

# Appendix 4-A · Trail Construction Definitions



Term	Definition	Reference	Minimum Width
<b>ROADWAY CORRIDORS &amp; FACILITIES</b>			
<i>Complete Street</i>	They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations.	National Complete Streets Coalition	
<i>Bicycle Path</i>	A pathway that is exclusively used by bicyclists, where a separate, parallel path is provided for pedestrians and other wheeled users. Most pathways are shared between bicyclists and other users: see Shared Use Path.	2010 DRAFT AASHTO Guide <sup>1</sup>	
<i>Bike Lane</i>	A portion of a roadway which has been designated by pavement markings and, if used, signs, for the preferential or exclusive use of bicyclists.	2010 DRAFT AASHTO Guide	5 feet (wider where necessary)
<i>Shared Lane (Wide Curb/Outside Lane)</i>	A lane of a traveled way that is open to bicycle travel and vehicular use.	2010 DRAFT AASHTO Guide	13 feet (14 feet preferred)
<i>Shared Roadway</i>	A roadway that is open to both bicycle and motor vehicle travel. This may be an existing roadway, a street with wide curb lanes, or a road with paved shoulders.	2010 DRAFT AASHTO Guide	
<i>Shared Roadway (No Bikeway Designation)</i>	Bicycle travel occurring on streets and highways without bikeway designations.	<sup>2</sup> VDOT Road Design Manual	
<i>Shoulder</i>	The portion of the roadway contiguous with the traveled way, for accommodation of stopped vehicles, emergency use and lateral support of sub-base, base and surface courses, often used by cyclists where paved.	2010 DRAFT AASHTO Guide	4 feet (5 feet preferred)
<i>Sidepath</i>	A shared use path located immediately adjacent and parallel to a roadway.	2010 DRAFT AASHTO Guide	
<i>Sidewalk</i>	That portion of a street or highway right-of-way, beyond the curb or edge of roadway pavement, which is intended for use by pedestrians.	2010 DRAFT AASHTO Guide	
<i>Sidewalk</i>	That portion of a public right-of-way between the curb line or lateral line of a roadway and the adjacent property line that is improved for use by pedestrians	VDOT Road Design Manual	60 inches wide (48 inches in exceptional cases)
<i>Signed Shared Roadway</i>	Roadways identified by signing as preferred bike routes.	VDOT Road Design Manual	

<sup>1</sup> Refers to the 2010 DRAFT AASHTO Guide for the Planning, Development, & Operation of Bicycle Facilities

<sup>2</sup> Refers to Section A-5 "Bicycle and Pedestrian Facility Guidelines" in the Road Design Manual

Term	Definition	Reference	Minimum Width
<b>INDEPENDENT CORRIDORS &amp; FACILITIES</b>			
<i>Greenway</i>	Linear Corridor of private or public recreation lands and waters, providing access to open space and recreational activities and linking rural and urban spaces (e.g. bicycle facilities, utility corridors, scenic roads and highways, abandoned railroad rights-of-way, etc.)	VDOT Road Design Manual	
<i>Shared Use Path</i>	A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users.	2010 DRAFT AASHTO Guide	10 feet (8 feet in exceptional cases)
<i>Shared Use Path</i>	Shared use paths are facilities on exclusive right-of-way and with minimal cross flow by motor vehicles. Users are non-motorized and may include bicyclists, inline skaters, roller skaters, wheelchair users (both motorized and non-motorized) and pedestrians including walkers, runner, and people with baby strollers and people walking dogs. Share use paths are most commonly designed for two-way travel...	VDOT Road Design Manual	10 feet (8 feet in exceptional cases)
<i>Rail-Trail</i>	A shared use path, either paved or unpaved, built within the right-of-way of a former railroad.	2010 DRAFT AASHTO Guide	
<i>Rail-with-Trail</i>	A shared use path, either paved or unpaved, built within the right-of-way of an active railroad.	2010 DRAFT AASHTO Guide	
<i>Rail-with-Trail</i>	Any shared use path or trail adjacent to an active railroad corridor.	VDOT Road Design Manual	
<i>Unpaved Path</i>	Path not surfaced with a hard, durable surface such as asphalt or Portland cement concrete.	2010 DRAFT AASHTO Guide	

Term	Definition	Reference	Minimum Width
<b>ACCESSIBLE CORRIDORS &amp; ROUTE TERMINOLOGY</b>			
<i>Accessible Route</i>	A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. This term applies only to individual sites (see "Pedestrian Access Route" for routes in the public right-of-way). Accessible route surfaces shall be firm, stable, and slip-resistant	VDOT Road Design Manual	
<i>Beach Access Route</i>	A continuous unobstructed path designated for pedestrian use that crosses the surface of the beach. Beach access routes connect an entry point to the beach to the: High tide level at tidal beaches; the mean high water level at river beaches; or normal recreation water level at lake, pond, and reservoir beaches.	Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009)	60 inches min.
<i>Outdoor Recreation Access Route (ORAR)</i>	A continuous, unobstructed path intended for pedestrian use that connects constructed features within a picnic area, camp living area, trailhead, or other recreation site where modifications are provided for visitor convenience and comfort	U.S. Forest Service Outdoor Recreation Accessibility Guidelines	36 inches min clear width (32 inches for short distance)
<i>Pedestrian Access Route</i>	Refers to the portion of the public right-of-way that serves as an accessible route. The pedestrian access route provides a continuous accessible means of passage.	VDOT Road Design Manual	48 inches min. clear width
<i>Trail</i>	A pedestrian route developed primarily for outdoor recreational purposes. A pedestrian route developed primarily to connect elements, spaces, or facilities within a site is not a trail.	Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009)	36 inches min clear width (32 inches for short distance)
<i>Trailhead</i>	An outdoor space developed to serve as an access point to a trail. The junction of two or more trails, where no other access point is provided to the trails, is not a trailhead.	Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009)	
<i>Walk or Promenade</i>	An exterior prepared surface for pedestrian use, including pedestrian areas such as plazas and courts	ADA Standards for Accessible Design	

Term	Definition	Reference	Minimum Width
<b>NATURAL &amp; ENVIRONMENTAL RESOURCE CORRIDORS &amp; FACILITIES</b>			
<i>Access Path</i>	A narrow pedestrian walkway through [a Resource Protection Area] buffer that provides access to the water.	VA DCR Chesapeake Bay Local Assistance Dept.	
<i>Passive Recreation Facilities</i>	The Bay Act Regulations restrict recreational uses within the 100-foot wide buffer to passive recreation facilities, including trails, boardwalks and paths. The [CBLAD] generally considers passive recreation to be non-motorized activities such as walking, bike riding, picnicking, hiking, sun bathing and bird watching.	VA DCR Chesapeake Bay Local Assistance Dept.	
<b>VIRGINIA OUTDOORS PLAN TERMINOLOGY</b>			
<i>Blueway or Water Trail</i>	Managed systems of access points and support facilities that allow trail users to plan multi-day trips with assurances that access points, camping sites, rest stops and re-supply sites are clearly identified on maps and on signs visible from the water.		
<i>Corridor</i>	A narrow, linear segment of land that connects ecosystems, water bodies or human activity. Examples would be biological corridors, hydrological corridors, wildlife corridors and resource-based outdoor recreational corridors. Corridors provide protection for the movement of wildlife and plant life across the landscape (ecological corridors), recreational access for rural and urban populations (trails), and enhancement or restoration of water quality (riparian corridors).		
<i>Greenway</i>	A linear open space established along either a natural corridor, such as a riverfront, stream valley or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, a scenic road or other route. Any natural or landscaped trail for pedestrian, equestrian or bicycle passage. An open space connector linking parks, nature reserves, cultural features or historic sites with each other and with populated areas. Locally, certain strip or linear parks designated as a parkway or greenbelt. (Adapted from Charles Little, Greenways for America. 1990. The Johns Hopkins Press).		
<i>Single-Use Trail</i>	A trail designed for a single use other than pedestrian (i.e. mountain bicycling, fishing horseback-riding, OHV, challenge courses)		
<i>Trail</i>	The treadway or shoulders of a cleared or improved path.		
<i>Trunkline Trail</i>	A generally long-distance trail designed to accommodate multiple uses--a key component of the state trail system as a major trail to which connector trails link.		

# Appendix 4-B • Sample Easements





Exempted from recordation taxes under the Code of Virginia  
Sections 58.1-811 (A) (3), 58.1-811 (C) (4) and 10.1-1803

### DEED OF GREENWAY EASEMENT

THIS DEED OF GREENWAY EASEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_, 2009, between \_\_\_\_\_, a Virginia corporation, Grantor, and the **TOWN OF BLACKSBURG, VIRGINIA**, a Town chartered by the Commonwealth of Virginia, herein called "Town," Grantee.

#### WITNESSETH:

That in consideration of the sum of One Dollar cash in hand, and other good and valuable consideration, the receipt of which is hereby acknowledged by the Grantor, the Grantor does hereby grant and convey unto Grantee, its successors and assigns, the following described easement and right-of-way located in the Town of Blacksburg, Montgomery County, Virginia:

Being a \_\_\_\_\_ foot wide greenway easement over and across the property of Grantor, as shown on a plat prepared by \_\_\_\_\_, dated \_\_\_\_\_, designated Job No. \_\_\_\_\_, said easement being located along the \_\_\_\_\_ side of Grantor's property and meandering parallel to \_\_\_\_\_ Street, said plat attached hereto and incorporated by reference. This shall be known as the "Easement Area."  
TAX MAP # \_\_\_\_\_

1. Purpose

It is the purpose of this Greenway Easement to make the Easement Area available for the Town's Greenway trail system and associated public amenities. This Easement provides for public access through the Easement Area. Members of the general public shall have free access to and use of the trail subject to the laws and ordinances of the Town of Blacksburg.

The Greenway trail system is a linear park, which includes a paved trail suitable for walking, jogging, bicycling and other forms of recreation. The trail provides an alternate means of transportation to the automobile, as well as a recreational facility for the enjoyment of Blacksburg citizens and visitors.

2. Rights of the Grantor

The Grantor, its successors and assigns, shall have the right to use the Easement Area for all purposes, provided:

- a. That such use shall not interfere with constructing, maintaining, renewing, replacing, repairing, relocating or operating the trail and appurtenances, nor injure the same, and shall not interfere with the Town's free access to the trail at all times and for all purposes; and provided further that no building or structure shall be erected on the Easement Area by the Grantor, its successors and assigns, without the prior written consent of the Town. Further, no parking lots, parking spaces, drive aisles, or private roads shall be permitted

upon the Easement Area without the prior written consent of the Town.

- b. The Grantor shall not remove, destroy, or cut trees within the easement area except as may be approved by the Town or its assigns for maintenance of the trail, reduction of hazard, flood control, good husbandry practice, or prevention or treatment of disease.

3. Indemnification

Pursuant to § 29.1-509, Virginia Code, and as authorized by § 15.2-1806, Virginia Code, the Town shall hold Grantor harmless from all liability and be responsible for providing, or for paying the cost of, all reasonable legal services required by Grantor as the result of a claim or suit attempting to impose liability upon Grantor by persons using the Easement Area for recreational purposes.

4. Rights of the Town

- a. In the event that there exists within the easement area a condition that in the sole judgment of the Town poses a hazard to the public, the Town may abate the hazard in any manner that in its sole judgment is reasonable.
- b. The Town has the right to construct, operate, maintain, and repair a public trail and associated amenities such as mile markers, landscaping, litter receptacles, benches, and directional or informational signs in and through the Easement Area. All facilities installed in the easement shall be and remain the property of the Town, its successors and assigns.
- c. The Town shall replace grass, vegetation, and topsoil, where necessary due to the Town's damage of same in the construction, replacement and/or repair of the easement area; however, the Town shall exercise sole discretion in determining the type, brands and amounts of materials to be used in replacing said grass, vegetation, and topsoil. Additionally, the Town shall exercise sole discretion in determining when repairs or replacement efforts are deemed complete.
- d. The Town is not obligated to remove snow from the trail.
- e. The Town shall have no obligation to maintain the Easement Area unless and until it constructs a trail therein.
- f. The Town shall have the right to maintain the Easement Area, once the trail is constructed. Maintenance includes the repair, repaving, or re-construction of the paved trail, removal of obstructions in or near the trail, repainting of trail markings, trimming and pruning vegetation, the periodic mowing of grass along the edge of the trail, removal of trash, and other activities necessary to provide a usable Greenway trail.

5. Easement for Public Recreational Use

Upon conveyance of this easement to the Town, this easement in gross will benefit the public, and the public is granted an affirmative right to enter upon and to use the Easement Area

for passive and active recreation activities, including but not limited to walking, jogging, bicycling, roller-blading, skateboarding and other similar recreational uses. Access by motorized vehicles including but not limited to motorcycles, 4-wheel drives, motor bikes, mopeds, ATVs, and snowmobiles, shall be prohibited, except as may be undertaken by the Town in furtherance of the purposes of this easement, in an emergency, or as otherwise authorized by the Town.

6. Utilities

Underground public utilities may with Grantor's and Town's consent, or under due process of law, be installed under the Easement Area, provided such utilities do not adversely affect the use of the Easement Area for the Greenway trail.

7. Immunities

Nothing herein shall be construed to waive the Town's sovereign immunity in the operation of a recreational facility, or otherwise. Nothing herein shall be construed as a waiver of Grantor's immunity under § 29.1-509, Virginia Code, or successor statute, or through any other grant of immunity.

8. Perpetual Easement

The covenants agreed to and the terms, conditions, and restrictions imposed herein shall be binding upon the Town and the Grantor, its agents, heirs, and assigns and shall continue as a servitude running in perpetuity with the described land. The Grantor and Town both agree that the terms, conditions and restrictions of this easement will be inserted by it in any subsequent deed or other legal instrument by which it divests itself of either the fee simple title to, or of its possessory interest in, the subject property.

The easement conveyed herein shall run with the land and be binding upon the successors and assigns of the parties hereto.

TO HAVE AND TO HOLD unto Grantee, its successors, and assigns.

IN WITNESS WHEREOF Grantors and the Town have set their hands on the day and year first above written.

Acceptance of this conveyance by the Town is authorized by §§ 10.1-1701, 15.2-1800 and 15.2-1806, Virginia Code, and the terms of Blacksburg Town Council Resolutions 2-F-01 and 8-H-08.

WITNESS the following signatures and seals.

By: \_\_\_\_\_

Its: \_\_\_\_\_

Accepted:

TOWN OF BLACKSBURG, VIRGINIA

BY: \_\_\_\_\_

Approved as to form

\_\_\_\_\_  
Town Attorney

COMMONWEALTH OF VIRGINIA

COUNTY OF MONTGOMERY

Acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2009, by  
\_\_\_\_\_, the \_\_\_\_\_ of \_\_\_\_\_,  
a Virginia corporation, Grantor.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

COMMONWEALTH OF VIRGINIA

COUNTY OF MONTGOMERY

Acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2009, by  
\_\_\_\_\_, the \_\_\_\_\_,  
of the Town of Blacksburg, Virginia, Grantee.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_

TRAIL EASEMENT (*Courtesy of Fairfax County Park Authority*)

NOW THEREFORE, in consideration of the premises and the sum of One Dollar (\$1.00), cash in hand paid, the receipt and sufficiency of which are hereby acknowledged, Owner hereby grants and conveys unto the Park Authority, its successors and assigns, the Permanent Trail Easement for the purpose of constructing, operating and maintaining the Trail through and across the Property of Owner, subject to the following terms and conditions:

1. All facilities installed in the Permanent Trail Easement shall be and remain the property of the Park Authority, its successors and assigns.

2. The Park Authority and its agents shall have full and free use of the Permanent Trail Easement for the purposes named, and shall have all rights and privileges reasonably necessary to the enjoyment and exercise of the Permanent Trail Easement including the right of reasonable access to and from the Permanent Trail Easement and the right to use adjoining land of the Owner adjacent to the easement where necessary; provided, however, that this right to use adjoining land shall be exercised only during periods of actual surveying, construction, reconstruction or maintenance, and further, this right shall not be construed to allow the Park Authority to erect any building or structure of a permanent nature on such adjoining land.

3. The Park Authority shall have the right to trim, cut and remove trees, shrubbery, fences, structures or other obstructions or facilities in or near the Permanent Trail Easement, deemed by it to interfere with the proper and efficient construction, operation, maintenance or enjoyment of the Trail; provided, however, that the Park Authority at its own expense shall restore, as nearly as possible, the Property to its original condition, such restoration to include the backfilling of trenches, the replacement of shrubbery, the seeding or sodding of lawns or pasture areas, and the repair and replacement of asphalt to the adjacent access road, but not the replacement of structures, trees or other obstructions.

4. Owner reserves the right to construct and maintain roadways over the Permanent Trail Easement and to make any use of the Permanent Trail Easement not inconsistent with the rights herein conveyed, nor interfere with the use of the Permanent Trail Easement by the Park Authority for the purposes named, provided, however, that the Owner shall not, without obtaining the prior written approval of the Park Authority, erect any building or other structure on the Permanent Trail Easement, with the exception of a fence running parallel to the Permanent Trail Easement.



NOV - 2 2010

THIS AGREEMENT, made and entered into by and between

**NORFOLK SOUTHERN RAILWAY COMPANY**, a Virginia corporation, hereinafter styled "Railway"; and the Town of Luray, Virginia, a Virginia government entity, hereinafter styled "Licensee":

W I T N E S S E T H:

THAT the PARTIES HERETO agree as follows:

1. THAT, for and in consideration of the premises and payment of a fee of FIVE HUNDRED AND 00/100 DOLLARS (\$500.00), payable in advance, Railway hereby grants unto Licensee, insofar as Railway's title enables it so to do and without warranty, the right to construct, maintain, use and remove a pedestrian walkway crossings (hereinafter together "Crossing"), beneath the Railway's trestles carrying the H track; at milepost 88.88; upon the right of way and property of Railway, at or near U.S. Department of Transportation Crossing Identification Number 468701J, located above U.S. Route 340 in the Town of Luray, Virginia; TOGETHER WITH the right to construct and maintain a trail pedestrian shelter under the trestle; (hereinafter "Improvements"); said Crossing and Improvements to be constructed and located substantially as shown upon print of Drawings marked Exhibits 1A, 1B and 1C, attached hereto and made a part hereof.

2. Licensee will, at the expense of Licensee, construct, maintain and remove the Crossing and Improvements including all necessary drainage, in all respects in accordance with the requirements of Railway looking to the safe and convenient operation and maintenance of its line of railway as shown on said Drawings; which said Improvements shall not become fixtures upon the realty, but shall remain the property of Licensee and shall be removed upon termination of this Agreement.

3. Licensee accepts the privilege hereby granted with full cognizance of the risk of loss of life, personal injury and property loss or damage that may be caused by Railway operations at or in the vicinity of the Crossing and by the construction, maintenance, use or removal of the Crossing and/or the Improvements by the Licensee or the public. The Licensee is willing to assume this risk and covenants that the privilege hereby granted shall be at the sole risk of the Licensee, and that Railway shall not have any responsibility whatever for any such loss, injury or damage. To that end, Licensee hereby agrees to indemnify and save harmless Railway, its officers, agents and employees, from and against all liability, claims, loss, damage, expense (including attorneys' fees) or costs for personal injuries (including death) and/or property damage to whomsoever or whatsoever, occurring or arising in any manner from Railway's operations at or in the vicinity of the Crossing and by the construction, maintenance, use or removal of the Crossing or the Improvements by the Licensee or others. The indemnity obligations imposed upon the Licensee by this paragraph shall be absolute and shall not be affected by the negligence, either primary or contributory, of the Railway or its officers, agents and employees.

4. In order to contribute toward the safety of train operations, Licensee will not erect any structures on or near the Crossing and the Improvements unless specifically permitted by this Agreement or an agreement supplemental hereto, executed by Railway and Licensee.

5. (a) Prior to entry on Railway's property or use of the Crossing, Licensee shall procure and maintain during the life of this Agreement a policy of Commercial General Liability Insurance with a combined single limit of not less than \$2,000,000 per occurrence for injury to or death of persons and damage to or loss or destruction of property. Such policy shall be endorsed to provide contractual liability coverage for liability assumed under this Agreement and shall be of a form that does not deny coverage for operations conducted within 50 feet of any railroad hazard. In addition, said policy shall be endorsed to name Railway as an additional insured and shall include a severability of interests provision. As evidence of said insurance, a

certificate of insurance shall be furnished to and approved by the Risk Manager, Norfolk Southern Corporation, Three Commercial Place, Norfolk, Virginia 23510-2191 prior to entry on Railway's property or use of the Crossing. The certificate of insurance shall state that thirty (30) days advance written notice will be given to Railway of any material change in, or cancellation of such insurance.

(b) The insurance coverage required herein shall in no way limit Licensee's liability under this Agreement.

6. Licensee shall bear the cost of furnishing, installing and maintaining any and all protective devices reasonably necessary, at any time, to protect the public at or near the Crossing. If Licensee fails to take any reasonably necessary corrective measures in a timely manner, or if in an emergency situation is presented which, requires immediate repairs to the Crossing or the Improvements, Railway, at Licensee's expense, may undertake such reasonably necessary corrective measures or repairs.

7. Notwithstanding any other provision of this Agreement, it is understood, agreed and covenanted that Licensee accepts this Agreement as a mere license and assumes all risk of damage to its Crossing and Improvements by reason of their presence on Railway property or use thereof herein described caused by any defects therein or business conducted thereon, whether caused by the negligence of Railway, its officers, agents or employees, or otherwise, and Licensee hereby indemnifies Railway, its officers, agents, and employees, from and against any such liability for said damage.

8. Licensee shall not assign this Agreement without the written consent of Railway.

9. The word "Railway" as used herein shall include any other company whose property at the aforesaid location may be leased or operated by Railway. Said term also shall include Railway's officers, agents and employees, and any parent company, subsidiary or affiliate of Railway and their officers, agents and employees.

10. After one (1) year next following its execution, either party hereto may terminate this Agreement at any time hereafter by serving upon the other thirty (30) days written notice of its election to do so. If Licensee shall violate any of its covenants herein, Railway may terminate this Agreement by serving upon Licensee thirty (30) days written notice of its election to do so. At or before the expiration of the time limited by any notice to either party of the other's election to terminate this Agreement, Licensee will discontinue use of the Crossing and Improvements and will restore said right of way or property to the condition existing prior to the construction of the Crossing and Improvements thereupon; or, if Licensee defaults, in addition to any other legal remedy it may have, Railway may close the Crossing and remove the Improvements, and restore the condition of said right of way or property at the sole cost and expense of Licensee.

11. Should the use of the Crossing and Improvements be abandoned for a continuous period of six (6) months, Railway may terminate this Agreement by serving upon Licensee thirty (30) days written notice of its election to do so, and Licensee shall, at its sole cost, remove the Crossing and Improvements located within the limits of the right of way or property of Railway, and restore said right of way or property to the condition existing prior to the construction of the Crossing and Improvements thereupon; or, if Licensee defaults, in addition to any other legal remedy it may have, Railway may close the Crossing and remove the Improvements, and restore the condition of said right of way or property at the sole cost and expense of Licensee.



12. It is agreed that Railway shall be exempt from any and all charges or assessments of any kind or character on account of the location, construction and/or improvement or maintenance of the Crossing and Improvements within the limits of the right of way or property of Railway, or on account of any other thing done or omitted to be done by Licensee in connection therewith.

13. This Agreement shall take effect as of the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate, each part being an original, as of the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**NORFOLK SOUTHERN RAILWAY COMPANY**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: Real Estate Manager

**TOWN OF LURAY, VIRGINIA**

By: \_\_\_\_\_  
Name: Richard M. Black  
Title: Town Manager

COMMONWEALTH OF VIRGINIA,  
COUNTY/CITY OF \_\_\_\_\_, TO-WIT:

The foregoing was acknowledged before me this \_\_\_\_ day of November, 2007, by \_\_\_\_\_.

My commission expires on the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

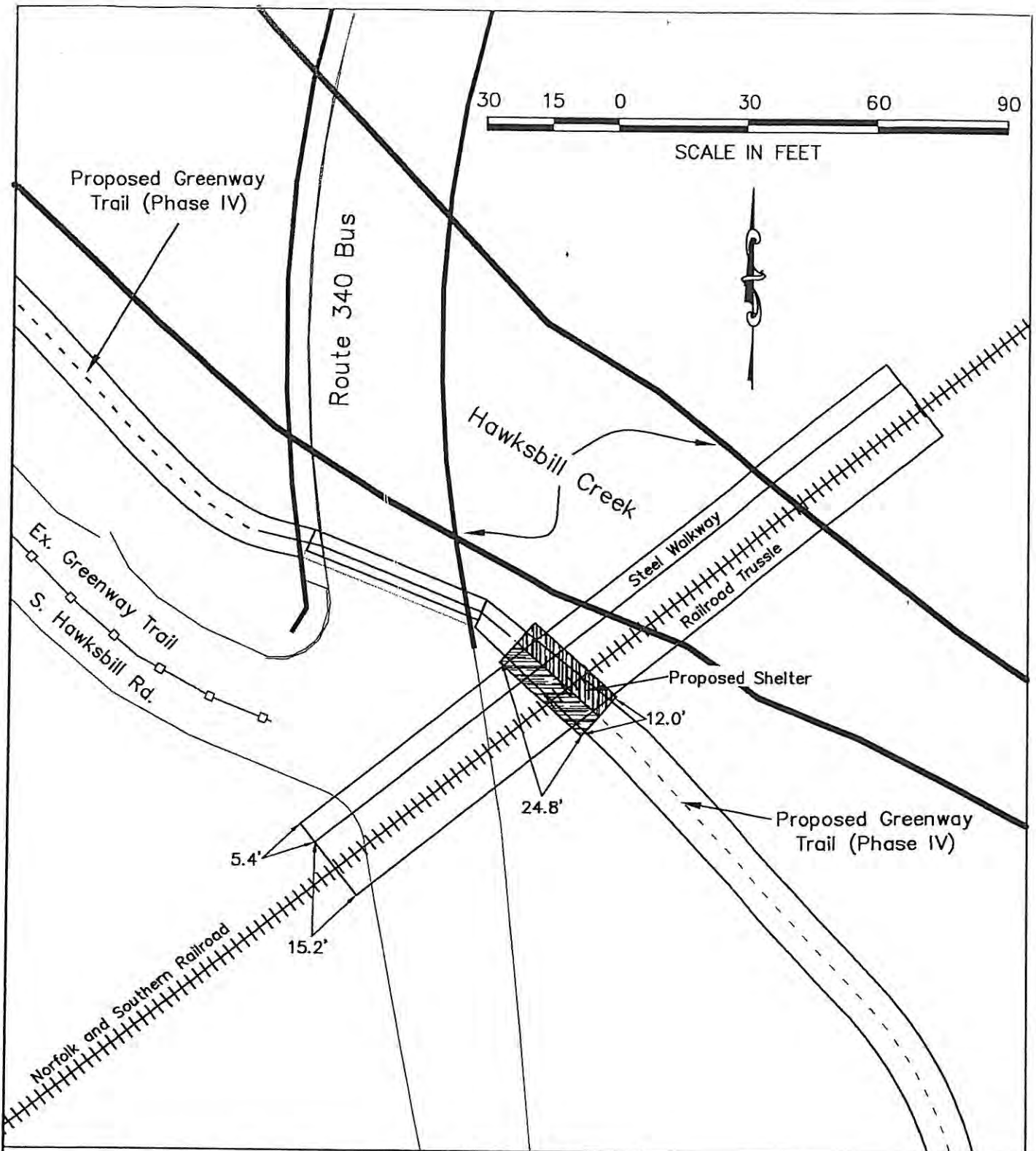
\_\_\_\_\_  
Notary Public

COMMONWEALTH OF VIRGINIA,  
COUNTY/CITY OF \_\_\_\_\_, TO-WIT:

The foregoing was acknowledged before me this \_\_\_\_ day of November, 2007, by Richard M. Black.

My commission expires on the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

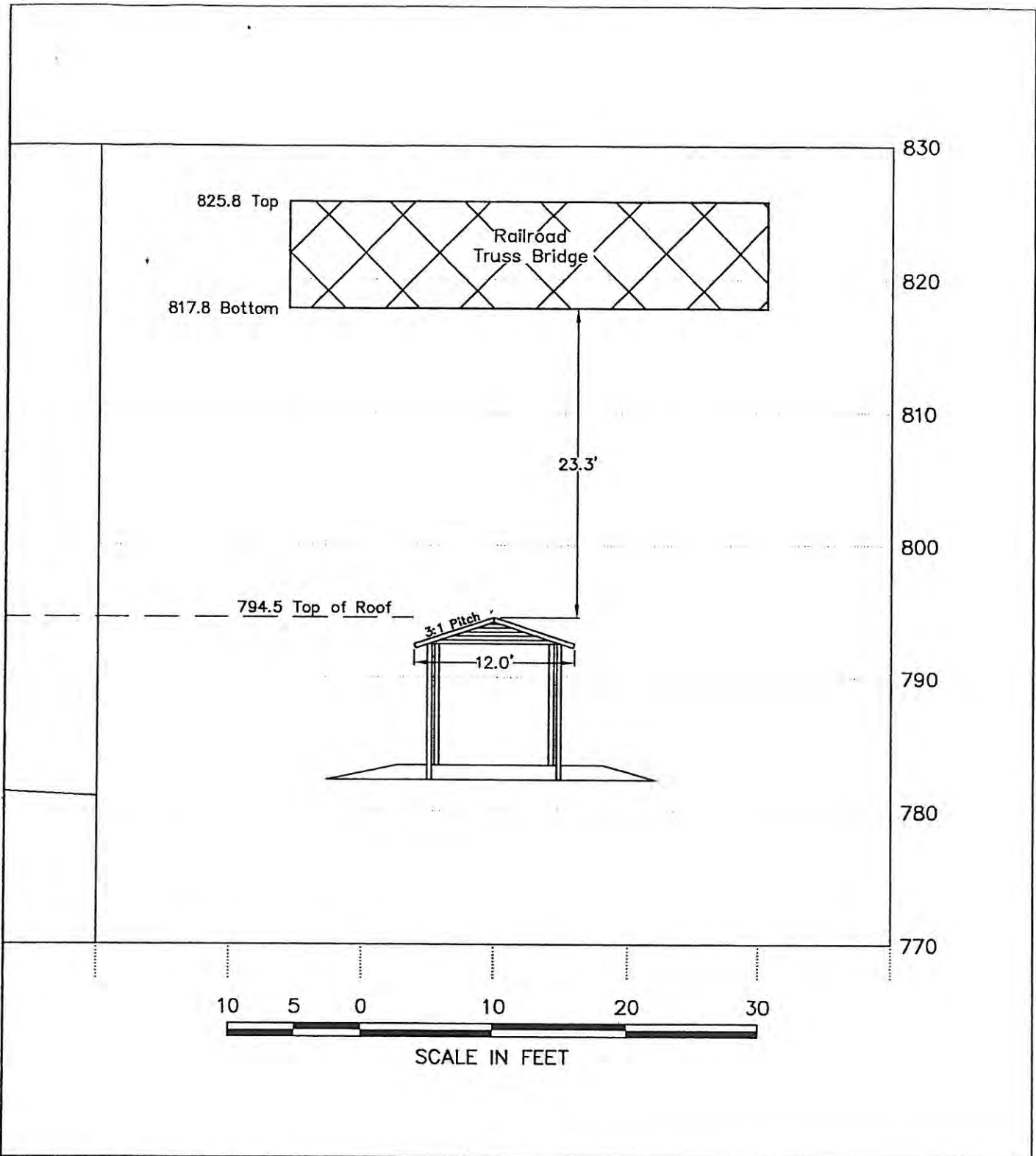
\_\_\_\_\_  
Notary Public



**RACEY**  
ENGINEERING  
RLC  
312 WEST MAIN ST - P.O. BOX 387  
LURAY, VA 22835  
PH: (540) 743-9227 - FAX: (540) 743-6118

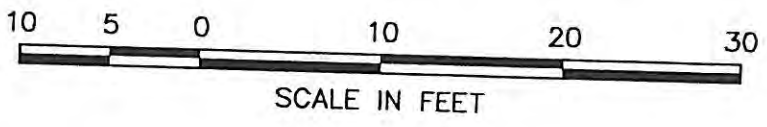
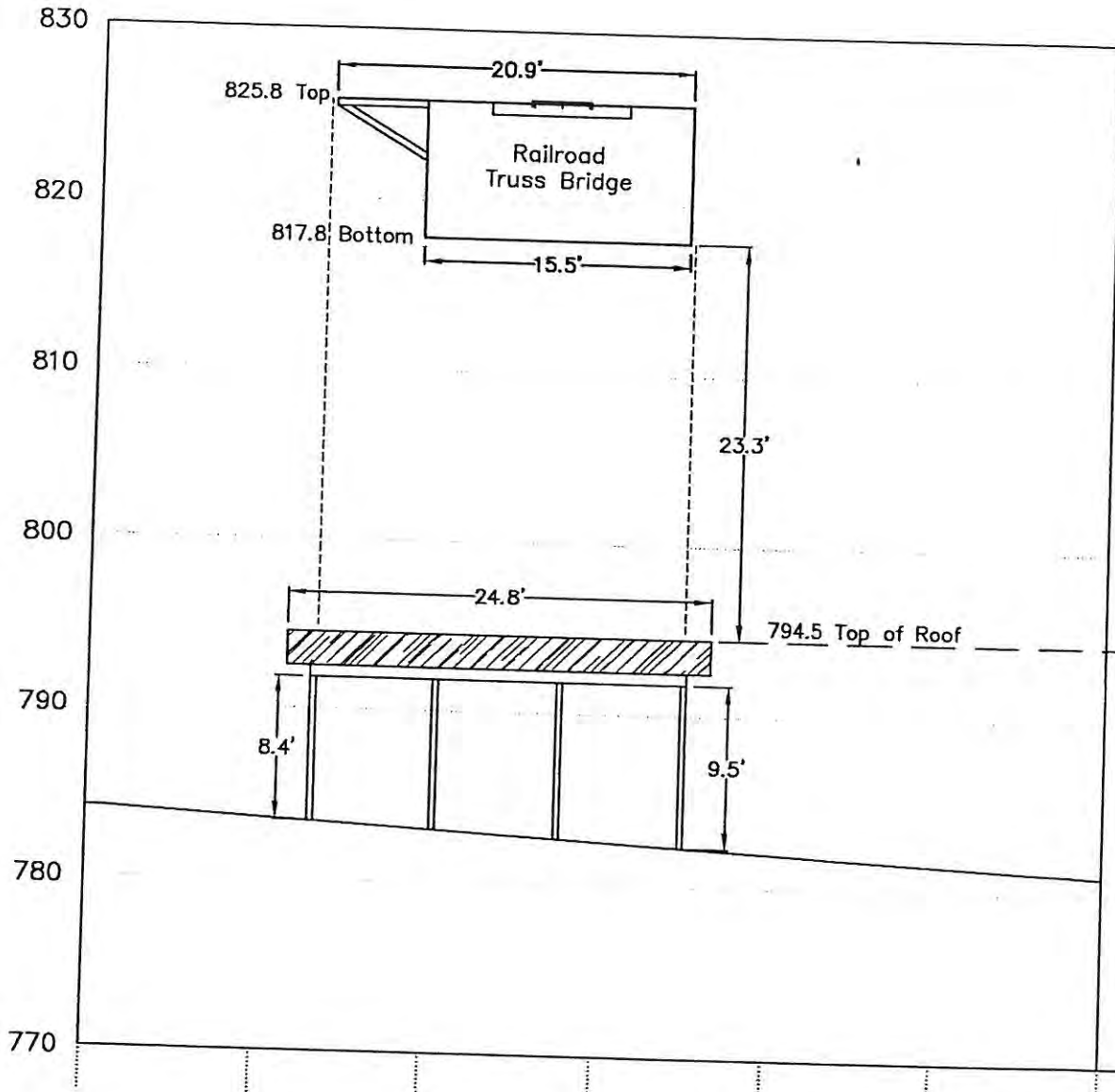
Draft:	MTM
Check:	DA
Project:	3191
DWG:	3191RR
Date:	8/29/07
Scale:	Above

Town of Luray Greenway  
Trail Shelter  
Plan View  
Exhibit 1A



Draft:	MTM
Check:	DA
Project:	3191
DWG:	3191RR
Date:	8/29/07
Scale:	Above

Town of Luray Greenway  
 Trail Shelter  
 Section View  
 Exhibit 1B



Draft:	MTM
Check:	DA
Project:	3191
DWG:	3191RR
Date:	8/29/07
Scale:	Above

Town of Luray Greenway  
Trail Shelter  
Profile View  
Exhibit 1C

September 19, 2006

Paul E. McCray  
Park Operations Director  
Northern Virginia Regional Park Authority  
5400 Ox Road  
Fairfax Station, VA 22039

Dear Mr. McCray:

At your request, Howard Hughes Medical Institute (“HUGHES”) and Selden Island Holding, LLC (“SELDEN”) hereby grant permission (“Permit”) to the Northern Virginia Regional Park Authority (“NVRPA”) to construct, use and maintain public recreation, non-vehicular trail improvements (collectively, the “Trail”) on two portions of Loudoun County parcel numbers 056-36-7444-001, 056-49-1171-000, and 056-48-9322-000 (collectively, the “Property”) at the locations labeled Licensed Premises A and Licensed Premises B (together, the “Licensed Premises”) shown on attached Exhibit A, which is hereby incorporated by reference. This Permit is subject to the following conditions:

1. The Licensed Premises shall be limited as to use for a pedestrian and equestrian trail and not as a thoroughfare for any bicycles, including but not limited to mountain bikes, or motor vehicles. HUGHES and SELDEN shall allow public access on the Trail across the Licensed Premises while this Permit remains in effect.
2. By its signature on this Permit, NVRPA hereby expressly confirms its agreement and consent that any trail constructed across the Licensed Premises shall be consistent with and is permitted under the easement granted to NVRPA on July 20, 1978 and recorded in Deed Book 710, at page 112 among the land records in the Clerk’s Office of the Circuit Court of Loudoun County, Virginia.
3. The parties shall work together in a reasonable manner to ensure that the use of the Trail by the public shall be compatible with and not unduly interfere with HUGHES and/or SELDEN's use of the Property. The parties shall work together in a reasonable manner to ensure that the public access is limited to the Licensed Premises. Such efforts shall include, but are not limited to, installation by NVRPA of signage prohibiting trespassing outside of the Trail, and/or installation of gates or similar barriers as needed. HUGHES and SELDEN shall have the right to review and approve NVRPA’s proposed signage and the placement thereof before the Trail is opened for public use. In addition, HUGHES and SELDEN reserve the right to add signage prohibiting trespassing outside of the Trail as they deem appropriate in their sole discretion.
4. If HUGHES and/or SELDEN conclude that the Trail interferes with HUGHES and/or SELDEN’s use of their property or exposes HUGHES and/or SELDEN to unreasonable risk as a result of trespassers or otherwise, NVRPA shall remove the improvements at such time and in a manner as shall reasonably be directed by HUGHES and/or SELDEN, and this Permit shall terminate. In the event HUGHES and/or SELDEN wish to terminate this Permit, HUGHES and/or SELDEN agree to provide NVRPA 180 days written notice prior to said termination. Removal of NVRPA's improvements shall be at the expense of NVRPA, and NVRPA shall restore the areas

disturbed by the removal of the improvements, such restoration to include the backfilling of trenches and the reseeded or resodding of disturbed areas, but not the replacement of trees.

