Environmental Services Department
Environmental Promotion and Protection Branch

MEMORANDUM

TO: Members of the York Region Accessibility Advisory Committee

FROM: Ian Buchanan, Manager, Natural Heritage and Forestry

DATE: October 30, 2013

RE: **Accessibility Design Guidelines for York Regional Forest Trails**

We are pleased to provide members of the York Region Accessibility Advisory Committee with the final Accessibility Design Guidelines for York Regional Forest Trails. Input received from the Accessibility Advisory Committee has been incorporated into the final guidelines.

These design guidelines incorporate both the legislative requirements of the Accessibility for Ontarians with Disabilities Act and best practices for trail design, construction and maintenance. Implementation of the guidelines will ensure that the York Regional Forest is accessible to all residents while protecting the natural environmental.

We would like to thank the Accessibility Advisory Committee for their assistance in the development of these design guidelines. If you require further information on the guidelines or accessibility initiatives in the York Regional Forest please contact myself or James Lane, Program Manager, Forestry at 905-830-4444 extension 5271.

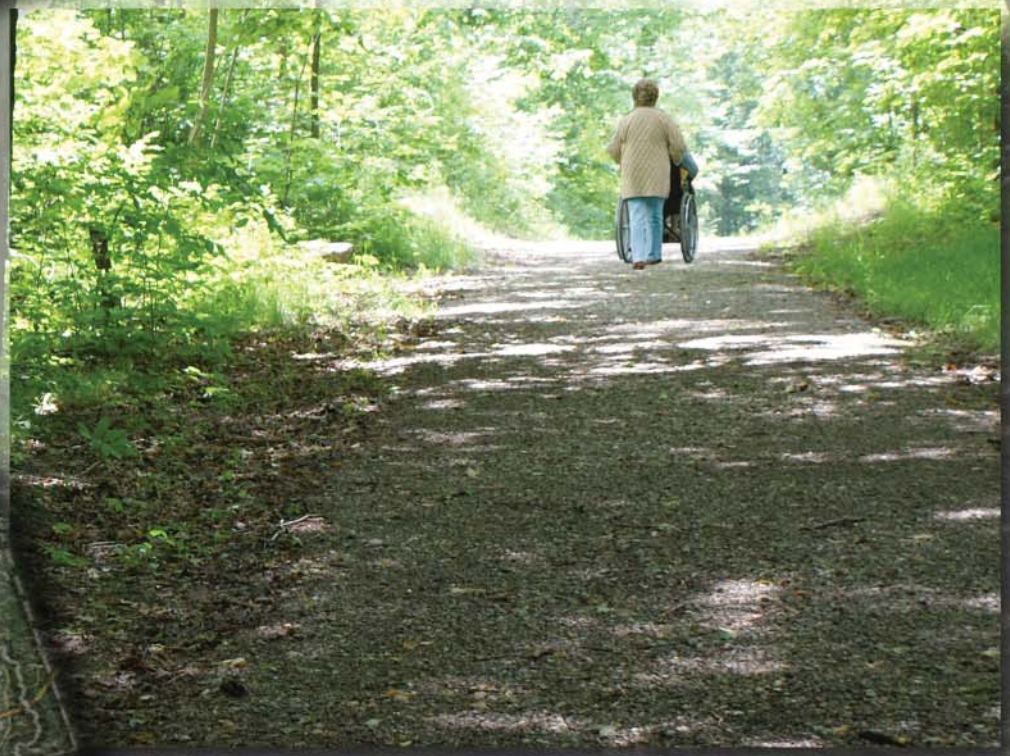
Ian Buchanan
Manager, Natural Heritage and Forestry
Phone Number: 905-830-4444 extension 5271

IB/jl

Attachment

YORK-#5229370-v1-Memo_from_Ian_Buchanan_to_YRAAC__Final_Accessiblity_Design_Guidelines_for_York_Regional_Forest_Trails

ACCESSIBILITY DESIGN GUIDELINES for YORK REGIONAL FOREST TRAILS



October 2013

York Region

York Region Forestry

Healthy Trees Healthy Communities

Prepared by:

the mbtw group

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1.0 INTRODUCTION

The York Regional Forest (YRF) contains over 120km of mapped forest access trails and provides opportunities for a variety of passive recreational activities including hiking, mountain biking, equestrian, cross country skiing, snowshoeing, and nature appreciation.

The following accessibility design guidelines for YRF trails, including best practices for multi-use trails and accessible trail design, incorporate the policies related to providing equal access for all trail activities. An important goal of these guidelines is to provide integrated recreational experiences for all visitors, with and without disabilities. Therefore, these guidelines should be used for all trails, when possible. Where full compliance with these accessibility guidelines is determined to be not feasible, trails and trail facilities will incorporate those accessible features that can be reasonably accommodated in order to provide the greatest degree of accessibility for the widest range of abilities. However, only those trails who meet all the standards can be identified as 'accessible'.

Although the building blocks of the YRF accessibility design guidelines are mostly based on wheelchair dimensions, clear space and maneuvering room, and arm reach ranges, the guidelines are intended to accommodate older adults, people with low vision, or people with other disabilities. These guidelines also provide design standards for multi-use trails to accommodate permitted uses including, but not limited to, mountain biking, walking, strollers, equestrian, and authorized motorized vehicle access.

The accessible trail design guidelines have been structured in four (4) Sections:

1. General Design Guidelines
2. Accessible Parking Facilities
3. Accessible Trail Design
4. Signage Requirements

The guidelines and standards provided in this document have been developed in consultation with the York Region Accessibility Advisory Committee, and meet or go beyond the requirements of the AODA Integrated Accessibility Standards.

2.0 CRITERIA FOR EXCEPTIONS

Characteristics of the natural environment, such as terrain, soils, and hydrology, could prevent compliance with some of the technical provisions provided in the Accessibility Design Guidelines for York Regional Forest Trails. Allowing some deviation is essential, as the outdoor environment is very different from a constructed indoor environment. Factors that influence the ability to provide fully accessible facilities, such as soil, surrounding vegetation, hydrology, terrain, and surface characteristics, are fundamental to outdoor areas. Without deviations from the technical provisions, compliance could significantly and unacceptably alter the nature of the outdoor experience.

For recreational trails that are designated for pedestrian use, regardless of the surface material used (boardwalk, pavement, dirt, concrete, asphalt, etc.), the specifications of Trail Design Sections 5.1 through 5.11 shall be met on the trail and the connecting surfaces to the trail, except where the following criteria for exception would occur:

1. The requirements, or some of them, would likely affect the cultural heritage value or interest of a property identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value or interest.

2. The requirements, or some of them, would affect the preservation of places set apart as National Historic Sites of Canada by the Minister of the Environment for Canada under the *Canada National Parks Act* (Canada).

3. The requirements, or some of them, would affect the national historic interest or significance of historic places marked or commemorated under the *Historic Sites and Monuments Act* (Canada).

4. The requirements, or some of them, might damage, directly or indirectly, the cultural heritage or natural heritage on a property included in the United Nations Educational, Scientific and Cultural Organisation's World Heritage List of sites under the *Convention Concerning the Protection of the World Cultural and Natural Heritage*.

5. There is a significant risk that the requirements, or some of them, would adversely affect water, fish, wildlife, plants, invertebrates, species at risk, ecological integrity or natural heritage values, whether the adverse effects are direct or indirect.

6. It is not practicable to comply with the requirements, or some of them, because existing physical or site constraints prohibit modification or addition of elements, spaces or features, such as where surrounding rocks bordering the recreational trail or beach access route impede achieving the required clear width.

Where an exception is permitted to a requirement that applies to a trail, the exception applies solely,

- to the particular requirement for which the exception is allowed and not to any other requirement that applies to the trail;
- to the portion of the trail for which it is claimed and not to the trail in its entirety;
- to the shortest section of trail where trail cannot comply.

The exceptions provided in this section are based on AODA Integrated Accessibility Standards.

3.0 GENERAL DESIGN GUIDELINES

Whether a new accessible trail is planned to be constructed or an existing recreational trail is intended to be redeveloped to become accessible, the general design guidelines stipulated in this section should be utilized for accessible trail design. This will help identify the best routes for construction of the trail, and the most suitable surface type and slopes to minimize environmental disturbance, while creating an enjoyable experience for all permitted users.

3.1 Site Character

The following site characteristics should be reviewed and analyzed before designing a trail:

a. Site Topography and Grading
b. Existing Drainage Patterns
c. Existing Surface and/or Base Material
d. Existing Trail Uses
e. Soil Type
f. Eroding and Hazardous Edges
g. Proximity to Wetlands and Water Courses
h. Sensitive Wildlife Habitat and Plant Communities
i. Other Ecological and Environmental Factors

3.2 Trail Route Selection

When selecting trail routes, the following criteria should be adhered to:

a. environmental disruption and removal should be minimized.
b. environmental sensitive areas should be avoided.
c. when accessible trails exceed 2km in length, relief routes should be considered.
d. forks and cross roads should be avoided to minimize confusion (if unavoidable, ensure clear signage and wayfinding)
e. where possible, consideration should be given to upgrading existing trails instead of constructing new routes,
f. where possible, locations with minimal slopes/topography should be used for accessible trail construction. However, sufficient slope shall be provided to allow adequate drainage of the trail while achieving these guidelines.

4.0 ACCESSIBLE PARKING FACILITIES

Accessible parking spaces shall be provided at each tract with an accessible trail. An accessible route shall be provided to connect the accessible parking to the accessible trail entrance. In this section, we overview the requirements of accessible routes and design requirements for accessible parking spaces, including: location, size, slopes, clearances, and required number of parking spaces.

4.1 Accessible Routes

An accessible route shall:

a. be provided from the accessible trail parking to the accessible trail entrance and be part of the shortest accessible route possible to the entrance.

b. be a maximum of 30m in length, where possible, from the accessible parking spaces to the accessible trail entrance.

c. wherever possible, be designed to avoid entering the vehicular entry routes and drives.

d. wherever possible, be designed to ensure clear and unobstructed views from accessible parking spaces to the accessible trail entrance.

e. have a firm, stable, and slip resistant surface.

f. have a minimum clear width of 1800mm, where possible, with an absolute minimum width of 1200mm.

g. have a height clearance of at least 2750mm.

h. have a running slope:
- not exceeding 1:20 (5%), unless one or more of the criteria for exceptions applies as noted in Section 2.0, Criteria for Exceptions, and in no case exceeding 1:10 (10%).
- equal to or less than the cross slope, where possible, to maintain sheet drainage.

i. have a cross slope not exceeding 1:20 (5%), unless one or more of the criteria for exceptions applies as noted in Section 2.0, Criteria for Exceptions, and in no case exceeding 1:10 (10%).

j. have a total slope of - running slope plus cross slope - not exceeding 1:6.67 (15%).

