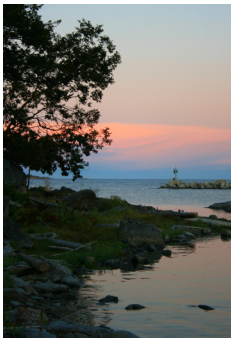
Schooner Cove

Pathway Standards







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1 SCHOONER COVE NEIGHBOURHOOD

Introduction

Schooner Cove Neighbourhood Plan, OCP Amendment Bylaw No.1400, adopted by the Regional District of Nanaimo in 2011, provides for the creation of a maritime village to live, work, shop and play. The 12.39 ha neighbourhood contributes towards the implementation of the Regional Growth Strategy and a more sustainable community.

The design for Schooner Cove takes its cue from traditional maritime villages with a focus on celebrating its relationship to the coast, featuring neighbourhood-scaled and community-oriented commercial services, all structured by public open spaces and pathways.

Through the design and implementation of the Neighbourhood Plan, Schooner Cove will foster a vibrant public realm featuring a waterfront green and boardwalk, plazas, public art, and pedestrian network.

The pedestrian network at Schooner Cove enhances the public realm through its interconnected system of sidewalks, pathways and trails with access to the waterfront preserved as a public amenity.

The following Pathway Standards serve as a framework to implement the public open space vision adopted in the Neighbourhood Plan. The methods and technical information used are sourced from Best Management Practices, including precedents from the City of Nanaimo and the Resort Municipality of Whistler, as well as the following professional reporting:

- *The Lakes District Preliminary Geotechnical Terrain Assessment*, (Trow Associates, 2008);
- *Archaeological Overview Assessment: Lakes District & Schooner Cove Neighbourhood Plan Areas, Nanoose Bay, BC*, (IR Wilson Consultants, 2008);
- *The Lakes District Study Area; Fairwinds Development Detailed Biophysical Inventory,* (Cascadia Biological, 2009);
- *Schooner Cove Nearshore Marine Assessment,* (Archipelago Marine Research Ltd, 2009); and,
- *Fairwinds' The Lakes District and Schooner Cove Neighbourhood Plan; Environmental Impact Assessment*, (Pottinger Gaherty Environmental Consultants, 2010).

General design standards for each pathway type are tailored with the goal of implementing and celebrating the public realm within Schooner Cove. Guidelines provide general directions for pathway construction; it is recognized that implementation may require adjustments. Future detailed design will be completed at the construction stage, under the supervision of a registered professional.

2 SCHOONER COVE PUBLIC REALM

FIG. 1 Schooner Cove Open Space Plan

- Public Access Open Space
- Private Strata Open Space
- Marina
- Public Access Plaza
- Public Access Marina Deck
- Public Road ROW
- Multi-Use Pathway 3.0m Hard Surface
- Sidewalk 1.5m Hard Surface
- Emergency Connector & Path 3.0m Hard Surface
- Waterfront Boardwalk
- Walking Pathway
- Existing Sidewalk
- Designated Street Crossing
- Public Destination View & Amenity
- Public Parking
- Transit Stop
- Jib Crane Boat Access

The Schooner Cove Neighbourhood envisions a vibrant mixed-use village as the waterfront heart for Nanoose Bay. Public access and open space is established through site-planning and design with particular attention to existing landform and landscape character, desired Village program, and opportunities for environmental conservation and enhancement.

A robust public realm design – including publicly accessible gathering spaces and plazas, pathways, pavilions, gardens and greenways – for the Schooner Cove Neighbourhood, integrates the range of Village land uses and provides an inviting 'sense of place.' The same intent extends to the private realm to create a thread of visual continuity and physical connectivity to the surrounding residential precincts, while addressing landscape buffers between the commercial, mixed-use and residential precincts.

SCHOONER COVE - elements of the public realm

A Public Waterfront Boardwalk
A key feature of the Schooner Cove Village, the public waterfront boardwalk links the commercial marina and waterfront village to the larger network of public access open space and inland pathways.

B Waterfront Commons
Designed to enhance the existing community green at Schooner Cove, the "Waterfront Green" is the central social gathering space for the Schooner Cove Village, framed by the waterfront programs of the Marine Services Building and Waterfront Pavilion restaurant and pub.

C Multi-use pathway
The Multi-use pathway provides a continuous pedestrian connection between the Lakes District and Schooner Cove Neighbourhoods. In addition to improving pedestrian access to the Village, the pathway creates greater physical separation between existing residential areas and the future residential area, while creating a more informal landscape edge to the Village and neighbourhood building program.

D Neighbourhood Focal Points
Each residential district within the Neighbourhood – including the mixed-use Village, the Commons and the Waterfront and Ridge – is organized around feature open space to serve as gathering areas and recreational program for residents.

E Forested Walk
A meandering pathway through the central forested lands provides connections to residential areas on the upper bench of Schooner Cove. In addition to providing a recreational amenity, the pathway and ridgetop forest creates significant landscape edges and transitions between residential areas while assisting to visually screen development from existing neighbourhoods.

F Walking Path
An extension to the Public Waterfront Boardwalk, the walking path completes the recreational promenade along the waterfront and connects to the local transportation network.

