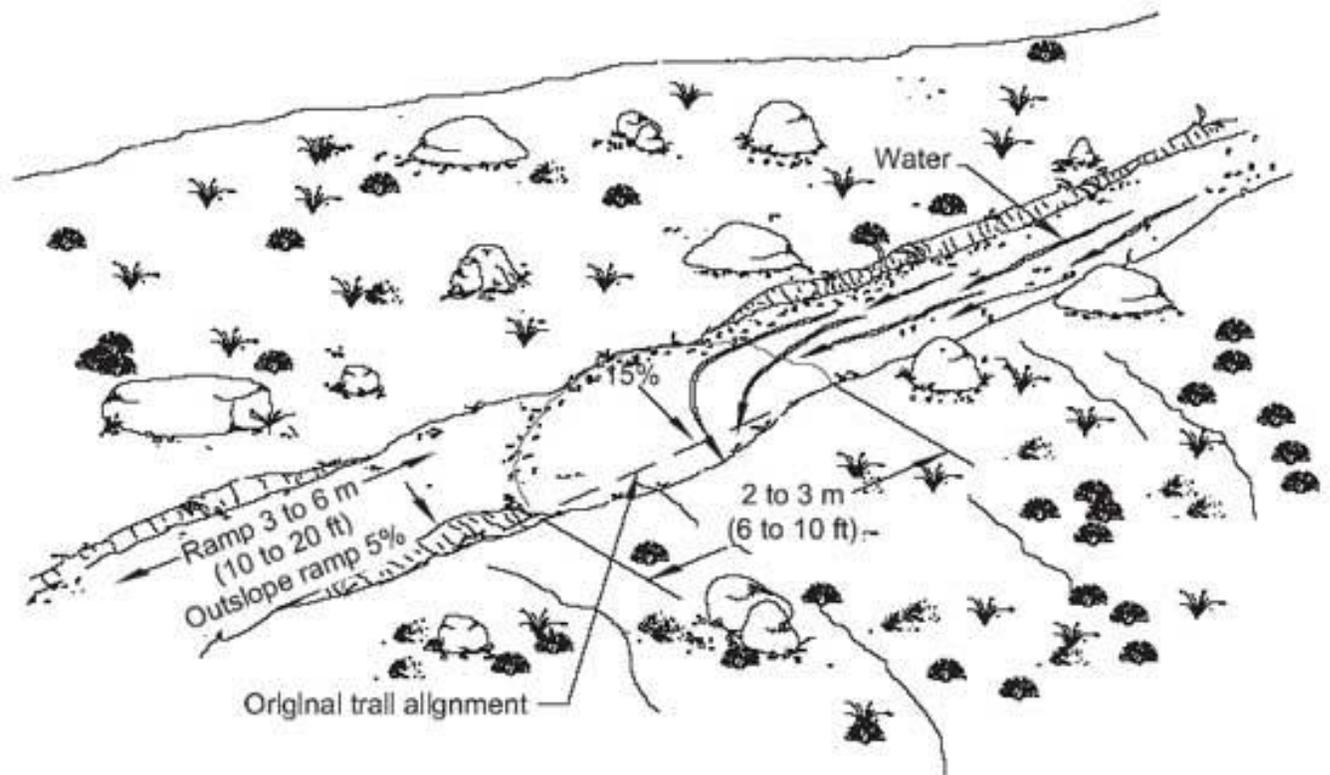


Source: *Trail Construction and Maintenance Notebook - 2007 Edition.*



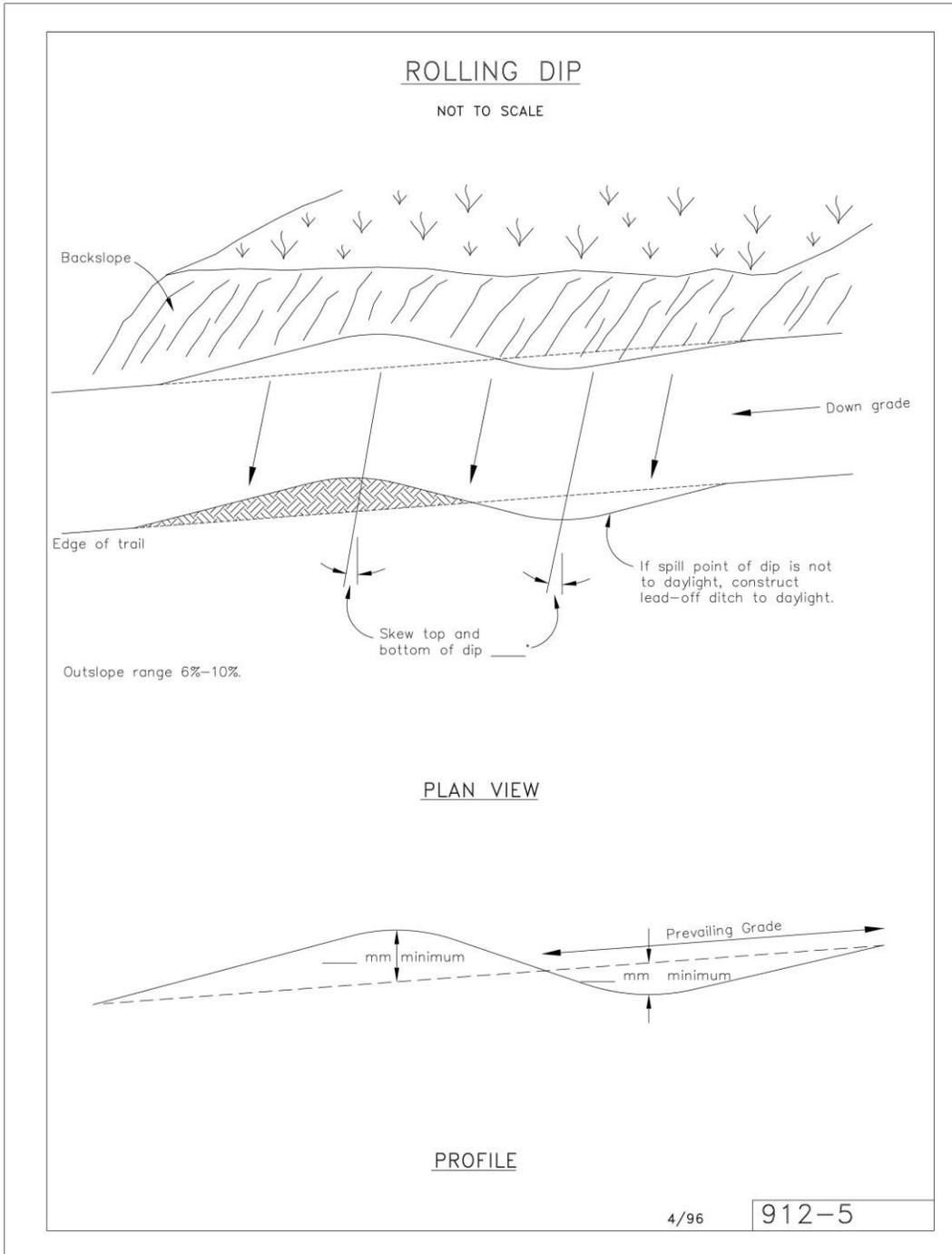
Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Grade Reversal



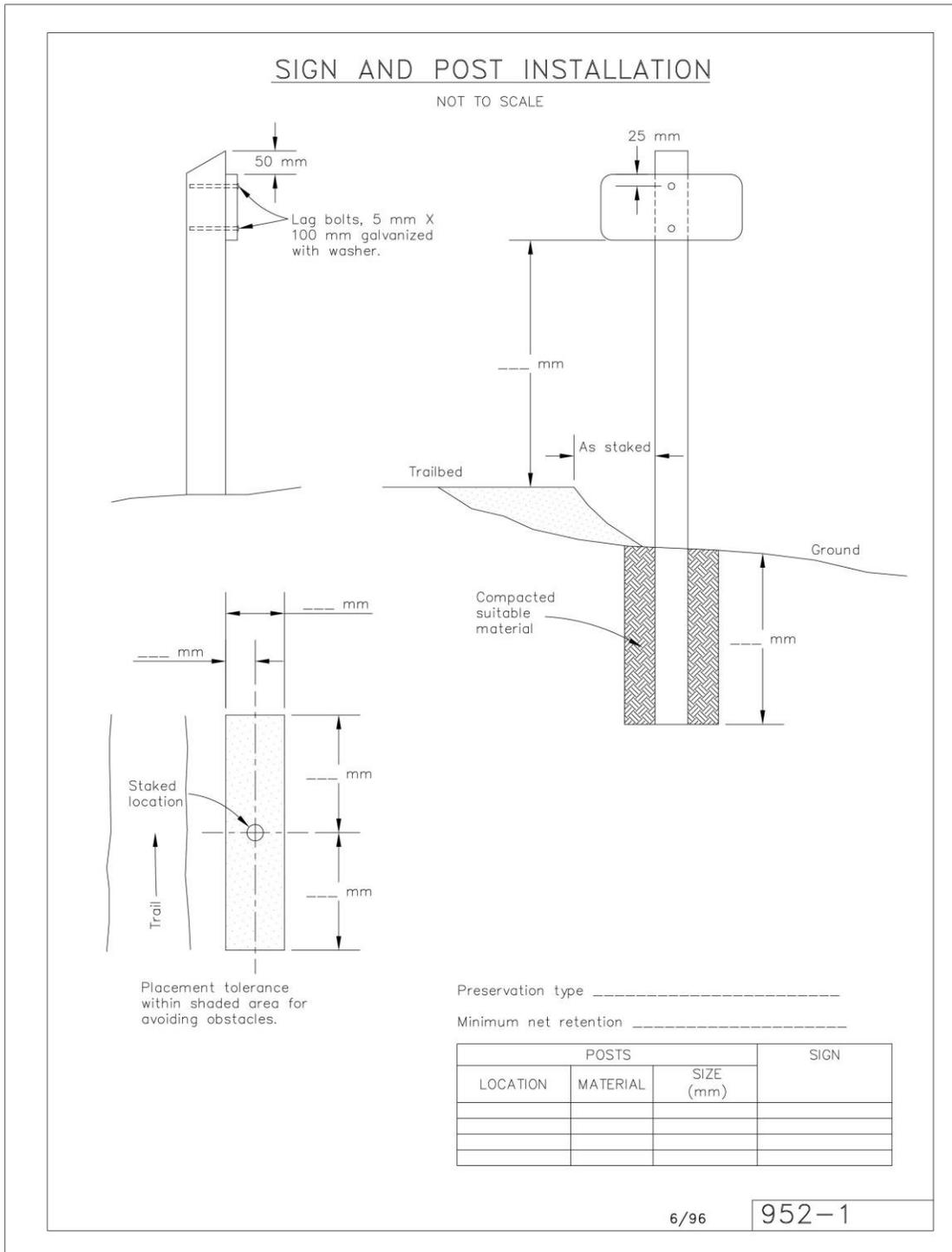
Source: *Trail Construction and Maintenance Notebook - 2007 Edition*.