All dimensions are in 'millimeter' except noted otherwise.

4.2 Accessible Parking Spaces

Accessible parking spaces shall:

a. be located on an accessible route to the trail and, where possible, be provided within 30m of the main accessible trail entrance.

b. have a firm, stable, and slip resistant surface.

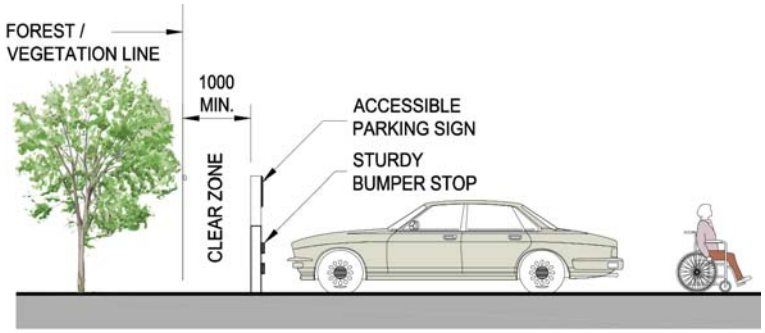
c. have a maximum running slope of 1:20 (5%).

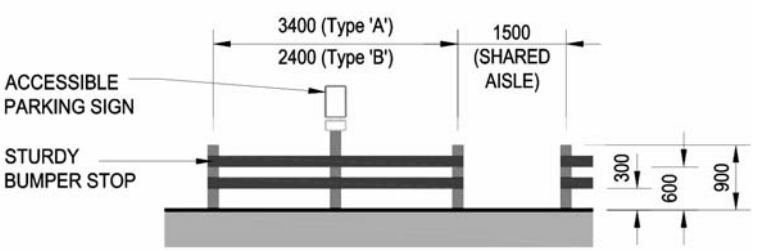
d. have a maximum cross slope of 1:20 (5%).

e. incorporate post-mounted designated signage according to the requirements of Section 6.2, Parking Signs.

f. maintain minimum 1.0m clearance zone from surrounding forest/ vegetation.

g. provide sturdy bumper stop at 300mm and 600mm above ground





All dimensions are in 'millimeter' except noted otherwise.

4.3 Parking Space Size

The following two types of parking spaces shall be provided at each Accessible Trail Parking:

a. Type 'A', a wider parking space which has a minimum width of 3400mm and signage that identifies the space as "Van Accessible".

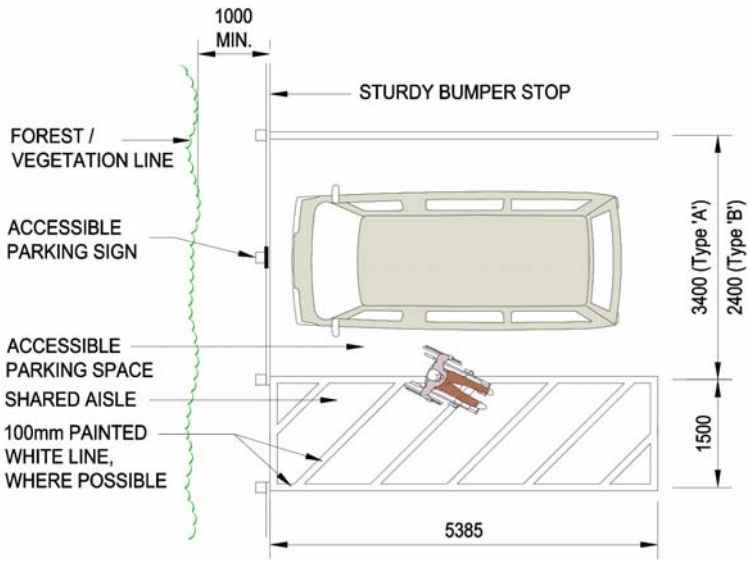
b. Type 'B', a standard parking space which has a minimum width of 2400mm.

Accessible parking spaces shall:

c. be at least 5385mm long.

d. have an access aisle of at least 1500mm wide, which may be shared by two parking spaces.

e. have a height clearance of at least 2750mm for Type 'A' and 2100mm for Type 'B' at the parking space and along accessible route to trail entrance.



4.4 Number of Parking Spaces

Provide a minimum number of accessible parking spaces in each parking area as follows:

Total Parking Spaces Provided	Minimum Accessible Parking Spaces Required
1-75	3 (1 Type 'A' and 2 Type 'B')
Over 75	Min. 4% Accessible (50% Type 'A' & 50% Type 'B')

5.0 ACCESSIBLE TRAIL DESIGN

All dimensions are in 'millimeter' except noted otherwise.

This section provides detailed technical information for design of accessible trails including trail width, slopes, surface type, safety measures and clearances, resting intervals and seating requirements, trail furniture, and site drainage. In addition, technical requirements for design of accessible multi-use trails have been provided in this section.

5.1 Trail Width and Passing Spaces

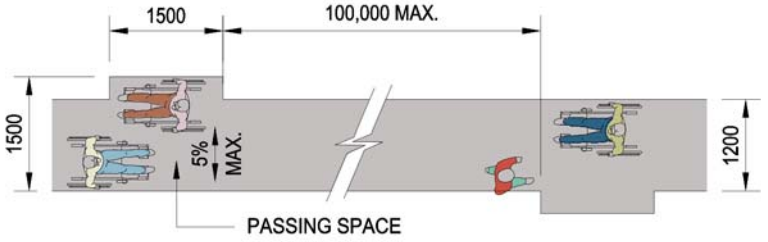
a. The entrance to a trail must provide a clear opening of between 850mm and 1000mm, whether the entrance includes a gate, bollard or other entrance design.

b. The minimum width of the trail surface shall be 1500mm. This is the space required for a wheelchair to make a 180-degree turn in a clear space, or the width required for two wheelchairs to pass comfortably and safely on a trail.

c. Should one or more of the criteria for exception outlined in Section 2.0, Criteria for Exception, be met, the trail width may be reduced to 1200mm provided that passing spaces are provided at intervals not to exceed 100m and the reduced width shall occur for the shortest distance possible.

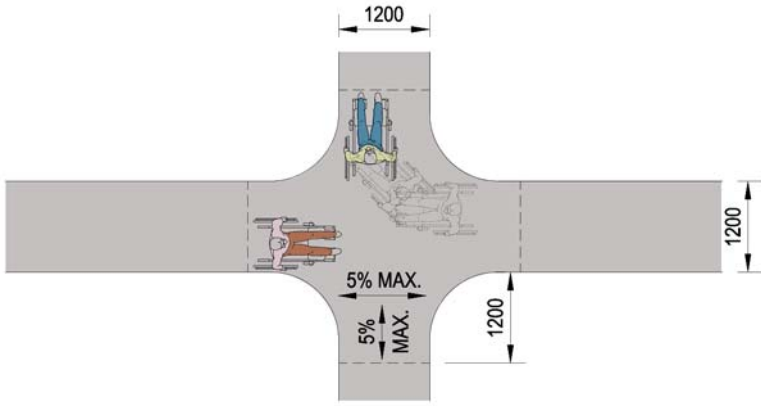
d. Passing spaces shall be at least 1500mm wide and 1500mm long.

e. The cross slope of passing spaces shall not exceed 1:20 (5%).



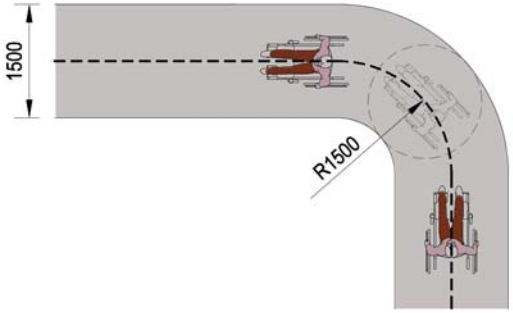
All dimensions are in 'millimeter' except noted otherwise.

f. An intersection of two trails ('T' or '+' shaped) can also be used as a passing space, provided that the arms of the intersection extend at least 1200mm beyond intersection with a slope not exceeding 1:20 (5%) in any direction.



5.2 Turning Radius

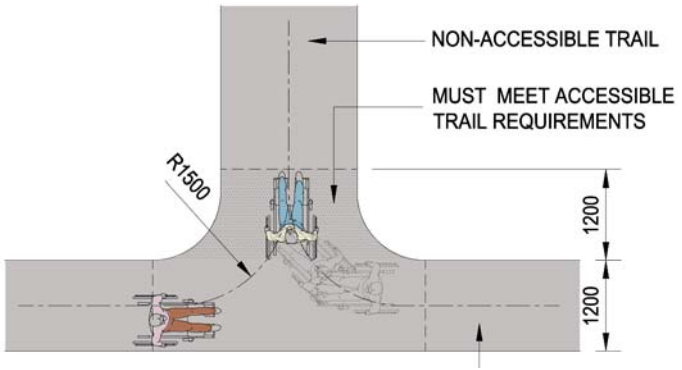
a. The turning radius or turning circle of a mobility device is the size of the smallest circular turn that the mobility device is capable of making. The minimum turning radius required at the centre of the trail shall be 1500mm.



5.3 Intersection with Non-Accessible Trails

a. Where an accessible trail meets a non-accessible trail, signage shall be posted according to Section 6.0, Signage Requirements.

b. If an arm of a non-accessible route is used as a passing space, it shall meet the slope, width, and surface type requirements of an accessible trail for the portion used as a passing space according to Section 5.1.f.

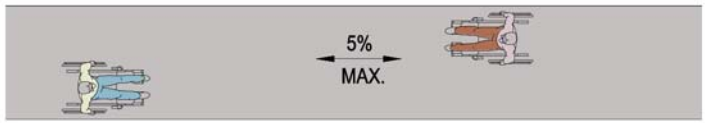


All dimensions are in 'millimeter' except noted otherwise.

5.4 Trail Route Gradient

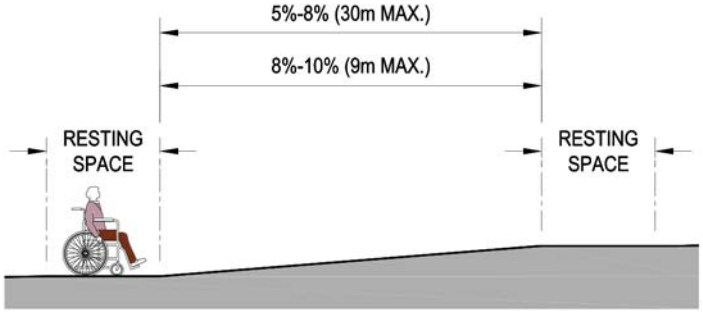
5.4.1 Running Slope

a. The running slope is recommended to be maximum 1:20 (5%) and in no case greater than 1:10 (10%), unless one ore more of the criteria for exceptions outlined in Section 2.0, Criteria for Exceptions, applies.

