

Recreational Trail Standards for HRM

Developed in partnership with HRTA, Recreational Trails Committee

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1. Trail Types and Standards

2. Trail Difficulty Rating System and Associated Standards

3. Standards for Structures

4. References

1. Trail Types and Standards

Trail Types are a description of non-motorized trail characteristics. Trail Type I has the highest amount of traffic and the most impact on the environment of the trail types. Conversely, Trail Type V has little traffic and the trail tread is minimal. Adapted from Whistler Trail Standards, Squamish Trail Standards, Parks Canada Trail Classification System, HRM Standard Detail for Active Transportation Off-Road Trail.

	Type 1	Type 2	Type 3	Type 4	Type 5
Tread surface	Paved or compacted aggregates	Compacted aggregates or mineral soil	Mineral soil/rock, on-site or imported as needed	Natural tread: on-site soil/rock	Unsurfaced Avoid grubbing
Tread width	2–4 m	1-2 m	50–100 cm	30-50 cm	30-50 cm
Cleared width	1-2 m each side (including shoulder)	0.6-1 m each side (including optional shoulder)	1–1.5 m (total)	1 m (total)	Minimal beyond tread
Cleared height (min)	3.5 m	3 m	2.4 m	2.4 m	2.4 m
Corridor width	18 m	8 m	6 m	6 m	Minimal disturbance
Typical users	Non-motorized multi-use, May be wheelchair accessible	Pedestrian, Biking	Pedestrian, Mountain biking	Pedestrian, Mountain biking	Pedestrian, Mountain biking
In-tread obstructions	None	None	Depends on difficulty rating	Depends on difficulty rating	Depends on difficulty rating

Definitions and Notes:

Tread surface: For all trail types, wood chips are not recommended as they retain moisture, rot, are easily moved by surface water and are a poor surface for wheeled trail users (strollers, wheelchairs, bicycles). Types 1 and 2 trails: Trail surface is typically outsloped rather than crowned for easier construction with large machines.

Tread width: Typical width of finished trail tread. May vary locally for types 3-5 or owing to natural terrain features.

Cleared width: Zone cleared of above-ground vegetation beside tread. Type 1 Trails: Build 50 cm wide shoulders topped with gravel or mulch in this zone.

Cleared height: Remove tree branches up to this height to the extent of the cleared width.

Corridor width: Zone within which to manage or remove obstructions that impede *sight line* or any other conditions that pose a hazard to trail users. Disturbance of vegetation and soil within the corridor may be necessary but is to be minimized.

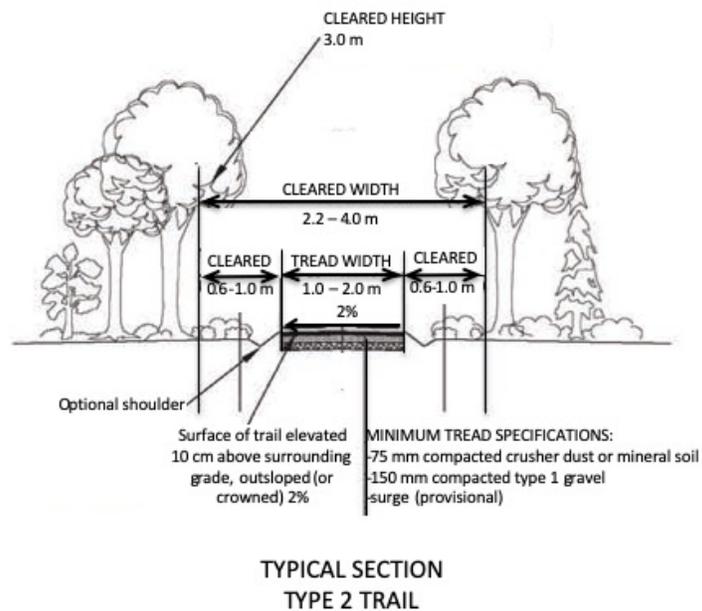
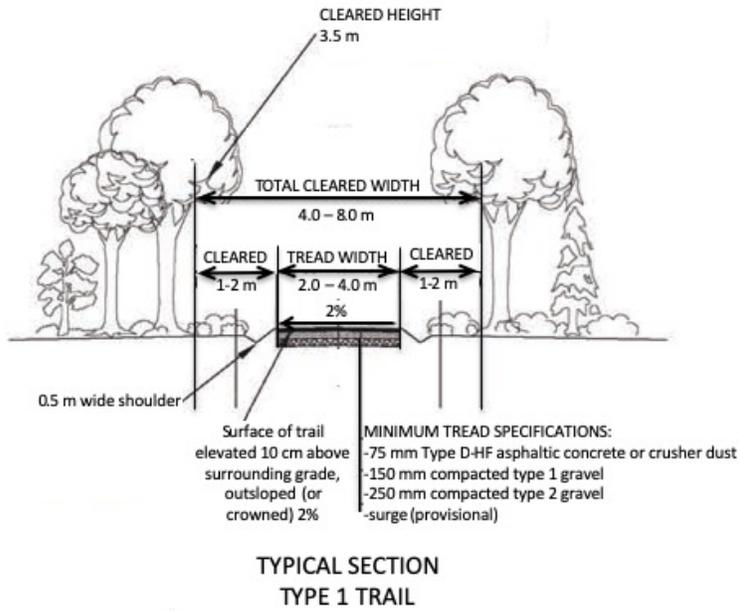
Typical users: Pedestrian includes all foot-users, eg. hiking, running, snowshoeing.