5. Should NVRPA abandon or remove the improvements without an intention to resume use within a reasonable time, this Permit shall terminate at the election of HUGHES and/or SELDEN.
6. The Trail may be constructed by NVRPA only of dirt, chipped debris or stone dust, at NVRPA's option. NVRPA shall not construct any structures within the Licensed Premises, without HUGHES and SELDEN's prior approval. NVRPA shall maintain the Trail constructed within the Licensed Premises in good condition and repair, clean and free of trash and debris, at no expense to HUGHES and/or SELDEN. NVRPA agrees that the cost of installing, maintaining and/or removing any improvements associated with the Trail, shall be borne by NVRPA, including but not limited to the cost of engineering, excavating, grading, permitting and fees. NVRPA shall keep the Property free from all mechanic's and materialmen's liens. If any mechanic's or materialmen's lien is filed against the Property for work or materials done for or furnished to NVRPA, the lien shall be discharged by NVRPA within ten (10) days thereafter, solely at NVRPA's expense, by paying off or bonding off the lien. If NVRPA shall fail to discharge such lien, HUGHES and/or SELDEN may do so and shall be entitled to collect from NVRPA all costs incurred by HUGHES and/or SELDEN to discharge such lien.
7. In connection with the exercise of the privileges granted in this Permit, NVRPA shall (a) secure and pay for all permits and governmental fees, licenses and inspections that may be required, (b) at its expense shall fully comply at all times with all applicable federal, state and local laws, rules, regulations, codes, standards, orders, ordinances, directions, notices and requirements, and (c) shall be responsible in accordance with applicable law for its acts and the acts of its agents, invitees, employees, contractors and consultants, including, without limitation, any failure to fulfill the obligations specified in this paragraph. To the extent allowed by law, NVRPA shall indemnify and hold harmless HUGHES and SELDEN and their employees, agents, officers, trustees and directors, from and against all claims, demands, actions and causes of action arising out of or as a result of work performed within the Licensed Premises and/or the use of the Licensed Premises. NVRPA's obligations under this paragraph will survive termination of this Permit. NVRPA's exercise of its rights, privileges and obligations pursuant to this Permit shall be at its own risk and expense.
8. NVRPA shall obtain, maintain and provide proof to HUGHES and SELDEN of a comprehensive liability insurance policy satisfactory to HUGHES and SELDEN with a company or companies licensed in the Commonwealth of Virginia and rated at least A+/7 by Best's insurance rating service, and with a minimum combined limit of two million dollars (\$2,000,000.00) to protect HUGHES and SELDEN and their agents, employees, officers, trustees and directors from and against all claims of damages resulting from the Trail. Such policy shall (i) designate HUGHES and SELDEN as additional insureds, (ii) include a waiver of subrogation against HUGHES, SELDEN and NVRPA, and (iii) provide for thirty (30) days prior written notice to HUGHES and SELDEN of any cancellation or other expiration of such policy or any defaults under such policy.
9. This Permit shall not be construed as a conveyance of any right, title or interest in the Property. NVRPA acknowledges and agrees that it does not have and will not assert at any time any claim of adverse possession or prescriptive easement with respect to the Trail or any portion of the

Property, nor any claim that by entering into this Permit, HUGHES and/or SELDEN has abandoned any of their rights to the affected portions of the Property.

- 10. This Permit shall be binding upon the parties, their successors and assigns. No agreement shall be effective to add to, change, modify or waive or discharge this Permit in whole or in part, unless such agreement is in writing and signed by the parties, their successors and assigns. This Permit may be executed in multiple original counterparts, each of which shall be deemed an original and all of which together shall constitute one and the same instrument.
- 11. Nothing contained in this Permit shall create or be construed to create any relationship between the parties except that of licensor and licensee.
- 12. This Permit, and the rights and obligations of the parties hereto, shall be construed and enforced in accordance with the laws of the Commonwealth of Virginia, without regard to conflicts of laws principles.

Please signify your acceptance of these conditions by signing both copies of this letter and returning one to me.

HOWARD HUGHES MEDICAL INSTITUTE:

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

SELDEN ISLAND HOLDING, LLC:

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

ACCEPTED:

NORTHERN VIRGINIA REGIONAL PARK AUTHORITY

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_





# Appendix 4-C · Rail-with-Trail Proposals



**REPORT OF THE  
DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION**

# **Rails with Trails/Pedestrian Crossing Project Initiation, Coordination and Review**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



## **REPORT DOCUMENT NO. 404**

**COMMONWEALTH OF VIRGINIA  
RICHMOND  
2009**



# COMMONWEALTH of VIRGINIA

CHARLES M. BADGER, P.E.  
Director

DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION  
600 EAST MAIN STREET, SUITE 2102  
RICHMOND, VA 23219-2416

(804) 786-4440  
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VIRGINIA RELAY CENTER  
1-800-828-1120 (TDD)

The Honorable Timothy M. Kaine  
Governor of Virginia  
Patrick Henry Building, 3rd Floor  
1111 East Broad Street  
Richmond, Virginia 23219

Senator Yvonne B. Miller  
Chairman, Senate Transportation Committee  
General Assembly Building, Room 315  
Richmond, Virginia 23219

Delegate Joe T. May  
Chairman, House Transportation Committee  
General Assembly Building  
P.O. Box 406  
Richmond, Virginia 23218

Ladies and Gentlemen:

Attached for your review is the "Rails with Trails/Pedestrian Crossing Project Initiation, Coordination and Review" that was requested by the 2009 General Assembly session in HB 2088. This report is provided by the Virginia Department of Rail and Public Transportation on behalf of the Secretary of Transportation, and responds to the General Assembly's direction to:

- i. Develop a process to coordinate and evaluate public recreational access and safety issues directly related to new railroad projects, if appropriate, that are funded in whole or in part by the Commonwealth.
- ii. Submit a report to the Chairmen of the House and Senate Transportation Committees communicating the results.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Charles M. Badger'.

Charles M. Badger  
Director

cc: Pierce R. Homer, Secretary of Transportation

*The Smartest Distance Between Two Points*  
[www.drpt.virginia.gov](http://www.drpt.virginia.gov)

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# Executive Summary

## ***Purpose and Need***

The 2009 Session of the General Assembly, through HB 2088 stated the following:

“No later than December 1, 2009, the Department of Rail and Public Transportation, the Department of Game and Inland Fisheries, and the Department of Conservation and Recreation shall develop a process to coordinate and evaluate public recreational access and safety issues directly related to new railroad projects, if appropriate, that are funded in whole or in part by the Commonwealth, and shall send a report to the Chairmen of the House and Senate Transportation Committees communicating the results.”

The Virginia Department of Rail and Public Transportation (DRPT), the Virginia Department of Conservation and Recreation (DCR) and the Virginia Department of Game and Inland Fisheries (DGIF) developed these recommended processes and procedures. In order to accomplish this, staff from the respective departments held stakeholder meetings with representatives from CSX Transportation (CSX), Norfolk Southern (NS), the Virginia Railroad Association (VRA), Bike Walk Virginia, Virginia Bike Federation, Float Fishermen of Virginia, Friends of the Rivers of Virginia, Richmond Area Bicycling Association, local governments and other recreational user groups to gain input on the proposed process to address recreational and safety issues and consider public recreation access to new railroad projects. In addition, the departments consulted the Virginia Department of Transportation (VDOT) and the United States Department of Homeland Security, Transportation Safety Administration (TSA) for technical guidance on infrastructure design and safety parameters.

In collaboration with the stakeholders above, the departments determined that a reference guide of design practices together with a process to identify and establish a recreational interface with rail lines would be an appropriate approach to the legislative mandate. The agreed upon process for communication between the departments, host railroads and trail stakeholders is detailed in Section 2. This process establishes two opportunities for incorporating trails or pedestrian crossings. The first is through a trail proposal submitted to DCR who will then coordinate with the host railroad. The second is through identifying proposed Rail Enhancement Fund projects and cross-referencing with existing trail proposals, as identified by DCR.

This report was developed to fulfill the requirements of HB2088. The report was reviewed by the various stakeholder groups and provides project development and design considerations for Rails with Trails/Pedestrian Crossings (RWT/PC) along the active right-of-way (ROW) of railroads, with more specific considerations given toward the development of these trails in Virginia. Recreational advocate groups have stated that RWT/PCs and public access alongside or adjacent to active rail lines in the Commonwealth of Virginia could serve as a link to a growing interconnected system of trails that run along the East Coast and through the Commonwealth. Railroad operators, however, have expressed concerns about the safety impacts to rail operations, liability of RWT/PC public access and the impact of liability in the design and decision process. Trail advocate groups believe that Virginia Code §29.1-509 (Virginia Landowner Liability Law) could provide indemnification to the railroads for RWT/PCs. The railroads do not necessarily share the trail advocates' confidence in the

liability law. Outside the purview of this document the Virginia landowner liability law discussion will continue in the future.

The design considerations and proposed process for incorporating recreational uses into new railroad projects presented in this report are for generic application only and intended as conceptual tools to be utilized by recreational or trail advocates, state agencies and host railroads to identify and consider possible applications of public access along active rail lines. No specific right-of-way, train frequencies or speeds are assumed. In addition, this report does not consider potential financial and/or political constraints, or legal and liability issues related to the development of trails along operating railroad ROW. However, the report does discuss in general Virginia's landowner liability law, Virginia Code §29.1-509, and compares to other states with similar provisions.

## **Contents**

This report is divided into two sections.

**Section 1** introduces the purpose of the report and involved stakeholders.

**Section 2** outlines a course of action to plan, develop and construct an RWT/PC or other recreational access facility. The process by which a trail advocacy group may submit a *Letter of Interest* for a trail proposal is outlined. DCR and/or DGIF will coordinate with DRPT and the host railroad to assess the feasibility of the trail proposal for new Commonwealth supported railroad projects. This section also lists other useful resources for the development of RWT/PCs.

**Appendix A** is a technical memorandum that reviews possible design considerations for the development of RWT/PC projects. Additional research is presented regarding other states' processes, policies and regulations regarding RWT/PCs, liability, safety and trespass issues. The appendix also summarizes the types of users likely to use the RWT/PC and general considerations for their safety and enjoyment of the RWT/PC facility. Finally, the appendix provides technical design considerations for RWT/PC trail facilities.

## **Summary**

This document was developed as a response to HB2088 and should be used as a common resource for state agencies, railroads, and trail advocates for arriving at a consensus on trail and railroad use. This report establishes a process for RWT/PCs project interface and development. The design considerations presented in this report (as Appendix A) *should not* be considered design guidelines, standards, or specifications. This report provides technical considerations and suggested practices to use as a starting point in the development of these types of facilities.

The Commonwealth assumes no liability in the use or application of the information presented in this report.

## **1.4 Recreational Access and Railroad Interface Process**

The process begins with a recreational advocacy group submittal of a *Letter of Interest* for a trail proposal to the Virginia Department of Conservation and Recreation (DCR). DCR will then coordinate with the Virginia Department of Game and Inland Fisheries (DGIF), the Virginia Department of Rail and Public Transportation (DRPT) and the host railroad to assess the feasibility of the trail proposal for new Commonwealth supported railroad projects as well as for existing rail lines.



## 2. Project Interface and Development

### 2.1 Course of Action for Rails with Trails/Pedestrian Crossing Development

This report presents several of the many steps in the planning process needed to complete an RWT/PC project. Both the Rails-to-Trails Conservancy and USDOT Rails with Trails Studies provide detailed recommendations in the planning process. In summary, these planning steps would include:

- A Project Feasibility Study, including an inventory and assessment of resources
- Stakeholder identification
- Railroad coordination/involvement
- Public involvement
- Legal issues and agreements between stakeholders
- Master planning
- Implementation and construction plans
- Maintenance plans and identification of responsible parties
- Funding sources

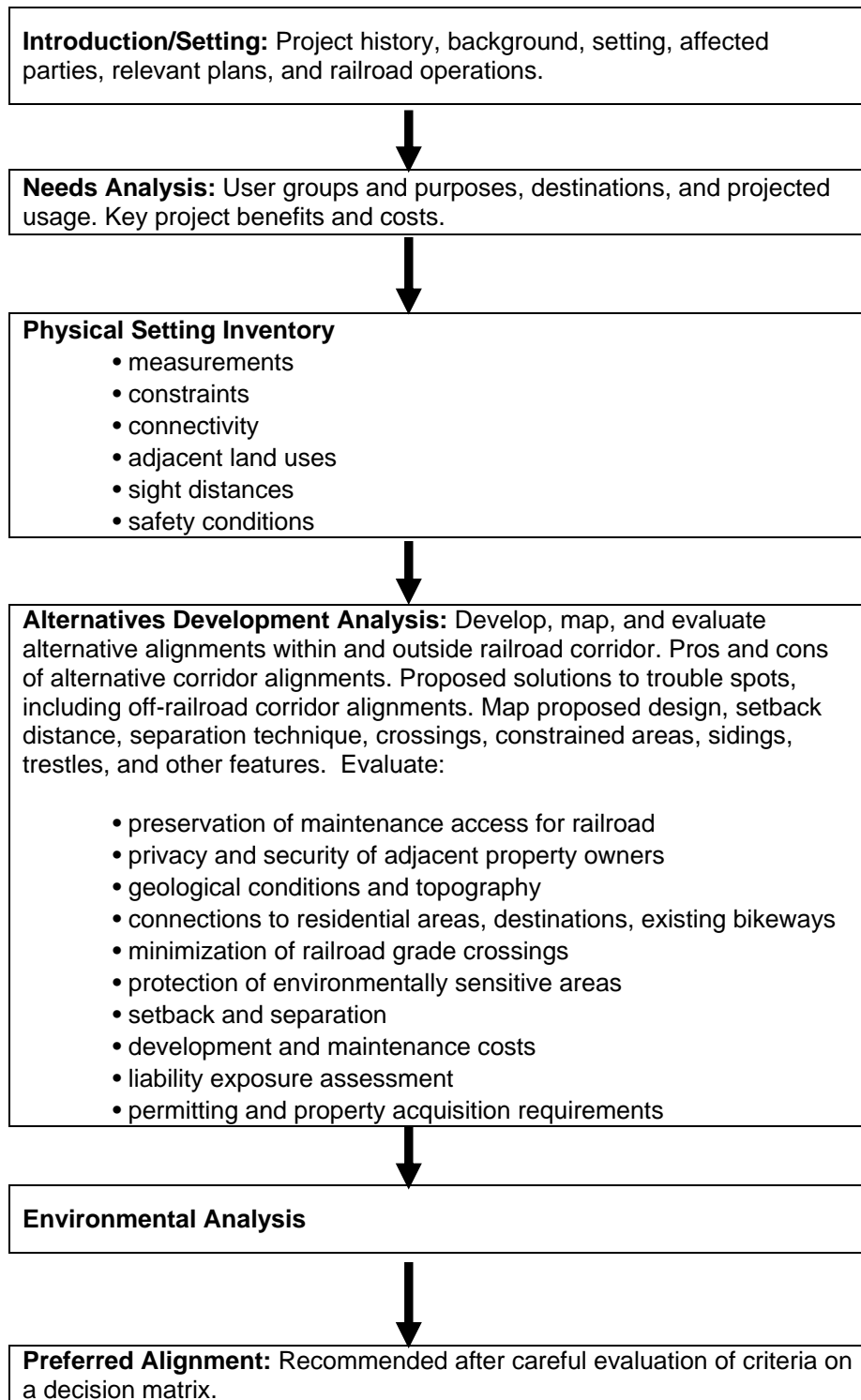
#### 2.1.1 Project Feasibility

Feasibility of the project should be established prior to the project initiation, coordination and review process detailed in Section 2.2. Again, this requires an evaluation of corridor specific constraints by trail planners and engineers. The USDOT outlines a methodology for a Feasibility Analysis which is provided in **Figure 2-1**.

Among other issues, a feasibility study serves to identify project constraints. Some of the constraints may be overcome while other constraints may be so cost prohibitive as to negate the possibility of the RWT/PC. Significant constraints can include:

- Number and type of water crossings and/or the presence of tunnels.
- Constrained ROW that would not meet railroad setback, ADA and other safety requirements.
- Rail lines that are considered high-volume “core” lines for existing and future expanded service.
- Numerous or at-grade rail/trail crossings without signals.

**Figure 2-1: Steps in an RWT/PC Feasibility Study**



Source: U.S. Department of Transportation, *Rails with trails: Lessons Learned*, 2002, pg. 32

## 2.1.2 Stakeholder Identification and Outreach

The categorization of trail users is covered in detail in Appendix A and includes:

- Pedestrians
- Bicyclists
- Mountain Bike Users
- Equestrian Users
- Cross-Country Skiers
- Motorized Vehicles
- In-Line Skaters
- Other Passive Users

Another related issue involves public and stakeholder outreach. The Rails-to-Trails Conservancy recommends early and extensive involvement with adjacent landowners to respond to their concerns. Other stakeholders to incorporate into the process include:

- Railroads
- Local, State and Federal Agencies (such as transportation agencies)
- Elected Officials
- Public/Citizen Groups

The Conservancy provides advice for identifying stakeholders, which are defined as individuals or groups which will be impacted by or benefit from an RWT/PC.

Public and stakeholder involvement can be completed with traditional outreach strategies but the Conservancy recommends other approaches, such as one-on-one meetings with individuals (such as concerned landowners); or establishing Citizen/Stakeholder Advisory Committees which can serve to resolve disputes between different parties. Other public involvement techniques include workshops which can address different aspects of the project. A workshop could, for example, present the proposed alignment of the RWT/PC and amenities (A Design Workshop).

## 2.1.3 Master Planning

Master planning of the RWT/PC is similar in approach to other planning process; the Conservancy recommends that a trail plan document provide:

- A Site Assessment
- The Vision, Goals and Objectives of the RWT/PC
- Routing/Design/Alignment (with maps)
- Implementation Strategies

The plan should also address how the RWT/PC fits with the region's master trail plan or comprehensive plan.

## 2.1.4 Implementation Plans

Implementation plans are carried out last in the trail development process. As the Conservancy recommends, this type of plan should outline:

- Activities necessary for acquiring easements, ROW, or land for the RWT/PC
- Identify necessary railroad, local, state, and federal permits and approvals
- Prepare final design and construction bidding documents
- Obtain funding for any land acquisition, design, construction and maintenance of the RWT/PC

## 2.2 ***Rails with Trails/Pedestrian Crossing Project Initiation, Coordination and Review***

The Class I and shortline railroads operating in Virginia have requested that Rails with trails proposals be coordinated and submitted for review through a single state agency. The Virginia Department of Conservation and Recreation (DCR) is the state agency responsible for initial review of public requests for RWT/PCs. The process for submitting a trail proposal to the DCR is outlined below.

### 2.2.1 **Rails with Trails/Pedestrian Crossing Proposal Submission for Existing Rail Lines**

Recreational trail advocates interested in developing a RWT/PC project in the Commonwealth of Virginia must first submit a *Letter of Interest (LOI)* to the Virginia Department of Conservation and Recreation (DCR). The LOI will precede a formal application or comprehensive trail planning process, and will allow the trail advocate(s) to assess the preliminary feasibility of the project from the railroad operator's perspective. While not all rail corridors may be suitable for trail projects, the LOI is an important first step, without a major commitment of time and resources that a comprehensive trail planning process would require.

The LOI will address several topics, which will be used to evaluate the initial feasibility of the project:

1. The termini of the proposed trail project. These locations may be expressed as mileposts, geographic coordinates, or other easily noted locations such as highway crossings.
2. A 7.5' USGS Quad Map(s) with an illustrative sketch of the proposed trail alignment. Other topographic mapping on a scale of 1 inch=2,000 feet may be used as well.
3. Name of the operating railroad and maps of railroad ownership in project area.
4. Geographic extent of the project (county or counties that encompass the project).
5. Anticipated sources and status of funding for both construction and maintenance.
6. Estimated project cost (if known).
7. The target group of trail users, e.g. pedestrians, bicyclists, equestrian users, etc.
8. Sponsoring trail advocacy group or jurisdiction, and name of entity who would own, operate and maintain the trail.
9. Name and title of applicant contact.

Prior to submittal of the LOI, it is strongly encouraged that the applicant(s) review guidance provided in the Process for Evaluating Recreational Access Railroad Interface in the Commonwealth of Virginia, and guidelines of the host railroad. The process was developed by the Virginia Department of Rail and Public Transportation (DRPT), Department of Conservation and Recreation (DCR) and Department of Game and Inland Fisheries (DGIF) in consultation with Virginia railroads and trail stakeholders. This report is available online at [www.drpt.virginia.gov](http://www.drpt.virginia.gov), [www.dcr.virginia.gov](http://www.dcr.virginia.gov) and [www.dgif.virginia.gov](http://www.dgif.virginia.gov). This report identifies several factors which should be considered in evaluating the feasibility of a RWT/PC.

Once the LOI is reviewed and preliminarily accepted by DCR, DCR will then coordinate with the operating railroad for the potential development of a RWT/PC. DCR will also contact DGIF and DRPT to advise of the LOI.

The sequence for the review process consists of the following:

1. Applicant submits the LOI to DCR for review.
2. DCR reviews LOI and contacts applicant if clarifications are required (within 60 days).
3. DCR submits LOI to the railroad operator/ROW owner for consideration with a copy to DRPT.
4. DCR provides trail advocate(s) and DRPT with a written response detailing the railroad's decision to continue consideration of the trail/crossing proposal or to decline the proposal. If the railroad declines, the process ends. Future resubmission is permitted if the project parameters changes.
5. If the railroad does not disapprove the project as proposed in the LOI, the DCR will notify the applicant and DRPT. The railroad will at this point, notify DCR for any required conditions that must be met to proceed through the trail planning process. DCR will forward such conditions to the applicant.
6. The applicant may then decide to advance the project by preparing a formal trail plan which is then submitted to the DCR.
7. The formal trail plan should include at a minimum:
  - a. The engineered solution to safety and design issues as identified by the railroad
  - b. Potential alternatives
  - c. Signing plan
  - d. Maintenance and operations plan
8. The formal trail plan is last reviewed by a state designated Review Committee. The Committee is made up of representatives of DRPT, DCR, DGIF and the host railroad (rotating). The Committee shall also include up to 2 members of access advocacy groups within the Commonwealth.
9. The Review Committee will issue a recommendation on the trail/crossing proposal, which will then be submitted to the railroad to render a final decision.

## **LOI Submittal**

The LOI should be submitted to:

Planning Bureau Manager  
Virginia Department of Conservation and Recreation  
203 Governor Street, Suite 326  
Richmond, VA 23219

## 2.2.2 Process for Considering Rails with Trails/Pedestrian Crossings for new Rail Projects Funded with Rail Enhancement Funds

During the Rail Enhancement Fund (REF) application period DRPT will notify DCR of the applications received. DCR, DGIF and DRPT will undertake a review of REF applications and conduct a screening for the applicability and feasibility of a RWT/PC in conjunction with the proposed rail project. Trail proposals will not delay the REF funding and project development process. The sequence for the review process is as follows:

1. DRPT prepares announcements of the REF application period and requests applications. Information is also posted on the DRPT website. Applicants for rail projects must submit applications within the advertisement period as identified by DRPT.
2. Upon receipt of applications, DRPT will review the REF applications and post them on the DRPT Rail Advisory Board website for review.
3. DCR will review existing RWT/PC proposals on file. DCR and DGIF will also cross reference their files/databases of existing/future parks, trails and boat launches for applicability and feasibility of establishing a RWT/PC to link existing or future recreational facilities in connection with a project application (within 30 days of DRPT posting).
4. Where DCR and/or DGIF find an applicable and feasible RWT/PC proposal in their files/databases, DCR will identify and work with an appropriate recreational or trail advocate group to be a sponsor of a RWT/PC proposal submission. The proposal submission will follow the procedures above.
5. If a RWT/PC proposal is found to be applicable within an REF proposed project area, DRPT, in coordination with DCR and DGIF, will work with the REF applicant and any affected railroads to establish whether a RWT/PC may be feasible.
6. If a trail or pedestrian crossing is determined to be worthy of further consideration, a Letter of Intent (LOI) is submitted by the project sponsor to DCR. The LOI process described above and detailed in the RWT/PC proposal submission will then be followed.

Based on the REF application review and project selection criteria, DRPT will develop rail project recommendations for the Rail Advisory Board (RAB). The RAB reviews the projects and makes recommendations to the Commonwealth Transportation Board (CTB). The CTB will approve and allocate REF funds to specific eligible projects in the Six-Year Improvement Plan (SYIP).

7. The Code of Virginia does not allow for the use of Rail Enhancement Funds for RWT/PC projects. Therefore, funding for the RWT/PC projects must be provided by funds other than REF funds. REF funded projects will advance without delay as the RWT/PC project is being negotiated.

## 2.3 Legal Issues

Liability, access easements, and other legal issues associated with RWT/PC will need to be addressed by all stakeholders—the trail advocates and owners, the host railroads, and the Commonwealth of Virginia. Issues of liability must be addressed separately from the technical guidance presented in this report.

While, technically, unlawful activity (trespassing on railroad property) was at the root of 426 injuries and 458 fatalities on United States railroad property in 2008, railroads, as potentially liable landowners, expressed a desire to minimize such incidents.<sup>1</sup>

Many other states have legislation which relates to the development of an RWT/PC project, including limited liability statutes. Other states which have some type of a limited liability statute for trails include Alaska, Georgia, Hawaii, Indiana, New Hampshire, New Mexico, North Carolina and Pennsylvania.<sup>2</sup>

In addition to building actual structures to isolate rail lines, some states have enacted landowner liability laws. One such law, passed in Maine in 2005, has given landowners—from local farmers to nationwide railroad corporations—a large degree of protection from lawsuits related to injuries on their property.<sup>3</sup> It discourages lawsuits in two ways. First, the law is worded to protect landowners so directly that injured parties perceive little opportunity to build winning cases. Additionally, should a plaintiff lose, he or she must pay the defendant's (i.e. the landowner's) legal fees and court costs.<sup>4</sup>

At one point, however, Maine's limited liability statute is slightly ambiguous—it does not protect “malicious” landowners.<sup>5</sup> Maliciousness, as defined in the law, does not require conscious desire to harm trespassers. Rather, malicious intent can be *inferred* if landowners knowingly neglect to warn against a dangerous situation.<sup>6</sup> The long-term effects of Title 14 on Maine's railroad companies remain to be seen, however no citizen has won a “landowner liability” personal injury case since this law was passed.

The Pennsylvania Legislature, in 2004, passed a statute aimed specifically at railroad property. Known as the “Railroad Trespass Statute,” it facilitated the process for holding individuals accountable for trespassing if such acts occurred on railroad ROW. It reinforces Pennsylvania law allowing recreational crossing of tracks (perpendicularly) but specifies that any pedestrian movement along tracks (longitudinally) is illegal. Not only are Pennsylvania's railroad trespass penalties stricter than its general trespass laws but, under this statute, they can also be imposed on perpetrators of other rail-related crimes (e.g. jumping onto rail cars, or vandalism). As with Maine's Title 14, the success of Pennsylvania's trespass statute cannot yet be determined. It may reach its peak of effectiveness when police officers and magisterial judges statewide understand that railroad crimes have been increased to a third degree misdemeanor.

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<sup>1</sup> Operation Lifesaver, *2008 Statistics by State: Crossing Collisions and Casualties, Trespass Casualties*.

<sup>2</sup> United States Department of Transportation, *Rails with trails: Lessons Learned*, August 2002, pg. 113.

<sup>3</sup> Maine Landowner Relations Program, *Landowner Liability Law Explained*, 2008.

<sup>4</sup> Maine Title 14, §159-A, *Limited liability for recreational or harvesting activities*.

<sup>5</sup> Brown, Tommy L. *Analysis of Limited Liability Recreation Statutes in the Northern Forest States*. Cornell University, October 2006.

<sup>6</sup> Maine Landowner Relations Program, 2008.

Virginia's Landowner Liability Law (Virginia Code § 29.1-509) attempts to address this issue as well. Similar to Maine's liability law, the protection to landowners does not protect from malicious or grossly negligent actions. Also, protection is not afforded to landowners who charge a fee for usage or for an easement. However if the landowner enters into an agreement with the Commonwealth (state agency) for recreational access the agency is obligated to hold the landowner harmless and is responsible for providing the legal expenses of a landowner in the event a case is filed. Since its inception the Virginia landowner liability law has not been utilized or tested in a court of law. The railroads feel that this provision does not adequately address potential risks due to the unique conditions of existing railroad use arrangements.

## **2.4 Additional Resources**

Primary sources for this report have been mentioned throughout. Other general trail planning and design resources include:

- Regional Pedestrian and Bicycle Plans (Metropolitan Planning Organizations)
- U.S. Department of Transportation (USDOT), Rails with trails: Lessons Learned, Literature Review, Current Practices, Conclusions, 2002 (<http://www.fhwa.dot.gov/environment/rectrails/rwt/>)
- The Virginia Bicycle Facility Resource Guide (<http://www.virginiadot.org/programs/bk-default.asp>)
- The Virginia Department of Transportation (VDOT) Road Design Manual, last revised September 2005.
- American Association of State Highway and Transportation Officials (AASHTO), Guide for the Development of Bicycle Facilities, 3rd Edition ([www.aashto.org](http://www.aashto.org))
- Rails-to-Trails Conservancy, Trails for the Twenty-First Century, Second Edition, 2001 ([www.railstotrails.org](http://www.railstotrails.org)).
- Rails-to-Trails Conservancy, Design, Management and Operating Characteristics of 61 Trails Along Active Railroads, 2000 ([www.railstotrails.org](http://www.railstotrails.org)).
- American Railway Engineering and Maintenance-of-Way Association (AREMA), Manual for Railway Engineering, 2002 ([www.arema.org](http://www.arema.org))
- Americans with Disabilities Act (ADA), ADA and ABA Accessibility Guidelines, 2004
- CSXT Transportation, Public Project Information for Construction and Improvement Projects that may involve the Railroad, 2005 ([www.csx.com](http://www.csx.com))
- Norfolk Southern Corporation, Guidelines for Design of Grade Separation Structures ([www.nscorp.com](http://www.nscorp.com))
- National Park Service ([www.nps.gov](http://www.nps.gov))
- American Society of Landscape Architects (ASLA) ([www.asla.org](http://www.asla.org))
- American Planning Association (APA) ([www.planning.org](http://www.planning.org))
- Virginia State Pedestrian and Bicycle Plans ([www.virginiadot.org/info/service/bk-default.asp](http://www.virginiadot.org/info/service/bk-default.asp))



# Appendix 4-D · Environmental Screening Forms



## **Environmental Screening Forms**

### **Examples of Typical Forms Used for Trail & Path Projects**

The following forms are included to give you and your organization an idea of what type of environmental screening forms may be required by your specific funding and/or approving agency. If you are using not using public funding or do not have agency review requirements, you may still find these forms useful as checklists for environmental issues that may be applicable regardless of funding source or construction type.