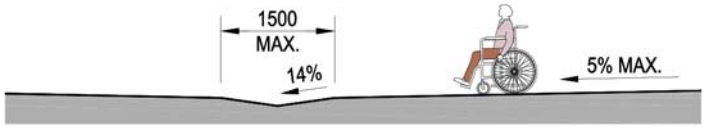


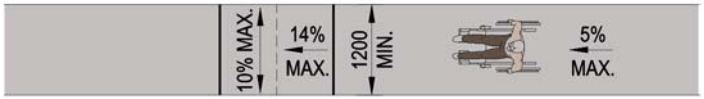
b. Where a greater slope than 5% is used, resting spaces shall be provided according to the requirements of Section 5.6, Resting Intervals, for the slopes noted below:

i. 1:12 (8%) for up to maximum 30m.
ii. 1:10 (10%) for up to maximum 9m.



c. At the bottom of open drainage structure, the running slope may be a maximum of 1:7.1 (14%) for a distance of 1500mm where cross slope does not exceed 1:10 (10%).





d. No more than 30% of the total length of the trail may exceed a grade of 1:12 (8%)

e. The total slope of running and cross slopes shall not exceed 1:6.67 (15%). For example, a trail surface having a running slope of 6% cannot have a cross slope greater than 9% (6%+9%=15%).

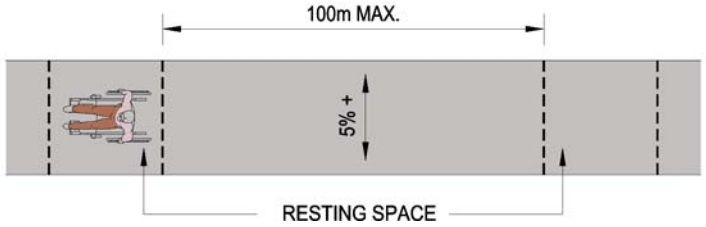
All dimensions are in 'millimeter' except noted otherwise.

5.4.2 Cross Slope

a. The cross slope is recommended to be maximum 1:20 (5%) and in no case greater than 1:10 (10%), unless one ore more of the criteria for exceptions outlined in Section 2.0, Criteria for Exceptions, applies.

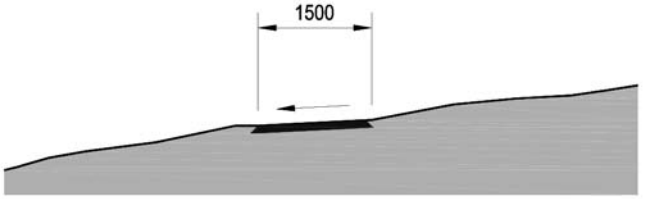
b. The total slope of running and cross slopes shall not exceed 1:6.67 (15%).

c. Where the trail cross slope exceeds 5%, a level rest area shall be provided every 100m according to the requirements of Section 5.6, Resting Intervals.

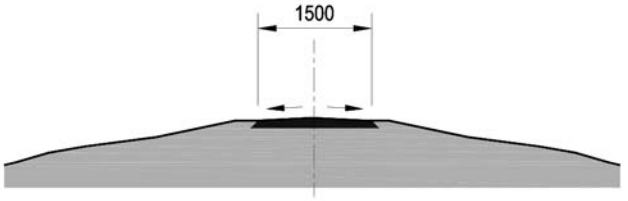


5.5 Trail Drainage

a. Where possible, the cross slope shall be equal or greater than the running slope to maintain sheet drainage from one side of the trail to the other. The trail can also be crowned along the centre line to drain water away to either side of the trail.



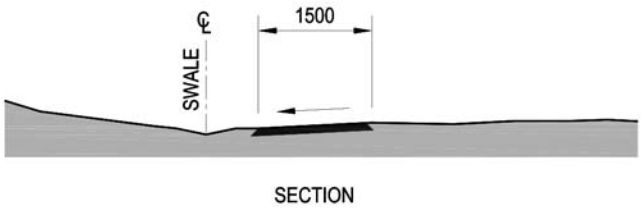
SHEET DRAINAGE



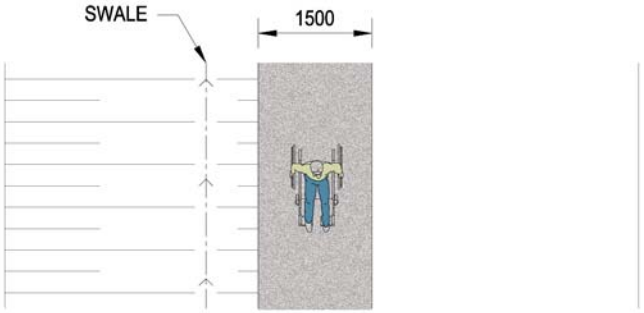
CENTRE LINE CROWNED

All dimensions are in 'millimeter' except noted otherwise.

b. Swales can be used to drain water away from the trail and to facilitate runoff infiltration into the soil.

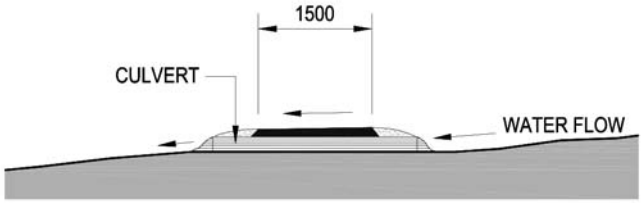


SECTION



PLAN

c. Culverts can be used to allow water to flow under the trail, where trail is acting as an obstruction to water flow.



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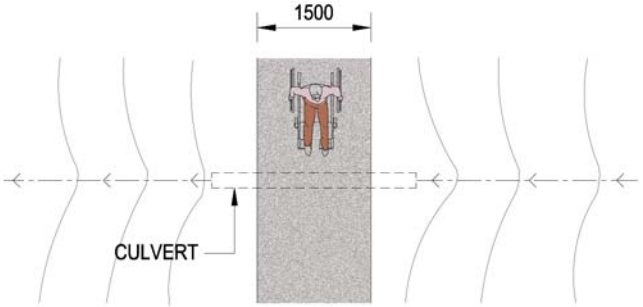

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All dimensions are in 'millimeter' except noted otherwise.

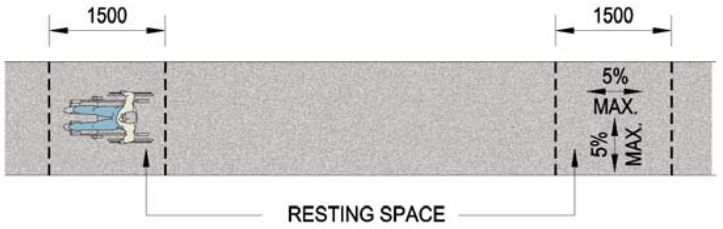
5.6 Resting Intervals

a. Where the trail running slope exceeds 1:20 (5%), resting intervals shall be provided according to the distances specified in Clause 5.4.1.b.

b. Where the trail cross slope exceeds 1:20 (5%), a level rest area shall be provided according to the distance specified in Clause 5.4.2.c.

c. Resting intervals shall be at least 1500mm long and at least as wide as the trail leading into it. Depending on the design and location, the intersection of two trails may act as a resting interval.

d. The slopes of a resting interval shall not exceed 1:20 (5%) in any direction.



5.7 Seating Requirements

a. Intervals for bench spacing should respect the requirements of the permitted trail user groups, with no intervals longer than 350m.

5.8 Trail Surface

a. The surface of the trail shall be firm, stable, and produce minimal glare.

b. The surface of the trail shall be resistant to damage by normally occurring weather conditions and able to sustain the wear and tear produced by normally permitted uses between planned maintenance cycles.

c. Paving with asphalt or concrete is appropriate for highly developed areas. For less developed settings (natural areas), recycled/crushed concrete, crushed gravel, packed soil, and other natural materials can provide a firm and stable surface suitable for accessible trails. Natural materials also can be combined, if suitable, with synthetic bonding materials that provide stability and firmness.

d. Crushed aggregate treads can be constructed by mechanically compacted crushed rock that contains a range of particle sizes (typically 2 cm or less, including a proportion of crushed fines).

e. Please refer to Appendix 'B' for Typical Trail Details and refer to Appendix 'C' for Material Specifications.

f. Trail surfaces are to be constructed to minimize maintenance requirements while providing a firm and stable surface. For crushed aggregate trails, ensure that sufficient drainage is provided through grading to minimize erosion. For asphalt or concrete surfaces ensure that an appropriate aggregate base is provided to minimize winter heaving.

Asphalt

Concrete

Recycled Concrete

Crushed Gravel

Limestone Screenings

All dimensions are in 'millimeter' except noted otherwise.

5.9 Hazards, Safety Measures, and Obstacles

5.9.1 Edge Protection and Safety Shoulder

a. Edge protection shall be provided on boardwalks, bridges, culvert crossings, or other trails or paths adjacent to water. Edge protection can be a raised curb, wall, railing, or other projecting surface that defines the edge of a travel surface and helps keep people and assistive devices from accidentally falling off the edge.

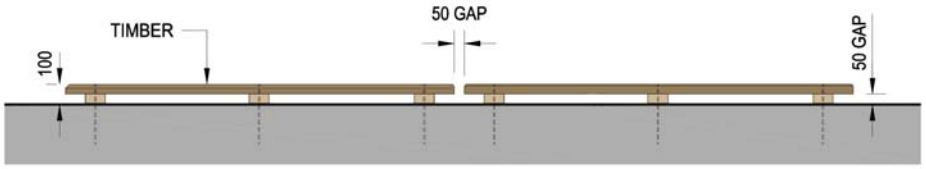
b. When an accessible trail is located adjacent to a slope, for the safety of the users, a safety shoulder - with a material different from the trail surface material - or edge protection shall be provided between the edge of the trail and top of slope.

c. Where edge protection is provided, the edge shall:

   i. be at least 100mm high, since a lower surface might not be obvious or detectable to people with limited vision, those who walk with the assistance of canes, or persons using wheeled mobility devices.