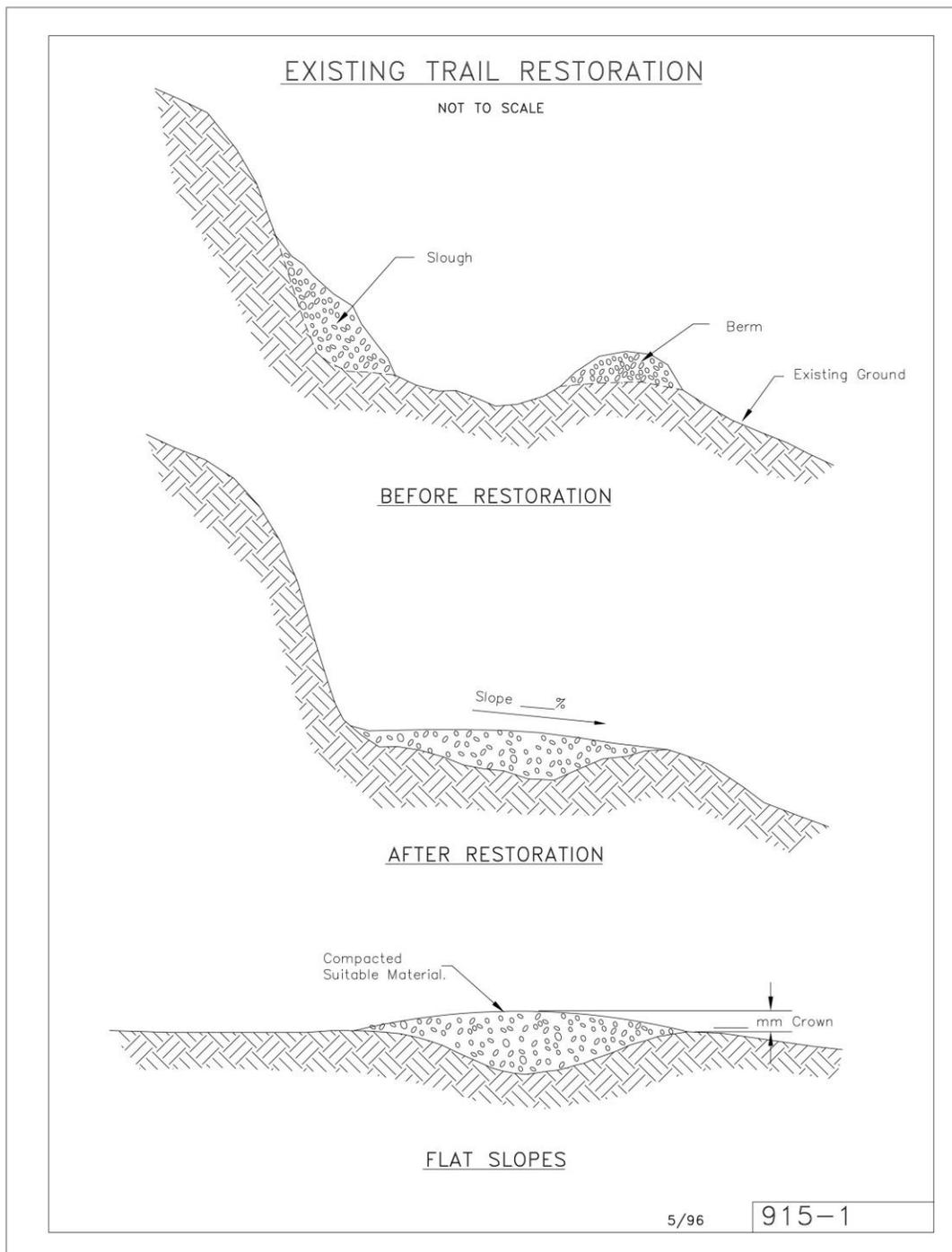
Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Sign Posts



Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Trail Re-grading



Source: Standard Specifications for Construction and Maintenance of Trails (USFS)
<http://www.fs.fed.us/ftpoot/pub/acad/dev/trails/trails.htm>

Kiosk Plans: Planning a Trailhead Kiosk, 2012, Appalachian Trail Conservancy

RECOMMENDED BY:
APPALACHIAN TRAIL CONFERENCE
NPS APPALACHIAN TRAIL PROJECT OFFICE

FRONT ELEVATION
SCALE: 3/4" = 1'-0"

END ELEVATION
SCALE: 3/4" = 1'-0"

FRAMING DETAIL
SCALE: 3/4" = 1'-0"