Use these forms as reference only and check with your funding source, review/approval agency, and/or permitting agencies to make sure you have the correct forms for your project. You may need to complete more forms or checklists than what is included in this appendix or may be exempt from certain forms.

The following items are included:

- An excerpt from the FHWA Recreational Trails Program application entitled “Resource Agency Coordination and Environmental Screening Forms” *(Required for application to the Recreational Trails Program)*
- VDOT’s “Environmental Requirements for Transportation Enhancement Projects”
- VDOT’s EQ-555 Checklist entitled “Water Quality Permits and Natural Resource Due Diligence Checklist for Locally Administered Projects” *(Required for TEA-funded trail and path projects)*
- VDOT’s EQ-121 Checklist entitled “Hazardous Materials Due Diligence Certification for Locally Administered Projects” *(Required for TEA-funded trail and path projects)*
- VDOT’s Preliminary Environmental Screening Form (PEI) & State Environmental Review Process Form (SERP) *(SERP is applicable only for State-funded construction projects estimated to cost more than \$500,000)*



## Excerpt from DCR Recreational Trails Program

### Resource Agency Coordination and Environmental Screening Forms

This portion of the PDESA is a working tool used to identify the potential impact to the environment as a result of the proposed trail project. By completing the ESF, the project sponsor is providing information that will support the proposal:

1. meets criteria to be categorically excluded (CE) from further NEPA or
2. requires further analysis through an environmental assessment (EA) or an environmental impact statement (EIS).

An ESF alone does not constitute adequate environmental documentation unless a CE is recommended. If an EA is required, the EA process and resulting documents must be developed for further consideration for approval by the FHWA. If an EIS is needed, DCR and FHWA will determine the appropriate steps on how to proceed.

The ESF contains two parts that must be completed:

#### Part A. Environmental Resources

#### Part B. Mandatory Criteria

**Part A:** For each environmental resource topic, choose an impact estimate level (none, negligible, minor, exceeds minor) that describes the degree of potential negative impact for each listed resource that may occur directly, indirectly and cumulatively as a result of federal approval of your proposal. For each impacted resource provide a brief explanation of how the resource will be affected, how the impact level was determined, and why the chosen impact level is appropriate. For impacted resources describe planned mitigation for each applicable resource, and choose an impact level as mitigated. If the resource does not apply to your proposal, mark NA in the first column. Add any relevant resources (see A.24 on the ESF) if not included in the list.

**Part B:** This is a list of mandatory impact criteria that preclude the use of categorical exclusions. If you answer “yes” or “maybe” for any of the mandatory criteria you must contact DCR for consultation.

#### Division of Natural Heritage

The Division of Natural Heritage (DNH) has instructions posted online for obtaining comments at [www.dcr.virginia.gov/natural\\_heritage/infoservices.shtml#er](http://www.dcr.virginia.gov/natural_heritage/infoservices.shtml#er).

In general, DNH will need a project description, a USGS topographic map with the project boundaries clearly delineated and a completed information services order form. The order form is available on the DNH website. For specific questions, please contact Rene’ Hypes, Information Services Manager, at 804.371.2708.

## **Virginia Department of Game and Inland Fisheries**

A detailed project description, location map, total land disturbance involved and description of existing conditions should be submitted to Ms. Shirl Dressler at the Virginia Department of Game and Inland Fisheries (VDGIF), 4010 West Broad Street, Richmond, Virginia 23230.

It is imperative that you advise that your project has advanced to the second stage of the Recreation Trails Program competition and are in contention for funding in order to obtain a review.

Please follow any recommended further coordination guidance provided in the comments received. For example, if the initial response from DGIF states that you should contact the Environmental Services Section (ESS) of DGIF, you must contact ESS and obtain their comments in writing.

## **Virginia Marine Resources Division**

If your project involves any work in wetlands, rivers, streams or other bodies of water, please visit the Habitat Management Division of the Virginia Marine Resources Commission (VMRC) website at [www.mrc.state.va.us/hmac/hmoverview.shtm](http://www.mrc.state.va.us/hmac/hmoverview.shtm). Determine the staff person responsible for your area and contact them to determine if your project may need to submit a Joint Permit Application.

## **United States Fish and Wildlife Service**

The U. S. Fish and Wildlife Service has online instructions for obtaining project review information. Please follow their steps as posted at [www.fws.gov/northeast/virginiafield/endspecies/Project\\_Reviews.html](http://www.fws.gov/northeast/virginiafield/endspecies/Project_Reviews.html)

In addition to the above agencies, you may need to consult with other local, state, federal or other entities to complete Parts A and B.

Attach copies of the comment letters received from the natural resource agencies and other relevant supporting information to the PDESA.

**For conversions, complete one ESF for each of the converted and replacement sites.**

<b>A. ENVIRONMENTAL RESOURCES</b> Indicate potential for adverse impacts. Use a separate sheet to clarify responses per instructions for Part A on page 9.	<b>Not Applicable-</b> Resource does not exist	<b>No/Negligible Impacts-</b> Exists but no or negligible impacts	<b>Minor Impacts</b>	<b>Impacts Exceed Minor</b> EA/EIS required	<b>More Data Needed to Determine Degree of Impact</b> EA/EIS required
1. Geological resources: soils, bedrock, slopes, streambeds, landforms, etc.					
2. Air quality					
3. Sound (noise impacts)					
4. Water quality/quantity					
5. Stream flow characteristics					
6. Marine/estuarine					
7. Floodplains/wetlands					
8. Land use/ownership patterns; property values; community livability					
9. Circulation, transportation					
10. Plant/animal/fish species of special concern and habitat; state/federal listed or proposed for listing					
11. Unique ecosystems, such as biosphere reserves, World Heritage sites, old growth forests, etc.					
12. Unique or important wildlife/wildlife habitat					
13. Unique or important fish/habitat					
14. Introduce or promote invasive species (plant or animal)					
15. Recreation resources, land, parks, open space, conservation areas, rec. trails, facilities, services, opportunities, public access, etc. <i>Most conversions exceed minor impacts. See Step 3.B</i>					
16. Accessibility for populations with disabilities					
17. Overall aesthetics, special characteristics/features					
18. Historical/cultural resources, including landscapes, ethnographic, archeological, structures, etc. Attach SHPO/THPO determination.					
19. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure					
20. Minority and low-income populations					
21. Energy resources (geothermal, fossil fuels, etc.)					
22. Other agency or tribal land use plans or policies					
23. Land/structures with history of contamination/hazardous materials even if remediated					
24. Other important environmental resources to address.					

<b>B. MANDATORY CRITERIA If your LWCF proposal is approved, would it...</b>	<b>Yes</b>	<b>No</b>	<b>To be determined</b>
1. Have significant impacts on public health or safety?			
2. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands, wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (E.O. 11990); floodplains (E.O 11988); and other ecologically significant or critical areas.			
3. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA section 102(2)(E)]?			
4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?			
5. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?			
6. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?			
7. Have significant impacts on properties listed or eligible for listing on the National Register of Historic Places, as determined by either the bureau or office.(Attach SHPO/THPO Comments)			
8. Have significant impacts on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species.			
9. Violate a federal law, or a state, local, or tribal law or requirement imposed for the protection of the environment?			
10. Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?			
11. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007)?			
12. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area, or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?			

**Environmental Reviewers**

The following individual(s) provided input in the completion of the environmental screening form.

List all reviewers including name, title, agency, field of expertise. Keep all environmental review records and data on this proposal in state compliance file for any future program review and/or audit. The ESF may be completed as part of a LWCF pre-award site inspection if conducted in time to contribute to the environmental review process for the proposal.

- 1.
- 2.
- 3.

The following individuals conducted a site inspection to verify field conditions.

List name of inspector(s), title, agency, and date(s) of inspection.

- 1.
- 2.
- 3.



# Environmental Requirements for Transportation Enhancement Projects

Enhancement projects are federally funded requiring a [National Environmental Policy Act](#) (NEPA) document before any land acquisition or construction can begin. The NEPA document is an “umbrella” document that demonstrates compliance with a number of different environmental laws, regulations, and Executive orders, including [Section 106](#) of the National Historic Preservation Act, the [Clean Water Act](#), and many others.

VDOT will complete the NEPA document and supporting coordination for all Enhancement projects with Project Administration Agreements executed after October 2008. For projects with agreements executed prior to October 2008, VDOT can complete the NEPA document and supporting coordination at the Sponsors request. VDOT will provide Sponsors with an estimate of time and cost for environmental work on an Enhancement project.

Sponsors are responsible for obtaining any state/federal water quality permits (for guidance see Water Quality Permit & Natural Resources Due Diligence [checklist](#)) and performing necessary due diligence for hazardous material issues (submitted to VDOT on Hazardous Materials Certification Due Diligence [form](#)).

Close coordination on environmental requirements between the Sponsor and the [VDOT District Environmental Manager](#) will be necessary so that project scopes, plans, schedules, and budgets accurately reflect the cost, requirements, and duration of the environmental work. Please contact your District Environmental Manager directly to determine your project specific environmental requirements.

## Environmental Commitments

If any environmental commitments have been identified during agency coordination, the Sponsor is responsible for ensuring they are implemented at the appropriate time. Implementation of environmental commitments is not optional, but required. Environmental commitments for Enhancement projects can include, but are not limited to, conducting an archaeological survey, providing the Virginia Department of Historic Resources (VDHR) with copies of final plans before construction, or having a qualified archaeologist monitor during ground disturbing activities. Once the Sponsor has implemented the environmental commitments, documentation to that effect must be forwarded to the VDOT District Environmental Manager.

Failure to implement environmental commitments may jeopardize FHWA’s federal funding of an Enhancement project.

# Environmental Requirements for State Funded Projects

The Virginia Department of Transportation (VDOT) assists Localities by providing state funds for various access roads to qualifying airports, industrial sites and rail sites through the Industrial, Airport, and Rail Access Fund program. In addition, state funds are available to Localities to provide access to recreational and historical sites through the Recreational Access Fund program. The revenue share program also provides Localities with state funds for eligible projects.

If a state funded construction project is estimated to cost more than \$500,000, VDOT must comply with the State Environmental Review Process (SERP). If VDOT determines that a SERP Preliminary Environmental Inventory (PEI) is required, that documentation will be provided to the Locality. The Locality is solely responsible for compliance required by any state and/or federal regulations, laws, etc.

If a state funded project is estimated to cost less than \$500,000, the SERP is not required and no further documentation will be forthcoming from VDOT on environmental requirements. The Locality is solely responsible for compliance required by any state and/or federal regulations, laws, etc.

The Locality will complete a [Project Certification form](#) and provide a copy to the VDOT Project Coordinator. VDOT will periodically perform Quality Assurance audits of Localities project documentation files.

## Forms:

- [Project Early Notification form](#) (EQ-429) – completed to initiate SERP if necessary

## Guidance

- [SERP Preliminary Environmental Inventory form](#)

<b>VIRGINIA DEPARTMENT OF TRANSPORTATION</b>  <b>WATER QUALITY PERMITS AND NATURAL RESOURCE DUE DILIGENCE CHECKLIST FOR LOCALLY ADMINISTERED PROJECTS</b>	<b>FORM EQ-555</b> (Revised 6/9/09)  UPC: _____  Project: _____
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**APPLICABILITY:**

This checklist is designed to assist the LPA in compiling appropriate water quality/natural resource documentation for transportation projects. The LPA shall acquire all required water quality permits and natural resources clearances and reflect any commitments in the project construction documents. The supporting documentation must be submitted to VDOT prior to project certification for advertisement/construction.

**Water Quality Permits:**

The LPA is responsible for obtaining all necessary water quality permits for this project prior to advertisement.

Water Quality Permit(s) Requirements for the project are listed below:

Permitting Agency	Permit Required Yes/No	Permit Type	Permit Number	Issued Date	Expiration Date
Corps of Engineers					
Department of Environmental Quality					
Virginia Marine Resource Commission					
Tennessee Valley Authority					

Attach Copy of all Permits Acquired for the project.

**Compensatory Mitigation**

The LPA is responsible for providing the water quality permit required compensatory mitigation for this project.

Is compensatory mitigation required for the unavoidable wetland and stream impacts? Yes  No

If Yes, Complete below chart and select appropriate compensatory mitigation type

Compensation Type	Cowardin Classification	Impact HUC	Impact Size	Compensation HUC	Compensation Required
Wetlands					
Streams					

**Compensation Project:**

1. The LPA and the applicable State and Federal agencies having jurisdiction over the use and disturbance of waters of the United States including areas known as wetlands and stream have agreed that compensatory mitigation requirements may be satisfied by the implementation of a compensation project for the disturbance of Insert Number acres of wetlands and Insert Number linear feet of streams.
2. Compensation Project Types: (Check Appropriate)
  - Establishment/Creation:** The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Establishment results in a gain in wetland acres.
  - Restoration:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland or stream.
  - Enhancement:** The manipulation of the physical, chemical, or biological characteristics of a wetland and or stream (undisturbed or degraded) to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but do not result in a gain in wetland acres.
  - Protection/Maintenance (Preservation):** The removal of a threat to, or preventing the decline of, wetland and/or stream

conditions by an action in or near a wetland or stream. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation. Preservation does not result in a gain of wetland acres and will be used only in exceptional circumstances.

3. Compensation Project consists of Insert Number wetlands acres and Insert Number linear feet of streams, located in Insert County, Virginia.
4. The LPA is responsible for accomplishing, maintaining, and monitoring the compensation project and for providing long-term management and financial assurances set aside for remedial measures to ensure mitigation success. This includes identifying the party that will provide for long-term management and protection of the compensation project.

**Mitigation Bank:**

1. Insert Name of Locality and the applicable State and Federal agencies having jurisdiction over the use and disturbance of waters of the United States including areas known as wetlands and stream have agreed that compensatory mitigation requirements may be satisfied by the purchase from Insert Name of Bank of Insert Number Credits, as provided in this Agreement and in accordance with the Mitigation Banking Instrument, subject to case-by-case approval through the permitting process.
2. Insert Name of Mitigation bank consists of Insert Number wetlands acres and Insert Number linear feet of streams, more or less, located in Insert County, Virginia. The Bank's Mitigation Banking Instrument was approved by the U.S. Army Corps of Engineers ("Corps") on Insert Date. The Bank is authorized to sell mitigation credits to compensate for unavoidable impacts to waters of the United States caused by projects approved pursuant to permits or authorizations granted by the Corps ("Credits"). Operation, management and maintenance of the Bank is subject to the requirements of the Mitigation Banking Instrument, to the statutes, regulations and policies cited therein and to the requirements of all Federal and State permits as applicable.

**Trust Fund Payment**

1. Name of Locality and the applicable State and Federal agencies having jurisdiction over the use and disturbance of waters of the United States including areas known as wetlands and stream have agreed that compensatory mitigation requirements may be satisfied by the payment of \$Insert Dollar amount to the Trust Fund for the disturbance of Insert Number acres of wetlands and Insert Number linear feet of streams.

**Threatened and Endangered Species**

The LPA is responsible for obtaining all necessary regulatory clearances for this project prior to advertisement.

This section must be completed to document threatened or endangered species review for all activities.

The LPA has reviewed the project and appropriate data sources and have made one of the following determinations with respect to this project: (Check Appropriate)

- Based upon a review of the DGIF data and DCR Natural Heritage Conservation Site Maps for the project area, no Threatened or Endangered species collections/records are within a 2-mile search distance for the project. A copy of this determination has been provided to VDOT.
- Based upon a review of the DGIF data and DCR Natural Heritage Conservation Site Maps for the project area, Threatened or Endangered species collections/records are within the required 2-mile search distance for the project. (Check Appropriate)
- Insert Name has conducted a site evaluation within the area of effect for the project. A copy of the assessment has been provided to DGIF, DNH, and FWS on Insert Date. The agency comments (check appropriate)  were received within 30 days or  were not received within 30 days. Comments received from the agencies are addressed in the project plans and contract documents. This documentation has been provided to VDOT.

Indicate results of Site Evaluation:

- No Habitat identified  
 Habitat identified

- Habitat identified and a species survey was requested by Insert Agency, performed by insert name, and coordination conducted on Insert Date with DGIF, DNH, and FWS. The agency comments were received and addressed. This documentation has been provided to VDOT.

Section 7 Consultation for a species in the project area was required by Insert Name of Federal Agency. The Biological Opinion prepared by Fish and Wildlife Service was received on Insert Date and the requirements of the Biological Opinion have been incorporated into the project design and contract construction documents. A copy of the Biological Opinion has been provided to VDOT.

**T&E Species:** (*List all species for which this form applies.*) \_\_\_\_\_.

LPA should note:

- (1) Where actual or potential impacts to wetlands, streams, and/or endangered species have been identified, appropriate actions have been taken (or will be taken) by the LPA to address these issues in terms of avoidance, minimization or compensation. Where such actions are required to be taken during construction, appropriate contract provisions have been/will be developed to incorporate those costs as pay items in the contract.
- (2) Estimated costs for project construction inspections and post-construction monitoring and remediation for the compensatory mitigation have been/will be taken into consideration.
- (3) The project will be inspected in accordance with state and federal requirements.
- (4) The construction contractor will be made aware of any environmental issues that may be encountered during construction and will be provided access to any study results to assist the Contractor in developing and implementing the project in accordance with the regulatory permits and clearances.



<b>VIRGINIA DEPARTMENT OF TRANSPORTATION</b>  <b>HAZARDOUS MATERIALS DUE DILIGENCE CERTIFICATION FOR LOCALLY ADMINISTERED PROJECTS (EQ-121)</b>	<b>FORM EQ-121</b> (Revised 2/27/09)
	UPC: _____
	Project: _____

**I. APPLICABILITY:**

This form must be completed by the LPA and submitted to the VDOT District Environmental Manager who will use this as documentation to support the Environmental Certification (Form EQ-103) and/or PS&E Re-evaluation (Form EQ-200) for any construction project. No project will receive certification to advance to construction until the form is received.

**II. CONDITIONS:**

The LPA shall complete this form when all hazardous materials-related issues have been identified and addressed for the project. It is not necessary that all hazardous materials issued be resolved prior to submission of this form, however, a plan must be in place to ensure resolution. This form must be submitted prior to acquiring project Right-of-Way. All existing right of way, or properties to be acquired for use as right of way, must receive an appropriate level of study. This includes existing VDOT right of way, locality-owned, proffered, or donated properties.

**III. CERTIFICATION:**

I hereby certify that:

- (1) \_\_\_\_\_ *Insert Locality Name* \_\_\_\_\_ has performed studies, analyses, reviews and/or investigations of hazardous materials-related issues for all properties that it has acquired or intends to acquire for the project. Such studies, investigations, etc. constitute an appropriate level of inquiry to identify the likely presence of any hazardous substances or petroleum products or conditions that indicate an existing release, a past release, or the material threat of a release of hazardous substances into the soil, groundwater or surface water of the property or adjacent properties, or the presence of such impairments associated with buildings or structures. The following lists the consultants and reports that were utilized in the conduct of the due diligence studies:

Consultant	Title of Consultant Report	Report Date

- (2) (Choose one of the following):

- No potential or actual contaminated environmental media or other environmental impairments that would affect construction were identified within the project right-of-way.
- Actual or potential environmental impairments have been noted on the following properties and as indicated, a cost estimate(s) of potential remediation/closure activities to meet state and/or federal regulations is provided as well as an indicator of any coordination made with the Virginia Department of Environmental Quality and/or the U.S. Environmental Protection Agency:

Property	Parcel Number	Agency Coordination?	Closure/Remediation Estimate
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$

		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$
		<input type="checkbox"/> Yes <input type="checkbox"/> No	\$

Attach additional pages as necessary.

- (3) Where actual or potential environmental impairments have been identified, appropriate actions have been taken (or will be taken) to address these issues in terms of avoidance, containment, management, minimization or remediation. Where such actions are required to be taken during construction, appropriate contract provisions have been/will be developed to incorporate those costs as pay items in the contract.
- (4) Estimated costs for regulatory closure/remediation have been/will be taken into consideration in determining fair market value for properties to be acquired.
- (5) All structures will be inspected for the presence of asbestos-containing materials (ACM) and any regulated ACM will be removed in accordance with state and federal requirements.
- (6) The construction contractor will be made aware of any environmental issues that may be encountered during construction and will be provided access to any study results to assist the Contractor in developing and implementing appropriate Employee Health and Safety measures.

Certification provided on behalf of \_\_\_\_\_ [Locality] \_\_\_\_\_ by:

\_\_\_\_\_   
 Local Official

Date: \_\_\_\_\_

\_\_\_\_\_   
 Title



**VDOT Preliminary Environmental Screening Form & State  
Environmental Review Process Form  
(applicable only to State-funded construction projects estimated  
to cost more than \$500,000)**

Date:

Route:  
Project:  
City/County:  
PPMS ID:

**MEMORANDUM**

- TO:  Department of Conservation and Recreation Resources  
 Department of Environmental Quality - Air Division  
 Department of Environmental Quality - Waste Division  
 Department of Environmental Quality - Water Division  
 Department of Forestry  
 Department of Game and Inland Fisheries  
 Department of Health  
 Department of Historic Resources (File # \_\_\_\_\_ )  
 Department of Mines, Minerals, and Energy  
 Virginia Marine Resources Commission  
 Virginia Outdoors Foundation

CC: Brennan Snyder – VDOT Central Office Environmental (*via electronic mail*)

Enclosed is the Preliminary Environmental Inventory and a 7.5 minute USGS topographic quadrangle map prepared for the referenced project. Please review the information and return a copy of this memorandum with your response no later than \_\_\_\_\_. Thank you.

Sincerely,

YOUR NAME  
VDOT- CHOOSE DISTRICT District Environmental  
DISTRICT ADDRESS  
CITY, STATE, ZIP  
PHONE NUMBER

-----  
We CHOOSE ONE wish to see this project presented at an IECC meeting.

Comments: \_\_\_\_\_

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Agency: \_\_\_\_\_

## Preliminary Environmental Inventory

Project Information		
<b>PPMS ID #:</b> <b>Route:</b> <b>Road Name:</b> <b>VDOT project #:</b> <b>From:</b> <b>To:</b> <b>Scope of proposed work:</b>	<b>Date:</b> <b>City/County:</b> <b>Lat.:</b> °                    '                    "	<b>EQ Staff Initials:</b> <b>Zip code:</b> °                    '                    "
	<b>Project Administered by Local Government?</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	<b>Target Advertisement Date:</b>
	<b>Funding Source:</b> <input type="checkbox"/> State <input type="checkbox"/> Federal	

Road Type	Type of project	Location of work	Road Conditions	Existing Conditions	Proposed Conditions
<input type="checkbox"/> Interstate <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> Urban <input type="checkbox"/> Other	<input type="checkbox"/> Construction <input type="checkbox"/> Maintenance/Replacement <input type="checkbox"/> Maintenance <input type="checkbox"/> Railroad	<input type="checkbox"/> Work within existing corridor <input type="checkbox"/> Work on new location <input type="checkbox"/> Changes to existing alignment	Pavement width ( <i>feet</i> ) Right-of-way width ( <i>feet</i> ) Bridge/drainage structure? If yes, over what? Area of disturbance (acres)		

Resource Information					
Resource	Detailed Resource Information			Level of Impact	
<b>Potential commercial, residential, or non-profit displacements</b>	# Commercial:	# Residential:	# Non-profit:	# Industrial:	<i>Unknown</i>
	Comments:				
<b>Known hazardous materials/waste sites/landfills</b>	Locations: <i>DEQ Waste</i> (                    )- <i>Provided a list of hazardous waste notifiers, solid waste management facilities, CERCLA sites, and environmental incidents within the project area.</i>				<i>Unknown</i>
	Comments:				
<b>Known underground storage tanks</b>	Recorded tank sites:		Observed or potential sites:		<i>Unknown</i>
	Comments:				
<b>Air quality</b>	Attainment area: <input type="checkbox"/>		Non-attainment area: <input type="checkbox"/> Maintenance area: <input type="checkbox"/>		<i>Unknown</i>
	Comments: <i>DEQ Air</i> (                    )-				
<b>Public parks and recreation areas</b>	Parks:		Recreation areas:		<i>Unknown</i>
	Comments:				
<b>Public waterfowl/wildlife refuges</b>	Refuges:				<i>Unknown</i>
	Comments:				
<b>Historic resources</b>	Number of previously recorded architectural resources:		Number of previously recorded Archaeological resources:		<i>Unknown</i>
	VDOT effect/survey needs determination: (                    )-				
	<i>No Historic Properties Present or Affected.</i>				
	Comments:				
	If applicable, justify "No Historic Properties Present or Affected" finding:				
	Describe Area of Potential Effects (APE):				
	Comments: <i>DHR</i> (                    )-				
<b>Agricultural/forestral districts</b>	Number of agricultural districts:		Number of forestal districts:		<i>Unknown</i>
	Anticipated # of acres impacted in agricultural/forestral operation:				
	Anticipated # of acres impacted in agricultural/forestral district:				
	Comments:				
<b>Farm land</b>	Name or Location of farm:		Acres impacted:		<i>Unknown</i>
	Comments:				
<b>Forest land</b>	Name or Location of forest:		Acres impacted:		<i>Unknown</i>
	Comments:				
<b>Existing open space easements</b>	Number and location of easements:				<i>Unknown</i>
	Comments: <i>VOF</i> (                    )-				
<b>Geology of site</b>	Location of areas of concern:				<i>Unknown</i>
	Comments: <i>DMME</i> (                    )-				
<b>Public water supply</b>	Location of public water supply:				<i>Unknown</i>

Resource Information		
Resource	Detailed Resource Information	Level of Impact
	Comments: <i>VDH</i> ( )-	
Scenic resources	Wild and Scenic Rivers: _____ Virginia Byways: _____ Comments: <i>DCR</i> ( )-	Unknown
Threatened or endangered species	DGIF identified a FE, FT, SE or ST terrestrial or aquatic species in their Collections database within a 2-mile radius of the project, therefore the project is under review by the Department's Biologist: <input type="checkbox"/> DCR identified a FE, FT, SE or ST plant or insect species in the VDACS/DCR database, therefore the project is under review by the Department's Biologist: <input type="checkbox"/> Comments: <i>DCR for VDACS</i> ( )- <i>VDOT</i> ( )- A two-mile radius search was conducted on the Department of Game and Inland Fisheries Online Fish and Wildlife Information Service to identify any threatened or endangered species.	Unknown
Natural heritage resources	Documented? Yes: <input type="checkbox"/> No: <input type="checkbox"/> Site visit performed by DCR? Yes: <input type="checkbox"/> No: <input type="checkbox"/> Date site visit performed: _____ Comments: <i>DCR</i> ( )-	Unknown
Trout waters/ Anadromous fish	Location: _____ Comments: _____	Unknown
Known shellfish grounds	Location: _____ Comments: _____	Unknown
100-year floodplain areas	FEMA FIRM Community Panel Number: _____ Within 100-year floodplain? Yes: <input type="checkbox"/> No: <input type="checkbox"/> Comments: <i>DCR</i> ( )-	Unknown
Water quality permits	Streams involved? Yes: <input type="checkbox"/> No: <input type="checkbox"/> If yes, name of stream(s): _____ If yes, is stream flow: <5 miles <sup>2</sup> : <input type="checkbox"/> ≥5 miles <sup>2</sup> : <input type="checkbox"/>	Unknown
	Wetlands involved? Yes: <input type="checkbox"/> No: <input type="checkbox"/> If yes, amount of impact: <1/3 acre: <input type="checkbox"/> ≥1/3 acre: <input type="checkbox"/>	
	Are permits required? Yes: <input type="checkbox"/> No: <input type="checkbox"/> If yes, type of permit required: _____	
	Comments: <i>VMRC</i> ( )- <i>DEQ-Water</i> ( )-	
Existing public access to waterways	Yes: <input type="checkbox"/> No: <input type="checkbox"/> Comments: _____	Unknown

**Overall project comments:**  
PEI Form Template (7/1/02)



# Appendix 4-E · Recreation & Liability Laws



## **Federal and State Laws Relating to Recreation, Trails, and Paths**

The following is a compilation of federal and State of Virginia laws pertinent to the planning, design, and construction of trails and paths. Many of these laws apply only to trails and paths developed on public lands or using public funds. Make sure, however, to check with your funding source, locality, attorney, or other resources to be certain you've addressed all legal requirements and regulations. It is also a good idea to check with your local planning department to make sure applicable zoning codes and design ordinances are followed, particularly for facilities such as trailheads, bridges, parking lots, and buildings or shelters.

Many of the laws can be found by searching the United States Code or Code of Virginia at the following websites:

United States Code

<http://www.gpoaccess.gov/uscode/>

Code of Virginia

<http://leg1.state.va.us/000/src.htm>

### **General State of Virginia Conservation Laws**

#### **Code of Virginia Title 10.1 Conservation Chapters 1-26**

This part of the Code of Virginia details numerous laws regarding conservation of natural and cultural resources within the State. Title 10.1 includes laws pertaining to erosion and sediment control, historic preservation, invasive species, the Chesapeake Bay Preservation Act, and conservation easements. Title 10.1 is available on-line at:

<http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC1001000>

### **Liability Laws**

#### **State of Virginia Recreational Use Statute (Code of Virginia § 29.1-509)**

This law outlines the "duty of care" and liability for damages of landowners who make their property available to hunters, fishermen, sightseers, and other recreational users. The law states that "A landowner shall owe no duty of care to keep land or premises safe for entry or use by others...for any other recreational use, for ingress and egress over such premises to permit passage to other property used for recreational purposes or for use of an easement granted to the Commonwealth or any agency thereof or any not-for-profit organization granted tax-exempt status under § 501(c)(3) of the Internal Revenue Code to permit public passage across such land for access to a public park, historic site, or other public recreational area. No landowner shall be required to give any warning of hazardous conditions or uses of, structures on, or activities on such land or

premises to any person entering on the land or premises for such purposes, except as provided in subsection D. The provisions of this subsection apply without regard to whether the landowner has given permission to a person to use their land for recreational purposes.” Additional language, exemptions, and requirements are found in the full text of this law located on-line at <http://leg1.state.va.us/lis.htm> and in this Appendix.

### **State of Virginia Tort Claims Act**

Virginia’s Tort Claims Act defines the scope of governmental liability and limits liability for local and State governments. Because the Tort Claims Act limits the liability and caps the dollar amounts awarded in cases of negligence, the Act offers a degree of protection to municipalities such as towns or cities who choose to build trails. Additional language, exemptions, and requirements are found in the full text of this law located on-line at <http://leg1.state.va.us/lis.htm> and in this Appendix.

### **Recreation Laws**

#### **Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. §§ 528-531, June 12, 1960)**

This Act declares that the purposes of the national forest include outdoor recreation, range, timber, watershed, and fish and wildlife. The Act directs the Secretary of the Agriculture to administer national forest renewable surface resources for multiple use and sustained yield. This Act forms the basis for recreational activity within national forests including motorized and non-motorized trails.

#### **The Sikes Act (16 U.S.C. §§ 670a-670o, September 15, 1960 as amended 1968, 1974, 1978, 1982, 1988, and 1989)**

This Act authorizes the Secretary of Defense to develop cooperative plans for conservation and rehabilitation programs on military reservations and to establish outdoor recreation facilities. It provides for the Secretaries of Agriculture and the Interior to develop cooperative plans for the conservation, restoration, and management of species and their habitats in cooperation with State wildlife agencies on public lands under their jurisdiction.

#### **The Land and Water Conservation Fund Act of 1965 (16 U.S.C. §§ 460I-4 through 460I-11, September 3, 1964 as amended 1965, 1968, 1970, 1972-1974, 1976-1981, 1983, 1986, 1987, 1990, 1991, 1993-1996)**

This Act was established in order to assist with preserving, developing, and assuring access to outdoor recreation resources and to strengthen the health and vitality of U.S. citizens by providing funds and authorizing federal assistance to states in planning, acquiring, and developing land and water areas and facilities and by providing funds for federal acquisition and development of lands and other areas. This Act regulates admission and special recreation user fees at certain recreational areas and established a fund to subsidize state and federal



acquisition of lands and waters for recreational and conservation purposes. More information about the program—including grant programs—is available at <http://www.nps.gov/lwcf/>

**The National Trails System Act (16 U.S.C. §§ 1241-1251, October 2, 1968 as amended 1976, 1978-1980, 1983, 1984, 1986-1988, 1990, 1992, 1993, and 1996)**

This Act created a national system of trails that continues to provide for the outdoor recreation needs of the United States' expanding population as well as promote the preservation of and access to outdoor areas and historic resources. The system consists of national recreation trails, national scenic trails, national historic trails, and connecting or side trails. The Act designates 19 national scenic trails and national historic trails.

**The National Parks and Recreation Act of 1978 (16 U.S.C. 1242-1243)**

Established a number of national historic trails which cross public lands.

**Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005 (SAFETEA-LU)(23 U.S.C. §§ 206)**

This Act provides flexible funding from the Federal Highway Administration that may be used by States and localities for projects on any Federal-aid highway, including the national highway system, bridge projects on any public road, transit capital projects, and intra-city and intercity bus terminals and facilities. It builds on the 1998 Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21). The most relevant concept is that SAFETEA-LU provides matching funds for trails and paths that connect to or support transportation-related elements such as sidewalks, bike lanes, historic railroad depots, and transportation museums. The Act also allocates funds for the Recreational Trails Program which develops and maintains trails for recreational purposes that include pedestrian, equestrian, bicycling and non-motorized snow activities as well as off-road motorized vehicle activities.

**Natural Resources Laws**

**Virginia Soil and Water Conservation (Code of Virginia Title 10.1 Conservation, Chapter 5 Soil and Water Conservation)**

This section of the code includes requirements for erosion and sediment control programs, plans, and practices. It serves as the basis for enforcing the controls outlined in the Virginia Erosion and Sediment Control Handbook and reviewed by local and State erosion and sediment control programs.

**Fish and Wildlife Act of 1956 (16 U.S.C. §§ 742a-754j-2, August 8, 1956 as amended 1961, 1962, 1964, 1965, 1970-1972, 1974-1976, 1978, 1980, 1982-1984, and 1986)**

This Act directs the Secretary of the Interior to develop policies and procedures necessary for carrying out fish and wildlife laws and to research and report on

fish and wildlife matters. The Act establishes the Fish and Wildlife Service within the Department of the Interior.