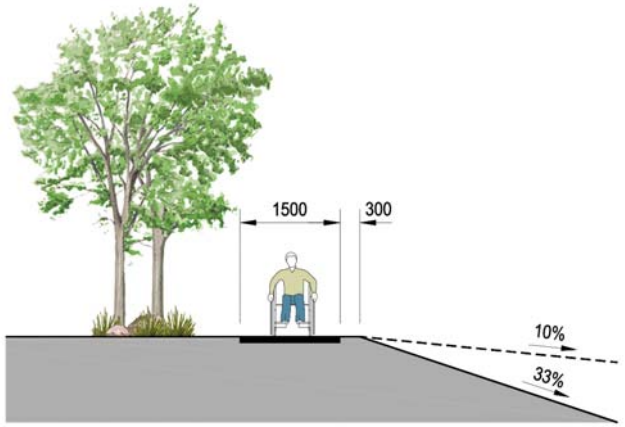
   ii. have a colour contrasted from the background and comply with Section 6.1.2, Colour/Tonal Contrast.

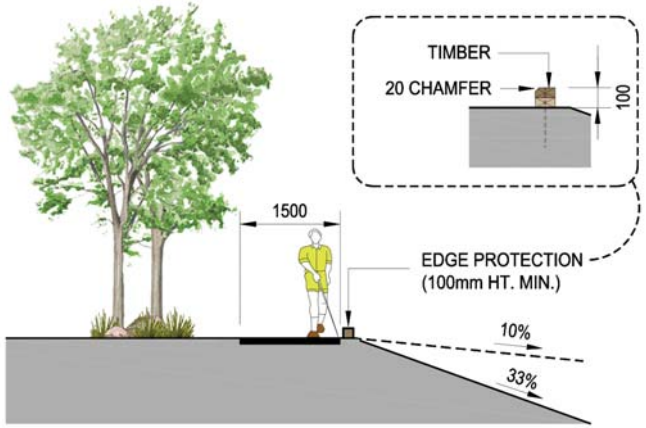
   ii. be designed so as not to impede drainage of the trail surface.



All dimensions are in 'millimeter' except noted otherwise.

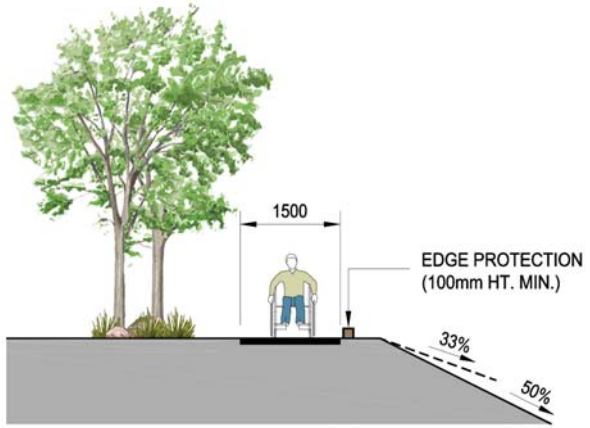
d. If a trail is adjacent to a slope of between 10:1 (10%) and 3:1 (33%), a 300mm wide safety shoulder or a 100mm high edge protection shall be provided.



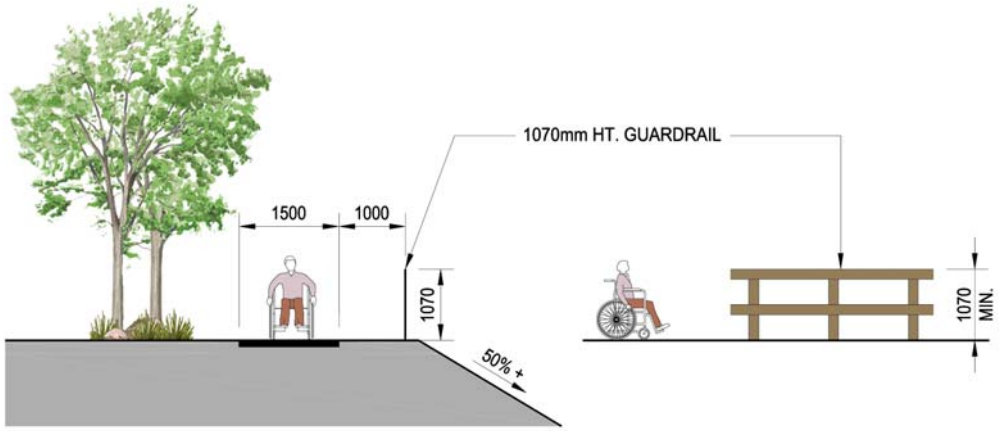


All dimensions are in 'millimeter' except noted otherwise.

e. If a trail is adjacent to a slope of between 3:1 (33%) and 2:1 (50%), a 100mm high edge protection shall be provided.

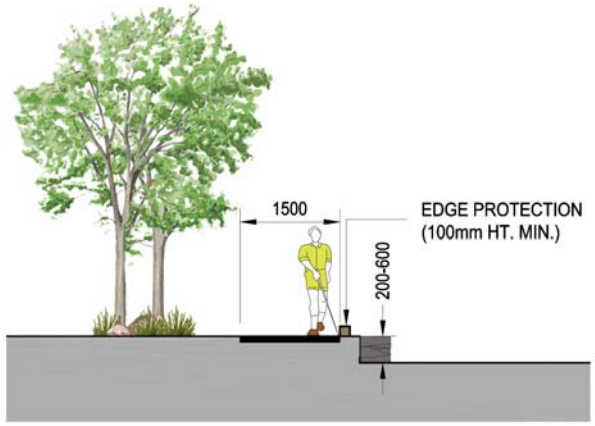


f. If a trail is adjacent to a slope of 2:1 (50%) or greater, a guard rail with a minimum height of 1070mm shall be provided with a setback of at least 1.0m from the trail tread.

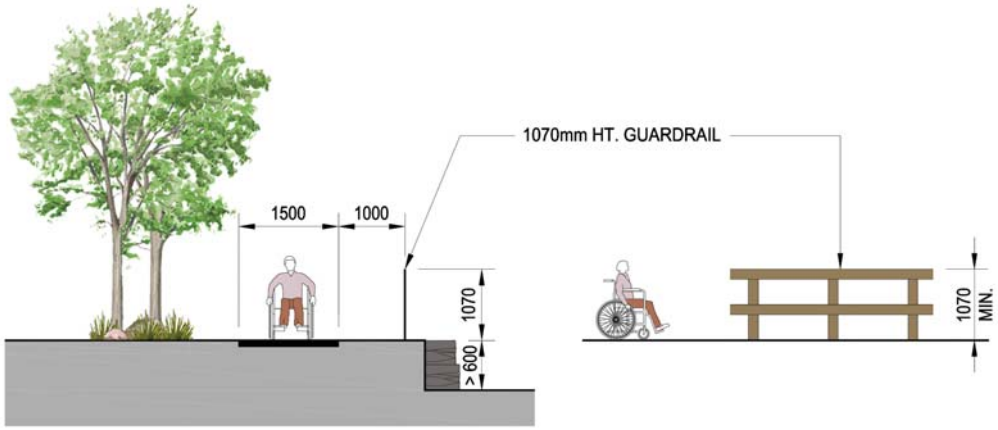


All dimensions are in 'millimeter' except noted otherwise.

g. A 100mm high edge protection shall be provided where there is a grade differential between 200mm and 600mm.



h. Where there is a fall height of 600mm or greater, a guard rail with a minimum height of 1070mm shall be provided with a setback of at least 1.0m from the trail tread.



5.9.2 Tread Obstacles on Trails

a. A tread obstacle is anything that interrupts the evenness of the tread surface. On trails, tread obstacles often occur as a result of roots, ruts, and rocks in the tread surface. Tread obstacles cannot be more than 50mm in height. This requirement minimizes the chance that someone who uses a mobility device, or a person who shuffles their feet while walking, falling over or turning an ankle when crossing a tread obstacle.

All dimensions are in 'millimeter' except noted otherwise.

5.9.3 Protruding Objects and Clearances

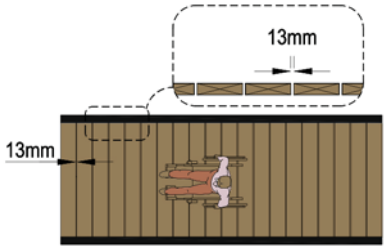
a. Protruding objects extend into the clear width area of a trail from beside or above the trail. Leaning tree trunks, rock ledges, and branches are common protruding objects. There shall be at least 2100mm of clear headroom above trails.

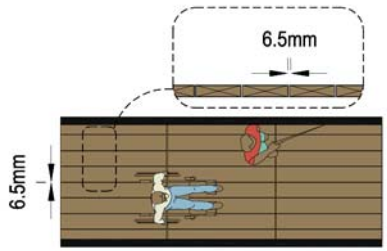
5.9.4 Openings on Trail Surface

a. Openings in the trail surface (e.g., grates or spaces between boards on a boardwalk) shall be designed so as not to allow any permitted users or their assistive devices to sink below the level of the surrounding trail surface.

b. Elongated openings shall be placed so that the long dimension runs perpendicular or diagonal to the primary direction of travel. The opening shall not allow passage of a sphere 20mm in diameter.

i. Elongated openings are permitted to be parallel to the dominant direction of travel where opening does not allow passage of a 6.5mm diameter sphere and surface is constructed to ensure adequate drainage of water and debris from the trail tread.





All dimensions are in 'millimeter' except noted otherwise.

5.10 Multi-use Trails

The guidelines provided in this document are intended to provide guidance for designing accessible trails for pedestrians, with or without disabilities. These guidelines also provide design standards for multi-use trails to accommodate permitted uses such as mountain biking, equestrian, hiking, strollers, and authorized motorized vehicle access. Where accessible trails are multi-use, the following guidelines should apply and proper signage shall be provided according to Section 6.0, Signage Requirements.

5.10.1 Accessible Multi-use Trails

The guidelines for accessible multi-use trails are, in general, the same as those for accessible pedestrian trails, as these users will address requirements of most other users. However, the following recommendations for designing safe and enjoyable trails for mountain bicyclists and equestrians should also be considered when designing accessible multi-use trails in York Regional Forest:

a. *Width:* The width of the multi-use trail surface is recommended to be minimum 3000mm to accommodate maintenance and emergency vehicles. Where providing 3000mm trail width is not practical, it may be reduced to a minimum of 2400mm.

b. *Running Slope:* The running slope of multi-use trails shall be governed by Section 5.4.1, Running Slope.

c. *Cross Slope:* The trail shall be sloped in one direction rather than having a crown in the middle of the trail. The cross slope of multi-use trails shall be governed by Section 5.4.2, Cross Slope.

d. *Edge Protection:* Some types of edge protection may be hazardous to bicyclists, particularly raised surface elements, curbs or rails that are located immediately adjacent to the travel surface. Multi-use trails proposed in York Regional Forest should consider the safety needs of these users. As a general rule, curbs should not be less than 100mm in height. If guardrails are desired for safety reasons, they should be at least 1070mm high and set back minimum 1.0m from the tread.