In-tread obstructions: Natural ground features such as rocks and roots.

Sight line: Distance required for trail users to see each other with sufficient time to communicate and yield if necessary. Varies with anticipated speed of trail users.

Construction of Trail Types 3 – 5: Follow: *Sustainable Trail Development A Guide to Designing and Constructing Native-surface Trails*, IMBA (link in References). Trail types 3-5 are built in highly variable natural environments using methods that are limited to builders' capacities. Reasonable efforts must be made to construct trails to standards shown, but variances may occur in sections of a trail owing to reasons of sustainability, construction feasibility, or trail user safety or experience.

Diagrams showing standards for Types 1 and 2 trails



2. Trail Difficulty Rating System and Associated Standards

Adapted from IMBA and Whistler Trail Standards and Squamish

The following trail rating system is to be used to classify trail difficulty. While initially developed for Mountain Bike trails, where hike/cycle/equestrian trails exist and only one rating system is feasible, these ratings shall be the default.

Trail Rating Designations	Green circle Easy	Blue square More difficult	Black Diamond Very difficult	Double black diamond Extremely difficult
General Description	Gentle slopes and easily avoidable obstacles such as rocks, roots and potholes.	Challenging trail with steep slopes and/or obstacles, narrower trails. Uneven trail surfaces require attention by all trail users. Some off-camber slopes on grippy granite.	Mixture of steep and off-camber slopes, numerous difficult obstacles to avoid or jump over, drop-offs and sharp corners.	A variety of challenging terrain including steep, off-camber slopes, loose trail surfaces, gaps between large boulders, drop-offs and sharp corners. Requires excellent balance, agility and control.
Typical trail type	Types 1 – 3	Types 3 – 4	Types 3 – 5	Types 3 - 5
Obstacles in tread	Max. 10 cm high	Max. 20 cm high	Exceed 20 cm high	Exceed 20 cm high
Max. average sustained grade	8% (5% for wheelchair accessible trails)	10%	15%	May exceed 15%
Maximum grade	15%, except rock faces at 25%	Climbing – 25%, Descending – 35%, Rock Surface - 45%	Climbing – 35%, Descending rock faces/ramps – 120%	May exceed 35%
Width of structures	Minimum 1.0 m Consider access for intended maintenance vehicles.	Half the height above surface below; min. 50 cm	¼ the height above surface below; min 30 cm	
Minimum curve radius	2.4 m	1.8 m	Sharp corners	Sharp corners
Drops (maximum height)	None	Drops up to 30 cm, with exit cleared of all obstacles.	Drops greater than 30 cm. Mandatory air less than 1 m.	Mandatory air.
Jumps (maximum height)	None	45 cm. No jumps with consequences for lack of speed. Table top jumps max. 40 cm. high.	Table tops, no maximum height. No gap jumps.	Same, except may include gap jumps.