**National Environment Policy Act of 1969 (NEPA)(42 U.S.C. §§ 4321-4347, January 1, 1970 as amended 1975 and 1994)**

This Act declares it a national policy to encourage productive and enjoyable harmony between man and the environment and promote efforts to better understand and prevent damage to ecological systems and natural resources important to the nation. The Act requires systematic, interdisciplinary planning to ensure the integrate se of natural and social sciences and the environmental design arts in making decisions about major Federal actions. Agencies are required to prepare a detailed environmental impact statement for any major federal action significantly affecting the environment. The Act also establishes the Council on Environmental Quality to review government policies and programs for conformity with the Act. NEPA provides the basis for reviews required by the Army Corps of Engineers, Virginia Department of Environmental Quality, Virginia Department of Game and Inland Fisheries, and other state and federal environmental agencies. The full text of the law is available at:

<http://frwebgate3.access.gpo.gov/cgi-bin/TEXTgate.cgi?WAISdocID=F67Ou2/1/1/0&WALSaction=retrieve>

**The Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544, December 28, 1973 as amended 1976-1982, 1984, and 1988**

This Act provides broad protection for species of fish, wildlife, and plants that are in danger of, or threatened with, extinction or listed as rare, threatened, or endangered. The Act provides a means of conserving the ecosystems upon which rare, threatened, and endangered species depend. Provisions are made for listing species as well as for recovery plans and the designation of critical habitat for listed species. The Act outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions.

**Executive Order 11990 Protection of Wetlands (May 25, 1977; 42 F.R. 26961)**

Directs that wetland and riparian habitats on public lands be identified, protected, enhanced, and managed.

**Historic Preservation and Cultural Resource Laws**

**The Historic Sites Act (16 U.S.C. 461)**

Declares national policy to identify and preserve historic sites, buildings, objects, and antiquities of national significance thereby providing the foundation for the National Register of Historic Places.

**The National Historic Preservation Act of 1966 (as amended, 16 U.S.C. 470)**

This Act expands protection of pre-historic, historic, and archaeological properties to include those of national, state, and local significance. Section 106

of this Act directs federal agencies to consider the effects of proposed actions on properties eligible for or included in the National Register of Historic Places. This Act serves as the basis for review of trails and paths that are built on public lands and/or use public funding, including reviews by Virginia's Department of Historic Resources (DHR). The full text of the Act is available at:

<http://frwebgate1.access.gpo.gov/cgi-bin/TEXTgate.cgi?WAISdocID=02Qhyi/0/1/0&WAIAction=retrieve>

**The Archaeological Resources Protection Act of 1979 as amended (16 U.S.C. 470a, 470cc, and 470 ee)**

Requires permits for the excavation or removal of Federally-administered archaeological resources; encourages increased cooperation among Federal agencies and private individuals; provides stringent criminal and civil penalties for violations; and requires Federal agencies to identify important resources vulnerable to looting and to develop a tracking system for violations.

**The Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)**

This Act requires public agencies to inventory archaeological and ethnological collections in their possession or control (including sites and museums) for human remains, associated funerary objects, sacred objects, and objects of cultural patrimony; to identify these items geographically and culturally; and to notify appropriate tribes within 5 years.

**Universal Accessibility Laws**

**Architectural Barriers Act of 1968 (42 U.S.C. §§ 4151 as amended through 1984)**

This Act ensures that certain buildings financed with federal funds are designed, constructed, renovated, or restored to be accessible and usable by persons with physical disabilities.

**Americans with Disabilities Act of 1990**

This Act extends to the private sector the rights and protections already prohibiting discrimination based on disabilities.

**Formation of Federal Agencies**

**Forest Service Organic Administration Act of 1897 (16 U.S.C. §§ 473-478, 479-482, and 551; June 4, 1897, as amended 1905, 1911, 1925, 1962, 1964, 1968, and 1976)**

This act is the original organic act governing the administration of national forest lands and establishing National Forests. Today, it is one of several federal laws under which the U.S. Forest Service operates; the primary ones being the Multiple-Use Sustained-Yield Act of 1960 (MUSYA) and the National Forest

Management Act of 1976 (NFMA). While the original Act remains significant, it must be read in conjunction with the later acts, which expand the purpose and uses of the national forests.

**National Park Service Act (16 U.S.C. §§ 1-18f-1m August 25, 1961 as amended 1920-1996)**

This act created the National Park Service within the Department of the Interior and established the NPS as the agency in charge of national parks, monuments, and reservations.

**Reorganization Plan No. 3 of 1946 (§§ 403, July 16, 1946)**

Established the Bureau of Land Management (BLM) by joining the General Land Office and Grazing Service agencies through a governmental reorganization.

**The Wilderness Act of 1964 (16 U.S.C. §§ 1131-1136, September 3, 1964 as amended 1978)**

This Act established the National Wilderness Preservation System (NWPS). The Secretary of the Interior was directed to review every roadless area of 5,000 acres or more and every roadless island within the national wildlife refuge and national park systems for possible inclusion in the NWPS. The Act also included some national forest lands in the NWPS and directed the Secretary of Agriculture to recommend others.

**Acquisition Laws**

**43 U.S.C. 1715**

Provides the Secretary of the Interior authorization to acquire, by purchase, exchange, donation, or eminent domain (for access to public lands only), land and interests in lands. Applies primarily to federally-owned and federally-funded lands and projects under the jurisdiction of the Department of the Interior, including National Park Service and Bureau of Land Management lands.

## **Duty of Care (Liability Law)**

**Found at Code of Virginia Title 29.1 - GAME, INLAND FISHERIES AND BOATING**

### **§29.1-509**

§ 29.1-509. Duty of care and liability for damages of landowners to hunters, fishermen, sightseers, etc.

A. For the purpose of this section:

"Fee" means any payment or payments of money to a landowner for use of the premises or in order to engage in any activity described in subsections B and C, but does not include license fees, insurance fees, handling fees, transaction fees, administrative fees, rentals or similar fees received by a landowner from governmental, not-for-profit, or private sources, or payments received by a landowner for rights of ingress and egress or from incidental sales of forest products to an individual for his personal use, or any action taken by another to improve the land or access to the land for the purposes set forth in subsections B and C or remedying damage caused by such uses.

"Land" or "premises" means real property or right-of-way, whether rural or urban, waters, boats, private ways, natural growth, trees, railroad property, railroad right-of-way, utility corridor, and any building or structure which might be located on such real property, waters, boats, private ways and natural growth.

"Landowner" means the legal title holder, any easement holder, lessee, occupant or any other person in control of land or premises, including railroad rights-of-way.

"Low-head dam" means a dam that is built across a river or stream for the purpose of impounding water where the impoundment, at normal flow levels, is completely within the banks, and all flow passes directly over the entire dam structure within the banks, excluding abutments, to a natural channel downstream.

B. A landowner shall owe no duty of care to keep land or premises safe for entry or use by others for hunting, fishing, trapping, camping, participation in water sports, boating, hiking, rock climbing, sightseeing, hang gliding, skydiving, horseback riding, foxhunting, racing, bicycle riding or collecting, gathering, cutting or removing firewood, for any other recreational use, for ingress and egress over such premises to permit passage to other property used for recreational purposes or for use of an easement granted to the Commonwealth or any agency thereof or any not-for-profit organization granted tax-exempt status under § 501(c)(3) of the Internal Revenue Code to permit public passage across such land for access to a public park, historic site, or other public recreational area. No landowner shall be required to give any warning of hazardous conditions or uses

of, structures on, or activities on such land or premises to any person entering on the land or premises for such purposes, except as provided in subsection D. The provisions of this subsection apply without regard to whether the landowner has given permission to a person to use their land for recreational purposes.

C. Any landowner who gives permission, express or implied, to another person to hunt, fish, launch and retrieve boats, swim, ride, foxhunt, trap, camp, hike, bicycle, rock climb, hang glide, skydive, sightsee, engage in races, to collect, gather, cut or remove forest products upon land or premises for the personal use of such person, or for the use of an easement or license as set forth in subsection B does not thereby:

1. Impliedly or expressly represent that the premises are safe for such purposes; or
2. Constitute the person to whom such permission has been granted an invitee or licensee to whom a duty of care is owed; or
3. Assume responsibility for or incur liability for any intentional or negligent acts of such person or any other person, except as provided in subsection D.

D. Nothing contained in this section, except as provided in subsection E, shall limit the liability of a landowner which may otherwise arise or exist by reason of his gross negligence or willful or malicious failure to guard or warn against a dangerous condition, use, structure, or activity. The provisions of this section shall not limit the liability of a landowner which may otherwise arise or exist when the landowner receives a fee for use of the premises or to engage in any activity described in subsections B and C. Nothing contained in this section shall relieve any sponsor or operator of any sporting event or competition including but not limited to a race or triathlon of the duty to exercise ordinary care in such events. Nothing contained in this section shall limit the liability of an owner of a low-head dam who fails to implement safety measures described in subsection F.

E. For purposes of this section, whenever any person enters into an agreement with, or grants an easement or license to, the Commonwealth or any agency thereof, any locality, any not-for-profit organization granted tax-exempt status under § 501(c)(3) of the Internal Revenue Code, or any local or regional authority created by law for public park, historic site or recreational purposes, concerning the use of, or access over, his land by the public for any of the purposes enumerated in subsections B and C, the government, agency locality, not-for-profit organization, or authority with which the agreement is made shall indemnify and hold the landowner harmless from all liability and be responsible for providing, or for paying the cost of, all reasonable legal services required by any person entitled to the benefit of this section as the result of a claim or suit attempting to impose liability. Any action against the Commonwealth, or any agency thereof, for negligence arising out of a use of land or railroad rights-of-

way covered by this section shall be subject to the provisions of the Virginia Tort Claims Act (§ [8.01-195.1](#) et seq.). Any provisions in a lease or other agreement which purports to waive the benefits of this section shall be invalid, and any action against any county, city, town, or local or regional authority shall be subject to the provisions of § [15.2-1809](#), where applicable.

F. Any owner of a low-head dam may mark the areas above and below the dam and on the banks immediately adjacent to the dam with signs and buoys of a design and content, in accordance with the regulations of the Board, to warn the swimming, fishing, and boating public of the hazards posed by the dam. Any owner of a low-head dam who marks a low-head dam in accordance with this subsection shall be deemed to have met the duty of care for warning the public of the hazards posed by the dam. Any owner of a low-head dam who fails to mark a low-head dam in accordance with this subsection shall be presumed not to have met the duty of care for warning the public of the hazards posed by the dam.

(Code 1950, §§ 8-654.2, 29-130.2; 1962, c. 545; 1964, c. 435; 1977, c. 624; 1979, c. 276; 1980, c. 560; 1982, c. 29; 1983, c. 283; 1987, c. 488; 1988, c. 191; 1989, cc. 26, 500, 505; 1990, cc. 799, 808; 1991, c. 305; 1992, c. 285; 1994, c. [544](#); 2007, c. [664](#); 2010, c. [43](#).)

## **Virginia Tort Claims Act**

### **Found at Code of Virginia Title 8.01 – CIVIL REMEDIES AND PROCEDURE §8.01-195.1**

§ 8.01-195.2. Definitions.

As used in this article:

"Agency" means any department, institution, authority, instrumentality, board or other administrative agency of the government of the Commonwealth of Virginia and any transportation district created pursuant to Chapter 45 (§ [15.2-4500](#) et seq.) of Title 15.2 and Chapter 630 of the 1964 Acts of Assembly.

"Employee" means any officer, employee or agent of any agency, or any person acting on behalf of an agency in an official capacity, temporarily or permanently in the service of the Commonwealth, or any transportation district, whether with or without compensation.

"School boards" as defined in § [22.1-1](#) are not state agencies nor are employees of school boards state employees.

"Transportation district" shall be limited to any transportation district or districts which have entered into an agreement in which the Northern Virginia Transportation District is a party with any firm or corporation as an agent to provide passenger rail services for such district or districts while such firm or corporation is performing in accordance with such agreement.

(1981, c. 449; 1986, cc. 534, 584; 1991, c. 23.)

§ 8.01-195.3. Commonwealth, transportation district or locality liable for damages in certain cases.

Subject to the provisions of this article, the Commonwealth shall be liable for claims for money only accruing on or after July 1, 1982, and any transportation district shall be liable for claims for money only accruing on or after July 1, 1986, on account of damage to or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee while acting within the scope of his employment under circumstances where the Commonwealth or transportation district, if a private person, would be liable to the claimant for such damage, loss, injury or death. However, except to the extent that a transportation district contracts to do so pursuant to § [15.2-4518](#), neither the Commonwealth nor any transportation district shall be liable for interest prior to judgment or for punitive damages. The amount recoverable by any claimant shall not exceed (i) \$25,000 for causes of action accruing prior to July 1, 1988, \$75,000 for causes of action accruing on or after July 1, 1988, or \$100,000 for causes of action accruing on or after July 1, 1993, or (ii) the maximum limits of any liability policy



maintained to insure against such negligence or other tort, if such policy is in force at the time of the act or omission complained of, whichever is greater, exclusive of interest and costs.

Notwithstanding any provision hereof, the individual immunity of judges, the Attorney General, attorneys for the Commonwealth, and other public officers, their agents and employees from tort claims for damages is hereby preserved to the extent and degree that such persons presently are immunized. Any recovery based on the following claims are hereby excluded from the provisions of this article:

1. Any claim against the Commonwealth based upon an act or omission which occurred prior to July 1, 1982.

1a. Any claim against a transportation district based upon an act or omission which occurred prior to July 1, 1986.

2. Any claim based upon an act or omission of the General Assembly or district commission of any transportation district, or any member or staff thereof acting in his official capacity, or to the legislative function of any agency subject to the provisions of this article.

3. Any claim based upon an act or omission of any court of the Commonwealth, or any member thereof acting in his official capacity, or to the judicial functions of any agency subject to the provisions of this article.

4. Any claim based upon an act or omission of an officer, agent or employee of any agency of government in the execution of a lawful order of any court.

5. Any claim arising in connection with the assessment or collection of taxes.

6. Any claim arising out of the institution or prosecution of any judicial or administrative proceeding, even if without probable cause.

7. Any claim by an inmate of a state correctional facility, as defined in § [53.1-1](#), unless the claimant verifies under oath, by affidavit, that he has exhausted his remedies under the adult institutional inmate grievance procedures promulgated by the Department of Corrections. The time for filing the notice of tort claim shall be tolled during the pendency of the grievance procedure.

Nothing contained herein shall operate to reduce or limit the extent to which the Commonwealth or any transportation district, agency or employee was deemed liable for negligence as of July 1, 1982, nor shall any provision of this article be applicable to any county, city or town in the Commonwealth or be so construed as to remove or in any way diminish the sovereign immunity of any county, city or town in the Commonwealth.

(1981, c. 449; 1982, c. 397; 1986, c. 584; 1988, c. 884; 1989, c. 446; 1993, c. 481; 1998, cc. [203](#), [820](#); 2007, c. [250](#).)

§ 8.01-195.4. Jurisdiction of claims under this article; right to jury trial; service on Commonwealth or locality.

The general district courts shall have exclusive original jurisdiction to hear, determine, and render judgment on any claim against the Commonwealth or any transportation district cognizable under this article when the amount of the claim does not exceed \$4,500, exclusive of interest and any attorneys' fees. Jurisdiction shall be concurrent with the circuit courts when the amount of the claim exceeds \$4,500 but does not exceed \$15,000, exclusive of interest and such attorneys' fees. Jurisdiction of claims when the amount exceeds \$15,000 shall be limited to the circuit courts of the Commonwealth. The parties to any such action in the circuit courts shall be entitled to a trial by jury.

In all actions against the Commonwealth commenced pursuant to this article, the Commonwealth shall be a proper party defendant, and service of process shall be made on the Attorney General. The notice of claim shall be filed pursuant to § [8.01-195.6](#) on the Director of the Division of Risk Management or the Attorney General. In all such actions against a transportation district, the district shall be a proper party and service of process and notices shall be made on the chairman of the commission of the transportation district.

(1981, c. 449; 1984, c. 698; 1986, c. 584; 1987, cc. 567, 674; 1989, cc. 121, 337; 1991, c. 23; 1992, cc. 111, 796; 2002, c. [645](#); 2005, c. [144](#).)

§ 8.01-195.5. Settlement of certain cases.

The Attorney General shall have authority in accordance with § [2.2-514](#) to compromise and settle claims against the Commonwealth cognizable under this article.

The chairman of the commission for a transportation district against which a claim was filed pursuant to this article, or such other person as may be designated by the commission, shall have the authority to compromise, settle and discharge the claim provided (i) the proposed settlement and reasons therefor are submitted to the commission in writing and approved by its members or (ii) the settlement is made in accordance with a written policy approved by the transportation district commission for such settlements. The Director of the Division of Risk Management may adjust, compromise and settle claims against the Commonwealth cognizable under this article prior to the commencement of suit unless otherwise directed by the Attorney General.

(1981, c. 449; 1986, c. 584; 1991, c. 23; 1992, c. 796.)

§ 8.01-195.6. Notice of claim.

A. Every claim cognizable against the Commonwealth or a transportation district shall be forever barred unless the claimant or his agent, attorney or representative has filed a written statement of the nature of the claim, which includes the time and place at which the injury is alleged to have occurred and the agency or agencies alleged to be liable, within one year after such cause of action accrued. However, if the claimant was under a disability at the time the cause of action accrued, the tolling provisions of § [8.01-229](#) shall apply.

B. If the claim is against the Commonwealth, the statement shall be filed with the Director of the Division of Risk Management or the Attorney General. If the claim is against a transportation district the statement shall be filed with the chairman of the commission of the transportation district.

C. The notice is deemed filed when it is received in the office of the official to whom the notice is directed. The notice may be delivered by hand, by any form of United States mail service (including regular, certified, registered or overnight mail), or by commercial delivery service.

D. In any action contesting the filing of the notice of claim, the burden of proof shall be on the claimant to establish receipt of the notice in conformity with this section. A signed United States mail return receipt indicating the date of delivery, or any other form of signed and dated acknowledgment of delivery given by authorized personnel in the office of the official with whom the statement is filed, shall be prima facie evidence of filing of the notice under this section.

E. Claims against the Commonwealth involving medical malpractice shall be subject to the provisions of this article and to the provisions of Chapter 21.1 (§ [8.01-581.1](#) et seq.) of this title. However, the recovery in such a claim involving medical malpractice shall not exceed the limits imposed by § [8.01-195.3](#).

(1981, c. 449; 1984, cc. 638, 698; 1986, c. 584; 1991, c. 23; 1992, c. 796; 2002, c. [207](#); 2007, c. [368](#).)

§ 8.01-195.7. Statute of limitations.

Every claim cognizable against the Commonwealth or a transportation district under this article shall be forever barred, unless within one year after the cause of action accrues to the claimant the notice of claim required by § [8.01-195.6](#) is properly filed. An action may be commenced pursuant to § [8.01-195.4](#) (i) upon denial of the claim by the Attorney General or the Director of the Division of Risk Management or, in the case of a transportation district, by the chairman of the commission of that district or (ii) after the expiration of six months from the date of filing the notice of claim unless, within that period, the claim has been compromised and discharged pursuant to § [8.01-195.5](#). All claims against the

Commonwealth or a transportation district under this article shall be forever barred unless such action is commenced within eighteen months of the filing of the notice of claim.

The limitations periods prescribed by this section and § [8.01-195.6](#) shall be subject to the tolling provision of § [8.01-229](#) and the pleading provision of § [8.01-235](#). Additionally, claims involving medical malpractice in which the notice required by this section and § [8.01-195.6](#) has been given shall be subject to the provisions of § [8.01-581.9](#). Notwithstanding the provisions of this section, if notice of claim against the Commonwealth was filed prior to July 1, 1984, any claimant so filing shall have two years from the date such notice was filed within which to commence an action pursuant to § [8.01-195.4](#).

(1981, c. 449; 1984, cc. 638, 698; 1985, c. 514; 1986, c. 584; 1988, cc. 778, 801; 1992, c. 796.)

#### § 8.01-195.8. Release of further claims.

Notwithstanding any provision of this article, the liability for any claim or judgment cognizable under this article shall be conditioned upon the execution by the claimant of a release of all claims against the Commonwealth, its political subdivisions, agencies, and instrumentalities or against the transportation district, and against any officer or employee of the Commonwealth or the transportation district in connection with, or arising out of, the occurrence complained of.

(1981, c. 449; 1986, c. 584; 1991, c. 23.)

#### § 8.01-195.9. Claims evaluation program.

The Division of Risk Management of the Department of the Treasury and the Attorney General shall develop cooperatively an actuarially sound program for identifying, evaluating and setting reserves for the payment of claims cognizable under this article.

(1988, c. 644; 2000, cc. [618](#), [632](#).)

# Appendix 4-F · Construction Personnel Decision Matrix



My Trail Project:	Volunteer	Contractor	Agency Staff
<i>Is simple and straight-forward</i>	●		●
<i>Has complex components</i>		●	●
<i>Has numerous experienced volunteers</i>	●		
<i>Has few volunteers that are familiar with construction</i>		●	●
<i>Has volunteers that live within 30 minutes</i>	●		
<i>Needs to be completed at one time</i>		●	●
<i>Can be built over a long period</i>	●		
<i>Is paved</i>		●	●
<i>Has a natural surface</i>	●		●
<i>Is well-funded</i>		●	
<i>Has limited funds</i>	●		●
<i>Is near sensitive environments</i>		●	●
<i>Will cause minimal impact to adjacent lands</i>	●		●

### **“Determining Who Builds Your Trail” Decision Matrix**

- **Volunteers:** skilled or unskilled people whose trail-building experience varies widely and may be available only in limited numbers or at limited times
- **Contractor:** paid, professional contractor with access to heavy equipment, bonding and insurance capabilities, and set completion schedule
- **Agency Staff:** staff employed by municipalities or non-profits for the express purpose of constructing and maintaining recreation facilities including trails and paths.





# Appendix 4-G · Permitting Agency Contacts



## **Permitting & Review Agencies**

### **Federal and State Agencies Potentially Involved With Permitting, Review, and Approvals for Trails and Paths**

#### **U.S. Army Corps of Engineers (USACE)**

Norfolk District  
803 Front Street  
Norfolk, VA 23510  
Wetlands/Permitting(757) 201-7652  
<http://www.nao.usace.army.mil/>

#### **Virginia Department of Conservation and Recreation (DCR)**

*Main Office Location*  
Department of Conservation and Recreation  
203 Governor Street | Richmond, VA 23219-2094  
(804) 786-1712  
<http://www.dcr.virginia.gov/aboutus.shtml>

*Erosion and Sediment Control Program*  
(804) 371-7440  
[http://www.dcr.virginia.gov/soil\\_and\\_water/e\\_and\\_s.shtml](http://www.dcr.virginia.gov/soil_and_water/e_and_s.shtml)

*Stormwater Management Programs*  
(804) 786-3998  
[http://www.dcr.virginia.gov/soil\\_and\\_water/stormwat.shtml](http://www.dcr.virginia.gov/soil_and_water/stormwat.shtml)

*Planning & Recreational Resources: Environmental Review*  
(804) 371.2594  
[http://www.dcr.virginia.gov/recreational\\_planning/index.shtml](http://www.dcr.virginia.gov/recreational_planning/index.shtml)

*Natural Heritage Division: Project Review & Information Requests*  
(804) 371-2708  
[http://www.dcr.virginia.gov/natural\\_heritage/ereview.shtml](http://www.dcr.virginia.gov/natural_heritage/ereview.shtml)

#### **Virginia Department of Environmental Quality (DEQ)**

*DEQ Central Office*  
629 East Main Street  
Richmond, VA 23218  
(804) 698-4000  
(800) 592-5482 (toll free in Virginia)  
<http://www.deq.state.va.us/about/contact.html>

*Water Permits and Compliance*  
(804) 698-4285

*Wetlands and Water Protection*  
(804) 698-4105

**Virginia Department of Game and Inland Fisheries (DGIF)**

*Richmond Headquarters*  
4010 West Broad Street  
P.O. Box 11104  
Richmond, Virginia 23230  
Phone/VTDD: (804) 367-1000  
Fax: (804) 367-9147  
<http://www.dgif.virginia.gov/contact/>

**Virginia Department of Historic Resources (DHR)**

*Richmond Headquarters*  
2801 Kensington Avenue  
Richmond, VA 23221  
Phone: (804) 367-2323  
[http://www.dhr.virginia.gov/homepage\\_features/staff2.html](http://www.dhr.virginia.gov/homepage_features/staff2.html)

*Environmental Review and Compliance*  
<http://www.dhr.virginia.gov/review/orcStaff.html>

**Virginia Department of Transportation (VDOT)**

*Richmond Central Office*  
Virginia Department of Transportation  
1401 E. Broad St.  
Richmond, VA 23219

*District Offices and Local Residencies*  
<http://www.virginiadot.org/about/districts.asp>

*Local Assistance Division*  
<http://www.virginiadot.org/business/local-assistance.asp>

[http://www.virginiadot.org/business/resources/local\\_assistance/LADstaffasof02-28-11.pdf](http://www.virginiadot.org/business/resources/local_assistance/LADstaffasof02-28-11.pdf)

*Enhancement/Scenic Byway Programs (TEA-funded Trails and Paths)\**

804-786-2734

- Manages Enhancement Program and Coordination for the Enhancement Program in the Culpeper, Staunton, and NOVA Districts

804-786-9125

- Manages Virginia Byways Program, National Scenic Byways Program, and Coordination for Enhancement Program in the Bristol, Richmond, and Salem Districts

804-786-7399

- Manages ARC, Public Lands and Forest Highway Programs and Coordination for the Enhancement Program in Lynchburg, Hampton Roads, and Fredericksburg Districts

\*You will be assigned a local residency or district contact upon grant award. This person will become your day-to-day contact within VDOT.

**Virginia Marine Resources Commission (VMRC)**

*Virginia Marine Resources Commission Main Office*  
2600 Washington Avenue, 3rd Floor  
Newport News, VA 23607  
Main Agency Telephone: (757) 247-2200  
VTDD: (757) 247-2292

All staff directory: <http://www.mrc.state.va.us/staffdirectory.shtm>  
*Habitat Management Division (Wetlands and Permitting)*  
Phone: (757) 247-2252

Visit the following link for contacts in your specific area:  
[http://www.mrc.state.va.us/territory\\_assignments.shtm](http://www.mrc.state.va.us/territory_assignments.shtm)



# Appendix 4-H · Sample Invitation to Bid





## Sample Invitation to Bid

Below is a sample "Invitation to Bid" which should be sent to local, regional, and State media outlets to make potential contractors aware that the project is open for bid. Media outlets include newspapers and town, city, or county websites. If you are a public agency or municipality within the State of Virginia, you may be able to post your Invitation to Bid on the State's procurement website called "eVA." You can access eVA at <http://www.eva.virginia.gov/>.

The Invitation to Bid should run in the media for at least two weeks in order to get the best responses. Some public funding sources and localities, however, have specified time limits for advertising the project. For example, TEA-funded projects that require VDOT oversight require that the Invitation to Bid be advertised for a minimum of 21 days (3 weeks). If you are using public money to build your trail or path, check with your funding source and/or locality regarding procurement requirements.

### Notice of Invitation To Bid

Greenway County invites sealed bids for the construction of Toolbox Trail Phase 1. Contractor shall furnish all labor and materials to construct approximately ½ mile of recreation trail. Work shall include, but is not limited to: installation of trail base and surfacing, site furnishings, signage, grading, drainage, erosion and sediment control, and seeding. This is a Federally-funded transportation enhancement grant project with DBE requirements. Plans are available Monday, January 31, 2011 at the Greenway County Offices, 1234 Bike Lane Ave., Anywhere, VA 22222 and Valley Construction News, 904-C South High St., Harrisonburg, VA 22801. Bids are due on Friday, February 25, 2011 no later than 3:00 pm in the Greenway County Offices. A non-mandatory pre-bid meeting will be held on Friday, February 11, 2011 at 10:00 am at the project site. For more information, contact Mattock Pulaski with Greenway County at (540) 567-8901.



# Appendix 4-I · In-Field Soil Tests



<b>• No Ball</b>	
If it is not possible to make a ball or it crumbles easily it will drain well, but will probably not support steeper grades.	<ul style="list-style-type: none"> <li>• Soil has low cohesion but best drainage</li> <li>• Reduce average grades by 3%</li> <li>• Reduce maximum running grades by 5%</li> <li>• Sideslopes should be at least 10% in grade to maintain drainage</li> </ul>
<b>• Ball</b>	
Soil that makes a ball but will not form a pliable ribbon has a higher clay content and will not drain as well, but will hold steeper grades. These soils have limited use during wet seasons or after storm events.	<ul style="list-style-type: none"> <li>• Good cohesion and good drainage</li> <li>• Average grades can be up to 7% and running grades can be up to 15%</li> <li>• Sideslopes should be at least 20% or greater in grade to maintain drainage</li> </ul>
<b>• Ribbon</b>	
Soil that can be formed into a 1" to 2" long ribbon with thumb and forefinger has an even higher clay content and will support steeper grades with higher shear forces, but doesn't drain well or support wet weather use as well.	<ul style="list-style-type: none"> <li>• Excellent cohesion but poor drainage</li> <li>• Increase average grades by 3% and maximum running grades by 5%</li> <li>• Armor low spots and enhance drainage features</li> </ul>

### IMBA's Quick Soil Test

*Grab a handful of soil from your proposed trail route and try to make it into a ball. Refer to the guidance above for how the soil does, or does not, form a ball.*

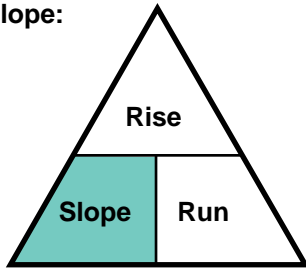


# Appendix 4-J · Slope Equations

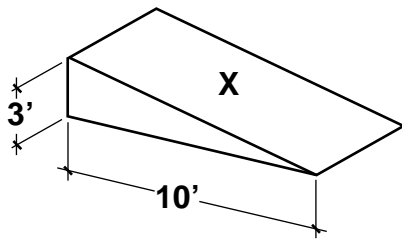




Find Slope:



$$\text{Rise} / \text{Run} = \text{Slope}$$

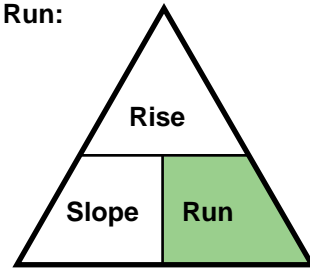


$$X = 3' / 10'$$

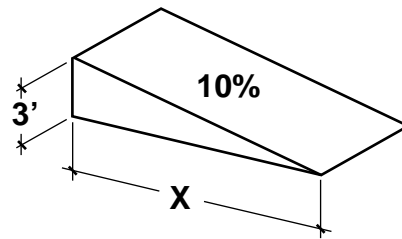
$$X = .30 * 100$$

$$X = 30\% \text{ Slope}$$

Find Run:



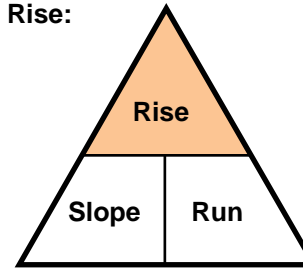
$$\text{Rise} / \text{Slope} = \text{Run}$$



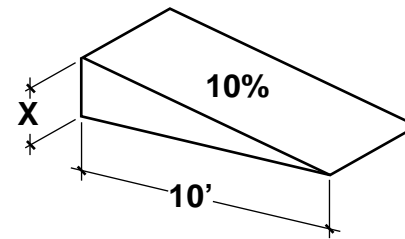
$$X = 3' / 0.10\%$$

$$X = 30' \text{ Run}$$

Find Rise:

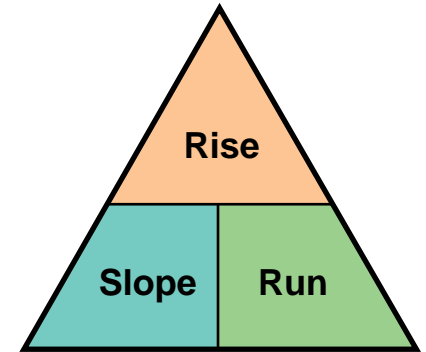


$$\text{Slope} * \text{Run} = \text{Rise}$$



$$X = .10\% * 10'$$

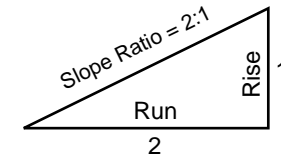
$$X = 1' \text{ Rise}$$



### Examples of the Slope Equation

Use the triangle diagram to determine which variable you are looking for and then which order to multiply or divide the variables.

When working with inches, convert to feet before using the equation by dividing the number of inches by 12



Ratio	Percent
1:1	100%
2:1	50%
3:1	33%
8:1	12.5%
10:1	10%
12:1	8.33%
50:1	2%

**Slope Ratios & Percentages**

## Understanding Slopes and Grades



# Appendix 4-K · Trail Type Decision Matrix



TRAIL TYPE	Hiking	Mountain Bike	Equestrian - Unpaved	Blueway/Water	Paved Path - Aggregate	Paved Path - Asphalt & Concrete	Bike Lane	Rail-with-Trail	Beach	Motorized
	<b>TRAIL FACTORS</b>									
Cost To Construct	Low	Low	Moderate	Low	High	High	Moderate	High	Low	Moderate
Construction Intensity <sup>1</sup>	Low	Low	Low	Low	High	High	High	Varies	Low	Moderate
Potential to Harm Environment <sup>2</sup>	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Low	Low	Moderate
Potential for Agency Reviews <sup>3</sup>	Low	Low	Low	Moderate	High	High	High	High	Moderate	Moderate
Potential for Shared-Use Activity <sup>4</sup>	High	High	High	Low	High	High	High	High	High	Moderate
<b>POTENTIAL INTENDED USERS<sup>5</sup></b>										
Walkers and Joggers	X				X	X		X	X	
Backcountry Hikers & Trail Runners	X							X	X	
Mountain Bikers		X								
Road/Path Bicyclists					X	X	X	X		
Equestrians			X		X			X	X	
Snowmobilers										X
Off-Highway Vehicles										X
Kayakers and Canoers				X						
Cross-country Skiers	X		X		X	X		X	X	X

1. Based on level of intrusion upon existing site and amount of construction required.
2. Based on potential for users to leave designated trails.
3. Based on potential need for site planning, VDOT, E&S, and other formal reviews
4. Based on potential for physical characteristics of trail to support multiple users regardless of conflicts.
5. Based on the primary type of intended trail user for each trail category; does not account for shared uses.



# Appendix 4-L · Trail Surface Decision Matrix





TRAIL FACTORS	TRAIL SURFACE	Asphalt	Chip and Seal	Concrete	Crushed Stone	Soil Cement	Resin-based Stabilized Material	Boardwalk	Natural Soil Surface	Mown Grass	Wood Chips	Stabilized Engineered Surface	Wood Sand
	Construction Intensity <sup>1</sup>		High	High	High	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	Low
Universal Accessibility		High	High	High	High	High	High	High	Varies	Varies	Low	High	Low
Cost To Purchase/Install		High	Moderate	High	Moderate	Moderate	High	High	Low	Low	Low	Moderate	Low
Cost To Maintain <sup>2</sup>		Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Low
Life Expectancy		High	High	High	Moderate	Moderate	Moderate	High	Low	Low	Low	Moderate	Low
Availability of Material <sup>3</sup>		High	High	High	High	Moderate	Moderate	High	High	High	High	Moderate	High
POTENTIAL INTENDED USERS <sup>4</sup>													
Walkers and Joggers		X	X	X	X	X	X	X	X	X	X	X	X
Backcountry Hikers & Trail Runners						X			X	X	X		
Mountain Bikers						X			X	X			
Road/Path Bicyclists		X	X	X	X		X	X					
Equestrians					X	X	X	X	X	X	X		X
Off-Highway Vehicles		X	X	X	X				X	X			X

1. Based on level of disturbance to surrounding areas required to install materials
2. Based on maintenance costs relative to other trail surfaces
3. Based on ease of acquiring and importing material to site from local or regional sources.
4. Based on the primary type of intended trail user for each trail category.