All dimensions are in 'millimeter' except noted otherwise.

e. *Obstacles:* Bicyclists and equestrians tend to have a higher vertical profile than do other trail users. As a result, the vertical clearance on multi-use trails shall be:

i. a minimum of 3600mm to accommodate equestrian trail users. Where providing 3600mm vertical clearance is not practical, it may be reduced to a minimum of 3000mm.

ii. a minimum of 3000mm to accommodate mountain bicycles. Where providing 3000mm vertical clearance is not practical, it may be reduced to a minimum of 2400mm.

iii. while tread obstacles, as explained in Section 5.9.3, Tread Obstacles on Trails, are often barriers to trail users in wheelchairs, they are hazardous to bicyclists and should be avoided on multi-use trails.

iv. the number of openings in multi-use trail surfaces should be minimized and openings, large enough to permit a bicycle wheel to enter, should be avoided.

v. vegetation on either side of the trail shall be cleared for a minimum of 600mm.

All dimensions are in 'millimeter' except noted otherwise.

5.11 Trail Furniture

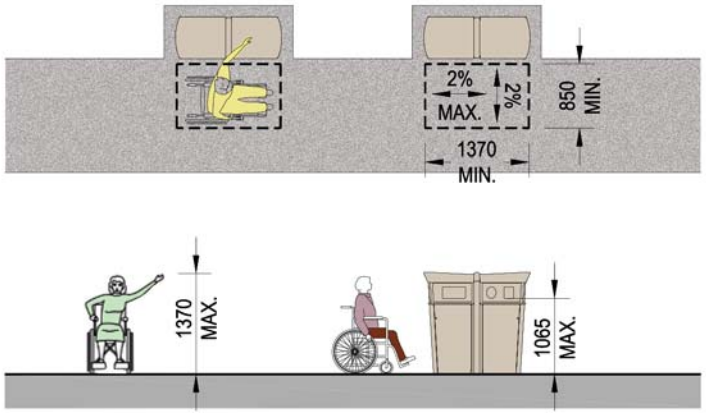
5.11.1 Waste Receptacles

Trash and recycling containers should be located at the trailheads.

a. *Controls:* In order to be easily operable with one hand, controls must not require tight grasping, pinching or twisting. This does not apply to hinged lids and controls that are designed to keep out large animals such as bears.

b. *Opening:* The waste receptacle opening is recommended to be no higher than 1065mm from grade, but it is acceptable for the opening to be higher to a maximum of 1300mm from grade.

c. *Clear Ground Space:* A clear ground space that is at least 850mm by 1370mm shall be provided in front of the containers. The surface of the clear space must be firm and stable with a slope that does not exceed 2% in any direction.

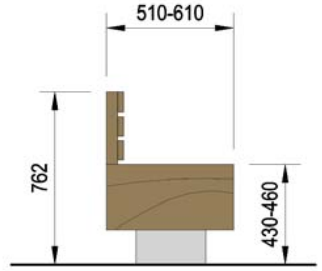


5.11.2 Benches

All dimensions are in 'millimeter' except noted otherwise.

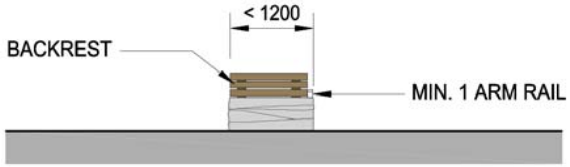
a. Where permanent benches are provided, they shall:

i. be 510mm to 610mm deep, 430mm to 460mm above the finished grade, with a backrest of 762mm in height.

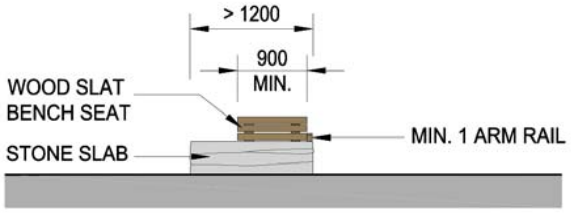


ii. provide minimum 1 arm rail.

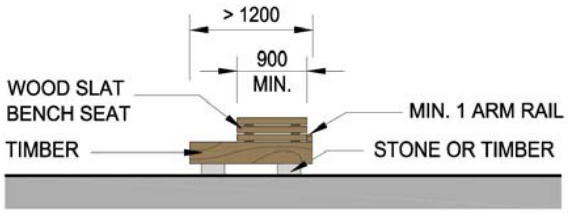
iii. provide a backrest for entire length of bench, if bench is 1200mm in length or less, unless the bench is permanently located against an upright structure.



iv. provide a backrest which is minimum 900mm in length, if bench is longer than 1200mm.

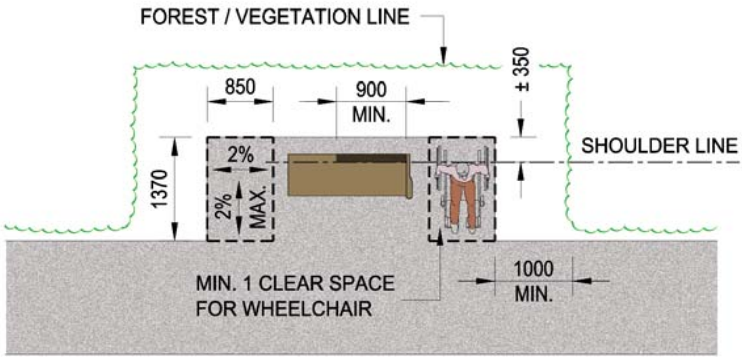


v. have a colour (not green) contrasted from the background and comply with Section 6.1.2, Colour/Tonal Contrast.



b. At least one clear ground space that is at least 850mm x 1370mm shall be provided at one end of the bench and positioned to allow wheelchair users to be seated shoulder-to-shoulder with an individual seated on the bench. The surface of the clear space shall be firm and stable, and have no slope exceeding 2% in any direction. Maintain minimum 1.0m clearance zone from surrounding forest/vegetation.

All dimensions are in 'millimeter' except noted otherwise.



6.0 SIGNAGE REQUIREMENTS

In this section, general technical requirements for signage design have been provided. Required signage includes parking, directional, information, warning, and wayfinding signs. Except where noted, all signs in this section have been customized for YRF Trails.

6.1 General Requirements

6.1.1 Signage for general orientation and the provision of information shall:

a. use letters that are universal, specifically sans serif font upper and lower case.

b. use numbers that are universal, specifically Arabic font and have a width-to-height ratio between 3:5 and 1:1.

c. have a stroke-width-to-height ratio between 1:5 and 1:10.

d. have letters, numbers, pictograms, and symbols that comply with the following Table for height and viewing distance:

Minimum Character Height (mm)	Maximum Viewing Distance (mm)
200 mm	6000 mm
150 mm	4600 mm
100 mm	2500 mm
75 mm	2300 mm
50 mm	1500 mm
25 mm	750 mm

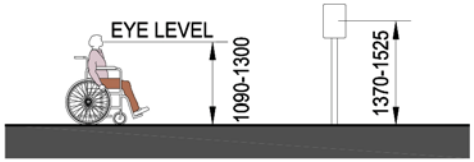
All dimensions are in 'millimeter' except noted otherwise.

e. be finished with a matte or other glare-free surface.

f. be positioned to avoid shadow areas and glare.

g. have a colour contrasted from the background and comply with Section 6.1.2, Colour/Tonal Contrast.

i. the centre of all directional signage and location signage should be mounted at eye-level, between 1370mm and 1525mm high.



6.1.2 Colour/Tonal Contrast

a. Where high visual colour/tonal contrast is required to distinguish an element from its surroundings, the difference in tone shall be at least 70%, and this may be achieved through the use of either light on dark or dark on light.

b. Yellow is the most visible color from a distance and, since it also traditionally signals caution, it can be used for warning signs and in objects that are used to caution approaching persons.

All dimensions are in 'millimeter' except noted otherwise.

6.2 Off-Trail Signs

6.2.1 Roadside Accessible Trail Sign

A Roadside Accessible Trail Sign shall be placed at the entrance to the York Regional Forest Tract from the main road to inform that an accessible trail exists in the tract. Signage shall:

a. incorporate the International Symbol of Access.

b. be at least 300mm wide and 450mm high.

c. meet the requirements of Section 6.1, Signage Requirements.

6.2.2 Directional Signage to Accessible Trail Parking

Where the location of designated accessible parking spaces is not obvious or is distant from the approach viewpoints, directional signage shall:

a. be placed along the route leading to the designated parking spaces.

b. incorporate the International Symbol of Access and the appropriate directional arrows.

c. be at least 300mm wide and 450mm high.

d. meet the requirements of Section 6.1, Signage Requirements.

All dimensions are in 'millimeter' except noted otherwise.

6.2.3 Directional Signage to Accessible Trail Location

Where the location of the accessible trail is not obvious or is distant from the approach viewpoints, and/or the accessible parking spaces, directional signs shall:

a. be placed along the route leading to the nearest accessible trail entrance.

b. incorporate the International Symbol of Access and the appropriate directional arrows.

c. be at least 300mm wide and 450mm high.

d. meet the requirements of Section 6.1, Signage Requirements.

6.2.4 Accessible Parking Signage Placement

Each accessible parking space shall be designated with signage that is:

a. mounted vertically on a post that is colour contrasted with the surrounding and background environment.

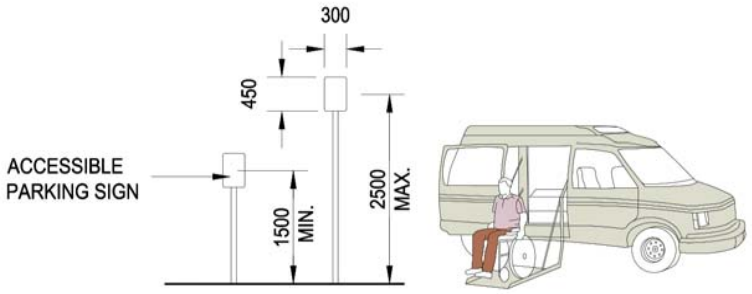
b. colour contrasted from the background and complies with Section 6.1.2, Colour/Tonal Contrast.

c. at least 300mm wide and 450mm high.

Ontario Traffic Manual (OTM) Sign# Rb-93

All dimensions are in 'millimeter' except noted otherwise.

d. installed at a height of 1500mm to 2500mm from the ground/floor surface to the centre line of the sign.



e. for perpendicular or angled parking, centred on and at the front of the parking space.

f. for parallel parking, located adjacent to and toward the front of the parking space.