G Emergency connector pathway
The Emergency Collector Pathway compliments the greater pathway network, while ensuring emergency vehicle accessibility within the Neighbourhood.

H Local sidewalk
The on-street pedestrian system includes 1.5m wide sidewalks throughout the Schooner Cove transportation network, ensuring local pedestrian access to all residential units within the Schooner Cove Neighbourhood.

4.0 PATHWAY CLASSIFICATIONS AND DESIGN STANDARDS

4.1 Pathway Hierarchy

The Schooner Cove pedestrian system includes a hierarchy of three pathway categories outlined below and summarized in Fig.2.

Each pathway type is tailored to reflect the landscape terrain and its designated use:

Multi-use Pathway (2.5 - 3.0m): As the link between the Schooner Cove and the Lakes District Neighbourhoods, the Multi-use Pathway provides a continuous pedestrian route along the Community Parkway, connecting to Dolphin Drive and the Schooner Cove village. The multi-use pathway is engineered to accommodate high traffic and a range of low-speed activities including walking, jogging and cycling, and is suitable for strollers or mobility impaired individuals.

Boardwalk (2.0-3.0m wide): A key feature of the Schooner Cove village, the public waterfront boardwalk links the marina and waterfront village to the larger public open space network.

Walking path (1.0-1.8m wide): Narrower than the multi-use pathway, the walking trail completes the waterfront boardwalk promenade. Surface materials may vary depending on level of use.

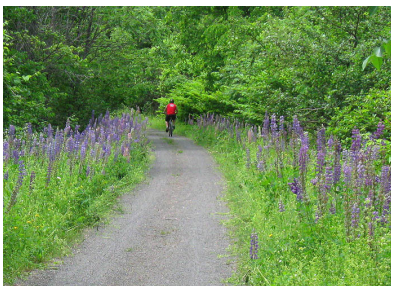
Standards for the emergency connector and sidewalks, described below, are included in the Lakes District and Schooner Cove Project Specific Street Standards:

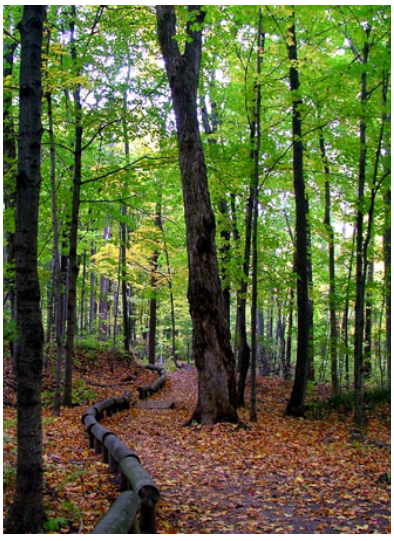
Emergency Connector & Pathway (3.0 wide): An extension of the public street providing emergency access along a controlled access pedestrian pathway.

Sidewalks (1.5m wide): As part of the pedestrian circulation system, sidewalks parallel local streets and link the multi-use pathway to Village plazas, boardwalks and neighbourhood walking paths.

In order to be successful over the long-term and to minimize maintenance, paths must be designed and built to specific standards. The exact locations and pathway types will be determined at the time of construction.

Given the variability of the terrain, the following design and construction guidelines depict typical pathway design; flexibility in design will be necessary.