# Appendix 4-M · Typical Construction Details



**United States Forest Service Trail & Bridge Construction Details**  
**Typical Construction Details**  
**Located on-line at:**

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

<http://www.fs.fed.us/eng/bridges/>

The following sheets depict typical trail and bridge construction details commonly used by the U.S. Forest Service. These details are intended to provide a general idea of what type of materials and techniques may be required to construct your own trail and trail features. The details must be adapted for use on your particular site conditions, climate, budget, and skill level.

More details are located at the web addresses provided above where the details are available in both PDF and AutoCAD format.

The U.S. Forest Service disclaimer is provided below:

**U.S. Forest Service Disclaimer**

Information and files maintained on this Web site have been developed for the guidance of employees of the Forest Service, USDA, its contractors and its cooperating Federal and State agencies. The Department of Agriculture assumes no responsibility for the interpretation or use of the information by other than its own employees. The use of trade, firm, or corporate names is for the information and convenience of the viewer. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval of any product or service to the exclusion of others that may be suitable.

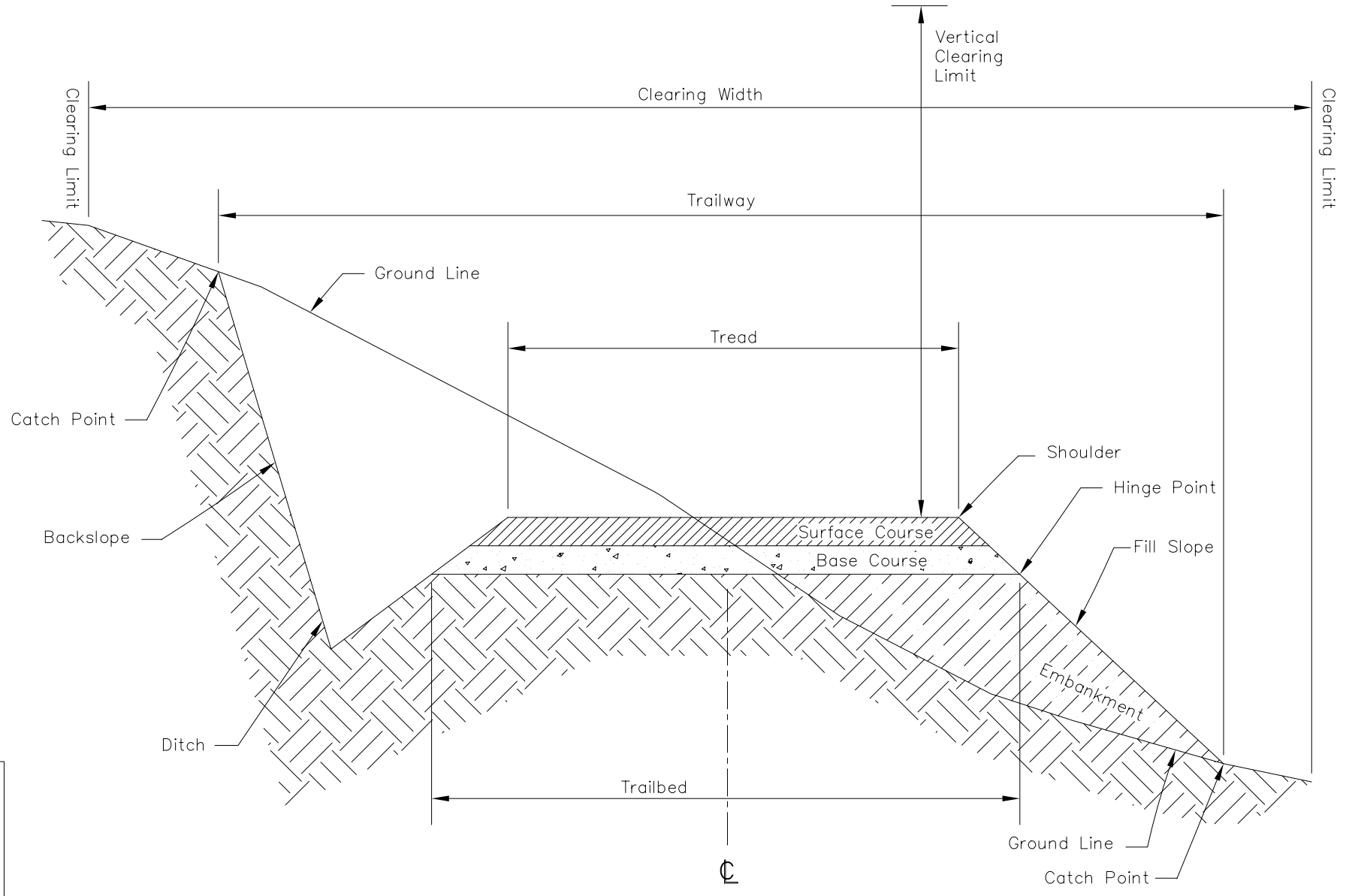
Also:

These drawings are public property and are not for sale. They are made available for professional use by engineers qualified to adapt these drawings to local conditions. The user accepts full liability for their use. No other supporting data about these drawings is available. They are made available on an as-is basis. If you have comments or technical questions on these drawings a technical contact is listed at end of this document. These drawings are created in AutoCad Ver 13.



# ILLUSTRATION OF TRAIL STRUCTURE TERMS

NOT TO SCALE



SECTION





# CLEARING LIMITS

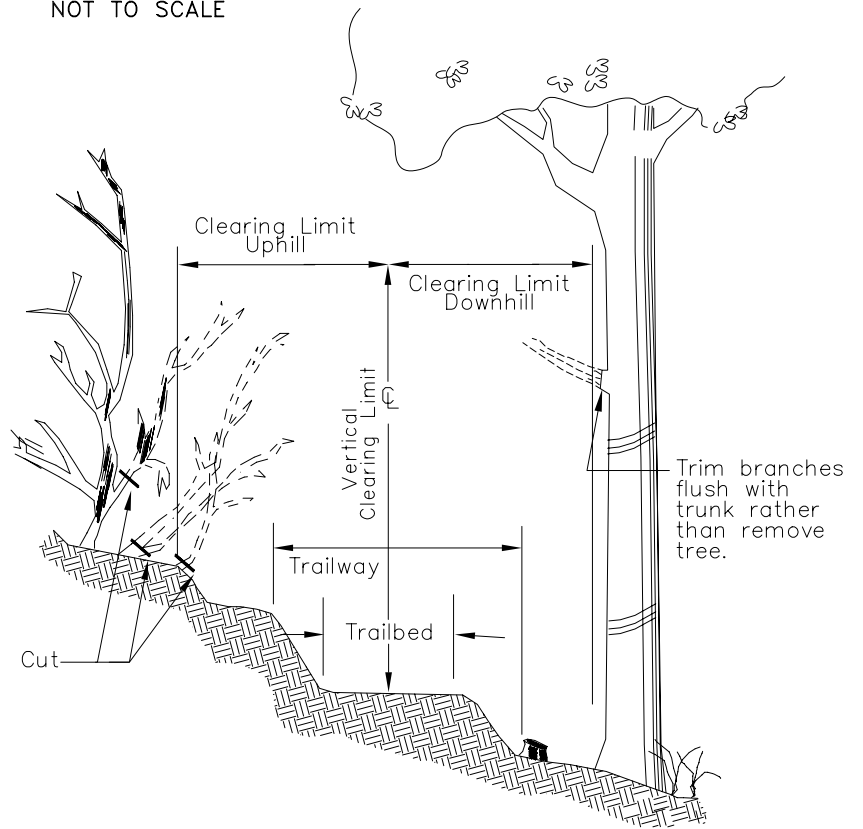
NOT TO SCALE

## Clearing Limits (mm)

Location	Uphill	Downhill	Height

Do not remove trees over \_\_\_ mm diameter if they are over \_\_\_ m from the centerline (both sides).

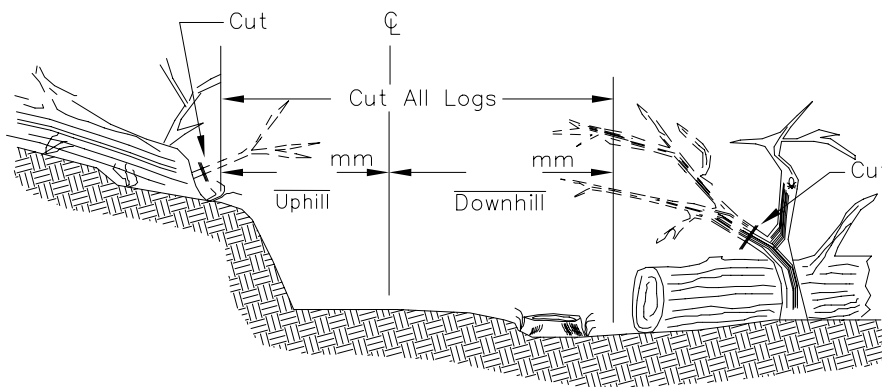
Remove all trees \_\_\_ mm or less in diameter if they are within \_\_\_ m of centerline (both sides).



## Stump Height Requirements\* (mm)

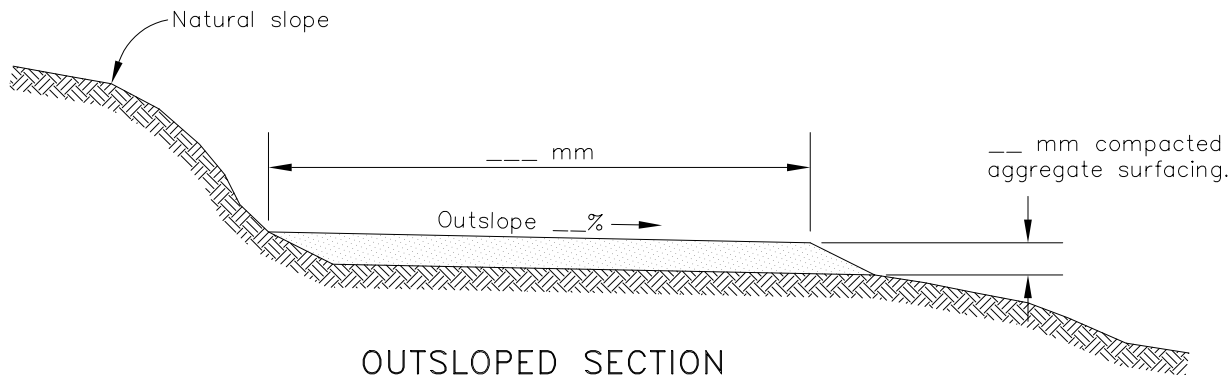
Stump Position	Side Slope	Uphill	Downhill
Stumps between the trailway and clearing limits.	Side slope less than or=to 10%		
	Side slope over 10%		
Stumps outside the clearing limits	Side slope less than or=to 10%		
	Side slope over 10%		

\*All heights measured on uphill side of stumps.

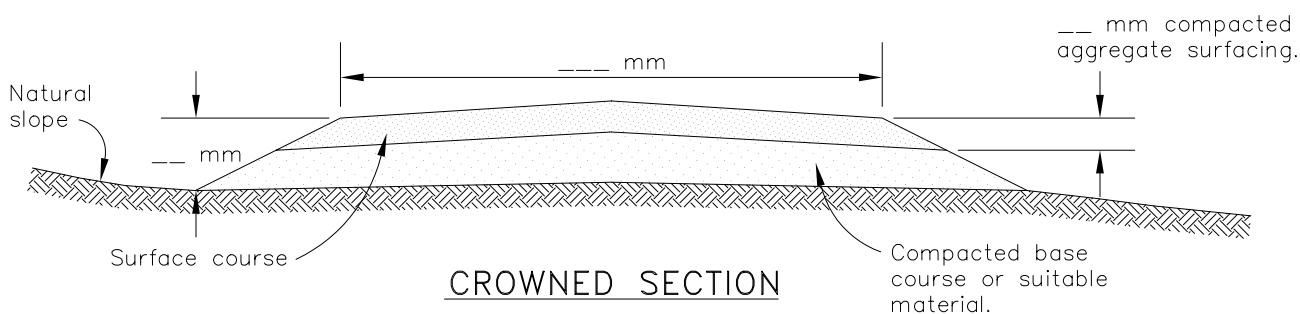


# AGGREGATE SURFACING

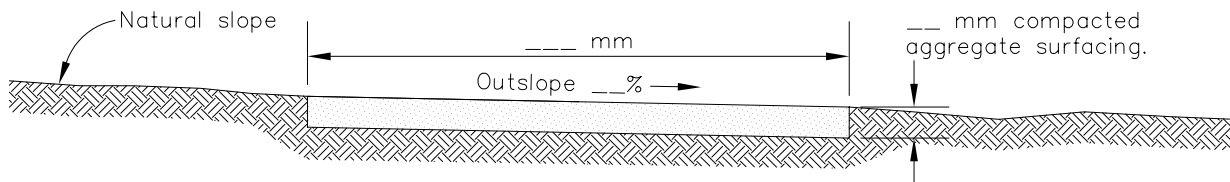
NOT TO SCALE



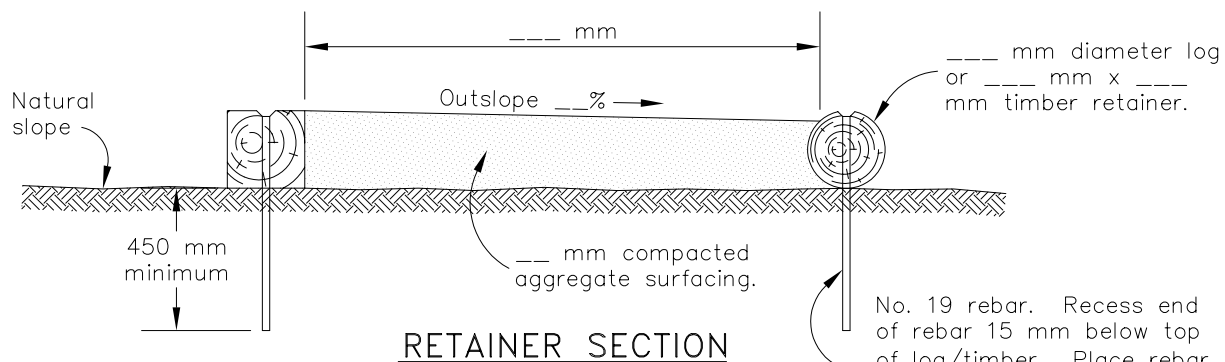
OUTSLOPED SECTION



CROWNED SECTION



EXCAVATED SECTION



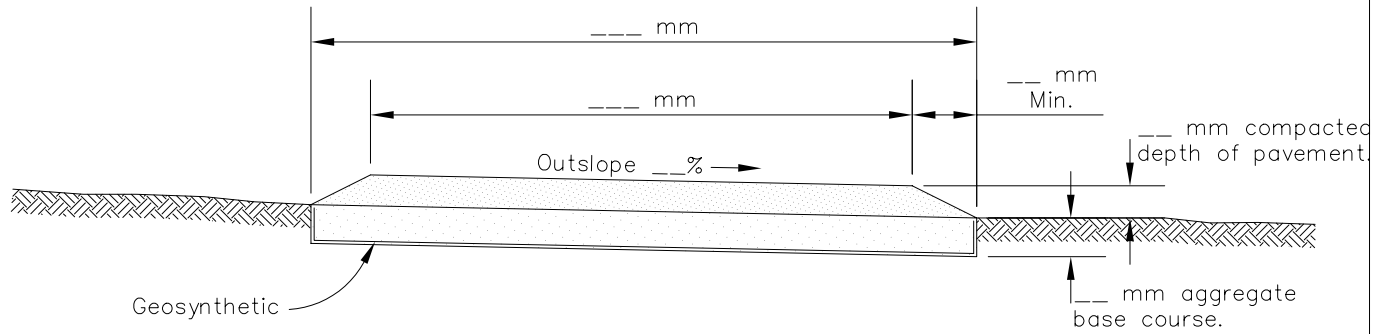
RETAINER SECTION

No. 19 rebar. Recess end of rebar 15 mm below top of log/timber. Place rebar 150 mm from each end of log/timber with maximum rebar spacing of 1 m.

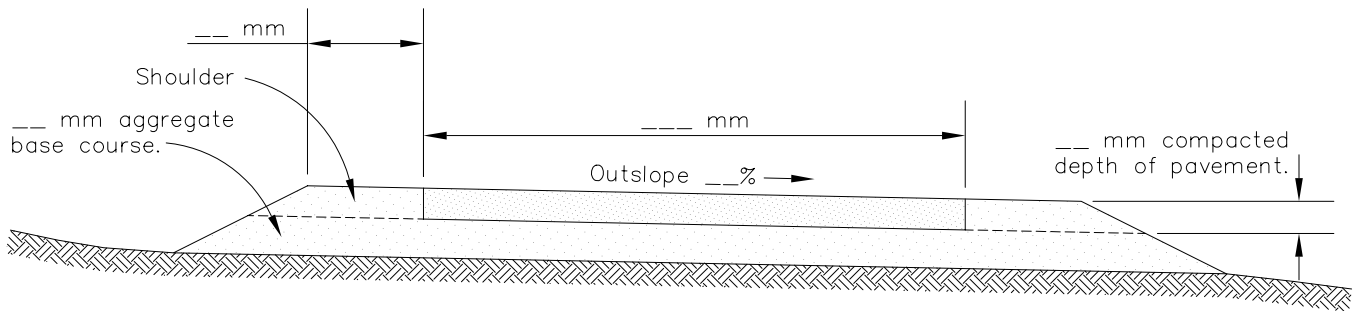
LOCATION	TREAD DEPTH (mm)	TREAD WIDTH (mm)	RETAINER MATERIAL	RETAINER SPECIES	SIZE (mm)	TYPE OF TREATMENT	MINIMUM RETENTION kg/m <sup>3</sup>

# BITUMINOUS SURFACING

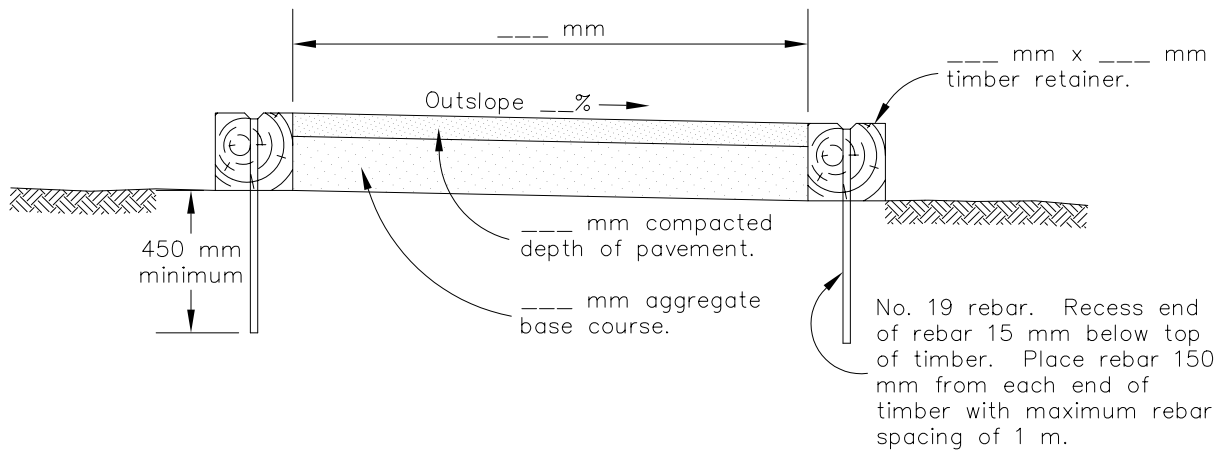
NOT TO SCALE



## BITUMINOUS SURFACING – NO SHOULDERS



## BITUMINOUS SURFACING WITH SHOULDERS



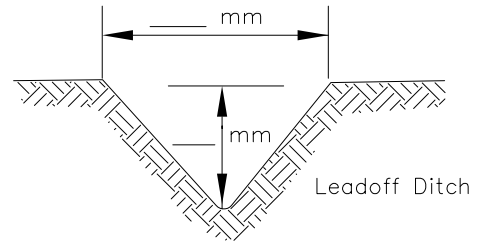
## BITUMINOUS SURFACING WITH RETAINERS

RETAINER NOTES:

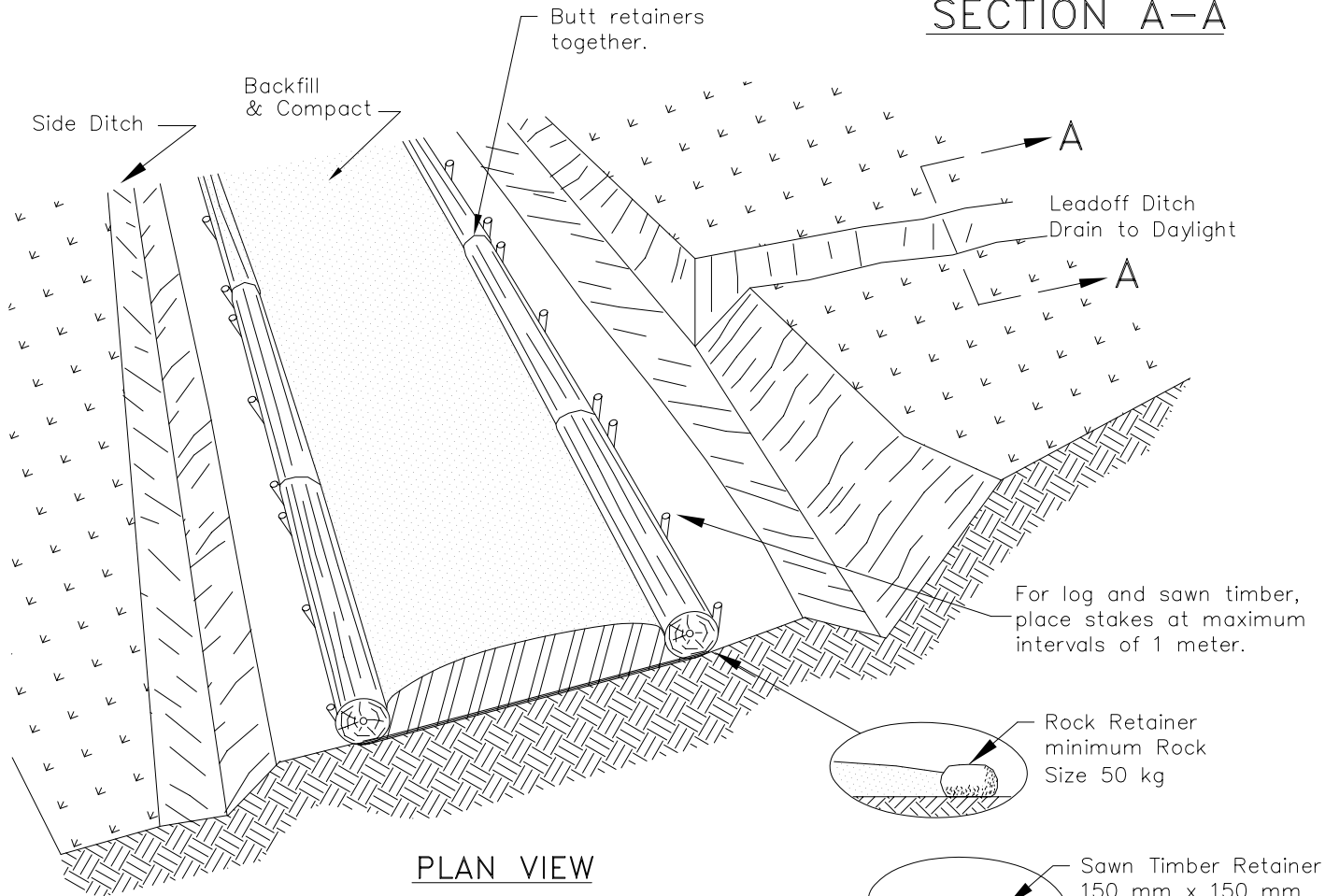
LOCATION	MATERIAL	SPECIES	SIZE (mm)	TYPE OF TREATMENT	MINIMUM RETENTION kg/m <sup>3</sup>

# TURNPIKE -TYPE I

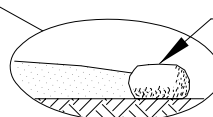
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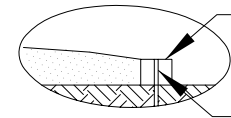
**SECTION A-A**



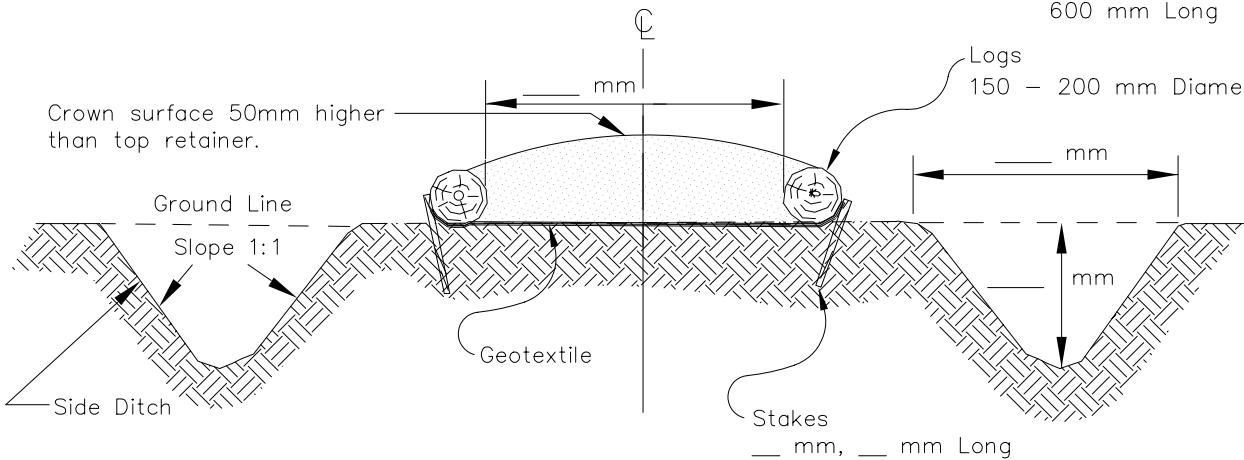
**PLAN VIEW**



Rock Retainer  
minimum Rock  
Size 50 kg



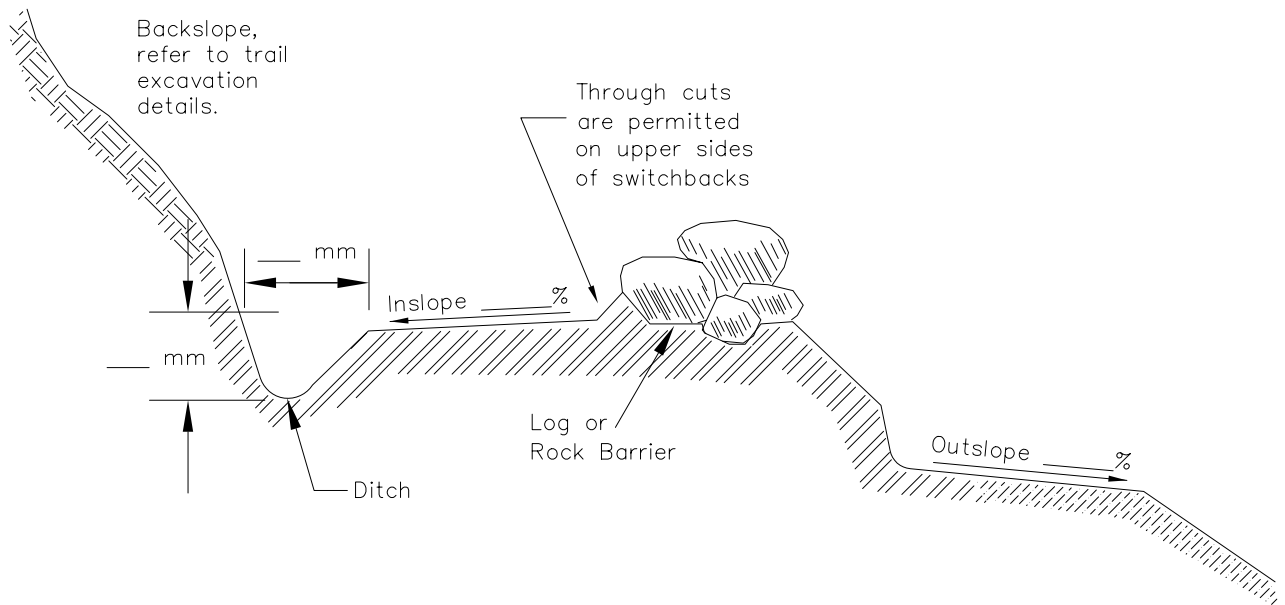
Sawn Timber Retainer  
150 mm x 150 mm  
No. 13 Rebar  
600 mm Long



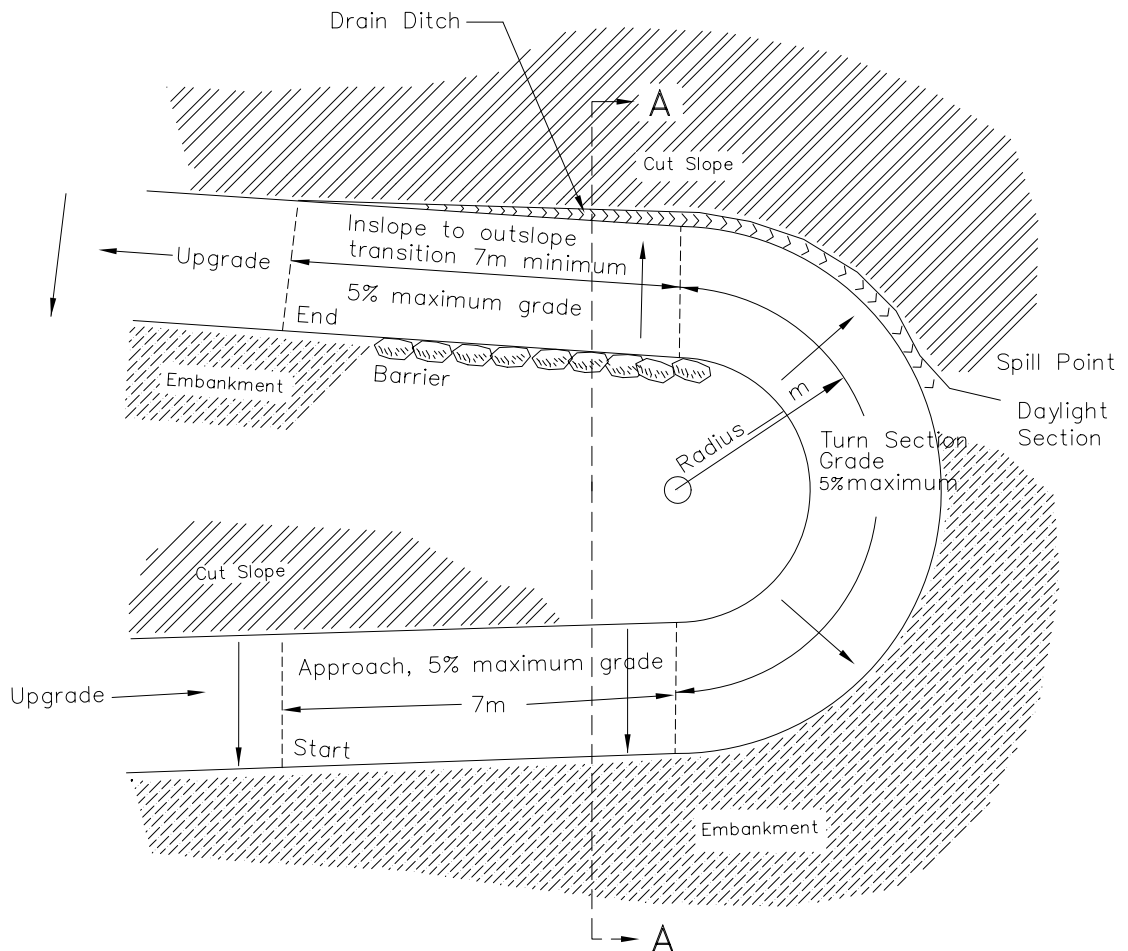
**CROSS SECTION**

# SWITCHBACK – TYPE I

NOT TO SCALE



## SECTION A-A

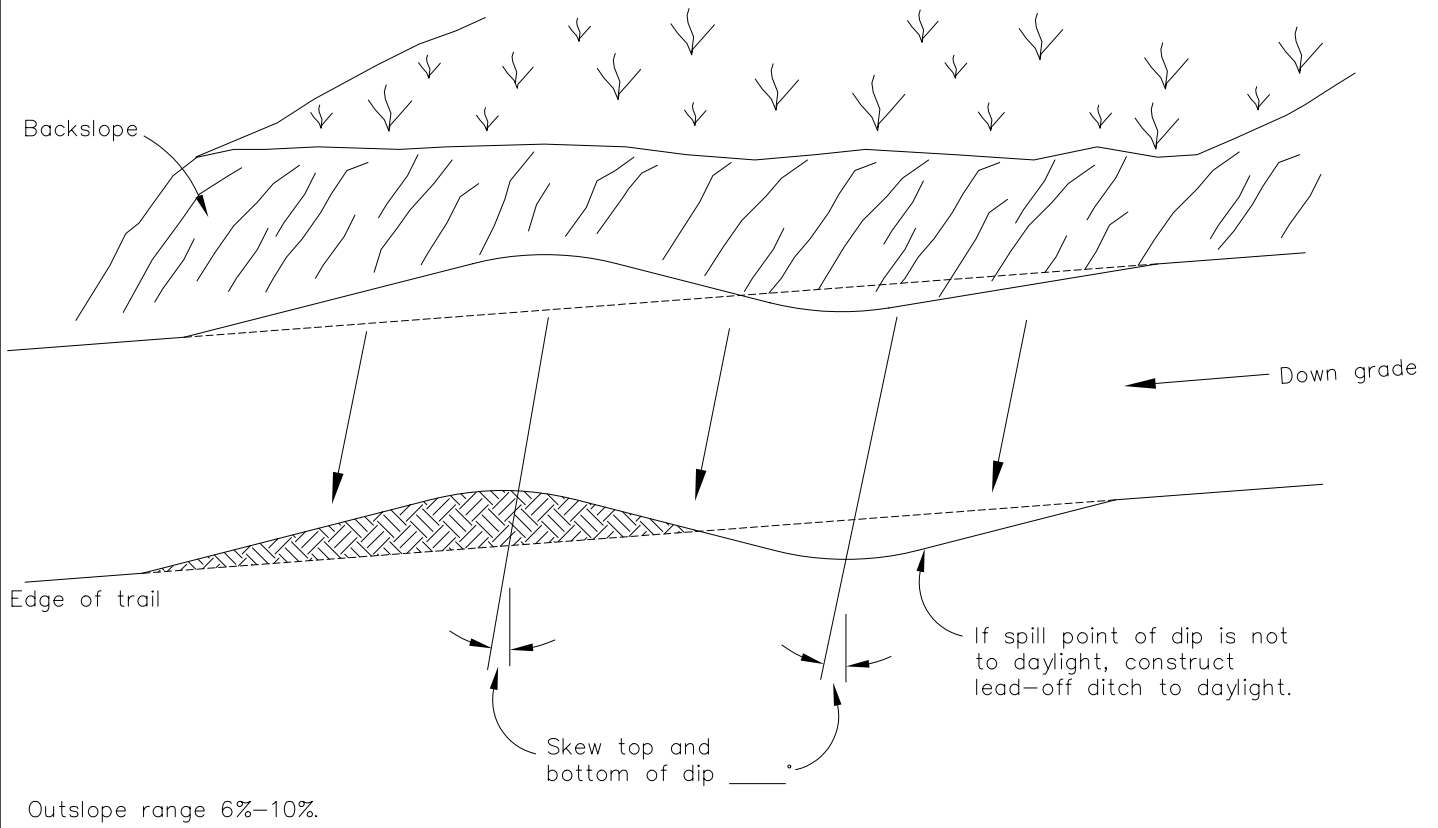


Radius point is staked at each individual site.