SIDE FRAMING DETAIL
SCALE: 3/4" = 1'-0"

ROOF ASSEMBLY
SCALE: 3/4" = 1'-0"

(NOT TO SCALE)

NOTES:

1. ALL WOOD SHOULD BE PRESSURE TREATED.
2. ALL HARDWARE AND NAILS SHALL BE GALVANIZED.
3. CEDAR WOOD SHAKES SHOULD BE APPROXIMATELY 18" X 1/2" HANDSPLIT WITH A 5 1/2" EXPOSURE.
4. FINISH SHOULD BE NATURAL.
5. STANDARD SLAT SIGN SHOULD HAVE APPROXIMATELY 2" LETTERS - "WELCOME TO THE APPALACHIAN TRAIL". WOOD ROUTED OR WHITE REFLECTIVE PAINT.
6. EASE ALL EXPOSED EDGES.
7. LEXAN COVER FOR PLYWOOD IS OPTIONAL. ATTACH 2" X 2" WOOD TRIM TO OUTSIDE EDGE OF LEXAN WITH 1/4" LAG SCREWS. ATTACH LEXAN TO PANEL AT TOP WITH 3" X 3" HINGES (OR COMPARABLE SIZE DOOR HINGES).
8. OPTIONAL: 5/8" REBAR MAY BE ATTACHED TO BACK OF 10"X10" SUPPORT POSTS TO DETER VANDALS.
9. IN NORTHERN LOCATIONS, SINK SUPPORT POSTS TO A MINIMUM DEPTH OF 4'.
10. IF CONCRETE WILL NOT BE USED AROUND SUPPORT POSTS (FOOTERS), INCREASE DEPTH AN ADDITIONAL 1'0".
11. OPTIONAL: USE COPPER FLASHING EXPOSED 1' ON EITHER SIDE FROM UNDER SHAKE CAP. (COPPER WASH ON ROOF HELPS PREVENT MOLD AND MILDEW)

DESIGN #1
LONG LASTING
BULLETIN BOARD

PRODUCT ILLUSTRATION
DESIGNED BY: L. VALLIN
DRAWN BY: L. VALLIN
CHECKED BY: T. GORMAN
FILE NAME: 2/10 - BULB - 7/12/22

DESIGNED BY: L. VALLIN
DRAWN BY: L. VALLIN
CHECKED BY: T. GORMAN
FILE NAME: 2/10 - BULB - 7/12/22

Appalachian Trail Gateway Bulletin Board

Materials List

Long-Lasting Bulletin Board

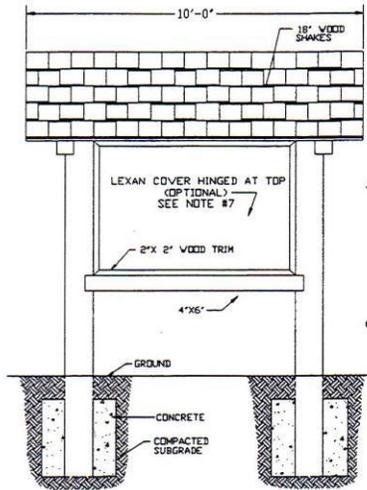
Design #1 # Needed	Material	Approximate Cost
2	10" x 10" x 12'6" pressure treated lumber (support posts)	400.00
4	6" x 8" x 4'6" pressure treated lumber	220.00
2	6" x 6" x 5' pressure treated lumber (rafters)	50.00
2	6" x 10" x 6'4" pressure treated lumber (horizontal beams)	135.00
1	6' x 4' x 3/4" plywood panel	28.00
1	6' x 4' x 1/4" Lexan®	240.00
2	2" x 2" x 4' pressure treated board (panel frame)	7.00
2	2" x 2" x 6' pressure treated board (panel frame)	7.00
1	15" (minimum) x 10' aluminum ridge flashing	27.00
approx. 18	2" x 4" pressure treated boards (roof frame)	70.00
as needed	Wood shakes, triple overlay, approx. 5" – 6" exposed (100 sq. ft.)	600.00
12	1/2" x 12" lag screws	60.00
18	1/4" x 4" lag screws (panel frame)	18.00
8	1/2" x 10" lag screws	40.00
2	5/8" x 3' rebar minimum (optional; to attach to back or side of posts to deter vandals from using chainsaw on support posts)	13.00
as needed	Galvanized nails to attach 2" x 4" roof frame	5.00
as needed	Galvanized nails to attach wood shakes on roof	5.00
12	60-pound bags of ready-mix concrete (optional; can be poured dry or wet around base of support posts to add stability)	50.00
8	12" bridge spikes or lag bolts (optional; can be pounded or nailed near base of support posts, below grade, to add stability)	7.00
Total Cost		\$1,982.00