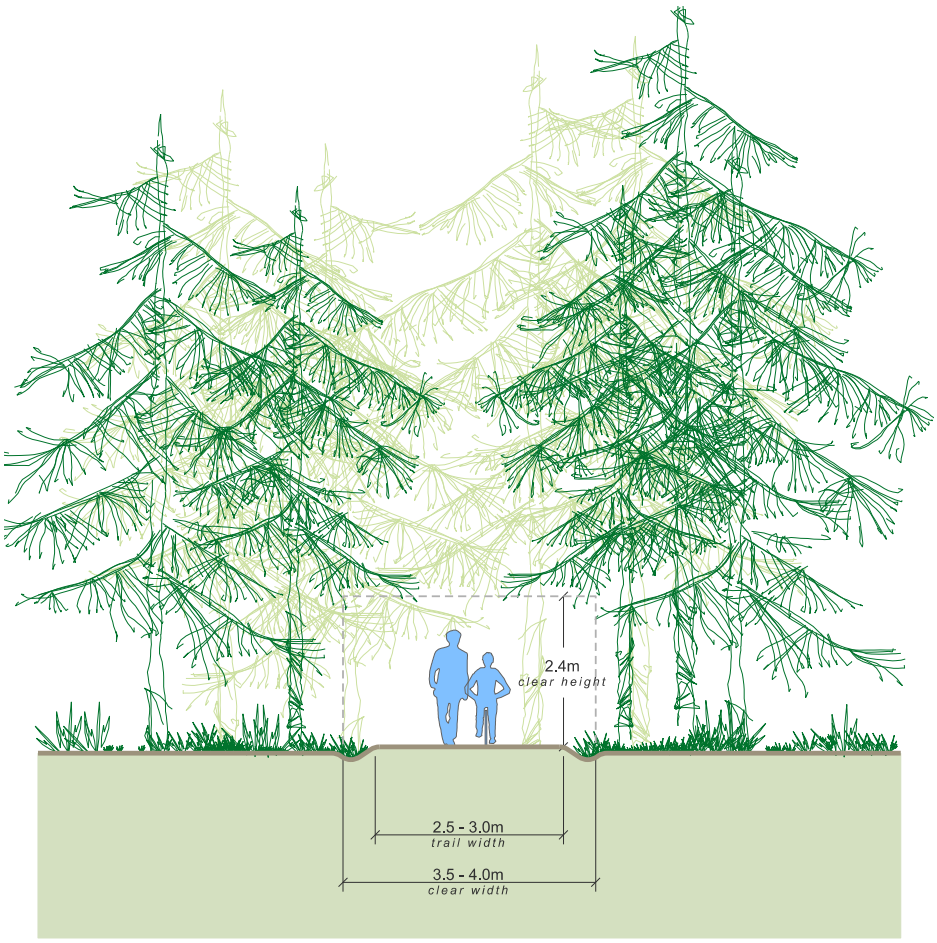


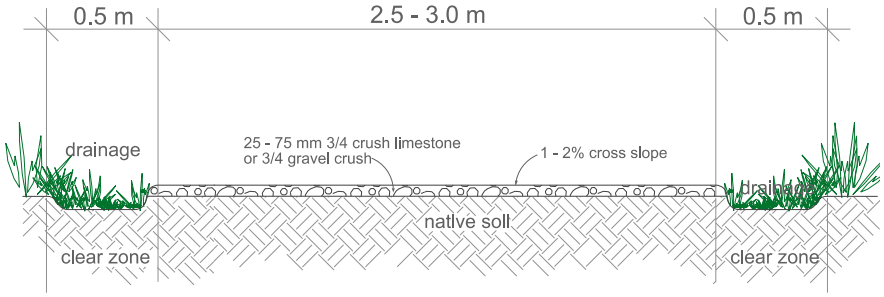


	MULTI-USE	BOARDWALK	WALKING
Purpose	• accommodates low-speed activities, suitable for strollers or mobility impaired individuals • connects residential & park uses	• provides public access to the waterfront • connects village with residential uses and public spaces	• provides pedestrian access to mildly sloped terrain
Level of Use	HIGH	HIGH	HIGH
Type of Use	walking, jogging, cycling, strollers, wheelchairs	walking, jogging, strollers, wheelchair	walking, jogging
Location	• adjacent Schooner Cove Drive and portions of Dolphin Drive	• Waterfront	• connects to Boardwalk • provides connections and recreational opportunities through strata open space
Width	2.5 - 3.0m	2.0 - 3.0m	1.0-1.8m
Surface	• crushed limestone or gravel	• wood decking, exact construction to be determined based on detailed design	• pavers or stamped concrete, • native soil and crushed limestone or gravel, or • wood decking
Slope	•ideally 0-5% / maximum 10% grade and short pitches up to 12%	n/a	• ideally 0-5% / maximum 10% grade and short pitches up to 12%
Access	• universal access where feasible	• universal access where feasible	• universal access where feasible
Buffer	• landscape or distance buffers adjacent to residential lands • minimum 0.5m adjacent to Dolphin Drive	n/a	• landscape or distance buffers adjacent residential uses
Drainage	• 1-2% cross slope • minimum 20cm ditch on uphill side of trail, both sides if on flat terrain or culverts every 50-100m, or as determined	n/a	• 1-2% cross slope • shallow swale on uphill side or culverts every 50-100m every 100- 150m
Surfacing Depth	• 25mm - 75mm	n/a	• concrete surfacing depends on subsurface • soil or crush should be 50-75mm
Clearing Width	• 3.5m-4.0m (0.5m each side)	n/a	• 3.0m-4.8m (1.0m each side)
Vertical Clearance	• 2.4m	• minimum 2.5m	• minimum 2.5m
Sight Lines	• minimum 20m • ideally 30m	• minimum 20m	• minimum 20m
Variations	• lookout or rest area approximately every 500m	• boardwalks structures will be designed and engineered based on topography	• surface materials vary depending on pathway location and purpose
Associated Park Features	• outdoor furniture: benches, garbage receptacles • orientation information and educational signage	• orientation information and educational signage	• outdoor furniture: benches, garbage receptacles • orientation information and educational signage