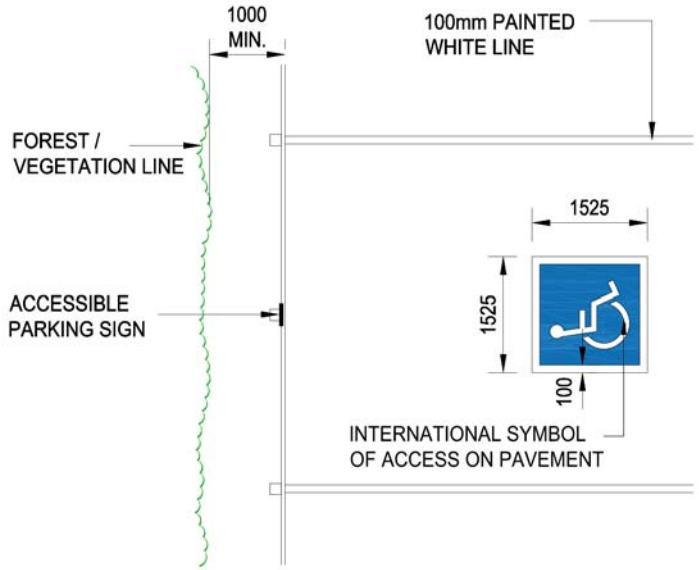
g. where possible, incorporated with pavement markings that:

i. are located near the back of the designated parking space for 90° or angled parking, and centered on the parking space for parallel parking spaces.

ii. are 1525mm wide by 1525mm deep.

iii. have a white border with a blue background filled colour.

iv. contain the International Symbol of Access.



All dimensions are in 'millimeter' except noted otherwise.

6.3 On-Trail Signs

a. Information shall be provided at each designated entry point to a trail, that:

i. objectively describes the typical conditions of the trail tread (length of trail, average and maximum running slope and cross slope, average and minimum width, and type and firmness of surface).

ii. objectively describes any extreme conditions (e.g., steep slopes, narrow widths) or obstacles that occur on the trail. Where an aerial map of the trail is provided, the location of specific trail conditions and obstacles should be identified on the map.

iii. states the condition of the trail when it was constructed or assessed including the construction or assessment date.

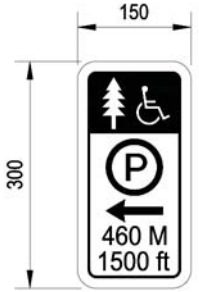
iv. shows current location on a map of the trail (i.e. 'You Are Here').

v. shows location of amenities, where provided.

vi. can be independently accessed by users of all abilities before the user embarks on the trail.

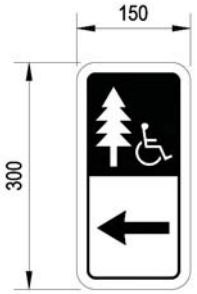
a) where possible, provide a tactile map (e.g. map with a raised outline) of all trails and features at the start of the trail.

b. *Accessible Trail Parking Distance Sign* shall be provided at major trail intersections, to identify the direction and distance back to the parking lot.

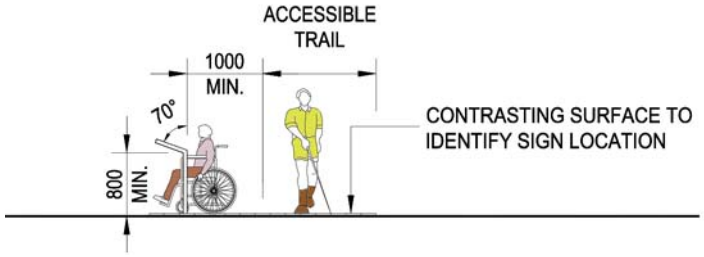


All dimensions are in 'millimeter' except noted otherwise.

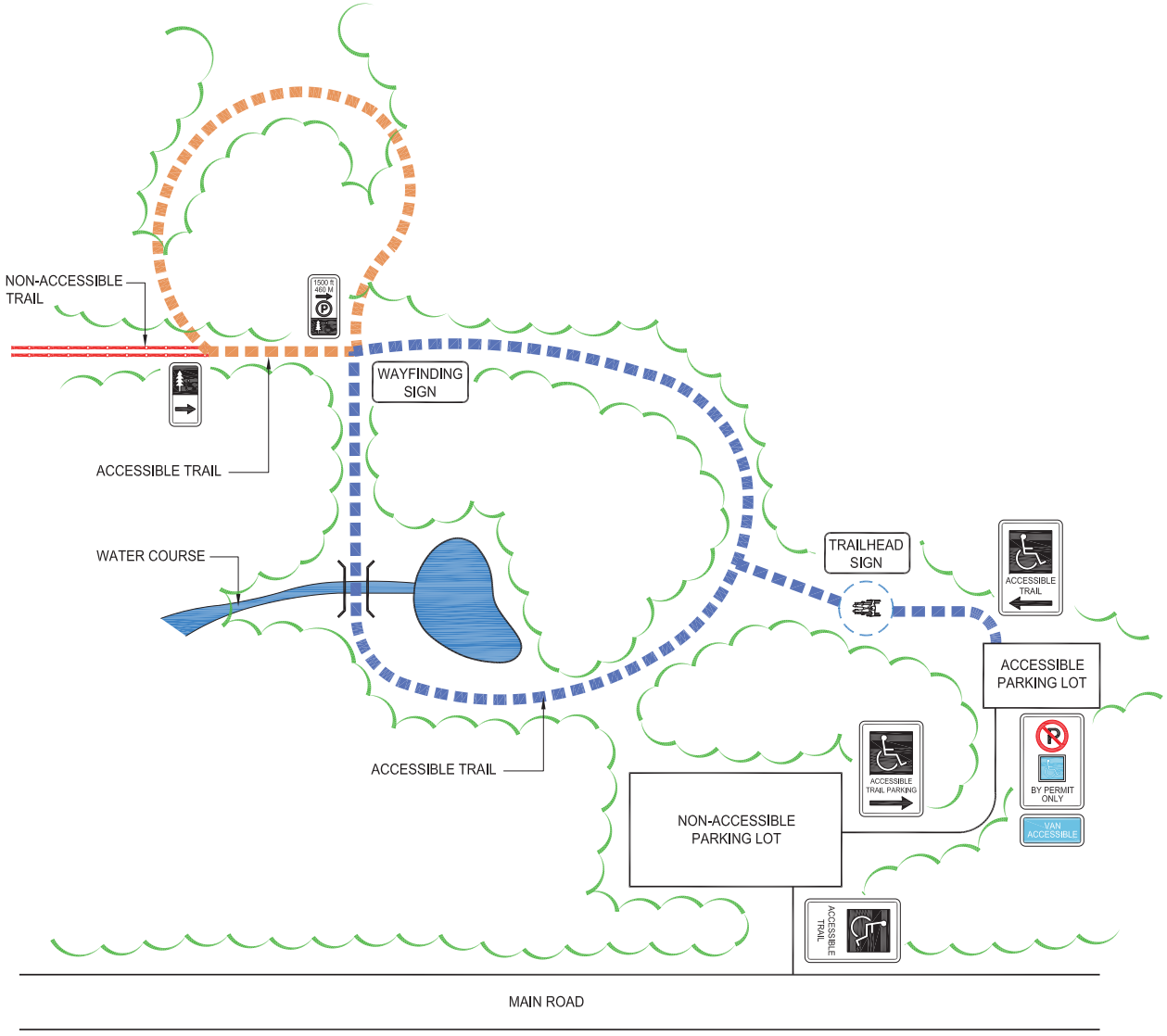
c. *Accessible Trail Direction Sign* shall be provided at intersections of accessible trails with non-accessible trails, to identify accessible trail routes. In addition to trail signage, a distinct change in surface type shall be provided at the intersection of accessible and non-accessible trails to further identify accessible trail routes.



d. Where provided, interpretative sign panels should show current location on a map of the trail (i.e. 'You Are Here'), and identifying all accessible and non-accessible routes, parking lot, and seating/resting areas.



e. Where regulatory signage is provided for trail users or signage that is not regulatory is provided to indicate risks, it shall be designed to be easily understood and detectable by users of all abilities (i.e. people with limited vision can independently know that the sign exists and what it says and people with limited language skills can understand the meaning), and shall meet the requirements of Section 6.1, Signage Requirements.



Schematic Trail Signage Layout Plan

Appendix 'A' - Accessible Trail Design Guidelines Summary

Accessible Parking Facilities

			AODA Integrated Accessibility Standards	York Region Guidelines		
Guideline	**Page**	**Description**	**Requirement**	**Requirement**	**Exceptions Allowed**	**Reference**
4.0	**6**	**ACCESSIBLE PARKING FACILITIES**				
4.1	***6***	***Accessible Routes***				
4.1.b	6	Distance from Accessible Parking to Entrance	-	30m Max. (Recommended)	Yes	ABES / TADG
4.1.f	6	Accessible Route, Clear Width	-	1800mm Min.	1200mm Min.	ABES
4.1.g	6	Accessible Route, Clear Height	-	2750mm Min.	-	TADG
4.1.h	6	Accessible Route, Running Slope	-	5% Max.	10% Max.	ABES
4.1.i	6	Accessible Route, Cross Slope	-	5% Max.	10% Max.	ABES
4.1.j	6	Accessible Route, Running Slope + Cross Slope	-	15% Max.	-	ABES
4.2	***7***	***Accessible Parking Spaces***				
4.2.c	7	Accessible Parking Space, Running Slope	-	5% Max.	-	ABES
4.2.d	7	Accessible Parking Space, Cross Slope	-	5% Max.	-	ABES
4.2.f	7	Clearance Zone from Surrounding Vegetation	-	1m Min.	-	-
4.3	***8***	***Parking Space Size***				
4.3.a	8	Type 'A' Parking Space, Width	3400mm Min.	3400mm Min.	-	IAS
4.3.b	8	Type 'B' Parking Space, Width	2400mm Min.	2400mm Min.	-	IAS
4.3.c	8	Parking Space, Length	-	5385mm Min.	-	TADG
4.3.d	8	Parking Space, Access Aisle	1500mm Min.	1500mm Min.		IAS
4.3.e	8	Parking Space, Clear Height	-	2100mm (Type B) / 2750mm Min. (Type A)	-	ABES / TADG
4.4	***8***	***Number of Parking Spaces***	Min. (1) Type 'A' for 1-12 Spaces	Min. (3) Accessible for 1-75 Spaces (1 Type 'A' & 2 Type 'B')	-	IAS
			Min. 4% for over 13-100 Spaces	Min. 4% Accessible for over 75 Spaces		
			1+Min. 3% for over 101-200 Spaces			
			2+Min. 2% for over 201-1000 Spaces			
			11+Min. 1% for over 1000 Spaces			

LEGEND

IAS: AODA Integrated Accessibility Standards
TADG: Toronto Accessibility Design Guidelines
ABES: Accessible Built Environment Standards