RECOMMENDED BY:
 APPALACHIAN TRAIL CONFERENCE
 NPS APPALACHIAN TRAIL PROJECT OFFICE

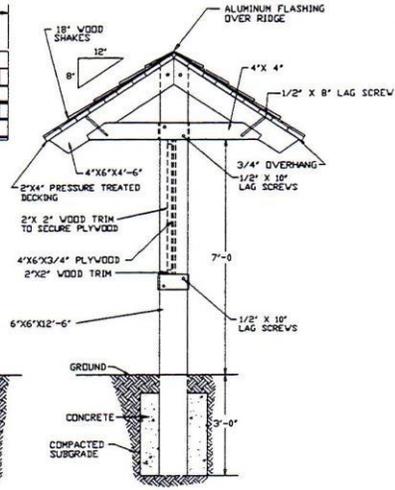
DESIGN #2
 ECONOMIC
 BULLETIN BOARD

PRODUCTION:
 DRAWING BY: E. HENKEL, L. GORHAM
 CHECKED BY: L. GORHAM
 FILE NUMBER: 3484 2/27/78

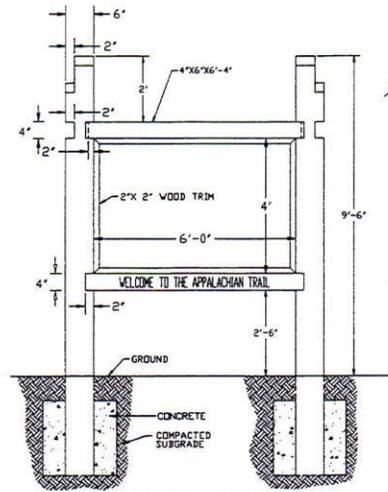
ENGINEER BY: V. VALUANI
 DRAWING BY: E. HENKEL
 CHECKED BY: V. VALUANI, B. DENK
 FILE NUMBER: 3484 2/27/78



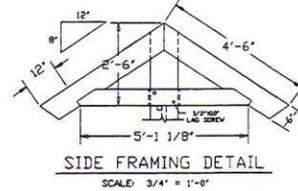
FRONT ELEVATION
 SCALE: 3/4" = 1'-0"



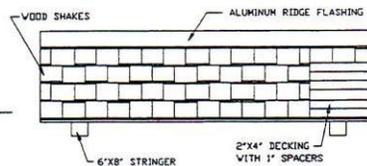
END ELEVATION
 SCALE: 3/4" = 1'-0"



FRAMING DETAIL
 SCALE: 3/4" = 1'-0"



SIDE FRAMING DETAIL
 SCALE: 3/4" = 1'-0"



ROOF ASSEMBLY
 SCALE: 3/4" = 1'-0"

(NOT TO SCALE)

NOTES:

1. ALL WOOD SHOULD BE PRESSURE TREATED.
2. ALL HARDWARE AND NAILS SHALL BE GALVANIZED.
3. CEDAR WOOD SHAKES SHOULD BE APPROXIMATELY 18" X 1/2" HANDSPLIT WITH A 5 1/2" EXPOSURE.
4. FINISH SHOULD BE NATURAL.
5. STANDARD SLAT SIGN SHOULD HAVE APPROXIMATELY 2" LETTERS - 'WELCOME TO THE APPALACHIAN TRAIL', WOOD ROUTED OR WHITE REFLECTIVE PAINT.
6. EASE ALL EXPOSED EDGES.
7. LEXAN COVER FOR PLYWOOD IS OPTIONAL. ATTACH 2' X 2' WOOD TRIM WITH 1/4" LAG SCREWS.
8. OPTIONAL: 5/8" REBAR MAY BE ATTACHED TO BACK OF 10"X10" SUPPORT POSTS TO DETER VANDALS.
9. IN NORTHERN LOCATIONS, SINK SUPPORT POSTS TO A MINIMUM DEPTH OF 4'.
10. IF CONCRETE WILL NOT BE USED AROUND SUPPORT POSTS (FOOTERS), INCREASE DEPTH AN ADDITIONAL 1'0".
11. OPTIONAL: USE COPPER FLASHING EXPOSED 1' ON EITHER SIDE FROM UNDER SHAKE CAP. (COPPER WASH ON ROOF HELPS PREVENT MOLD AND MILDEW)