3. Standards for Structures

Trail Types 1 and 2:

Structures must adhere to current standards applied by HRM Parks and Recreation.

Trail Types 3 – 5:

Structures may be built to cross wet areas, watercourses and awkward terrain, or to add interest and challenge.

WATERCOURSE CROSSINGS

Locate watercourse crossings to minimize disturbance to streambeds and banks. Sections of the waterway that are straight and where banks are stable are preferred for crossing.

Construct bridges across streams to extend beyond the top of the bank and avoid alteration of stream bed. This minimizes erosion of stream banks and sedimentation of streams. Review and adhere to Watercourse Alteration Regulations for Nova Scotia.

Structures over watercourses that appear on National Topographic Series maps must follow a pre-approved design or a custom design stamped by an engineer. Pre-approved trail bridge designs are available from the US Forest Service: https://www.fs.fed.us/recreation/programs/trail-management/documents/plans/trail_bridge_pdfs/COMBINED_STD_TRAIL_BRIDGE_PLANS.pdf

WIDTH and HEIGHT

The minimum width of a structure depends on the Trail Difficulty Rating, and is relative to the height of the structure (see table). Height is measured vertically to the lowest point within 1.0 m adjacent to structure. Tread width is the amount of flat tread.

STRENGTH and STABILITY

Each span of the structure must be capable of withstanding a centered vertical load of 225 kg (495 lb, 2 times heaviest user and gear), or the intended maintenance vehicle, whichever is greater. Every single rung should be capable of holding the weight of user and gear.

CONSTRUCTION PRACTICES

Cross bracing of vertical members is required. Acceptable fasteners, in order of preference: carriage bolts and nuts with washers, lag bolts and washers, wood screws or ardox (spiral) spikes and nails. All fasteners must be galvanized. At least half of the decking fastener's (nail or screws) length should penetrate the stringer. Loading on a member should be done in such a way as not to rely exclusively on the shear strength of the joining method.

LUMBER

Rough cut hemlock (2" thick) is recommended for decking, as it is naturally rot-resistant, provides better grip than milled lumber, and is thicker.

Rough cut hemlock or treated lumber may be used for all other components.

On-site native materials may be used where available, and where bringing in lumber is prohibitively difficult.

DECK SURFACES

Deck boards should be near-perpendicular to the direction of travel. Appropriate spacing between deck boards is 1 – 3 cm so that children will not catch their feet between boards, arms will not fit between boards and all users including dogs will use bridges as opposed to walking adjacent to the

bridge, compromising the sensitive area the bridge was intended to protect. Spacing of 3 cm is ideal to promote drainage of water and mud. Overhang deck boards past stringers by less than 5 cm.

It is recommended that wood surfaces with a slope exceeding 10° have an applied anti-slip surface. One recommended material is expanded, galvanized diamond lath. Chicken wire and rolled roofing material are not durable and roofing material traps moisture promoting premature rotting.

Guidelines for other Technical Trail Features: Refer to Whistler Trail Standards.

Trail Assessment and Repair: Refer to Sustainable Trail Development (IMBA) manual.

4. References

District of Squamish Trail Standards Manual

<http://squamish.ca/assets/Trail-Standards-Manual-0411.pdf>

Shuswap Trail Alliance – Trail Design Standards

http://www.shuswaptrailalliance.com/userfiles/file/sta_trail_design_standards_sml.pdf

Parks Canada Trail Types Classification

http://www.imbacanada.com/sites/default/files/Trail Classification System Final EN_0.pdf

Whistler Trail Standards

https://www.whistler.ca/images/stories/PDF/Resort Experience/Cycling_Committee/trail_standards_first_edition.pdf

Sustainable Trail Development: A Guide to Designing and Constructing Native Surface Trails. IMBA.

<http://crgov.com/DocumentCenter/View/1430/Sustainable-Trail-Development-Guidelines->

US Forest Service Standard Trail Plans and Specifications. United States Department of Agriculture.

<https://www.fs.fed.us/managing-land/trails/trail-management-tools/trailplans>