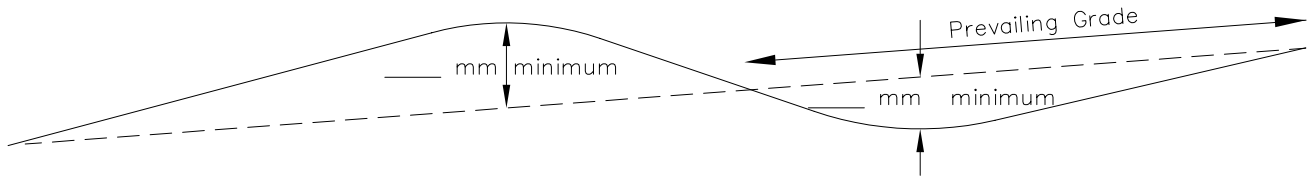
## PLAN VIEW

# ROLLING DIP

NOT TO SCALE



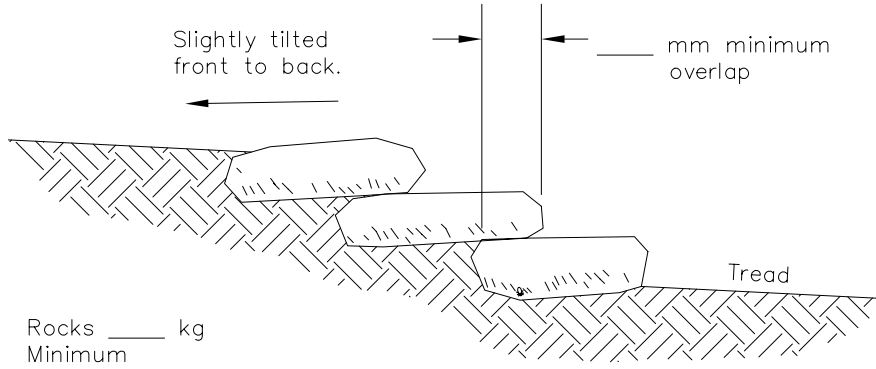
## PLAN VIEW



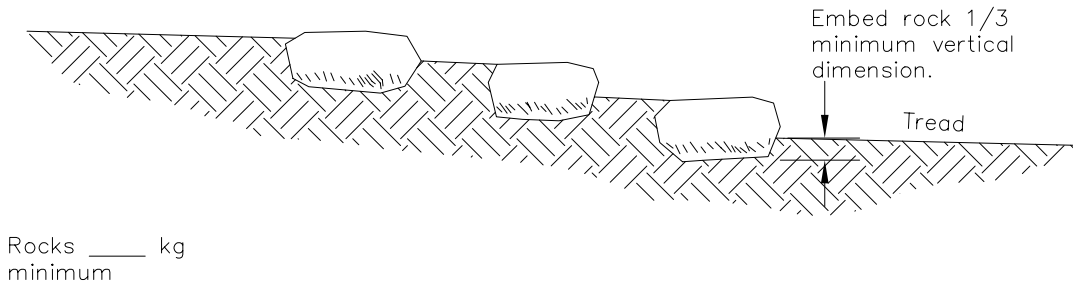
## PROFILE

# ROCK STAIRWAYS

NOT TO SCALE



## OVERLAPPING ROCK STAIRWAY

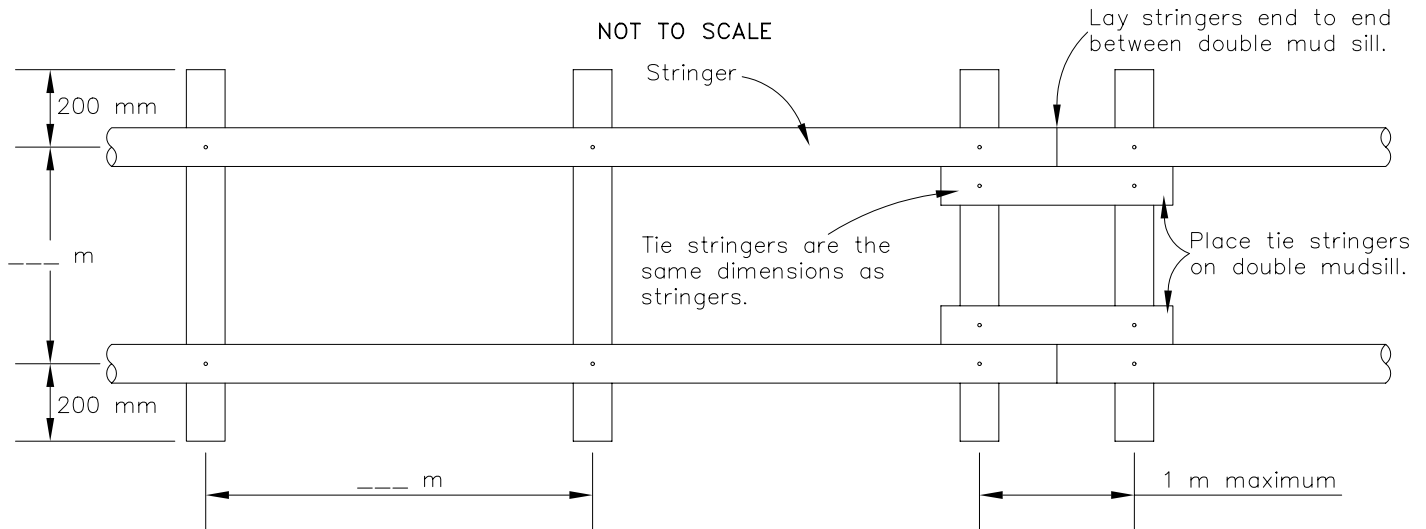


## ROCK RISER STAIRWAY

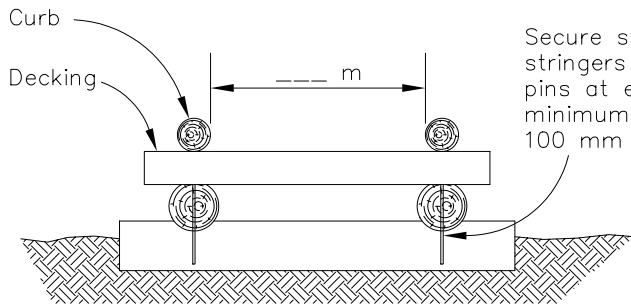
Location	Type	Maximum Step Rise	Maximum Step Run	Width

# PUNCHEON WITH DECKING

NOT TO SCALE

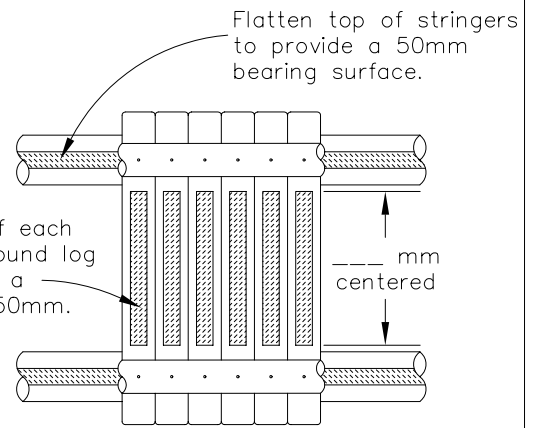


## MUD SILL AND STRINGER LAYOUT



SECTION A-A

Secure stringers and tie stringers with 9 mm drift pins at each sill with a minimum penetration of 100 mm into the sill.



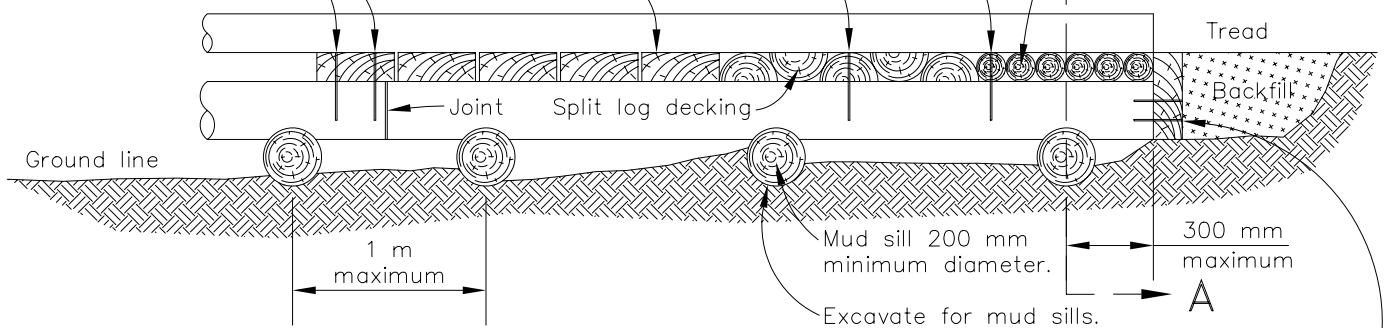
PLAN VIEW

Two \_\_\_ galvanized nails at each stringer to provide a minimum penetration of 50 mm into the stringer.

Sawn timber decking with a 10 mm maximum gap.

One \_\_\_ galvanized nail at each stringer to provide a minimum penetration of 50 mm into the stringer.

Round log decking



SECTION VIEW

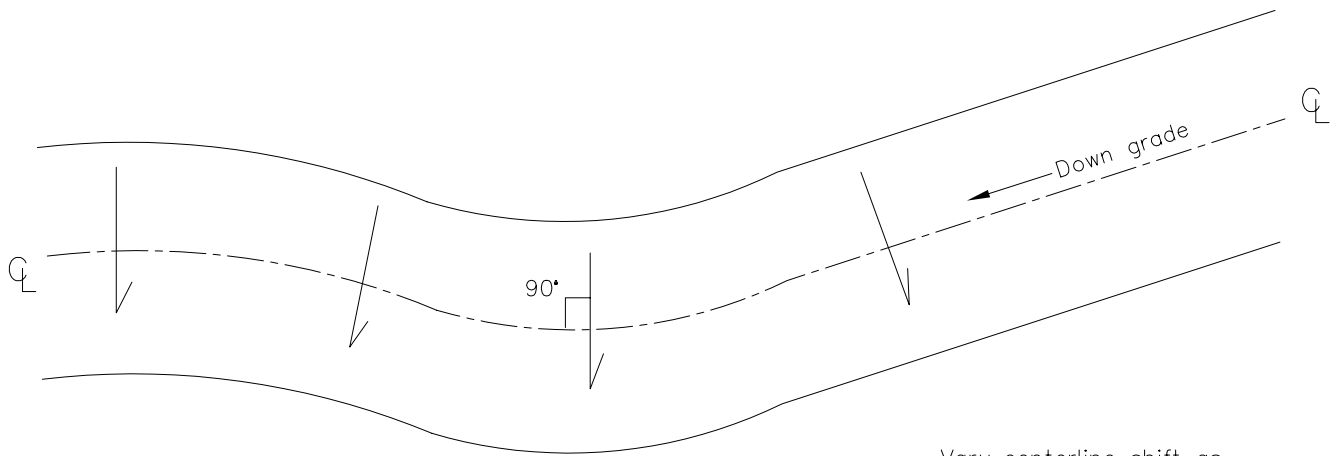
Bulkhead:  
Secure with a minimum of two galvanized spikes with a minimum penetration of 50 mm into the stringer.

MEMBER	TYPE	SPECIES	SIZE (mm)	TREATMENT TYPE	MINIMUM RETENTION (kg/m <sup>3</sup> )
Stringer					
Deck					
Curb					
Bulkhead					



# GRADE DIP

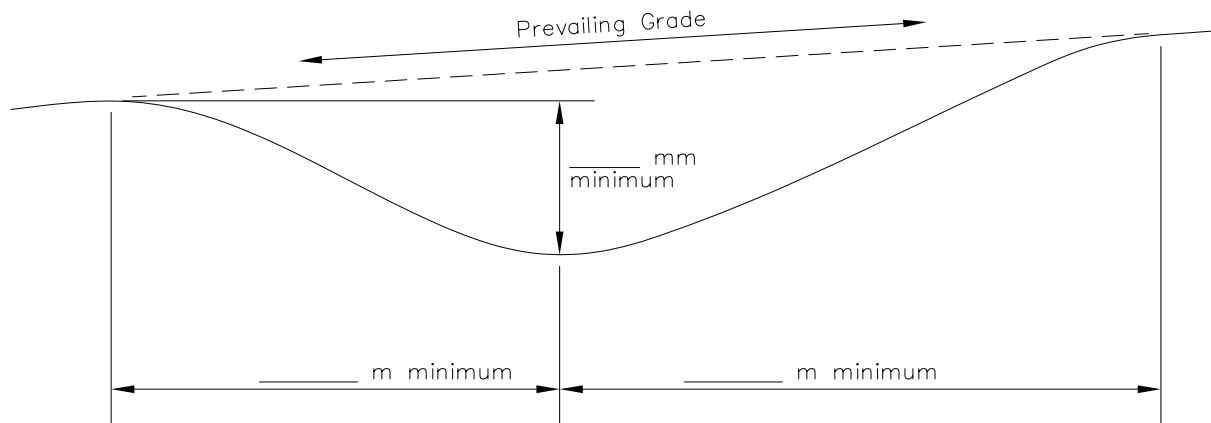
NOT TO SCALE



Maintain outslope  
and trailbed width.

Vary centerline shift as  
necessary to daylight  
spillway.

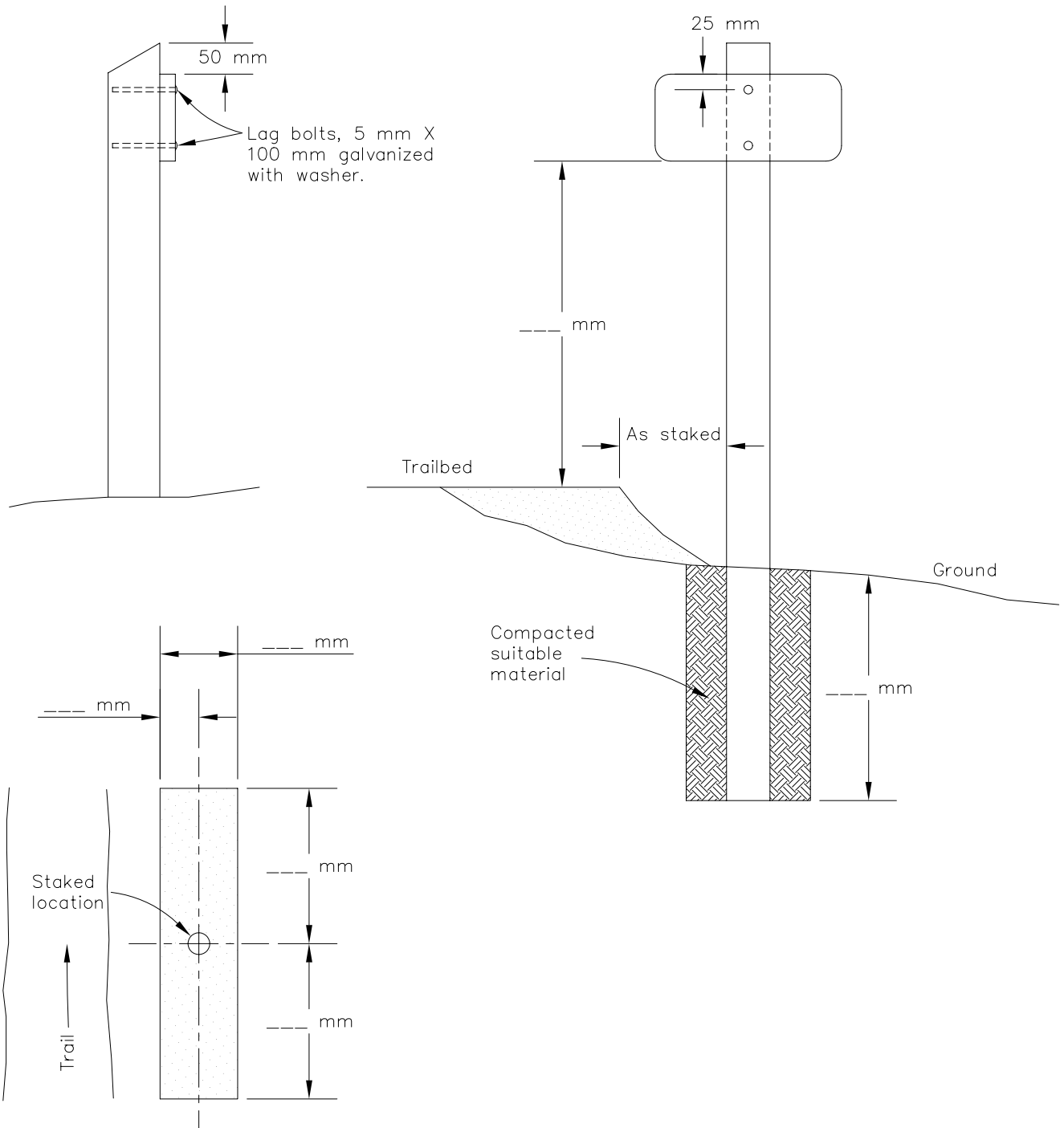
## PLAN VIEW



## PROFILE

# SIGN AND POST INSTALLATION

NOT TO SCALE



Placement tolerance within shaded area for avoiding obstacles.

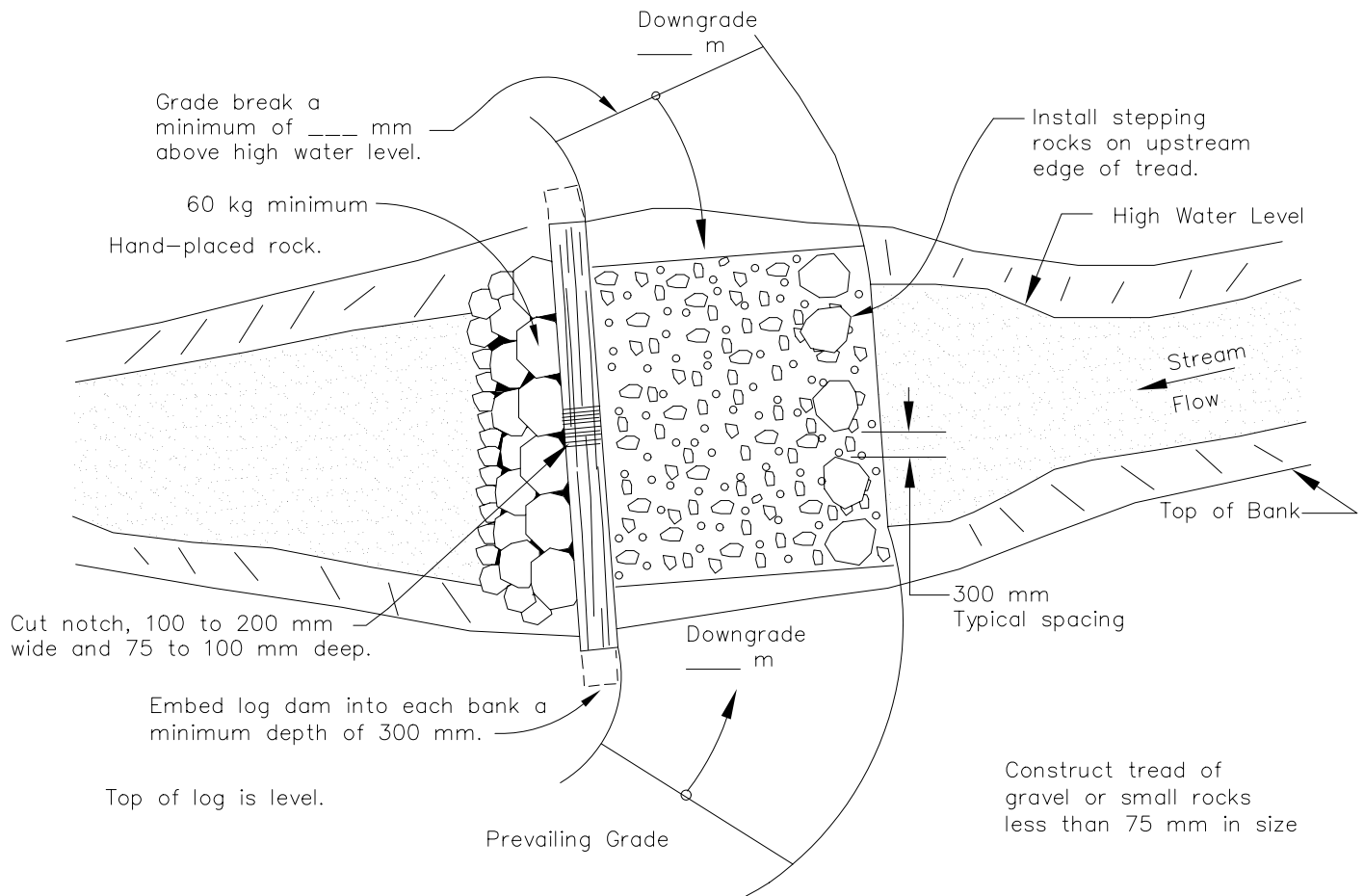
Preservation type \_\_\_\_\_

Minimum net retention \_\_\_\_\_

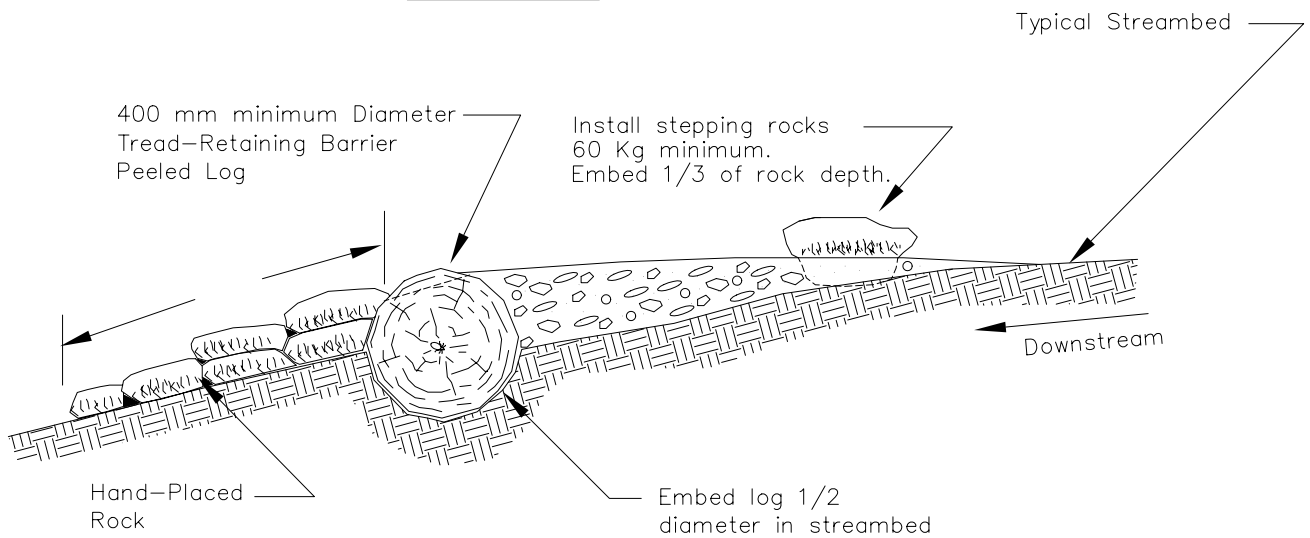
POSTS			SIGN
LOCATION	MATERIAL	SIZE (mm)	

# SHALLOW STREAM FORD OR GULLY CROSSING LOG STRUCTURE

NOT TO SCALE



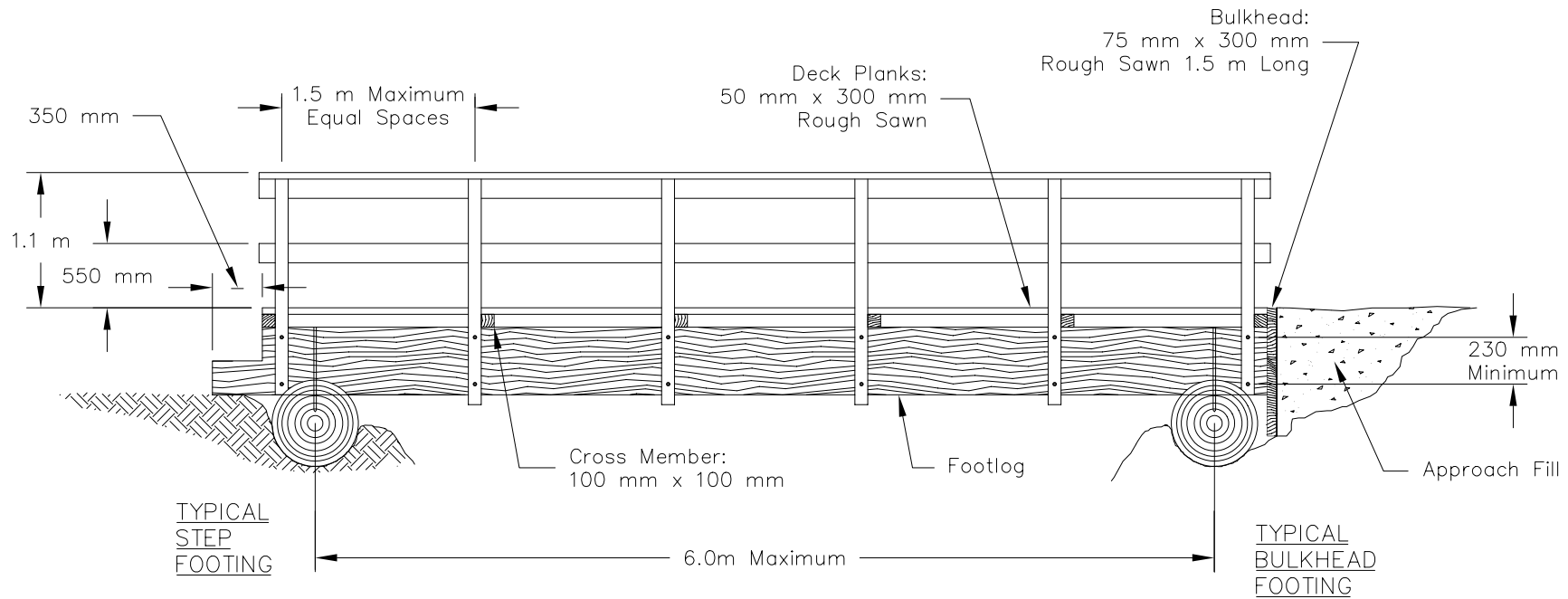
## PLAN VIEW



## CROSS SECTION

# 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.

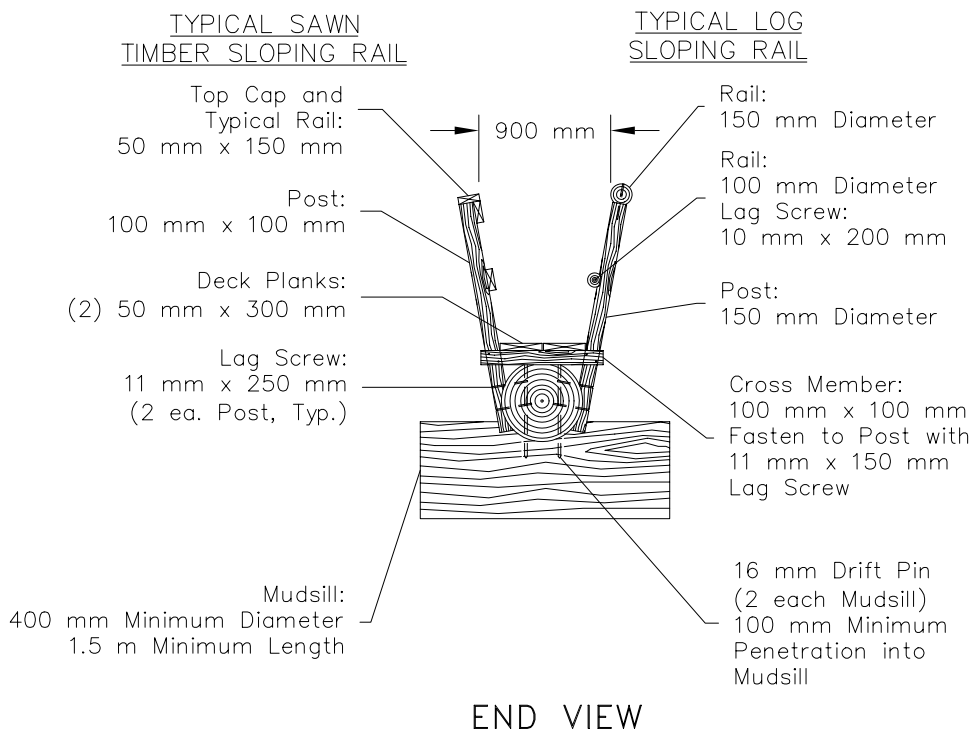
3/97

931-1a

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

# FOOT LOG TRAIL BRIDGE WITH 2 HANDRAILS

NOT TO SCALE



Minimum Log Diameter at Midspan	
Span m	Minimum Diameter mm
> 5	350
5.0	375
5.5	425
6.0	475

PROJECT DATA:

Type of Rail: \_\_\_\_\_

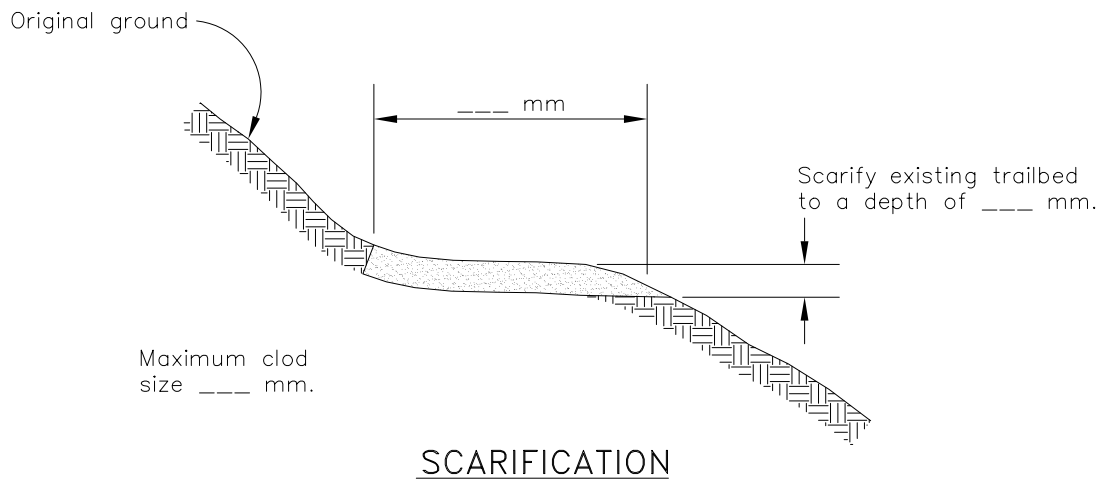
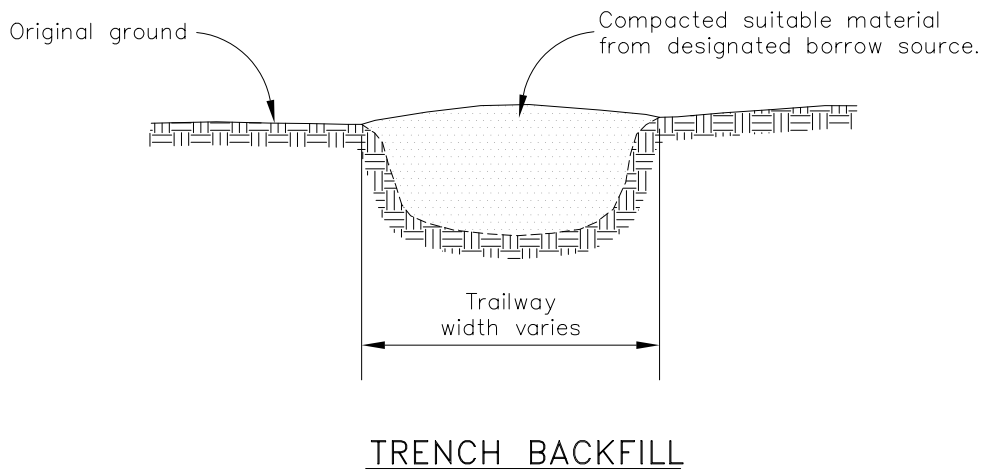
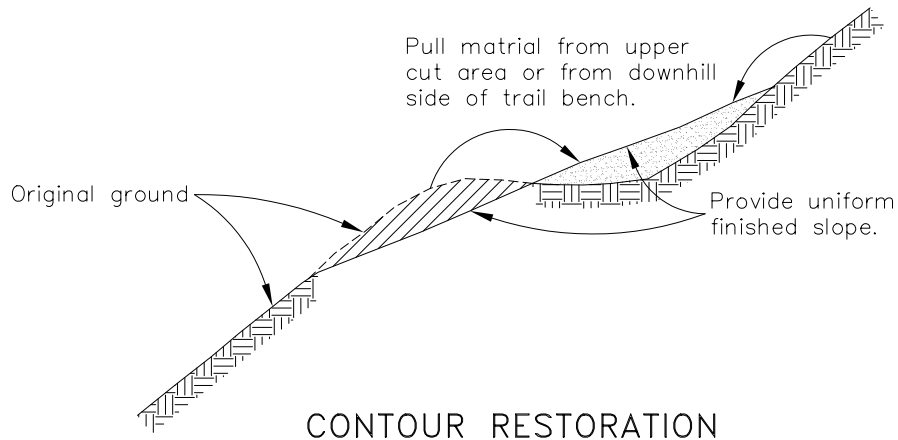
Ftg Type at Begin of Bridge \_\_\_\_\_

Ftg Type at End of Bridge \_\_\_\_\_

Fasten each cross member to footlog with 2-20d nails.