Appalachian Trail Gateway Bulletin Board

**Materials List
Economic Bulletin Board**

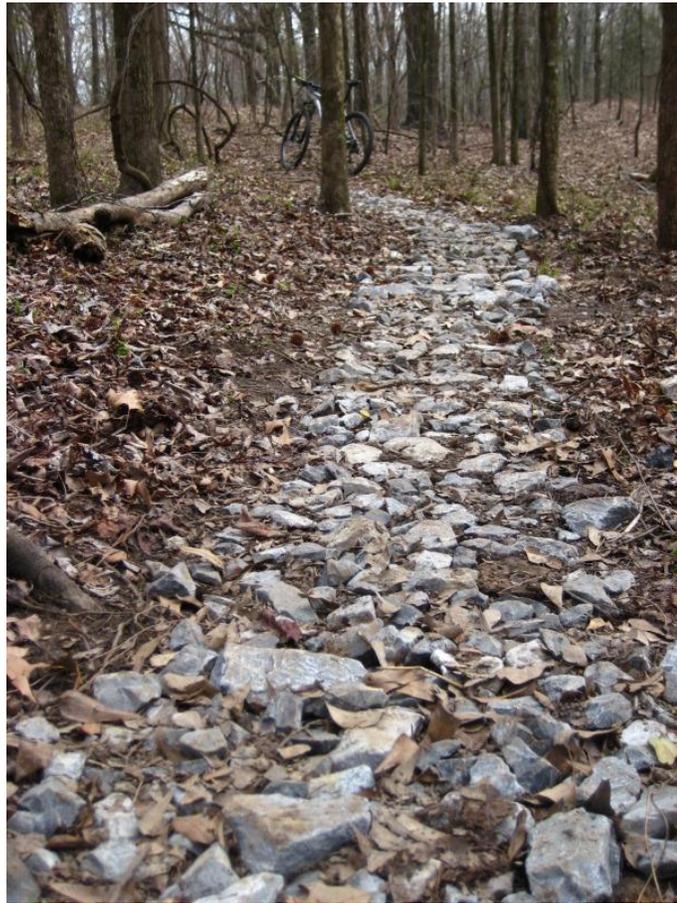
Design #1 # Needed	Material	Approximate Cost
2	6" x 6" x 12'6" pressure treated lumber (support posts)	70.00
4	4" x 6" x 4'6" pressure treated lumber	60.00
2	4" x 6" x 5' pressure treated lumber (rafters)	30.00
2	4" x 6" x 6'4" pressure treated lumber (horizontal beams)	30.00
1	6' x 4' x 3/4" plywood panel	28.00
1	6' x 4' x 1/4" Lexan®	240.00
2	2" x 2" x 4' pressure treated board (panel frame)	7.00
2	2" x 2" x 6' pressure treated board (panel frame)	7.00
1	15" (minimum) x 10' aluminum ridge flashing	27.00
approx. 18	2" x 4" pressure treated boards (roof frame)	70.00
as needed	Wood shakes, triple overlay, approx. 5" – 6" exposed (100 sq. ft.)	600.00
12	1/2" x 10" lag screws	60.00
18	1/4" x 4" lag screws (panel frame)	18.00
8	1/2" x 8" lag screws	24.00
2	5/8" x 3' rebar minimum (optional; to attach to back or side of posts to deter vandals from using chainsaw on support posts)	13.00
as needed	Galvanized nails to attach 2" x 4" roof frame	5.00
as needed	Galvanized nails to attach wood shakes on roof	5.00
12	60-pound bags of ready-mix concrete (optional; can be poured dry or wet around base of support posts to add stability)	50.00
8	12" bridge spikes or lag bolts (optional: can be pounded or nailed near base of support posts, below grade, to add stability)	7.00
Total Cost		\$1,351.00

Note: Costs for Kiosk designs based on 2012 prices.

BOARDWALKS



ROCK ARMORED TREAD



IMPORTED FILL



11.5 USFS Class Matrix



Trail Class Matrix (FSH 2353.142, Exhibit 01)