FIG. 2 Schooner Cove Pathway Hierarchy

4.2 MULTI-USE PATHWAY STANDARD



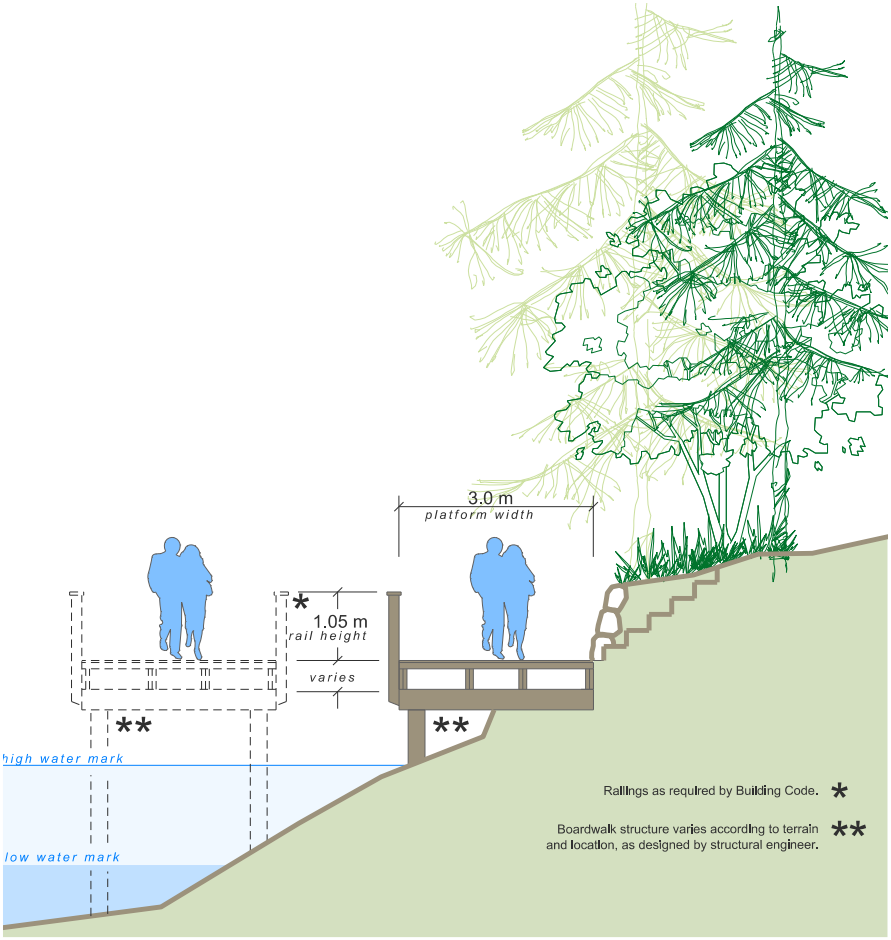


CONSTRUCTION NOTES

- *Use excavator or trail cat, except in environmentally sensitive areas.*
- *Clearing and grubbing to native soil.*

MULTI-USE PATHWAY	
Purpose	• accommodates low-speed activities, suitable for strollers, bikes or mobility impaired individuals • Connects residential & park uses
Level of Use	HIGH
Type of Use	walking, jogging, cycling, strollers, wheelchairs
Location	• Schooner Cove Drive adjacent • residential & regional park areas
Width	2.5 - 3.0m
Surface	• crushed limestone or gravel
Slope	• ideally 0-5% / maximum 10% grade and short pitches up to 12%
Access	• universal access where feasible
Trail Head Barriers	• bollards/gates to restrict vehicles
Buffer	• landscape or distance buffers adjacent to residential lands • minimum 0.5m adjacent to Dolphin Drive
Riparian/ESA	• minimize trail widths • use fencing to protect sensitive areas from people/pets • use boardwalks to at Enos Lake and Dolphin Lake to protect riparian areas
Drainage	• 1-2% cross slope • minimum 20cm ditch on uphill side of trail, both sides if on flat terrain or culverts every 50-100m
Surfacing Depth	• 25mm - 75mm
Clearing Width	• 3.5m-4.0m (0.5m each side)
Vertical Clearance	• 2.4m
Sight Lines	• minimum 20m • ideally 30m
Variations	• lookouts/rest areas approximately every 500m
Associated Park Features	• outdoor furniture: benches, garbage receptacles • orientation information and educational signage

4.3 BOARDWALK STANDARD



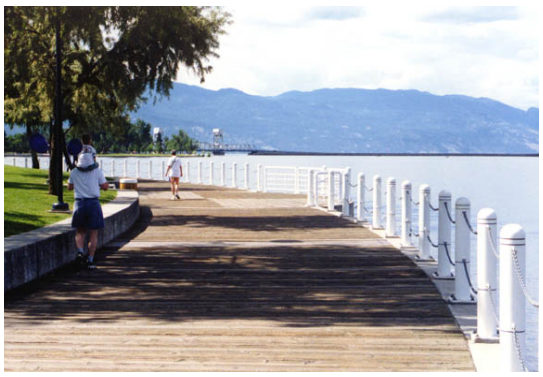
	BOARDWALK
Purpose	• provides public access to the waterfront • connects village with residential uses and public spaces
Level of Use	HIGH
Type of Use	walking, jogging, strollers, wheel-chair
Location	• Waterfront
Width	• 2.0-3.0m
Surface	• wood decking, exact construction to be determined based on detailed design
Access	• universal access where feasible
Vertical Clearance	• minimum 2.5m
Sight Lines	• minimum 20m
Variations	• boardwalks structures will be designed and engineered based on topography
Associated Park Features	• orientation information and educational signage