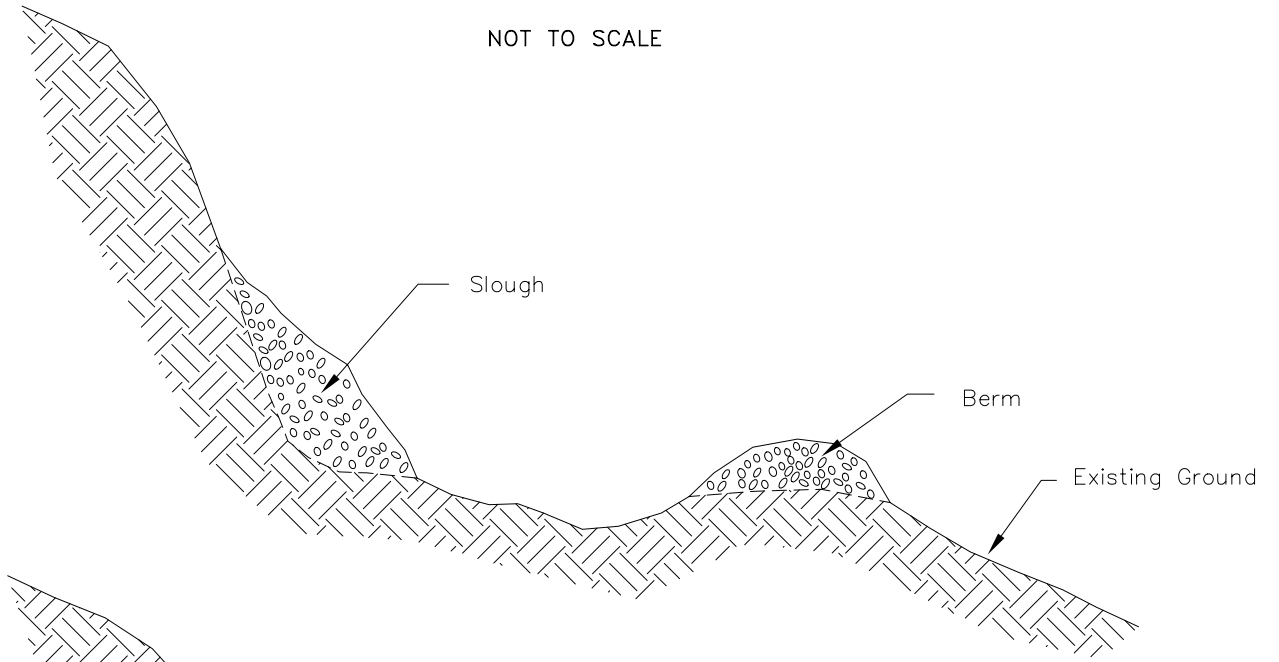
# TRAIL OBLITERATION

NOT TO SCALE

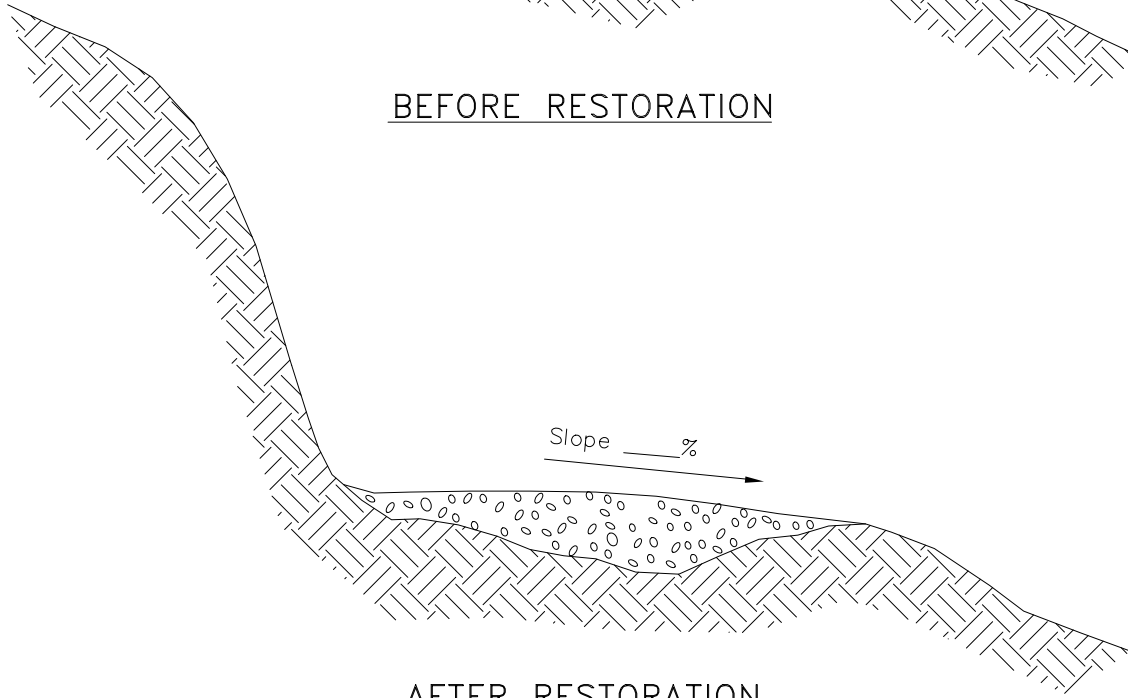


# EXISTING TRAIL RESTORATION

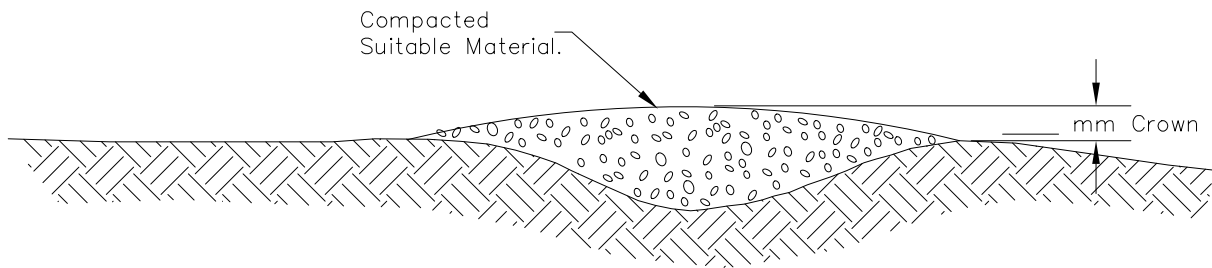
NOT TO SCALE



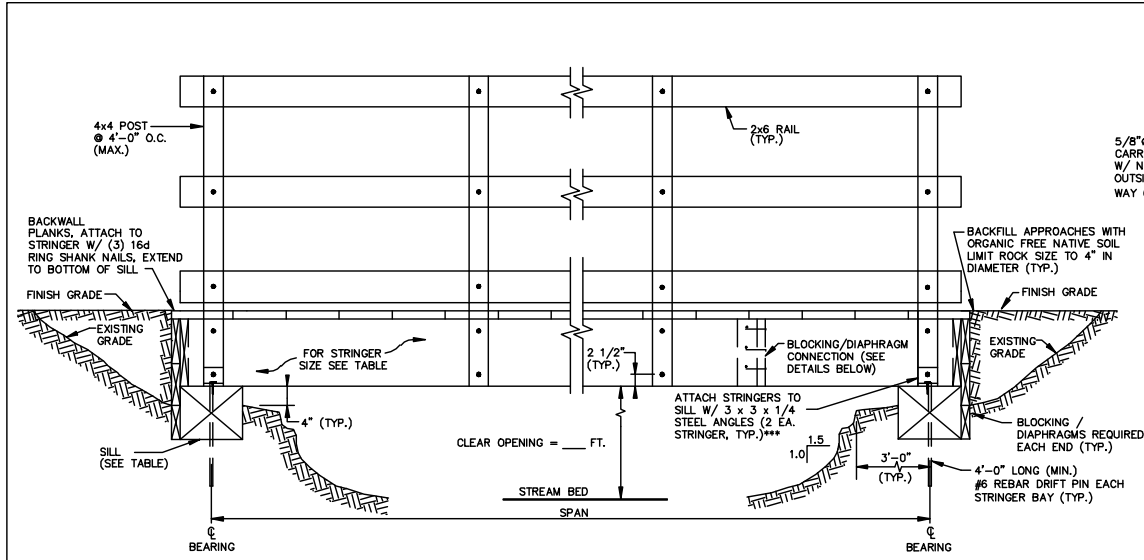
## BEFORE RESTORATION



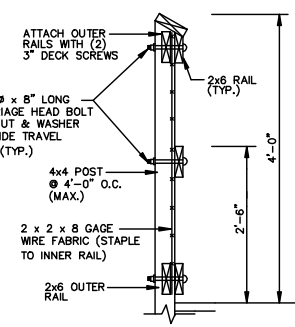
## AFTER RESTORATION



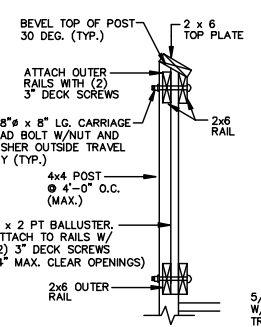
## FLAT SLOPES



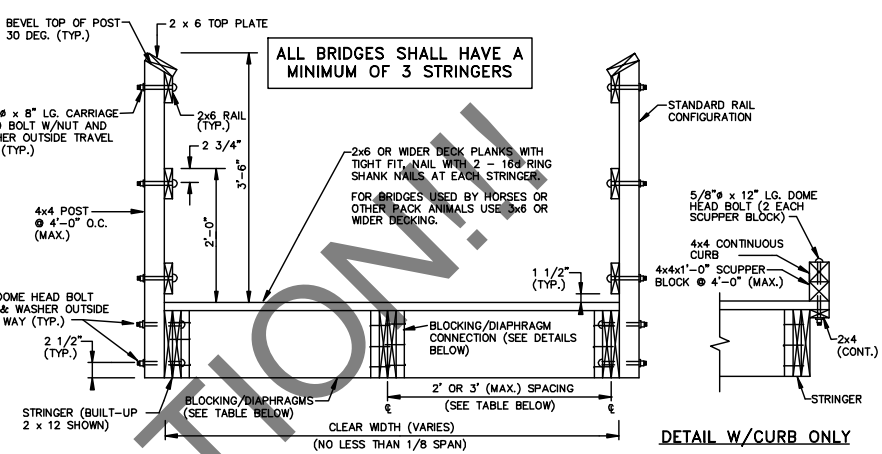
**ELEVATION OF STRUCTURE**  
SCALE: 3/4" = 1'-0"



**DETAIL W/RAIL AND WIRE FABRIC**



**DETAIL W/RAIL AND BALLUSTERS**



**BRIDGE CROSS-SECTION**  
SCALE: 3/4" = 1'-0"

**RAILING NOTE:**  
Rail details shown above shall be used as determined by the Forest Engineer. Railing shall be required on all structures unless waived by the Forest Engineer. All structures without rail shall have 4x4 continuous curbing.

SPAN (FT.)	DIM. LUMBER ** 2 FT. SPACING		DIM. LUMBER ** 3 FT. SPACING		BLK. PTS.	BLK. REQ'D	SILL REQ'D	PSL (PARALLEL) 2 FT. SPACING		PSL (PARALLEL) 3 FT. SPACING		BLK. PTS.	BLK. REQ'D	SILL REQ'D	STEEL BEAMS 2 FT. SPACING		STEEL BEAMS 3 FT. SPACING		DIA. PTS.	DIA. REQ'D	SILL REQ'D	
	(1) 2 x 12 int.	(2) 2 x 12 ext.	(1) 2 x 12 int.	(2) 2 x 12 ext.				WT. (LBS.)	WT. (LBS.)	WT. (LBS.)	WT. (LBS.)				WT. (LBS.)	WT. (LBS.)	WT. (LBS.)	WT. (LBS.)				
8 or less	(1) 2 x 12 int.	38	(2) 2 x 12 int.	75	1/2	2 x 12	8 x 8															
10	(1) 2 x 12 int.	47	(2) 2 x 12 int.	94	1/2	2 x 12	8 x 8															
12	(1) 2 x 12 int.	47	(2) 2 x 12 int.	94	1/2	2 x 12	8 x 8															
14	(2) 2 x 12 int.	113	(2) 2 x 12 int.	169	1/2	2 x 12	8 x 8															
16	(2) 2 x 12 int.	131	(2) 2 x 12 ext.	131	1/2	2 x 12	8 x 8															
18	(2) 2 x 12 int.	150	(3) 2 x 12 int.	197	1/2	2 x 12	8 x 8															
20	(2) 2 x 12 int.	150	(2) 2 x 12 ext.	150	1/2	2 x 12	8 x 8															
22	(3) 2 x 12 int.	253	(4) 2 x 12 int.	338	1/3	2 x 12	8 x 8	3-1/2 x 12 int.	272	3-1/2 x 14 int.	320	1/3	2 x 12	8 x 8	W 10 x 12	216	W 12 x 14	252	1/2	C6x10.5	8 x 8	
24	(2) 2 x 12 ext.	169	(3) 2 x 12 ext.	253	1/3	2 x 12	8 x 8	3-1/2 x 12 ext.	272	3-1/2 x 14 ext.	320	1/3	2 x 12	8 x 8	W 10 x 12	240	W 12 x 14	280	1/2	C6x10.5	8 x 8	
26	(4) 2 x 12 int.	375	(5) 2 x 12 int.	469	1/3	2 x 12	8 x 8	3-1/2 x 14 int.	356	3-1/2 x 16 int.	447	1/3	2 x 12	8 x 8	W 12 x 14	308	W 12 x 22	308	1/2	C6x10.5	8 x 8	
28	(2) 2 x 12 ext.	188	(3) 2 x 12 ext.	281	1/3	2 x 12	8 x 8	3-1/2 x 14 ext.	356	3-1/2 x 16 ext.	447	1/3	2 x 12	10 x 10	W 12 x 14	336	W 12 x 22	528	1/2	C6x12.5	10 x 10	
30								3-1/2 x 16 int.	487	3-1/2 x 18 int.	547	1/4	2 x 12	10 x 10	W 12 x 22	616	W 14 x 26	728	1/3	C8x11.5	10 x 10	
32								3-1/2 x 16 ext.	487	3-1/2 x 18 ext.	547	1/4	2 x 12	10 x 10	W 12 x 22	616	W 14 x 26	728	1/3	C8x11.5	10 x 10	
34								5-1/4 x 16 int.	854	5-1/4 x 18 int.	960	1/4	2 x 12	10 x 10	W 12 x 22	660	W 14 x 26	780	1/3	C8x11.5	10 x 10	
36								3-1/2 x 16 ext.	609	3-1/2 x 18 ext.	684	1/4	2 x 12	10 x 10	W 14 x 26	832	W 16 x 31	992	1/3	C8x11.5	10 x 10	
38								7 x 18 int.	1510			1/4	2 x 12	10 x 10	W 14 x 26	884	W 16 x 31	1054	1/3	C8x11.5	10 x 10	
40								3-1/2 x 18 ext.	775			1/4	2 x 12	10 x 10	W 16 x 31	1118	W 18 x 35	1260	1/3	C9x13.4	10 x 10	
42															W 16 x 31	1178	W 18 x 35	1330	1/3	C8.13.4	10 x 10	
44															W 16 x 31	1240	W 18 x 35	1400	1/4	C9x13.4	12 x 12*	
46															W 18 x 35	1470	W 21 x 44	1848	1/4	C10x15.3	12 x 12*	
48															W 18 x 35	1540	W 21 x 44	1936	1/4	C10x15.3	12 x 12*	
50															W 21 x 44	2024	W 24 x 55	2530	1/4	C12x20.7	12 x 12*	
															W 21 x 44	2112	W 24 x 55	2640	1/4	C12x20.7	12 x 12*	
															W 21 x 44	2200	W 24 x 55	2750	1/4	C12x20.7	12 x 12*	

\* Sills and bridge foundation require design by Forest Engineer \*\* Use full length stringers, no splices allowed.

**GENERAL NOTES AND SPECIFICATIONS**

**Loading & Design Criteria**

- USE OF THIS PLAN; DETERMINATION OF STRINGER LENGTH, TYPE, AND SPACING; RAILING REQUIREMENTS; AND STRUCTURE HEIGHT ABOVE STREAM BED SHALL BE AS APPROVED BY THE FOREST ENGINEER. ANY MODIFICATIONS TO THIS PLAN MUST BE APPROVED BY THE REGIONAL BRIDGE ENGINEER.
- Ground Snow Load -  $P_g = 70$  PSF (reduced in combination with Pedestrian Load).
- Deck Live Load - Pedestrian (AASHTO) = 85 PSF.
- Posts & Rails - Post & Rails designed for AASHTO Pedestrian Load only.
- Stringer Live Load Deflection Limits - Steel =  $L/500$ , Lumber =  $L/360$ .
- Bridge structure shall meet ADA accessibility requirements for trails. Structure shall have a level cross slope with no more than a 5% grade along its length, minimum 36" clear width, minimum 42" rail height, minimum 3" curb height (if no rail), and minimum 80" overhead clearance. Spacing between decking planks shall not exceed 1/2" after seasoning. The maximum vertical elevation change between deck planks is 1/2". There shall be a smooth transition from the approach onto the bridge.

**Specifications**

- AASHTO Standard Specification for Highway Bridges, 1996, 16th Edition.
- IBC 2000 International Building Code, 2000 Edition.
- National Design Specification for Wood Construction, 1997 Edition, by National Forest Products Assoc.
- American Wood Preservers Association Standards, Waterborne Preservative Standard P5 Type A, Standard C2, and Standard C14.

**Lumber**

- Lumber for solid sawn stringers, deck, backwall, rail, ballusters, posts, curbs, and mud sill shall be No. 2 or better Southern Yellow Pine pressure treated per AWPA Standards.
- Drawings are prepared using S4S finished dimensions unless noted otherwise. If rough sawn lumber is used adjust dimensions as required.
- All lumber shall be sawn and fabricated prior to pressure treatment with respective preservative.
- PSL (parallel strand lumber) shall be Wolmanized Paralam type, service level 2, and CCA pressure treated to 0.60 pcf or approved equal.

**Steel**

- Steel for stringers, and other structural sections, shall conform to ASTM A572 Grade 50. Steel angles shall meet ASTM A36. Shop prime with two coats of zinc oxide primer, after fabrication.
- Once steel is situated in field, apply zinc oxide primer to all areas where primer had been removed due to placement.

**Hardware**

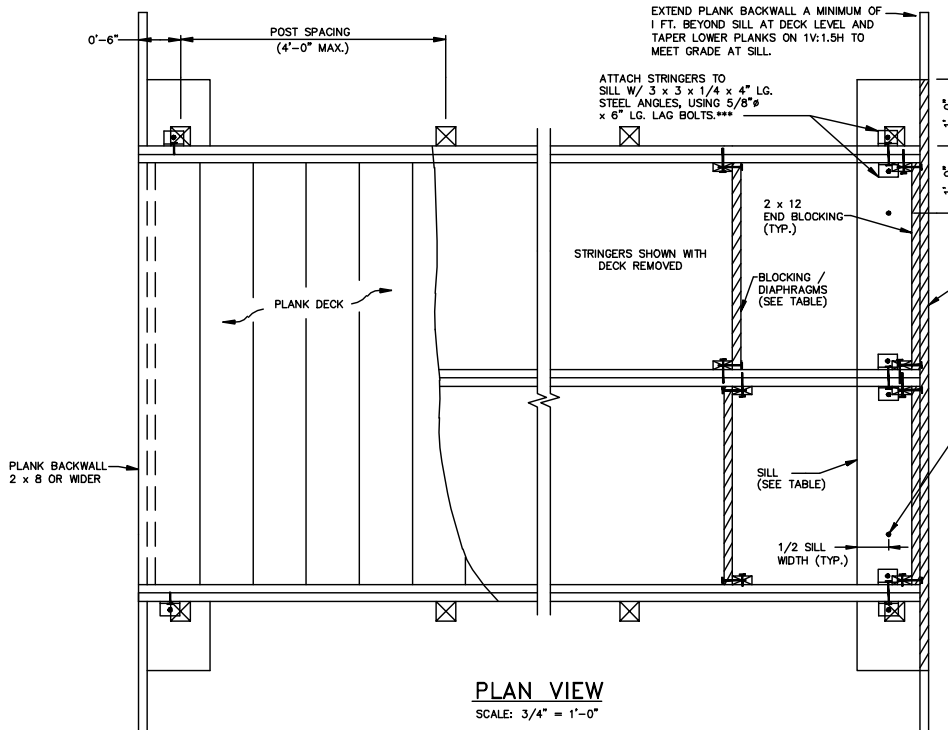
- All bolts, washers, nuts and miscellaneous metal hardware shall be ASTM A307 hot dipped galvanized.
- Fasteners shall be hot dipped galvanized ring shank nails or wood screws. Drift pins for sill shall be deformed No. 6 reinforcing bars meeting ASTM A615.

**Glue**

- Apply glue between each lamination using a waterproof exterior adhesive compatible with the preservative treatment such as PL-500 by Contech or approved equal. Apply 3/8" continuous bead @ 1 1/2" o.c.

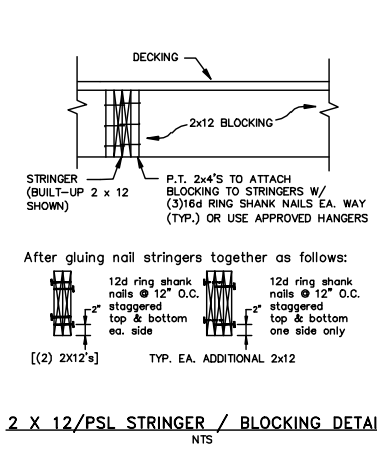
**Construction**

- Clear opening of bridge above the stream bed shall be determined by the Forest Engineer and approved by the governing Federal and State agencies as required.
- Mud sills shall bear on native soil or ledge rock free from compressible organic material and capable of supporting the bridge under full load. Provide uniform bearing under entire length of sill. Other foundation conditions require approval by a Forest Engineer.
- Stringers with camber shall be positioned so that camber is up and knots near the edge will be in the top half of the stringers.
- Deck planks shall be laid heart side down.
- Railing shall be required on all structures unless waived by Forest En

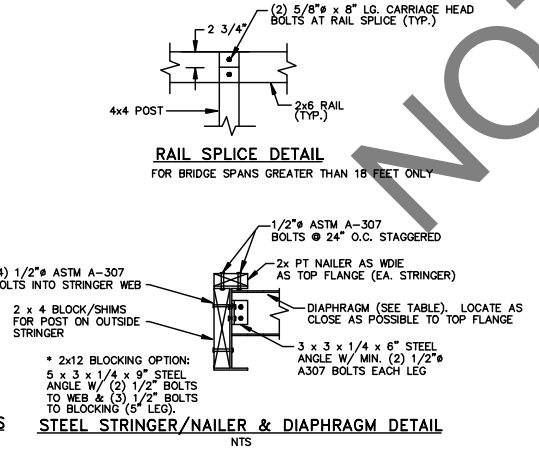


**PLAN VIEW**  
SCALE: 3/4" = 1'-0"

\*\*\* FOR STEEL STRINGERS DRILL BOTTOM FLANGE FOR 5/8" LAG BOLTING TO SILLS IN LIEU OF USING 3X3X1/4 ANGLES. SLOT HOLES IN FLANGES TO ALLOW FOR TEMPERATURE MOVEMENT.



**2 X 12/PSL STRINGER / BLOCKING DETAILS**  
NTS



**STEEL STRINGER/NAILER & DIAPHRAGM DETAIL**  
NTS

**General Notes**

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
R-9  
EASTERN REGION

Project Name: **STANDARD PEDESTRIAN AND CC SKI TRAIL BRIDGE**




Drawing Title: **STRUCTURAL PLAN & DETAILS**











Drawn	J. W. Kamb	Project	Standard
Checked	J. S. Grazier	Drawing No.	S-1
CAD File No.	RSSTTRAILBRDG.dwg		
Date	April 17, 2003		
Scale	as noted		



# Appendix 4-N · Typical Construction Equipment



Tool Name	Picture	Used to:
<p><b>Brushing Tools:</b></p> <p>Grass Whip</p>		<p>Clear trail corridors of succulent vegetation</p>
<p>Woodman's Pal Axe and Swedish Brush Axe</p>		<p>Cut and clear vegetation</p>
<p>Machete</p>		<p>Cut dense vegetation when surveying new trails</p>
<p>Bankblade and Brushhook</p>		<p>Cut brush, briar and undergrowth; Cut brush too heavy for a weed cutter and too light for an axe</p>
<p>Loppers and Handclip</p>		<p>Clearing heavy vegetation and cut limbs of 1 to 1-1/2 inches in diameter</p>
<p><b>Sawing &amp; Chopping Tools:</b> Bowsaw</p>		<p>Cut brush and trim small branches</p>
<p>Handsaw (Folding and Fixed) and Polesaw</p>		<p>Cut brush and trim small branches; Cut branches out of reach</p>
<p>Crosscut Saw (One and Two Person)</p>		<p>Cut logs and clear large deadfall</p>
<p>Axe (Single and Double Sided)</p>		<p>Chop deadfall from trails, shape stakes for turnpikes and waterbars, and cut notches for structures made of timber</p>
<p><b>Grubbing &amp; Raking Tools:</b> Pulaski</p>		<p>Loosen soil; cut through roots; shape notches and joints of turnpikes, bridges, and other timber projects</p>
<p>Mattock and Hoe</p>		<p>Building and repairing trail tread; digging trenches; breaking or prying small rocks; chopping roots</p>
<p>McCleod and Firerake</p>		<p>Removing slough and berm from a trail and tamping or compacting tread; shape a trail's backslope</p>
<p>Pick</p>		<p>Break or pry small rocks; loosen heavy soil and gravel; dig a trench or hole</p>

Tool Name	Picture	Used to:
<p><b><i>Digging, Tamping &amp; Hammering Tools:</i></b> Tamp, Poltholer</p>		<p>Loosen compacted or rocky soil; tamp soil; remove soil from holes</p>
<p>Sledge and Jack</p>		<p>Crush rock into gravel; drive stakes or rebar</p>
<p>Shovels</p>		<p>Move loosened dirt, dig holes and trenches, and remove weeds</p>
<p><b><i>Lifting &amp; Hauling Tools:</i></b> Rockbar</p>		<p>Pry and lever large, heavy objects such as boulders, logs, and beams</p>
<p>Peavey and Logcarrier</p>		<p>Rolling and positioning logs and timbers; transport heavy timbers</p>
<p>Comealong and Cable Wench</p>		<p>Pulling, lifting, or stretching; move rock or timber</p>
<p><b><i>Survey, Layout &amp; Measuring Tools:</i></b> Clinometer, Abney Level, Flagging, GPS Receiver, Measuring Tape/Wheel</p>		<p>Measure or set trail grade; highlight an area for trail alignment, construction, or maintenance; measure distance; gather way-points along a proposed trail</p>
<p><b><i>Mechanized Tools:</i></b> Chainsaw and Stump Grinder</p>		<p>Cut medium to large size blow-downs, clearing heavy sapling growth during trail construction, cutting trees into logs for wood construction projects</p>
<p>Brush Saw, Brush Mower &amp; Stump Grinder</p>		<p>Clear brush; cut heavy grass, weeds, briars, and small saplings; remove stumps</p>
<p>Rock Drills</p>		<p>Blast, split, shape rock; drive pipe and signposts</p>
<p>Walk Behind/Ride In Earthmovers</p>		<p>Grade trail bed</p>
<p>Mini-Dozer</p>		<p>Grade trail bed</p>

Tool Name	Picture	Used to:
<p><b>Heavy Construction Tools:</b></p> <p>Skid Steer Loader (Courtesy of Bobcat Company)</p>		<p>Dig and move earth, rocks and materials. Very versatile and easy to maneuver with numerous front-end attachments.</p>
<p>Backhoe (Courtesy of Volvo)</p>		<p>Dig deep holes and trenches and move materials.</p>
<p>Mini Track Excavator (Courtesy of Volvo)</p>		<p>Dig large quantities of soil and rocks in tight places. Also called a Crawler Excavator.</p>
<p>Bulldozer (Courtesy of Caterpillar)</p>		<p>Push soil, rocks, and trees.</p>
<p>Paver (Courtesy of Volvo)</p>		<p>Lay paving stone and asphalt.</p>



# Appendix 4-O · Typical Construction Costs





## Typical Costs for Trail & Path Construction

Trail and path construction costs vary greatly by location, complexity of design, surface material, choice of installer, and other factors and thus are typically presented as estimates rather than specific amounts. The estimates on the following pages were developed using average costs compiled from historical precedent, bid tabulations from current projects, VDOT bid tabulations, and other sources. The best source, however, often is the manufacturer or supplier who can provide up-to-the-minute costs over the telephone or via e-mail. In these instances, be sure to add in costs for shipping and installation since many manufacturers and suppliers only give costs for materials alone. Costs should be adjusted in subsequent years to adjust for varying economic conditions, fluctuations in material costs, and other variables.

Each dollar amount in the “Estimated Cost” column on the following spreadsheet represents a single cost for labor, materials, overhead and profit, and installation in 2011 dollars. The “Unit” column refers to the unit of measure typically applied to each item. For example, on-site earthwork is generally costed at \$5.00 per cubic yard and therefore one needs to know how many cubic yards are required for each project.

Always remember to add a line item for contingencies in your cost estimate to account for unexpected work. A typical contingency amount is 10% to 12% of the subtotaled construction cost. Design and consultant fees must also be accounted for and also typically range between 10% and 12% of the subtotaled construction cost.

### Cost Estimation Resources:

Flink, Charles A., Kristine Olka, and Robert M. Searns. *Trails for the Twenty-First Century: Planning, Design, and Management Manual for Multi-Use Trails*. Washington: Island Press, 2001.

R.S. Means/Reed Construction Data *Site Work & Landscape Cost Data*. Available at:  
<http://rsmeans.reedconstructiondata.com/>

Virginia Department of Transportation Bid Tabulations  
(Tabulation costs include overhead, profit, and labor costs)  
<http://www.viriniadot.org/business/const/resources-bidtabs.asp>



## Typical Costs for Trail & Path Construction

The costs shown below are in 2011 dollars and are variable based on location and material and labor cost fluctuations. Verify costs at the start of each trail or path project. All costs shown below include materials, labor, overhead, and profit. Using volunteer labor may reduce the costs of some items.

<b>ITEM</b>	<b>ESTIMATED COST</b>	<b>UNIT</b>	<b>COMMENTS</b>
<b>Site Preparation</b>			
Permitting and Bonds	10% Construction Cost		Contractor typ. applies for these but rolls costs in overall estimate
Site Clearing & Grubbing	\$2,000.00	AC	Varies greatly by location and type/density of vegetation
On-Site Earthwork	\$5.00	CY	Moving earth around on site
Imported Fill	\$40.00	CY	Hauling fill in from off-site source
Topsoil	\$55.00	CY	Imported topsoil for planting beds
<b>Erosion and Sediment Controls</b>			
Silt Fence	\$3.00	LF	
EC-2 Stabilization Matting	\$2.50	SY	Bio-degradable jute or jute-type matting
Geotextile Fabric	\$3.00	SY	Utilized under trail base in unstable or wet soils
Inlet Protection	\$250.00	EA	Installed at the upslope side of culverts
Check Dam	\$200.00	EA	Used in newly-constructed swales
Riprap/ Outlet Protection	\$50.00	TON	Used at the downslope side of culverts
<b>Drainage Features</b>			
15" Concrete Culvert	\$50.00	LF	Also called reinforced concrete pipe (RCP)
18" Concrete Culvert	\$65.00	LF	
15" Concrete End Section	\$450.00	EA	Flared end section fitted to culvert pipe
18" Concrete End Section	\$550.00	EA	
15" HDPE Culvert	\$35.00	LF	High-density polyethylene pipe (plastic)
18" HDPE Culvert	\$40.00	LF	

<b>ITEM</b>	<b>ESTIMATED COST</b>	<b>UNIT</b>	<b>COMMENTS</b>
<b>Surfacing (Per Unit Cost)</b>			
Boardwalk	\$45.00	SF	Pressure treated lumber with handrails
Pervious Concrete	\$120.00	CY	
Concrete	\$6.00	SF	
Asphalt	\$150.00	TON	
Resin-based Pavement	\$75.00	CY	costs similar to asphalt, varies greatly on location and CY needed
Prime & Double Seal	\$5.00	SY	
Crushed Stone (VDOT #21A)	\$35.00	TON	6"-8" depth used alone or as base material
Crusher Fines (VDOT #10)	\$30.00	TON	1"-2" depth used for surfacing over #21A base
Soil Cement	\$50.00	CY	
Engineered Wood Fibers	\$21.00	CY	Stabilized engineered wood fibers as tested by the USFS
Vitri-Turf Binder	\$18.00	GAL	Used to stabilize engineered wood fibers
<b>Surfacing (Per Linear Foot)(costs include earthwork, E&amp;S measures, surface &amp; base material, and other work</b>			
Boardwalk	\$600.00	LF	14 LF wide, pressure-treated lumber with handrails
Pervious Concrete	\$90.00	LF	6'-wide trail w/ 4" of pervious concrete on 6" 21A base and other work
Concrete	\$80.00	LF	6'-wide trail w/ 4" of concrete on 6" 21A base and other work
Asphalt	\$60.00	LF	10'-wide trail w/ 2" of SM 9.5 asphalt on 8" 21A base and other work
Resin-based Pavement	\$65.00	LF	costs similar to asphalt, varies greatly on location and CY needed
Prime & Double Seal	\$50.00	LF	10'-wide trail on 8" 21A base with prime/seal treatment and other work
Crushed Stone (VDOT #21A)	\$45.00	LF	10'-wide trail on 8" 21A base with culverts, grading, and other work
Soil Cement	\$20.00	LF	6'-wide trail
Engineered Wood Fibers	\$15.00	LF	6'-wide trail (total cost for wood fiber, binder, and labor)
Wood Chips	\$8.00	LF	4'-wide wood chip trail on natural surface
Native Soil (Typical - Machine))	\$2.50	LF	4'-wide trail, typical conditions using machines
Native Soil (Hard - Machine)	\$5.00	LF	4'-wide trail, hard conditions (clearing, rock, etc.) using machines
Native Soil (Typical - by hand)	\$5.00	LF	4'-wide trail, typical conditions hand-built
Native Soil (Hard - by hand)	\$10.00	LF	4'-wide trail, hard conditions (clearing, rock, etc.) hand-built

<b>ITEM</b>	<b>ESTIMATED COST</b>	<b>UNIT</b>	<b>COMMENTS</b>
<b>Site Furnishings</b>			
Bench	\$500 - \$1200	EA	
Litter Receptacle	\$500 - \$800	EA	
Drinking Fountain	\$2,500 - \$5,000	EA	Cost varies by design
Bike Rack	\$500 - \$800	EA	
Lights (overhead)	\$2000 - \$3500	EA	
Entrance Sign (HDPE)	\$200 - \$500	EA	
Interpretive Sign	\$300 - \$500	EA	
Pet Waste Containers	\$250 - \$350	EA	
Milemarkers	\$50 - \$200	EA	
Bollards (removable)	\$200 - \$400	EA	
Bollards (fixed)	\$100 - \$200	EA	
Wood fence	\$15 - \$20	LF	3-rail split rail fence, pressure-treated
Gates	\$500 - \$2000	EA	Varies greatly by design
Canoe Ramp	\$3500 - \$5,000	EA	Small concrete ramp w/ board slides, launch one boat at a time
Prefabricated Restroom	\$50,000 - \$100,000	EA	Gender-separated, concrete block building, varies greatly by design
Open-air shelter	\$15,000 - \$40,000	EA	Pre-fabricated construction, varies greatly by design
<b>Landscaping</b>			
Seeding	\$0.25	SF	Hydroseed
Mulch	\$50.00	CY	Hardwood
Shade Trees	\$350.00	EA	Costs decrease with larger orders
Ornamental Trees	\$250.00	EA	Costs decrease with larger orders
Shrubs	\$40.00	EA	Costs decrease with larger orders



# Appendix 5-A · Sample Trail Inspection Forms





## **Trail Inspection/Condition Forms**

### **Examples of Typical Forms Used for Inspecting and Reviewing Trails & Paths**

The following forms are included to as examples of how other trail organizations inventory and inspect their trails and paths. The forms included in this appendix will give you an idea of what types of categories, conditions, and issues to look for when you inspect your trail or path corridor. Keeping a log of inspections and filing reports such as these in your records will help you gain a better understanding of maintenance costs, numbers of people needed to maintain the trail, and also provide a level of insurance against claims of negligence.