Trail Classes are general categories reflecting trail development scale, arranged along a continuum. The Trail Class identified for a National Forest System (NFS) trail prescribes its development scale, representing its intended design and management standards.¹ Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Identify the appropriate Trail Class for each NFS trail or trail segment based on the management intent in the applicable land management plan, travel management decisions, trail-specific decisions, and other related direction. Apply the Trail Class that most closely reflects the management intent for the trail or trail segment, which may or may not reflect the current condition of the trail.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Tread & Traffic Flow	<ul style="list-style-type: none"> ♦ Tread intermittent and often indistinct. ♦ May require route finding. ♦ Single lane, with no allowances constructed for passing. ♦ Predominantly native materials. 	<ul style="list-style-type: none"> ♦ Tread continuous and discernible, but narrow and rough. ♦ Single lane, with minor allowances constructed for passing. ♦ Typically native materials. 	<ul style="list-style-type: none"> ♦ Tread continuous and obvious. ♦ Single lane, with allowances constructed for passing where required by traffic volume in places where there is no reasonable opportunity to pass. ♦ Native or imported materials. 	<ul style="list-style-type: none"> ♦ Tread wide and relatively smooth, with few irregularities. ♦ Single lane, with allowances constructed for passing where required by traffic volume in places where there is no reasonable opportunity to pass. ♦ Double lane where traffic volume is high and passing is frequent. ♦ Native or imported materials. ♦ May be hardened. 	<ul style="list-style-type: none"> ♦ Tread wide, firm, stable, and generally uniform. ♦ Single lane, with frequent turnouts where traffic volume is low to moderate. ♦ Double lane where traffic volume is moderate to high. ♦ Commonly hardened with asphalt or other imported material.
Obstacles	<ul style="list-style-type: none"> ♦ Obstacles common, naturally occurring, often substantial, and intended to provide increased challenge. ♦ Narrow passages; brush, steep grades, rocks and logs present. 	<ul style="list-style-type: none"> ♦ Obstacles may be common, substantial, and intended to provide increased challenge. ♦ Blockages cleared to define route and protect resources. ♦ Vegetation may encroach into trailway. 	<ul style="list-style-type: none"> ♦ Obstacles may be common, but not substantial or intended to provide challenge. ♦ Vegetation cleared outside of trailway. 	<ul style="list-style-type: none"> ♦ Obstacles infrequent and insubstantial. ♦ Vegetation cleared outside of trailway. 	<ul style="list-style-type: none"> ♦ Obstacles not present. ♦ Grades typically < 8%.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Constructed Features & Trail Elements	<ul style="list-style-type: none"> Structures minimal to non-existent. Drainage typically provided without structures. Natural fords. Typically no bridges. 	<ul style="list-style-type: none"> Structures of limited size, scale, and quantity; typically constructed of native materials. Structures adequate to protect trail infrastructure and resources. Natural fords. Bridges as needed for resource protection and appropriate access. 	<ul style="list-style-type: none"> Structures may be common and substantial; constructed of imported or native materials. Natural or constructed fords. Bridges as needed for resource protection and appropriate access. 	<ul style="list-style-type: none"> Structures frequent and substantial; typically constructed of imported materials. Constructed or natural fords. Bridges as needed for resource protection and user convenience. Trailside amenities may be present. 	<ul style="list-style-type: none"> Structures frequent or continuous; typically constructed of imported materials. May include bridges, boardwalks, curbs, handrails, trailside amenities, and similar features.
Signs²	<ul style="list-style-type: none"> Route identification signing limited to junctions. Route markers present when trail location is not evident. Regulatory and resource protection signing infrequent. Destination signing, unless required, generally not present. Information and interpretive signing generally not present. 	<ul style="list-style-type: none"> Route identification signing limited to junctions. Route markers present when trail location is not evident. Regulatory and resource protection signing infrequent. Destination signing typically infrequent outside wilderness areas; generally not present in wilderness areas. Information and interpretive signing uncommon. 	<ul style="list-style-type: none"> Route identification signing at junctions and as needed for user reassurance. Route markers as needed for user reassurance. Regulatory and resource protection signing may be common. Destination signing likely outside wilderness areas; generally not present in wilderness areas. Information and interpretive signs may be present outside wilderness areas. 	<ul style="list-style-type: none"> Route identification signing at junctions and as needed for user reassurance. Route markers as needed for user reassurance. Regulatory and resource protection signing common. Destination signing common outside wilderness areas; generally not present in wilderness areas. Information and interpretive signs may be common outside wilderness areas. Accessibility information likely displayed at trailhead. 	<ul style="list-style-type: none"> Route identification signing at junctions and for user reassurance. Route markers as needed for user reassurance. Regulatory and resource protection signing common. Destination signing common. Information and interpretive signs common. Accessibility information likely displayed at trailhead.
Typical Recreation Environments & Experience³	<ul style="list-style-type: none"> Natural and unmodified. ROS: Typically Primitive to Roaded Natural. WROS: Typically Primitive to Semi-Primitive. 	<ul style="list-style-type: none"> Natural and essentially unmodified. ROS: Typically Primitive to Roaded Natural. WROS: Typically Primitive to Semi-Primitive. 	<ul style="list-style-type: none"> Natural and primarily unmodified. ROS: Typically Primitive to Roaded Natural. WROS: Typically Semi-Primitive to Transition. 	<ul style="list-style-type: none"> May be modified. ROS: Typically Semi-Primitive to Rural. WROS: Typically Portal or Transition. 	<ul style="list-style-type: none"> May be highly modified. Commonly associated with visitor centers or high-use recreation sites. ROS: Typically Roaded Natural to Urban. Generally not present in Wilderness areas.

For National Quality Standards for Trails, Potential Appropriateness of Trail Classes for Managed Uses, Design Parameters, and other related guidance, refer to FSM 2353 and FSH 2309.18.

For standards and guidelines on the use of signs and posters on trails, refer to the Sign and Poster Guidelines for the Forest Service (EM-7100-15).

The Trail Class Matrix shows combinations of Trail Class and Recreation Opportunity Spectrum (ROS) or Wilderness Recreation Opportunity Spectrum (WROS) settings that commonly occur, although trails in all Trail Classes may and do occur in all settings. For guidance on the application of the ROS and WROS, refer to FSM 2310 and 2353 and FSH 2309.18.



Design Parameters (FSH 2309.18, Section 23.11, Exhibit 01)

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent¹. Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Designed Use HIKER/PEDESTRIAN		Trail Class 1	Trail Class 2	Trail Class 3 ²	Trail Class 4 ²	Trail Class 5 ²
Design Tread Width	Wilderness (Single Lane)	0" – 12"	6" – 18"	12" – 24" Exception: may be 36" – 48" at steep side slopes	18" – 24" Exception: may be 36" – 48" at steep side slopes	Not applicable
	Non-Wilderness (Single Lane)	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	Non-Wilderness (Double Lane)	36"	36"	36" – 60"	48" – 72"	72" – 120"
	Structures (Minimum Width)	18"	18"	18"	36"	36"
Design Surface ³	Type	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	24"	14"	10"	8"	No obstacles
Design Grade ³	Target Grade	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	Short Pitch Maximum	40%	35%	25%	15%	5% FSTAG: 5% – 12% ²
	Maximum Pitch Density	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail

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Designed Use HIKER/PEDESTRIAN		Trail Class 1	Trail Class 2	Trail Class 3²	Trail Class 4²	Trail Class 5²
Design Cross Slope	Target Cross Slope	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	Maximum Cross Slope	Natural side slope	25%	15%	10%	3%
Design Clearing	Height	6'	6' – 7'	7' – 8'	8' – 10'	8' – 10'
	Width	≥ 24" Some vegetation may encroach into clearing area	24" – 48" Some light vegetation may encroach into clearing area	36" – 60"	48" – 72"	60" – 72"
	Shoulder Clearance	3" – 6"	6" – 12"	12" – 18"	12" – 18"	12" – 24"
Design Turn	Radius	No minimum	2' – 3'	3' – 6'	4' – 8'	6' – 8'

¹ For definitions of Design Parameter attributes (e.g., Design Tread Width and Short Pitch Maximum) see FSH 2309.18, section 05.