Appendix 'A' - Accessible Trail Design Guidelines Summary

Accessible Trail Design

			AODA Integrated Accessibility Standards	York Region Guidelines		
Guideline	**Page**	**Description**	**Requirement**	**Requirement**	**Exceptions Allowed**	**Reference**
5.0	**9**	**ACCESSIBLE TRAIL DESIGN**				
5.1	***9***	***Trail Width and Passing Spaces***				
5.1.a	***9***	Entrance to Trail, Clear Width	850mm - 1000mm	850mm -1000mm	-	IAS
5.1.b	9	Trail Width	1000mm	1500mm Min.	1200mm Min.	IAS
5.1.c	9	Passing Space, Intervals	-	100m Max.	-	ABES
5.1.d	9	Passing Space, Size	-	1500mm x 1500mm Min.	-	ABES
5.1.e	9	Passing Space, Cross Slope	-	5% Max.	-	FSTAG
5.1.f	9	Passing Space at Intersection, Arm Extension	-	1200mm Min.	-	FSTAG
5.1.f	9	Passing Space at Intersection, Slopes	-	5% Max. in any direction	-	FSTAG
5.2	***10***	***Turning Radius***	-	1500mm Min.	-	-
5.3	***10***	***Intersection with Non-Accessible Trails***				
		Passing Space at Intersection, Arm Extension	-	1200mm Min.	-	FSTAG
		Passing Space at Intersection, Slopes	-	5% Max. in any direction	-	FSTAG
5.4	***11***	***Trail Route Gradient***				
5.4.1	***11***	***Running Slope***				
5.4.1.a	11	Running Slope	-	5% Max.	10% Max.	ABES
5.4.1.b	11	Trail Length, for Running Slopes 5.1%-8%	-	30m Max.	-	FSTAG
5.4.1.b	11	Trail Length, for Running Slopes 8.1%-10%	-	9m Max.	-	FSTAG
5.4.1.c	11	Open Drainage, Running Slope	-	14% Max.	-	ABES
5.4.1.c	11	Open Drainage, Cross Slope	-	10% Max.	-	FSTAG
5.4.1.c	11	Open Drainage, Length	-	1500mm Max.	-	ABES
5.4.1.d	11	Total Trail Length with Running Slopes Exceeding 8%	-	Max. 30% of Total Length of Trail	-	FSTAG
5.4.1.e	11	Trail, Running Slope + Cross Slope	-	15% Max.	-	ABES
5.4.2	***12***	***Cross Slope***				
5.4.2.a	12	Cross Slope	-	5% Max.	10% Max.	ABES
5.4.1.b	12	Trail, Running Slope + Cross Slope	-	15% Max.	-	ABES
5.4.1.c	12	Trail Length, for Cross Slopes Exceeding 5%	-	100m Max.	-	ABES
5.5	***12***	***Trail Drainage***	-	Cross Slope >= Running Slope *(Where Possible)*	-	ABES
5.6	***14***	***Resting Intervals***				
5.6.1.a	14	Resting Intervals, for Running Slopes 5.1%-8%	-	30m Max.	-	FSTAG
5.6.1.a	14	Resting Intervals, for Running Slopes 8.1%-10%	-	9m Max.	-	FSTAG
5.6.1.b	14	Resting Intervals, for Cross Slopes Exceeding 5%	-	100m Max.	-	ABES
5.6.1.c	14	Resting Intervals, Length	-	1500mm Min.	-	FSTAG
5.6.1.d	14	Resting Intervals, Slopes	-	5% Max. in any direction	-	FSTAG
5.7	***14***	***Seating Requirements***				
5.7.a	14	Bench Spacing Intervals	-	350m Max.	-	IAS
5.8	***15***	***Trail Surface***	Firm & Stable	Firm & Stable	-	IAS

LEGEND

IAS: AODA Integrated Accessibility Standards
TADG: Toronto Accessibility Design Guidelines
OBT: Ontario's Best Trails
FSTAG: U.S. Forest Service Trail Accessibility Guidelines
FSTAG: U.S. Forest Service Outdoor Recreation Accessibility Guidelines
FSEDG: U.S. Forest Service Equestrian Design Guidelines
PBIC: Pedestrian and Bicycle Information Centre
ABES: Accessible Built Environment Standards

Appendix 'A' - Accessible Trail Design Guidelines Summary

Accessible Trail Design

			AODA Integrated Accessibility Standards	York Region Guidelines		
Guideline	**Page**	**Description**	**Requirement**	**Requirement**	**Exceptions Allowed**	**Reference**
5.9	***16***	***Hazards, Safety Measures, and Obstacles***				
5.9.1	***16***	***Edge Protection and Safety Shoulder***				
5.9.1.c.i	16	Edge Protection, Curb Height	50mm Min.	100mm Min.	-	ABES / OBT
5.9.1.d	17	Trail Adjacent to a 10%-33% Slope	-	300mm Min. Shoulder / 100mm Min. Ht. Edge Protection	-	-
5.9.1.e	18	Trail Adjacent to a 33%-50% Slope	-	100mm Min. Ht. Edge Protection	-	-
5.9.1.f	18	Trail Adjacent to a Slope Greater Than 50%	-	Guardrail (1070mm Ht. Min.) w/ 1m Min. Setback	-	-
5.9.1.g	19	Levels Grade Differential, 200mm-600mm	-	100mm Min. Ht. Edge Protection	-	ABES
5.9.1.h	19	Levels Grade Differential, Greater Than 600mm	-	Guardrail (1070mm Ht. Min.) w/ 1m Min. Setback	-	ABES
5.9.2	***19***	***Tread Obstacles on Trails***				
5.9.2.a	19	Tread Obstacles, Height	-	50mm Max.	-	FSTAG
5.9.3	***20***	***Protruding Objects and Clearances***				
5.9.3.a	20	Overhead Clearance	2100mm Min.	2100mm Min.	-	IAS
5.9.4	***20***	***Openings on Trail Surface***				
5.9.4.b	20	Opening Size, Perpendicular to Direction of Travel	20mm Max.	20mm Max.	-	IAS
5.9.4.b.i	20	Opening Size, Parallel to Direction of Travel	-	6.5mm Max.	-	FSTAG
5.10	***21***	***Multi-Use Trail***				
5.10.1	***21***	***Accessible Multi-Use Trails***				
5.10.1.a	21	Trail Width	-	3000mm Min.	2400mm Min.	PBIC
5.10.1.b	21	Running Slope	-	5% Max.	10% Max.	ABES
5.10.1.c	21	Cross Slope	-	5% Max.	10% Max.	ABES
5.10.1.d	21	Edge Protection, Curb Height	-	100mm Min.	-	ABES / OBT
5.10.1.d	21	Edge Protection, Guardrail Height	-	1070mm Min.	-	ABES
5.10.1.e.i	22	Overhead Clearance, Equestrian	-	3600mm Min.	3000mm Min.	FSEDG
5.10.1.e.ii	22	Overhead Clearance, Mountain Bicycles	-	3000mm Min.	2400mm Min.	PBIC
5.10.1.e.v	23	Clearance Zone from Surrounding Vegetation	-	600mm Min.	-	PBIC
5.10.1.e.vi	23	Horizontal Clearance from Lateral Obstructions	-	1000mm Min.	-	PBIC
5.11	***23***	***Trail Furniture***				
5.11.1	***23***	***Waste Receptacle***				
5.11.1.b	23	Opening Height	-	1065 Max.	1300 Max.	TADG
5.11.1.c	23	Ground Space, Clearance Size for Wheelchair	-	850mm x 1370mm Min.	-	ABES
5.11.1.c	23	Ground Space, Slopes	-	2% Max. in any direction	-	FSORAG
5.11.2	***24***	***Bench***				
5.11.2.a.i	24	Bench, Depth	-	510mm - 610mm	-	ABES
5.11.2.a.i	24	Bench, Seat Height	-	430mm - 460mm	-	ABES
5.11.2.a.i	24	Bench, Backrest Height	-	762mm	-	ABES
5.11.2.a.ii	24	Arm Rail	-	1 Min.	-	ABES
5.11.2.a.iii	24	Bench Length Less Than 1200mm	-	Backrest Req'd for Entire Length	-	-
5.11.2.a.iv	24	Bench Length Greater Than 1200mm	-	Backrest Length to be 900mm Min.	-	-
5.11.2.b	25	Ground Space, Clearance Size for Wheelchair	-	850mm x 1370mm Min.	-	ABES
5.11.2.b	25	Ground Space, Slopes	-	2% Max. in any direction	-	FSORAG
5.11.2.b	25	Clearance Zone from Surrounding Vegetation	-	1m Min.	-	-

LEGEND

IAS: AODA Integrated Accessibility Standards
TADG: Toronto Accessibility Design Guidelines
OBT: Ontario's Best Trails
FSTAG: U.S. Forest Service Trail Accessibility Guidelines
FSTAG: U.S. Forest Service Outdoor Recreation Accessibility Guidelines
FSEDG: U.S. Forest Service Equestrian Design Guidelines
PBIC: Pedestrian and Bicycle Information Centre
ABES: Accessible Built Environment Standards