Using these forms as a reference, create your own form that meets the needs of your organization and trail/path corridor. Check with other organizations in your area to see how they utilize different types of reporting forms.

The following forms are included in this appendix:

- Carvins Cove Trail Assessment Form; Carvins Cove Natural Reserve in Roanoke, Virginia
- East Coast Greenway Trail Inspection Report; East Coast Greenway running between Maine and Florida with locations in Virginia
- U.S. Forest Service Trail Bridge Matrix; U.S. Forest Service standards for structural investigations. Contact your Region 8 engineer for more information at <http://www.fs.fed.us/r8/about/forestContacts.php?p=1.1.9.1> or 404-347-7395



# Carvins Cove Trail Assessment Form

Date \_\_\_\_\_

Trail Name:	
Trail Start:	
Trail End:	
Trail Junctions:	
Assessment Team	

Trail Length					
Attractions/Detractions					
Sum of Grades					
0-5%		Sum of Surface	Sum of Width		
6-10				Paved	< 2 ft
11-15				Gravel	2-4 ft.
16-20				Cinder	4.1-8 ft.
21-30				Hard soil	8.1-12 ft
>30%				Soft soil	>12 ft.

Station (ft)	Tread Width (in)	Tread X slope -%=in +%=out	Hillside Slope %	Surface	Grade (+%)		Feat. No.	Feat. Station	Trail/View	Cond. 1=Good 5=Bad	Feature Type, Materials, Description, Details, Needs
0							1				
							2				



## Explanation of Trail Assessment Field Headings

### Top sections to fill out during assessment

Trail Name	Common name for trail as shown on Carvins Cove map. If no name, describe location.
Trail Start and End	May be trail or road intersections. Describe if not.
Trail Junctions	List other trails crossed.
Assessment Team	List team members.
Assessment Date	Date or dates this assessment was done.
Trail Length	Should equal the last station number.
Attractions/Detractions	Describe what makes this trail great or not-so-great.

### Top sections to fill out in the office later

Sum of Grades	The length of trail at different grades will be computed in the office to determine ADA and difficulty for different users.
Sum of Surface	The length of trail with different surface types will be computed in the office, although many trails will be the same the whole way.
Sum of Width	The length of trail at different widths will be computed in the office to help determine difficulty for different users and sustainability.

### Bottom sections to fill out during assessment

Station	This will be a measured distance in feet, using a wheel, starting from the trail termini and wheeling continuously to the end of the trail. The first number will be 0; the last number will be at the end of the trail and will show total trail length. Measure in whole feet.
Tread Width	With a tape measure, measure the tread width in inches, rounding down to 6" increments - thus 12", 18", 24", 30", 36".
Tread X-Slope	This is measured with the Smarttool, set on the trail tread at an "average" point. If the trail slopes outward, the % is "positive"; if the trail is insloped, the % is negative. (Water running across the trail and down the hill is good or positive; water running into the inside edge and down the trail is bad or negative.)
Hillside Slope	This is measured with the clinometers and shows the steepness of the hillside that the trail is traversing. Stand above or below, not on, the trail, about 30 feet apart to take the measurement. Because the sustainability of the trail is contingent on the trail grade being 1/2 of the hillside cross-slope, this is an important measurement, even in places that are relatively flat.
Surface	Note the surface of the trail. Generally, this may be the same throughout the trail, but try to note places that are soft vs hard.
Grade	The slope in % will be measured between two stations by two people, both using a clinometer. We are measuring the steepness of the trail between points. Positive grades means the trail is headed uphill, negative=downhill.
Feature Number	Give your first feature #1, the next #2, etc. If the description takes more than one line, just jump down to the next available space for the following item. Typical features are listed on the next page. A feature may be an existing item or condition or it may be something needed in that location.
Feature Station	When you note a feature, have the wheel person tell you the wheel reading at that point. On the sheet, Feature Stations do not have to line up with the Stations in column 1.
Trail/View	Note whether the feature you are recording is actually on the trail or whether it is within view of the trail. Thus a rock outcrop or a mountain bike jump might be adjacent to the trail and be noted as <u>V</u> .
Condition	Note the condition, with 1=Good and 5=Bad. For negative features, such as eroded gullies, a 1 means it's not too bad and a 5 means it's horrible.
Description	List the feature type, materials from which it is made, and any details such as size. If your feature is something that is needed, vs something that is existing, tell conditions and actions needed.

## Typical Features to Record

Trailhead	Trail entrance with parking.
Junction or Trail Intersection	An intersection with another trail or road. Name other trail or road in description if known.
Pulloff	Space beside a road used to pull off and park or turn around.
Bootleg Trail	Intersection with new unknown trail.
Social trail	Well established trail to private property
Old road bed	Dual track road, usually unsurfaced, not used frequently for vehicles.
ATV track	Signs that ATV has been making its own path.
Road	Path for vehicular access, such as powerline maintenance.
Sign	Trail Sign in existence or needed. Note verbage or take a picture.
Privy	Sanitary facility near trail.
Kiosk	Bulletin board for user information.
Picnic Table	
Building/structure	Building, shelter or lean-to. State building purpose if known.
Bench	Constructed seat near trail.
Tree Stand	Platform or hunting structure in a tree.
Fireplace	Stone or built fireplace for cooking outdoors
EC	Erosion Control needed: water bar, rolling dip, de berm
Water Bar	Log, stone, or rubber installed across trail to divert water off trail.
Berm	Outside edge of trail is higher than center of tread, trapping water.
Rolling Dip	A grade change or wide lowered area of the trail that directs water off the trail.
Roots	Tree roots that stick up more than 2" or provide an obstacle
Culvert	A pipe or tunnel under the trail to carry water from one side to the other. Note size and materials.
French Drain	A drain system that allows water to seep trough a loose material into a below surface collection or removal passage.
Switchback	>120 degree turn in trail.
Bridge	Structure built to cross trail obstacles more easily.
Stream crossing	Crossing of unbridged stream or ravine
Steps	Stone or wooden steps built to ascend a steep hill.
Log Ramp	Logs piled on both sides of downed trees that bikes use to roll over and horses and hikers have more a problem with than original downed tree. Note whether it is on Trail or beside the trail (View). Describe if a sound bypass could allow log ramp to
Cribbing	Wall built near trail to help hold hillside on a steep slope.
Tread Problem	Ex: Bad root, slump(trail cross slope too steep or falling away), narrow width(compared to most of trail), tree down, hole or mud pit.
Braided trail	Multiple trails made by users to get around mud or a tread problem.
Vista	Good view from the trail
Rock outcrop	Rocks near the trail that provide scenic quality
Camping area	Area showing signs of camping and fires
Utility	Utility lines, powerline towers, sewer
Gate	Gate or chain that is or could be used to close a road or trail.
Snag	Tree hanging over the trail or in a way that it threatens trail users.
Fallen tree	Tree that has fallen across the trail.
Unlawful activity	Unlawful activity noted. Graffiti, Dump, litter, tree harvest, unauthorized use.
T&E	Threatened, endangered, rare or sensitive species near trail.
OTHER	Something not in this list that needs to be recorded.



## EAST COAST GREENWAY

## TRAIL INSPECTION REPORT

Name of Nominated Trail:

State:

Inspection was begun at (location):

Inspection was ended at (location):

Is this along the East Coast Greenway: Spine Route or      Alternate Route

**Review entire inspection form to assure familiarity with terms and protocols prior to commencing field activities.**

I.

- 1. Please remember to bring along: inspection form, designation application, provided ECG map, pen, tape measure & digital camera**
- Inspections should be conducted so as to provide the most accurate and detailed information possible.
- Please submit Trail Inspection Report to your ECGA state committee chair in electronic form.
- Please refer to Designation Application to determine the exact “start” and “end” points for trail or trail section being inspected. Please start and end inspection at these points.
- A Trail Inspection Map will be provided in hard copy through the ECGA Cartography Staff. Please mark this map with any specific trail conditions being noted and/ or any other information specifically requested.
- Digitally photograph typical trail sections and landscapes along the trail in addition to any situations being cited as having issues that need to be addressed. Submit photos with completed report.
- Please submit inspection reports (with map and photos) within three days of completion to the appropriate ECGA Staff for processing.

If you are unfamiliar with any of the terms listed within this inspection form please refer to the ECGA Trail Handbook at: <http://www.greenway.org/documents/TrailHandbook.doc>

Any further inquiries can be directed to:

Eric Weis, ECGA Trail Program Coordinator  
76 Dorrance St ste 402, Providence RI 02903  
(401) 450-7155  
eric@greenway.org

# ECGA Inspector

Name:

Phone:

email:

ECGA Affiliation:

I have read the designation application for this trail

---

## Inspector's Report:

Trail name:

Date(s) of Inspection:

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only:

Trail Surface:						
	asphalt	concrete	stone dust	crushed gravel	packed dirt	other:
Surface						
Percentage						
Condition*						

\*Please rate "Condition" as: **good**, **fair**, or **poor**

2. \*Width of trail:

\* (Please see question 5 for any qualifying conditions)

### Nomination Qualifications:

3. Are there any street, business, or residential crossings that present a hazard? yes no

If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder wheelchair use (e.g., grade or steps, lack of curb cuts, trail surface problems, other impediments)? yes no

If yes please describe and locate on map:



5. Please indicate if you encountered any of the following issues with the trail during the inspection:

inadequate trail width (under 8 feet)

design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc)

surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc.)

maintenance problems (e.g., encroaching vegetation, litter/ broken glass, etc.)

other similar substandard or hazardous conditions

Please list:

6. Please provide details about any issues indicated above and locate affected trail areas on map:

### **Report Summary:**

Segment recommended for **permanent off-road designation:**                      yes    no

If Segment not recommended for ECGA designation explain why:



## Trail Bridge Matrix (updated 2/15/2007)

The matrix below provides a summary of the definitions, inspection requirements, and data storage and inventory protocols for Trail Bridges, Trail Structures, and other structures commonly associated with trails.

Structure Categories	Definitions	Inspection			Data Storage
		Inspector Requirements	Inspection Form	Inspection Interval <sup>1</sup>	
<p><b>Trail Bridge</b></p> <p>General Definition</p> <p>Trail Bridge Classification</p>	<p>A trail structure, including supports, erected over a depression or obstruction such as water, roadway, trail or railway that provides a continuous pathway and has a deck for carrying traffic or other loads.</p> <p>-----</p> <p>Trail Bridges are divided into three classifications for inspection purposes:</p> <p><b>1. Complex Trail Bridges</b></p> <p><b>2. Major Trail Bridges</b></p> <p><b>3. Minor Trail Bridges</b></p> <p>Complex Trail Bridges and Major Trail Bridges generally have a clear span greater than 20 feet <u>and</u> a vertical distance greater than 5 feet from the ground or stream channel.<sup>2</sup></p> <p>Minor Trail Bridges must have a clear span less than 20 foot <u>or</u> a vertical distance less than 5 feet.</p> <p>Each trail bridge classification is defined in more detail below.</p>				

Structure Categories	Definitions	Inspection			Data Storage
		Inspector Requirements	Inspection Form	Inspection Interval <sup>1</sup>	
<b>1. Complex Trail Bridge</b>	<p><b>Complex Trail Bridges:</b> All trusses, suspension, multiple-span, and non-timber/log trail bridges with a span greater than 20 feet <u>and</u> a vertical distance greater than 5 feet.<sup>2</sup></p> <p><b>Additionally:</b></p> <p>Major Trail Bridges which develop significant structural defects and/or load limitations would be moved to the Complex Trail Bridge classification.</p> <p>Minor Trail Bridges, determined to have increased complexity or user safety concerns, could be classified as Complex Trail Bridges. An example of this might be a short concrete bridge (less than 20 feet) located over a deep gorge.</p>	Requires a <u>technical inspection</u> by an engineer or engineering technician certified road bridge inspector [FSM 7736.31].	Complex Trail Bridge Inspection Form <sup>3</sup>	5 years <sup>1</sup>	Infra Trail Bridges
<b>Major Trail Bridge</b>	<p><b>Major Trail Bridges:</b> All single-span timber/log trail bridges with a span greater than 20 feet <u>and</u> a vertical distance greater than 5 feet.<sup>2</sup></p> <p><b>Additionally:</b></p> <p>Minor Trail Bridges, determined to have increased complexity or user safety concerns, could be classified as Complex Trail Bridges. An example of this might be a short timber bridge (less than 20 feet) located over a deep gorge.</p>	<p>Requires a <u>technical inspection</u> by a person:</p> <ol style="list-style-type: none"> <li>1. Trained specifically for log and/or timber trail bridge inspections; and</li> <li>2. Deemed qualified, based on Regional or Forest policy, to perform this task under the general supervision of a certified road bridge inspector.</li> </ol>	Major Trail Bridge Inspection Form <sup>3</sup>	5 years <sup>1</sup>	Infra Trail Bridges
<b>3. Minor Trail Bridge</b>	<p><b>Minor Trail Bridges:</b> All trail bridges that do not meet the definition of a Complex or Major Trail Bridge, and that have a span less than 20 feet <u>or</u> a vertical distance less than 5 feet.<sup>2</sup></p> <p>Minor Trail Bridges do not include boardwalks, puncheon, and similar trail structures.</p>	Requires a <u>condition assessment</u> by a person trained and qualified, based on Regional or Forest criteria, to perform condition assessments of Minor Trail Bridges.	Minor Trail Bridge Condition Assessment Form <sup>3</sup>	5 years <sup>1</sup>	Infra Trail Bridges

Structure Categories	Definitions	Inspection			Data Storage
		Inspector Requirements	Inspection Form	Inspection Interval <sup>1</sup>	
<b>4. Trail Structures</b>	<b>Trail Structures:</b> Constructed features <u>on</u> a trail such as puncheon, boardwalk, retaining walls, water bars, etc. [Refer to <i>Trail Data Dictionary</i> for further identification of trail structures.]	Requires a <u>technical inspection</u> or <u>condition assessment</u> by appropriately trained personnel (structure dependent).	TRACS Survey Form and/or Trail Structure Inspection Form	Refer to current agency protocols	Infra Trails
<b>5. Other Structures Commonly Associated with Trails</b>	<b>Other Structures:</b> Structures such as fishing docks, viewing platforms, etc. that are frequently located on or adjacent to a trail. These features are often engineered similarly to a bridge, and often involve moderate-to-high risk to users in the event of structural failure. They do not meet the definition of a continuous pathway, however, and are often considered destination points instead.	Requires a <u>technical inspection</u> or <u>condition assessment</u> by appropriately trained personnel (structure dependent).	General Structure Inspection Form and/or Assessment Form	5 years <sup>1</sup>	Infra Trails or Infra RecSites

<sup>1</sup> A more frequent interval may be deemed appropriate due to complexity, age, condition and use of the structure.

<sup>2</sup> Clear span is measured between abutment faces, along centerline of trail. Vertical distance is measured from the trail surface to the ground or stream channel.

<sup>3</sup> For Complex Trail Bridge, refer to Regional Bridge Engineer for appropriate regional form. For Major and Minor Trail Bridges, a national form is underdevelopment (in the interim, however, refer to Regional Bridge Engineer for appropriate regional form).



# Appendix 5-B · Sample Maintenance Schedules





# Appendix 2 – Maintenance Schedules

Twenty-five trails responded with more detailed information about when various maintenance tasks are done. Topping the list of daily tasks were patrols by police and non-police agencies, followed by cleaning of restrooms. On a weekly basis, trails often do light clean-up work on the trail and trailheads, empty trash cans, do additional restroom cleaning, and cut the grass. Trails that don't have the resources to get to these things on a weekly basis do them monthly. It is quite common, especially for all-volunteer operations, to have monthly work days. Once a year seems to be a good frequency for applying herbicides, cleaning culverts, inspecting bridges, and catching up on non-critical repairs. Hands down, "as needed" is the most common frequency for all maintenance tasks except for trash and toilets. Here is the table of responses:

**Table 16: Frequency of Common Maintenance Tasks**

Maintenance Activity	How often is it done?						
	Day	Week	Month	Quarter	Year	As Needed	Other
Repaving of asphalt trail						5	
Coating or sealing of asphalt trail						5	5 years
Pothole repair on asphalt trail						5	
Snow removal from asphalt trail						6	
Surface cleaning of asphalt trail		1	2	1		4	
Pavement markings maintenance and replacement					2	3	
Resurface non-asphalt trail						12	
Grade non-asphalt trail					2	8	
Pothole repair and other patches on non-asphalt trail				1		13	
Snow removal from non-asphalt trail						2	
Surface cleaning of non-asphalt trail				1		5	
Keep trail-side land clear of trash and debris	1	4	5		3	9	
Mowing		7	5	1	2	6	
Leaf removal			2		3	8	
Tree pruning		1	1		3	17	
Tree removal			1		1	17	
Invasive species removal			1			12	
Planting new vegetation					1	7	
Application of herbicides or pesticides					5	6	
Clearing of drainage channels and culverts					4	18	
Surface maintenance of parking areas		2		1	3	12	
General maintenance of trailheads (litter clean-up, etc.)	1	6	1		1	9	
Landscaping/gardening at trailheads		4	2	1	2	4	
Empty trash cans at trailheads		2	3	1			2

Maintenance Activity	How often is it done?						
	Day	Week	Month	Quarter	Year	As Needed	Other
Maintenance of stationary toilets at trailheads (clean, empty, etc.)	4	2				1	
Maintenance of portable toilets at trailheads (clean, empty, etc.)		6				2	
Empty trash cans along trail		4				1	
Maintenance of stationary toilets along trail (clean, empty, etc.)	1	2					
Maintenance of portable toilets along trail (clean, empty, etc.)		2					
Maintenance of informational kiosks (repairs, etc.)		1	3		1	8	
Maintenance of picnic tables, benches, etc.				1		10	
Updating information in informational kiosks		2	1	2	1	8	
Installation of signs					1	19	
Repair/maintenance of signs					3	17	
Installation of pavement markings						4	1
Maintenance of pavement markings						3	
Patrols by police agency	7	1				5	random
Patrols by non-police agency (e.g. trail watch)	5	3				1	ongoing
Recovery from illegal acts such as dumping and vandalism	3		1		1	11	
Installation of lighting						1	
Maintenance of lighting						2	
Installation of emergency call boxes							—
Maintenance of emergency call boxes							—
Installation of gates, bollards and fencing						11	
Maintenance of gates, bollards and fencing			1			16	
Bridge, tunnel, underpass and crossing inspection	1	1		1	3	6	2-3 years
Bridge redecking						14	
Paint/stain/treat bridge deck or structure					1	6	
General bridge maintenance					2	14	
Tunnel lighting maintenance							—
Tunnel open/closed status							—
Paint tunnel/underpass walls and ceiling						2	
General tunnel/underpass maintenance						4	
Railroad grade crossing maintenance					1	4	
Road grade crossing maintenance		1			1	11	

The Chester County (Pennsylvania) Parks and Recreation Department submitted this detailed maintenance schedule for the Struble Trail:

Activity	January					February					March					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing													5			5
Trimming													5			5
Trash	2	2	2	2		2	2	2	2		2	2	2	2		26
Weeding														2		2
Invasive spraying																0
Bush hog																0
Signage																0
Fence repair												10				10
Pruning																0
Invasive pruning												20				20
Designated projects																0
Culverts																0
Gates																0
Bridge inspection									0.5							0.5
Grade ditches																0
Crosswalks																0
Trail surface																0
Flower bed planting																0
Storm damage																0
Vandalism																0

Activity	April					May					June					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing	5		5	5		5	5	5	5	5	5	5	5			60
Trimming	5		5	5		5	5	5	5	5		5	5	5		60
Trash	2	2	2	2		2	2	2	2	2	2	2	2			26
Weeding				2					2					2		6
Invasive spraying						10						10				20
Bush hog				16												16
Signage									20							20
Fence repair												10				10
Pruning			40													40
Invasive pruning																0
Designated projects											120					120
Culverts																0
Gates	6					6										12
Bridge inspection																0
Grade ditches																0
Crosswalks	6															6
Trail surface										16						16
Flower bed planting		10														10
Storm damage																0
Vandalism																0

Activity	July					August					September					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing	5		5		5	5		5	5			5	5		5	45
Trimming	5		5		5	5		5	5			5	5		5	45
Trash	2	2	2	2	2	2	2	2	2		2	2	2	2	2	28
Weeding				2				2					2			6
Invasive spraying	10					10					10					30
Bush hog											16					16
Signage								20								20
Fence repair							10									10
Pruning												40				40
Invasive pruning																0
Designated projects								120								120
Culverts																0
Gates																0
Bridge inspection																0
Grade ditches																0
Crosswalks																0
Trail surface																0
Flower bed planting																0
Storm damage																0
Vandalism																0

Activity	October					November					December					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing		5		5												10
Trimming		5		5												10
Trash	2	2	2	2		2	2	2	2	2	2	2	2			26
Weeding																0
Invasive spraying			10													10
Bush hog																0
Signage																0
Fence repair				10												10
Pruning																0
Invasive pruning							20									20
Designated projects																0
Culverts							8									8
Gates																0
Bridge inspection																0
Grade ditches							16									16
Crosswalks																0
Flower bed planting																0
Trail surface																0
Storm damage																0
Vandalism																0

# Appendix 5-C · Typical Maintenance Costs



## Typical Trail Maintenance and Operation Costs

Trail maintenance and operation costs are very difficult to generalize given the vast array of trail types, surfaces, locations, lengths and widths, and funding sources. This appendix includes average per mile costs as well as sample trail budgets taken from the Rail-to-Trail Conservancy's "Rail-Trail Maintenance and Operations" report.

The costs below were compiled from websites and books, a list of which is included at the back of this appendix.

### Average Annual Per Mile Costs

*Actual annual costs incurred by a trail agency:*

\$2,500/mile All asphalt trail system

\$2,000/mile General rule-of-thumb for mix of trail types

\$1,200/mile Very low-cost, minimum maintenance trail

*Actual annual costs incurred by a trail agency plus costs from other sources including city/county-funded police patrols and donated services and goods\*:*

\$7,600/mile Struble Trail in Chester County, PA (2.6 miles of asphalt trail)

\$9,200/mile Heritage Rail Trail County Park in York, PA (21 miles of aggregate/compacted stone trail)

\$7,000/mile Capital Area Greenbelt in Harrisburg, PA (20 miles of primarily asphalt trail)

### Trail Operations and Maintenance Costs Resources:

Flink, Charles A., Kristine Olka, and Robert M. Searns. *Trails for the Twenty-First Century: Planning, Design, and Management Manual for Multi-Use Trails*. Washington: Island Press, 2001.

Poole, Tim. "Rail-Trail Maintenance & Operation." Rails-to-Trails Conservancy Northeast Regional Office, July 2005. Available on-line at:

[http://www.railstotrails.org/resources/documents/resource\\_docs/maintenance\\_operations\\_report.pdf](http://www.railstotrails.org/resources/documents/resource_docs/maintenance_operations_report.pdf)

"Trail Maintenance and Management: Construction and Maintenance Costs for Trails." *National Trails Training Partnership*. Available on-line at:

<http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html>





# Appendix 3 — Budgets

As discussed in the narrative and demonstrated in the maintenance schedules in Appendix 2, trail maintenance is very much an ad-hoc business. Maintenance is done “as needed” and as funds present themselves — an approach that does not lend itself to meticulous budgeting. A couple of trails were kind enough to submit detailed budgets, and those follow.

The **Chester County (Pennsylvania) Parks and Recreation Department** submitted this detailed budget for the **Struble Trail**:

Activity	Times	Man Hours	Wages	Equipment Hours	Equipment Costs	Materials Costs	Transportation Costs	Total
Mowing	24	120	\$1,957	96	\$499	\$0	\$408	\$2,864
Trimming	24	120	\$1,380	96	\$86	\$0	\$0	\$1,466
Trash	52	110	\$743	0	\$0	\$30	\$884	\$1,657
Weeding	7	14	\$133	0	\$48	\$30	\$0	\$211
Invasive Spraying	6	60	\$682	0	\$40	\$60	\$102	\$884
Bush Hog	2	32	\$431	30	\$252	\$0	\$36	\$719
Signage	2	40	\$540	0	\$20	\$200	\$34	\$794
Fence Repair	4	40	\$454	0	\$20	\$300	\$68	\$842
Pruning	2	80	\$1,271	40	\$80	\$0	\$34	\$1,385
Invasive Pruning	2	40	\$540	20	\$40	\$0	\$34	\$614
Designated Projects	2	240	\$3,814	80	\$672	\$1,400	\$136	\$6,022
Gates	2	12	\$162	0	\$10	\$10	\$0	\$182
Culverts	1	8	\$91	0	\$10	\$20	\$17	\$138
Bridge Inspection	1	0.5	\$10	0	\$0	\$0	\$0	\$10
Grade ditches	1	16	\$182	0	\$10	\$10	\$17	\$219
Crosswalks	1	6	\$69	0	\$4	\$10	\$17	\$100
Trail Surface	1	16	\$182	0	\$5	\$30	\$17	\$234
Flower Bed Planting	1	10	\$95	0	\$5	\$120	\$17	\$237
Storm Damage	4	30	\$341	10	\$21	\$50	\$68	\$480
Vandalism	3	20	\$318	0	\$10	\$240	\$51	\$619
<b>Grand Total</b>								<b>\$19,677</b>

**Toolbox Note:**

*The Struble Trail (asphalt surface) is approx. 2.6 miles in length and costs are approx. \$7,600/mile.*

The following was submitted for the **Heritage Rail Trail County Park in York, Pennsylvania**. The trail was developed by the York County Rail-Trail Authority, the only entity of its kind devoted exclusively to rail-trail development. The trail is now maintained by the York County Parks and Recreation Department.

Maintenance Activity	Approximate annual labor cost	Approximate value of donated services	Approximate annual equipment & material cost	Total annual cost
Resurface non-asphalt trail	\$70,000			\$70,000
Grade non-asphalt trail				\$0
Pothole repair and other patches on non-asphalt trail	\$1,000			\$1,000
Snow removal from non-asphalt trail				\$0
Surface cleaning of non-asphalt trail				\$0
Keep trail-side land clear of trash and debris	\$5,200	\$5,200		\$10,400
Mowing	\$25,000		\$9,320	\$34,320
Leaf removal	\$1,000			\$1,000
Tree pruning	\$3,200		\$1,800	\$5,000
Tree removal				\$0
Invasive species removal				\$0
Planting new vegetation				\$0
Application of herbicides or pesticides	\$4,000			\$4,000
Clearing of drainage channels and culverts	\$3,000			\$3,000
Surface maintenance of parking areas				\$0
General maintenance of trailheads (litter clean-up, etc.)	\$1,500	\$1,500		\$3,000
Landscaping / gardening at trailheads	\$4,000		\$4,000	
Empty trash cans at trailheads	\$1,500			\$1,500
Maintenance of stationary toilets at trailheads (clean, empty, etc.)	\$9,000		\$1,000	\$10,000
Maintenance of portable toilets at trailheads (clean, empty, etc.)	\$2,400			\$2,400
Empty trash cans along trail				\$0
Maintenance of stationary toilets along trail (clean, empty, etc.)				\$0
Maintenance of portable toilets along trail (clean, empty, etc.)				\$0
Maintenance of informational kiosks (repairs, etc.)	\$1,000			\$1,000

Maintenance Activity	Approximate annual labor cost	Approximate value of donated services	Approximate annual equipment & material cost	Total annual cost
Maintenance of picnic tables, benches, etc.	\$250		\$250	\$500
Updating information in informational kiosks	\$500			\$500
Installation of signs	\$3,000		\$1,200	\$4,200
Repair/maintenance of signs	\$1,000			\$1,000
Installation of pavement markings	\$3,300		\$4,500	\$7,800
Maintenance of pavement markings	\$700		\$700	\$1,400
Patrols by police agency	\$20,000		\$12,000	\$32,000
Patrols by non-police agency (e.g. trail watch)		\$3,000		\$3,000
Recovery from illegal acts such as dumping and vandalism				\$0
Installation of lighting				\$0
Maintenance of lighting				\$0
Installation of emergency call boxes				\$0
Maintenance of emergency call boxes				\$0
Installation of gates, bollards and fencing				\$0
Maintenance of gates, bollards and fencing	\$3,500		\$1,400	\$4,900
Bridge, tunnel, underpass and crossing inspection	\$2,500			\$2,500
Bridge redecking				\$0
Paint/stain/treat bridge deck or structure				\$0
General bridge maintenance	\$50,000			\$50,000
Tunnel lighting maintenance				\$0
Tunnel open/closed status				\$0
Paint tunnel/underpass walls and ceiling				\$0
General tunnel/underpass maintenance				\$0
Railroad grade crossing maintenance	\$3,000			\$3,000
Road grade crossing maintenance	\$2,200			\$2,200
<b>Totals</b>	<b>\$146,750</b>	<b>\$13,700</b>	<b>\$32,170</b>	<b>\$192,620</b>

**Toolbox Note:**  
*The Heritage Rail Trail (aggregate/compacted stone) is approx. 21 miles in length and costs are approx. \$9,200/mile.*

The following budget was submitted for the **Capital Area Greenbelt in Harrisburg, Pennsylvania.**

Maintenance Activity	Labor cost	Donated services	Equipment & material cost materials	Donated equipment & cost for activity	Approximate total annual
Resurface non-asphalt trail		\$2,000	\$2,000	\$3,500	\$7,500
Grade non-asphalt trail					\$0
Pothole repair and other patches on non-asphalt trail		\$1,000	\$500	\$1,500	\$3,000
Snow removal from non-asphalt trail					\$0
Surface cleaning of non-asphalt trail					\$0
Keep trailside land clear of trash and debris		\$1,000	\$1,000		\$2,000
Mowing		\$2,000	\$1,000	\$2,000	\$5,000
Leaf removal					\$0
Tree pruning					\$0
Tree removal	\$500	\$800	\$200	\$1,000	\$2,500
Invasive species removal		\$1,000	\$500	\$800	\$2,300
Planting new vegetation		\$3,000	\$2,000	\$3,000	\$8,000
Application of herbicides or pesticides		\$1,000	\$300	\$1,000	\$2,300
Clearing of drainage channels and culverts		\$500	\$200	\$500	\$1,200
Surface maintenance of parking areas	\$2,000	\$1,000	\$300	\$1,000	\$4,300
General maintenance of trailheads (litter clean-up, etc.)		\$200	\$100	\$500	\$800
Landscaping / gardening at trailheads		\$3,000	\$2,000	\$3,000	\$8,000
Empty trash cans at trailheads	\$1,500		\$2,000	\$2,000	\$5,500
Maintenance of stationary toilets at trailheads (clean, empty, etc.)					\$0
Maintenance of portable toilets at trailheads (clean, empty, etc.)					\$0
Empty trash cans along trail					\$0
Maintenance of stationary toilets along trail (clean, empty, etc.)					\$0
Maintenance of portable toilets along trail (clean, empty, etc.)					\$0
Maintenance of informational kiosks (repairs, etc.)					\$0

Maintenance Activity	Labor cost	Donated services	Equipment & material cost materials	Donated equipment & cost for activity	Approximate total annual
Maintenance of picnic tables, benches, etc.					\$0
Updating information in informational kiosks		\$300	\$100	\$200	\$600
Installation of signs		\$200	\$300	\$500	\$1,000
Repair/maintenance of signs		\$200	\$300	\$500	\$1,000
Installation of pavement markings					\$0
Maintenance of pavement markings					\$0
Patrols by police agency	\$30,000				\$30,000
Patrols by non-police agency (e.g. trail watch)					\$0
Recovery from illegal acts such as dumping and vandalism					\$0
Installation of lighting	\$100		\$100		\$200
Maintenance of lighting	\$200		\$500		\$700
Installation of emergency call boxes					\$0
Maintenance of emergency call boxes					\$0
Installation of gates, bollards and fencing	\$1,000	\$200	\$100	\$20,000	\$21,300
Maintenance of gates, bollards and fencing	\$300	\$10,000	\$200	\$15,000	\$25,500
Bridge, tunnel, underpass and crossing inspection	\$50	\$50	\$50	\$50	\$200
Bridge redecking					\$0
Paint/stain/treat bridge deck or structure	\$300	\$600	\$300	\$1,000	\$2,200
General bridge maintenance	\$100	\$500	\$1,000	\$1,000	\$2,600
Tunnel lighting maintenance					\$0
Tunnel open/closed status					\$0
Paint tunnel/underpass walls and ceiling					\$0
General tunnel/underpass maintenance					\$0
Railroad grade crossing maintenance					\$0
Road grade crossing maintenance					\$0
<b>Totals</b>	<b>\$36,550</b>	<b>\$28,550</b>	<b>\$16,050</b>	<b>\$58,050</b>	<b>\$139,200</b>

**Toolbox Note:**  
*The Capital Area Greenbelt (primarily asphalt) is approx. 20 miles in length and costs are approx. \$7,000/mile.*