CONSTRUCTION NOTES

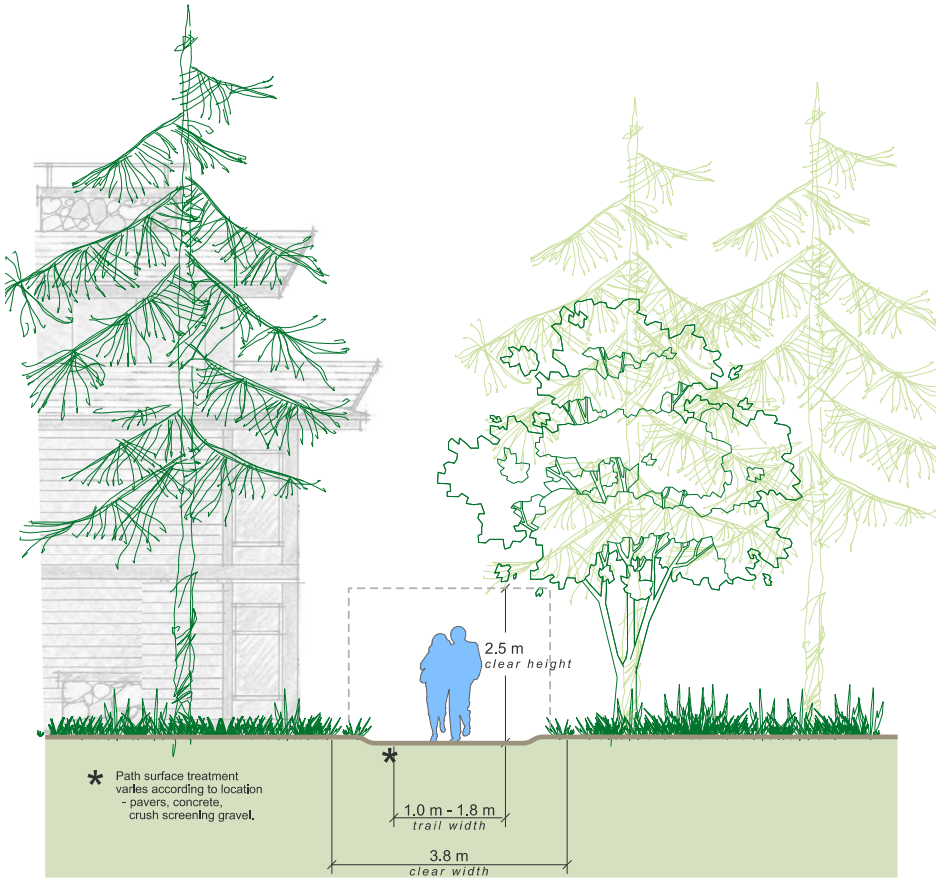
Boardwalks are 3.0m wide, with a raised edge or railing where elevated more than 0.6m above ground. The deck is generally wood but a half-meter section of expanded metal in the centre can be used to add extra tread. Decking material will be rough cedar or treated lumber.

Abutments are generally precast concrete or wood; however, they must be kept as small as possible and screened with riparian vegetation to ensure a minimal presence. Hand railings, if required, will be set to Provincial Building Code. Posts will be spaced no further than 3m spacing.

All construction in riparian areas must be completed during the fisheries window, in accordance with the Fairwinds' Lakes District and Schooner Cove Neighbourhood Plans Environmental Assessment (Pottiger Gaherty Environmental Consultants Ltd 2010), and with approval of Senior Government Agencies. Adequate silt measures must be utilized to ensure that no material is disturbed into the water.



4.4 WALKING PATH STANDARD



	WALKING
Purpose	• provides pedestrian access to mildly sloped terrain
Level of Use	HIGH
Type of Use	walking, jogging
Location	• connects to Boardwalk • provides connections and recreational opportunities through strata open space
Width	1.0-1.8m
Surface	• pavers or stamped concrete, • native soil and crushed limestone or gravel, or • wood decking
Slope	• ideally 0-5% / maximum 10% grade and short pitches up to 12%
Access	• universal access where feasible
Buffer	• landscape or distance buffers adjacent to residential uses
Drainage	• 1-2% cross slope • shallow swale on uphill side or culverts every 50-100m every 100- 150m
Surfacing Depth	• concrete surfacing depends on subsurface • soil or crush should be 50-75mm
Clearing Width	• 3.0-4.8m (1.0m each side)
Vertical Clearance	• minimum 2.5m
Sight Lines	• minimum 20m
Variations	• surface materials vary depending on pathway location and purpose
Associated Park Features	• outdoor furniture: benches, garbage receptacles • orientation information and educational signage

CONSTRUCTION NOTES

• Clearing and grubbing to native soil
• Where softscape surface treatment occurs, use gravel or crush (compatible with wheel chair accessibility wherever possible) in high traffic areas to prevent erosion
• Encourage permeable surfaces, wherever feasible

5 Pathway Planning + Development

These Standards provide general directions for pathway construction; it is recognized that implementation may require adjustments. Future detailed design will be completed at the construction stage, under the supervision of a registered professional.

5.1 Pathway Siting

Many factors influence the specific siting and placement of paths, including connections to existing trails and parks, existing site conditions, soil type, environmental sensitivity and biophysical conditions, hillside slopes, vegetation and drainage conditions.

To limit environmental impact and reduce cost, pathways will utilize existing routes wherever possible. Where unofficial trails intrude into Environmentally Sensitive Areas, preferred routes will be designated and unofficial trails will be decommissioned or discontinued.