Appendix 'A' - Accessible Trail Design Guidelines Summary

Signage Requirements

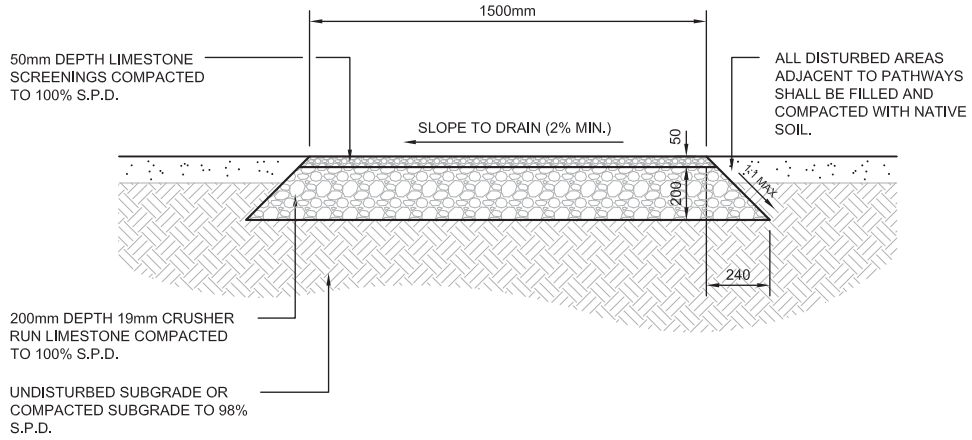
			AODA Integrated Accessibility Standards	York Region Guidelines		
Guideline	**Page**	**Description**	**Requirement**	**Requirement**	**Exceptions Allowed**	**Reference**
6.0	**26**	**SIGNAGE REQUIREMENTS**				
6.1	***26***	***General Requirements***				
6.1.1	***26***	***Signage for General Orientation and Information***				
6.1.1.a	26	Font	-	Sans Serif	-	ABES
6.1.1.b	26	Numbers, Width to Height Ratio	-	3:5 to 1:1	-	ABES
6.1.1.c	26	Stroke Width to Height Ratio	-	1:5 to 1:10	-	ABES
6.1.1.d	26	Min. Character Height / Max. Viewing Distance	-	25mm/750mm to 200mm/6000mm	-	ABES
6.1.1.i	27	Signage Mounting, Height	-	1370mm-1525mm	-	ABES
6.1.2	***27***	***Colour/Tonal Contrast***				
6.1.2.a	27	Contrast for distigushing elements from surroundings	-	70%	-	ABES
6.2	***29***	***Off-Trail Signs***				
6.2.1	***28***	***Roadside Accessible Trail Sign***				
6.2.1.b	28	Size	-	300mm x 450mm Min.	-	-
6.2.2	***28***	***Directional Signage to Accessible Trail Parking***				
6.2.2.b	28	Size	-	300mm x 450mm Min.	-	-
6.2.3	***29***	***Directional Signage to the Nearest Accessible Trail Entrance***				
6.2.3.c	29	Size	-	300mm x 450mm Min.	-	-
6.2.4	***29***	***Accessible Parking Signage Placement***				
6.2.4.c	29	Size	-	300mm x 450mm Min.	-	ABES
6.2.4.d	30	Placmenet	-	1500mm - 2500mm Above Gound		ABES
6.2.4.g.ii	30	Pavement Marking Size	-	1525mm x1525mm	-	ABES
6.3	***31***	***On-Trail Signs***				
6.3.b	31	Accessible Trail Parking Distance Sign, Size	-	150mm x 300mm Min.	-	-
6.3.c	32	Accessible Trail Direction Sign, Size	-	150mm x 300mm Min.	-	-

LEGEND

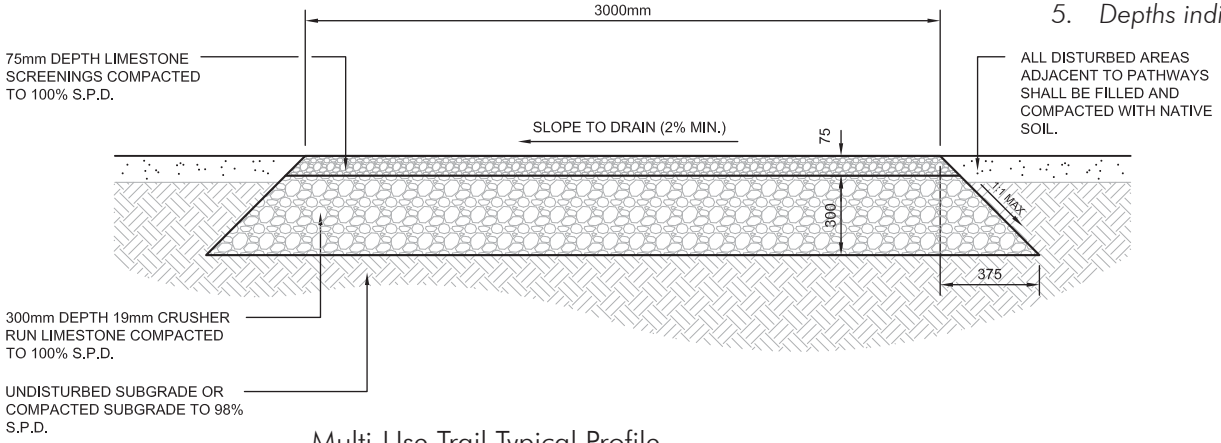
ABES: Accessible Built Environment Standards

Appendix 'B' - Typical Trail Details

The following typical details can be used for construction of York Regional Forest trails subject to review and approval of Geotechnical Engineer in charge of the project:



Pedestrian Trail Typical Profile



Multi-Use Trail Typical Profile

Notes to Typical Details:

1. *Excavation to be minimum 250mm depth for pedestrian trails and 375mm depth for multi-use trails, or as required by Geotechnical Engineer. Contractor shall contact the Region immediately if unsuitable or unstable subgrade is encountered, such as excess topsoil, soft spots, and/or organic matter. Method and/or material must be approved by the Region prior to commencement of work.*
2. *Subgrade preparation should remove all vegetation and topsoil from the proposed pathways. The exposed subgrade surface should be thoroughly compacted and proofrolled with a heavy roller and examined by Geotechnical Engineer. Any soft areas detected during proofrolling process should be subexcavated and replaced with imported granular material such as OPSS Granular 'B' compacted to 98% S.P.D. Any areas requiring filling can be brought up to final subgrade level with approved on-site or imported material placed in lifts not exceeding 300mm and compacted to 98% S.P.D. Compaction of subgrade and granular materials to conform with OPSS 501.*
3. *Where the subgrade comprised saturated soil, it is recommended that a filter fabric be provided beneath the granular base layer.*
4. *Granular materials to conform with OPSS 1010. Construction and installation to conform with OPSS 314.*
5. *Depths indicated are after compaction.*

Appendix 'C' - Material Specifications

Binding or stabilization materials create a solid and unified surface when mixed with natural soil or crushed aggregate. Binding agents should be carefully selected, based on the climate and other characteristics of the trail environment, because most will work best under particular conditions. The following bonding agent can be used in construction of York Regional Forest trails:

Bonding Agent: Organic-Lock™ from Envirobond Products Corporation

Organic-Lock is made from 100% naturally occurring materials. It is designed to be combined with crushed aggregate screenings to create a stabilized surface that resists erosion and reduces maintenance while maintaining a natural look and feel. Important features of a surface stabilized with Organic-Lock include:

- Erosion Control: Organic-Lock stabilized surfaces offer significantly improved resistance to erosion over unstabilized surfaces. When activated by water, Organic-Lock forms an adhesive gel which bonds sand particles together. In addition, this gel creates a thin film on the surface of the joint when wet. This film acts as a buffer zone which water can slide over, preventing washouts. Organic-Lock is particularly effective on sloped surfaces as these areas are the most prone to washout and rutting due to fast moving water.

- Self-Healing: Organic-Lock stabilized surfaces remain completely flexible to withstand thermal movement or settlement of the sub base materials. Additionally, the gelling ability of Organic-Lock allows the surface to self-heal. In conditions where cracking or movement may occur, rain water reactivates the Organic-Lock, allowing the surface to fill any cracks.

- Simple Surface Maintenance: The self-healing ability of Organic-Lock means that any maintenance that is required to the surface or below the surface is simple. Material can be shifted and reused by reactivating the Organic-Lock with water and re-compacting.

For more information, contact Envirobond at 416-628-3704.

Appendix 'D' - Sustainability

The following sustainable design principles should be adhered to when designing trails, to maximize benefits to user groups while minimizing the use of resources:

a. Minimize potentially harmful inputs such as toxins from pressure-treated wood, herbicides, insecticides, and chemical fertilizers.

b. Minimize the use of natural resources such as water, wood and petroleum based products.

c. Investigate the use of alternative materials that minimize the output of waste and harmful by-products during manufacturing.

d. Minimize waste outputs, such as water runoff and construction wastes.

e. Maximize natural capital, such as reusable materials and on-site water.

f. Maximize opportunities to enhance natural systems and wildlife habitats.

g. Maximize pedestrian and cyclist access and enjoyment to encourage healthier lifestyles and reduce dependence on cars for transportation.

h. Find solutions that balance economic, environmental and cultural priorities.

i. Maximize opportunities for shared systems and multi-purposing while providing flexibility for change over time.

Construct a Sustainable Tread

- Remove the brush and vegetation from the cut bank and fill slope: It is important to ensure that fill is not placed on top of existing vegetation because the filled area will become unstable and irregular (causing drainage problems) when the vegetation underneath the fill eventually rots.

- Shape and compact the bench: Establish the slopes required for the final tread by shaping and compacting the subgrade. The trail bench should be mechanically compacted, with a vibratory plate or roller compactor, to ensure that the slopes of the bench will be retained once final compaction of the trail surface material has been completed.

- Remove organic material from in, on and over the trail tread: All organic material (leaf debris, vegetation, loose topsoil) should be removed from the trail tread. Organic material left in the trail tread will eventually rot, leaving depressions that will alter drainage across the tread and make the tread more difficult to negotiate safely. Vegetation should also be removed from above the trail tread to create a clear, vegetation-free corridor for all trail users. Vegetation that is in the way of trail users is at risk of being broken or stripped in a way that will damage its health. In areas with deep layers of topsoil, only the loose soils should be removed.

- Construct the tread with a consistent outslope: The side-to-side slope of the tread should allow water to drain quickly across the tread and then continue down the adjacent slope. The steepness of the outslope will be determined by the tread material and surrounding terrain. The designed outslope should represent the best compromise between providing adequate drainage and enhancing access for all trail users.

- Compact the tread material: Mechanically compact the tread material with a vibratory plate or roller compactor. A minimum of 4 to 5 passes should be completed so that the finished surface becomes smooth, free of depressions and provides the required outslope and grade.

Appendix 'E' - Low Impact Construction

Low impact construction management practices help minimize waste and potential undesirable cost overruns and long-term health impacts. The following best practices should be considered:

a. Waste Reduction and Recycling:

   i. Determine the waste products of each activity and the potential to avoid waste at the beginning of the project.

   ii. Balance the site's earthwork cut and fill.

   iii. Use on-site material for backfill and paving base.

   iv. Avoid waste by proper activity sequences, just-in-time delivery, pre-install inspections, and loss prevention practices.

b. Site & Materials Management

   i. Plan to minimize impacts for on- and off-site traffic.

   ii. Limit the number of vehicles that contractors are authorized to bring to the site, thereby controlling congestion and encouraging the consolidation of trips.

   iii. Consider the possible impact of the flow of material and workers to natural features and amenities of the site and implement protective measures.

   iv. Develop a designated area for equipment washing, fueling, and oiling activities, and prevent spills from contaminating soil and water.

References

- AODA Integrated Accessibility Standards, *January 2013*
- Accessible Built Environment Standards, *June 2009*
- City of Toronto, Accessibility Design Guidelines, *April 2004*
- Ontario's Best Trails, *2006*
- United States Forest Service - Trail Accessibility Guidelines, *May 2006*
- United States Forest Service - Outdoor Recreation Accessibility Guidelines, *May 2006*
- United States Forest Service - Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds, *December 2007*
- Pedestrian and Bicycle Information Centre - Design Details, *www.bicyclinginfo.org*
- Low Impact Construction Practices Technical Brief, *Green Guide for Health Care*