² Trail Classes 3, 4, and 5, in particular, have the potential to provide accessible passage. If assessing or designing trails for accessibility, refer to the Forest Service Trail Accessibility Guidelines (FSTAG) for more specific technical provisions and tolerances (FSM 2350).

³ The determination of trail-specific Design Grade, Design Surface, and other Design Parameters should be based upon soils, hydrological conditions, use levels, erosion potential, and other factors contributing to surface stability and overall sustainability of the trail.



Design Parameters (FSH 2309.18, Section 23.13, Exhibit 01)

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent¹. Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Designed Use BICYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Tread Width	Single Lane	6" – 12"	12" – 24"	18" – 36"	24" – 48"	36" – 60"
	Double Lane	36" – 48"	36" – 48"	36" – 48"	48" – 84"	72" – 120"
	Structures (Minimum Width)	18"	18"	36"	48"	60"
Design Surface²	Type	Native, ungraded May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native, with limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present, but not common	Native, with improved sections of borrow or imported materials and routine grading Stable, with minor roughness	Likely imported material and routine grading Uniform, firm, and stable
	Protrusions	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, but not continuous	≤ 3" Uncommon and not continuous	No protrusions
	Obstacles (Maximum Height)	24"	12"	10"	8"	No obstacles
Design Grade²	Target Grade	5% – 20%	5% – 12%	3% – 10%	2% – 8%	2% – 5%
	Short Pitch Maximum	30% 50% on downhill segments only	25% 35% on downhill segments only	15%	10%	8%
	Maximum Pitch Density	20% – 30% of trail	10% – 30% of trail	10% – 20% of trail	5% – 10% of trail	0% – 5% of trail

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Designed Use BICYCLE		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Cross Slope	Target Cross Slope	5% – 10%	5% – 8%	3% – 8%	3% – 5%	2% – 3%
	Maximum Cross Slope	10%	10%	8%	5%	5%
Design Clearing	Height	6'	6' – 8'	8'	8' - 9'	8' - 9'
	Width	24" – 36" Some vegetation may encroach into clearing area	36" – 48" Some light vegetation may encroach into clearing area	60" – 72"	72" – 96"	72" – 96"
	Shoulder Clearance	0' – 12"	6" – 12"	6" – 12"	6" – 18"	12" – 18"
Design Turn	Radius	2' – 3'	3' – 6'	4' – 8'	8' – 10'	8' - 12'

¹ For definitions of Design Parameter attributes (e.g., Design Tread Width and Short Pitch Maximum) see FSH 2309.18, section 05.

² The determination of trail-specific Design Grade, Design Surface, and other Design Parameters should be based upon soils, hydrological conditions, use levels, erosion potential, and other factors contributing to surface stability and overall sustainability of the trail.



Design Parameters (FSH 2309.18, Section 23.31, Exhibit 01)

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent¹. Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Designed Use CROSS-COUNTRY SKI		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Groomed Width	Single Lane	Typically not designed or actively managed for cross-country skiing, allow use may be allowed	2' – 4' Typically not groomed	6' – 8' Or width of grooming equipment	8' – 10" Or width of grooming equipment)	Typically not designed or actively managed for cross-country skiing, allow use may be allowed
	Double Lane		6' – 8'	8' – 12'	12' – 16'	
	Structures (Minimum Width)		36"	36"	36"	
Design Grooming and Surface²	Type		Generally no machine grooming	May receive occasional machine grooming for snow compaction and track setting	Regular machine grooming for snow compaction and track setting	
	Protrusions		No protrusions	No protrusions	No protrusions	
	Obstacles (Maximum Height)		12" Uncommon	8" Uncommon (no obstacles if machine groomed)	No obstacles	
Design Grade²	Target Grade		5% – 15%	2% – 10%	0% – 8%	
	Short Pitch Maximum		25%	20%	12%	
	Maximum Pitch Density		10% – 20% of trail	5% – 15% of trail	0% – 10% of trail	
Design Cross Slope	Target Cross Slope		0% – 10%	0% – 5%	0% – 5%	
	Maximum Cross Slope (For up to 50')	20%	15%	10%		

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Designed Use CROSS-COUNTRY SKI		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Clearing	Height (Above normal maximum snow level)		6' – 8'	8' Or height of grooming equipment	8' – 10'	
	Width		24" – 60" Light vegetation may encroach into clearing area	72" – 120" Light vegetation may encroach into clearing area	96" – 168" Widen clearing at turns or if increased sight distance needed	
	Shoulder Clearance		0" – 6"	0" – 12"	0" – 24"	
Design Turn	Radius		8' – 10'	15' – 20' Or to accommodate grooming equipment	≥ 25'	

¹ For definitions of Design Parameter attributes (e.g., Design Tread Width and Short Pitch Maximum) see FSH 2309.18, section 05.

² The determination of trail-specific Design Grades, Design Surface, and other Design Parameters should be based upon soils, hydrological conditions, use levels, erosion potential and other factors contributing to surface stability and overall sustainability of the trail.