Pathways will be designed to compliment and respect the landscape. Natural features, such as rocks and logs, will be incorporated into the design to denote edges and pathway direction, and also to provide visual interest. The resulting pathway will appear to be directed by the landscape.

Steep or unstable slopes, as well as erodible soils, will be avoided. Retaining walls may be required to prevent side slopes from slumping onto trails, but will be avoided wherever possible by working with the terrain.

5.2 Drainage

Drainage is a critical component of pathway design, and if executed properly, lessens the impact to the environment while improving trail lifespan. Proper grading and site preparation enables water to flow across the trail, minimizing erosion.

The type of drainage utilized depends on the pathway location and soil types, but will include swales or culverts. Where pathways are situated on sloped hillsides, a shallow swale will be constructed on the uphill side of the pathway. Where pathways are situated on flat terrain and natural soils do not promote drainage, swales will be required on both sides of the pathway.

Culverts should be considered where pathways cross small ephemeral or intermittent watercourses, where bridges and raised walkways are not necessary or feasible. Where required, culverts should be regularly spaced on the trail to divert water. Based on slope angle, culvert spacing on multi-use paths will be between 100 and 150 metres, and on walking paths every 50 to 100m. Culverts are not required for the forested walk. In order to minimize water damage, pathways will avoid slope fall lines.

5.3 Pathway Turns

To ensure visibility, safety and adequate sight lines on the boardwalk, multi-use, and walking paths, turns will be minimized. Minor turns add an element of mystery to pathways as one continues on to see what is around the corner. However, adequate visibility will be ensured.

5.4 Landscaping

Natural and planted vegetation along a trail enhances the aesthetics and character of the pedestrian network, and buffers pathways from adjacent land uses. Vegetation will be balanced with safe vertical and horizontal clearance requirement and sight lines so that pathway users can see what's ahead and anticipate trail conditions. The landscape treatment and clearance width depends on the type of pathway and surrounding area. The following guidelines apply to all landscape treatments:

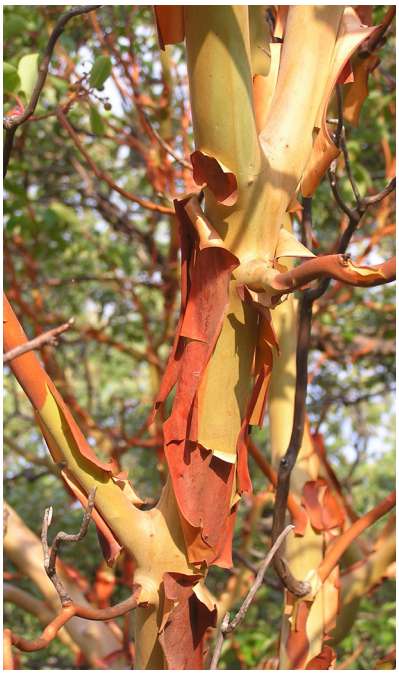
- Installation and maintenance practice must conform to BCLNA Standards and applicable Regional District of Nanaimo standards.
- No trees or shrubs shall be planted within the vertical or horizontal clearances as specified in the Pathway Standards.
- Plant masses will be not be planted where they impede visibility along the trail.
- Native replanting will be required in natural areas for restoration and screening.
- Changes in drainage patterns will be minimized.
- Trees planted near trails should not damage trail surfaces or bases. Root barriers along the trail adjacent to the tree should also be used to prevent roots from growing under hard trail surfaces.
- Where pathways are close to residential properties, plantings will be used for privacy screening, trail softening and enhanced aesthetics. However, tall and dense plantings will be avoided for safety and security reasons.

5.5 Trees and Vegetation Protection

Trees and vegetation add to the aesthetic and environmental value of recreational areas and the surrounding trail system. Care will be taken to protect trees where they do not negatively impact the routing, safety and clearance of trails. The following guidelines help to preserve trees:

- Where possible, pathways will be routed around the drip line of highly significant trees.
- Trees or tree roots that are to be retained will be protected during trail construction.
- For paved trails, all roots will be removed below the surface in preparing the sub-grade.
- Root barriers will be used to protect both trees and trails.

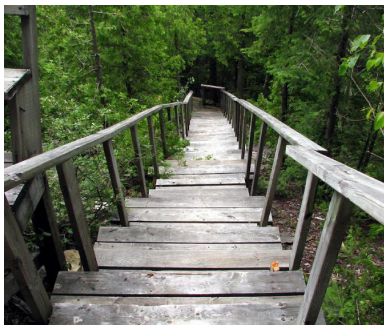
For further direction on tree planting procedures, refer to City of Nanaimo Engineering Specifications and Standards Section 14.



5.6 Retaining Walls

Retaining walls will be used to prevent side slopes from slumping onto paths or boardwalks. As much as possible, retaining walls will be avoided through trail siting and grading. Where walls must be installed, proper drainage and anchoring must be in place. Furthermore, any wall over 1.2m may need a railing. Mechanically Stabilized Earth (MSE) will be considered to eliminate the need for retaining walls.

6 Pathway Access + Interface



6.1 Barriers and Fences

Bollards, posts and sleeves, and gates may be used to direct pedestrian movement and preclude vehicle access on pathways. In universally accessible locations, they will allow for wheelchair access.

Where access for emergency or service vehicles and parks equipment access is required, barriers will be removable. Bollards, or posts and sleeves are the most common removable barrier and should be located at most trail heads.

Where vehicle access is a consideration, multi-use pathways will use post and sleeve barrier types. Barrier posts will be installed in odd numbers so that the centre post is positioned in the centre of the trail. Barrier posts may be fixed or removable. Pavement markings will be used to delineate posts.

Wood rail fences are used primarily to define setbacks from ESAs, protect sensitive areas and delineate private property. Low wood rail fences may also be located at viewpoints to define access yet maintain views and aesthetics. Wood fences will also be used to define circulation and prohibit access to hazards and ESAs.

6.2 Pathway Buffers

Many pathways in Schooner Cove are located adjacent roads and residential areas. Where sections of the multi-use pathway are located adjacent to road right-of-ways and residential uses, buffers or landscaping will be used to separate public and private realms. Good sightlines and Crime Prevention Through Environmental Design (CPTED) Guidelines will be implemented for all trail types.

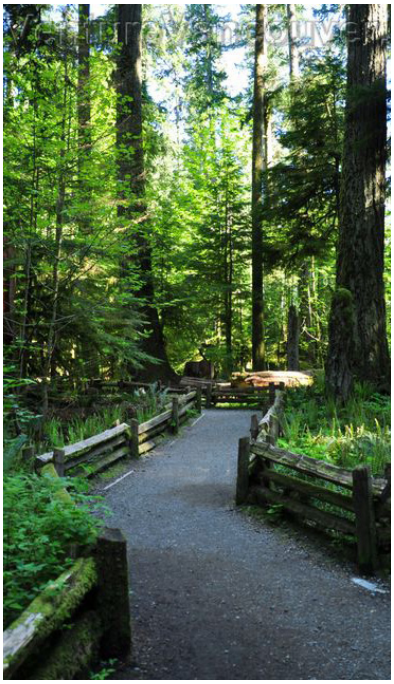
Minimum buffers from road right-of-ways are listed in the table below:

Road Type	Minimum Buffer
Low volume (under 50km/h)	0.5m
Low volume with on-street parking	0.75m
Moderate volume (under 60km/h)	1.0m

6.3 Universal Access

The following guidelines must be taken into consideration in the design, construction and maintenance of pathways to encourage physical accessibility.

- Recommended maximum slopes should not exceed 5% for long distances. Landings should be provided if the slopes exceed these grades.
- Surfacing will be uniform with no obstructions or depressions.
- Signs, light standards, power poles, power boxes, mail boxes, and bus stops can all obstruct the flow of a wheelchair or stroller. Install structures with consideration of their visual and physical impacts.
- Curb cuts will be provided where trails cross roads, where required.
- Bollards, baffles and other barriers will be spaced in such a way that a wheelchair can pass.
- Select rest areas and seating will allow wheelchairs to pull off the trail.
- Best Management Practices for specific accessibility and bicycle design details apply.



6.4 Pathway Street Crossing

The locations where pathways cross streets are a critical safety site for both trail users and vehicles. Several crossing treatments will be implemented to assist pathway users in safely continuing on the pathway and minimizing vehicle conflicts. The type of crossing depends on the pathway type, streets volumes, and streets design. Each of the following crossing types is detailed in the City of Nanaimo Bicycle Facility Design Guidelines (2001).

Signed crossings are common where pathways intersect major streets with low traffic volumes. Signs and crosswalk markings will be used to indicate the crossing and improve safety.

Pathway crossings will be located at intersections and mid-block sites. Where pathways are located parallel to streets, crossings will occur at intersections or as close to intersections as possible in order to maximize crossing visibility. Mid-block crossings will also be located to maximize visibility for approaching motorists with adequate signing and illumination (and possible median islands) to increase safety and visibility. The pathway crossings will also occur at right angles to the roadway.

Pathway intersections will be well marked for both pathway users and vehicles. Signage is used to alert multi-use pathway users to stop and dismount (if on bikes). As referenced in the Barrier and Fencing section of this document, post and sleeve vehicle barriers on multi-use pathways at road intersections will be placed in odd numbers with the centre post in the centre of the pathway.

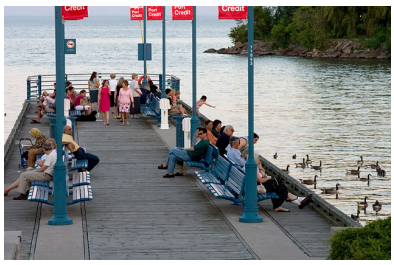
7 Pathway Features + Structures

7.1 Structures

The following will be implemented in all pathway types:

- Lumber used in pathway structures will be pressure treated lumber or dimensional cedar.
- To reduce risk of leaching toxic preservatives, piles in saturated soils/water will not be constructed of treated wood.
- When using cedar, walking surfaces will be rough sawn to reduce slipperiness when wet and metal-expanded grates or similar treatment should be used to prevent slipping.
- Decking will be perpendicular to the direction of travel.
- Wood handrails must be sanded and bevelled as required so the railing can be grasped easily.
- Where the railing is adjacent to a viewing site, it will be rounded or angled to provide comfortable leaning.
- Metal used for fences, bollards, and baffles will be welded, powder coated, galvanized or have two coats of marine enamel. Metal fasteners will be hot dip galvanized (especially near the ocean).
- Fasteners will be placed to avoid sharp edges and potentially snag clothes.
- Posts will be set into post saddles that have been grouted into rock or places in concrete footings.
- Railings will be built according to BC Building Code.
- Stair railings will be between 32"-36" and platforms will have bottom and mid rails.

7.2 Rest Areas and Destinations



Rest areas and destination points along pathways provide opportunities for sitting, socializing and passive recreation such as wildlife and scenery viewing.

Destination points are meant to provide a sense-of-arrival within the pathway network, and may include seating areas, public art, planters and landscaping and garbage bins.

Rest areas generally consist of a bench on a flat pad, and are placed at least 500m apart. The design of the area depends on the type of pathway, and site specific conditions such as soils, slope, views, vegetation, interpretive opportunities and adjacent lands uses and features.

The exact model of benches, bike racks, and waste receptacles depends on the budget and character of each site, but will reflect the high quality amenity proposed.

7.3 Stairs

Steps and staircases will be utilized for steep sections of pathways. Step construction and material depends on the site's drainage and soil or rock substrate. Stairs will be constructed from wood, wherever feasible. The following general guidelines apply:

- All steps should have a step tread ratio of 2:1 with optimal 150mm rise and 300mm run.
- Rise is very important and will be consistent, unless separated by landings.
- Landings will be provided on flights of 14 steps or more.
- Handrails will be provided on at least one side if the flight is long and steep, and on any side over 2 feet above the ground.

For specific wood stair construction details, refer to City of Nanaimo Beach Access Trail Design Guidelines.

7.4 Pathway Signage

Signage is an important directional and character defining element of a pathway. Sign types include:

- Entry signs;
- Informational providing open space and boardwalk regulations;
- Kiosks with orientation maps;
- Directional and distance;
- Seasonal or warning; and
- Interpretive/Educational signs which celebrate the natural and cultural heritage of Schooner Cove.

Interpretive signage will be used throughout the network to foster understanding of, and respect for, sensitive areas that need to be protected. In addition to providing information on the local ecology, signage reinforces why people and their pets should respect the marine ecology.

The following general guidelines apply to the placement of signs along pathways:

- Maps and kiosks will be located at all major trail heads and intersections, and will include the pathway name, regulations and permitted uses, a map of the pathway network and specific “you are here” location.

- Pathway name signs and direction/distance markers will be placed at major trail crossings and km intervals.

- Interpretive signs will be located at points of interest, ESAs, and/or rest areas.

- Although most park regulations are posted at the kiosk, hazards along the pathways, pedestrian crossings at intersections, and permitted trail user groups will be clarified through signage along the pathway.

- 2.1m is optimal height for sign legibility (excluding pathway markers). Where possible, sign placement will be obvious but not obtrusive. Signs will be consolidated as much as possible to avoid sign clutter along pathway.

7.5 Bridges and Boardwalks

The boardwalk is an integral component of the network, not only to provide waterfront access but also to function as a landmark and viewing platform, while adding to the maritime character of Schooner Cove. The design of the structure depends on the height of the structure and expected load.

Handrails are necessary if a boardwalk is more than two feet off the ground. Railing heights will be set according to BC Building Code.

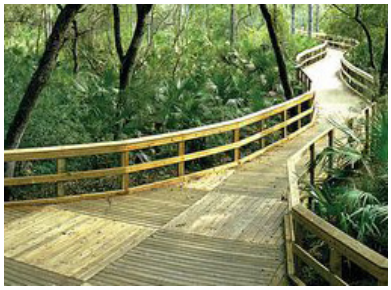
The deck is generally wood but a half-meter section of expanded metal in the centre can be used to add extra tread. Decking material will be rough cedar or treated lumber.

Boardwalks will be aligned along the path so that users do not have to make sharp turns at the end of the bridge. The intersection between the bridge and trail will also be clear to ensure user safety.

If used, observation decks will bow outward from the running boardwalk to create an outward focus. End decks are suitable on the end of spurs. Decks on both side areas are useful for viewing and can aid in traffic flow in busy sections. Decks on one side focus visitor attention and allow passing points for traffic.

Abutments are precast concrete or wood; however, they should be kept as small as possible and screened with riparian vegetation to ensure a minimal presence. Re-vegetating the site also slows erosion and stabilizes the bank.

All construction in riparian areas must be completed during the fisheries window, in accordance with the Fairwinds' Lakes District and Schooner Cove Neighbourhood Plans Environmental Assessment (Pottiger Gaherty Environmental Consultants Ltd 2010), and with approval of Senior Government Agencies. Adequate silt measures must be utilized to ensure that no material is disturbed into the watercourse.



8 Pathway Construction

8.1 Pathway Surfacing

The material used for pathway surfacing varies according to proposed use and level of traffic, and recommended material is listed in the Pathway Standards for each type. Permeable materials will be used wherever possible in order to allow groundwater infiltration, reduce cost, complement the existing landscape and reduce the speed of traffic.

Pathway surfacing is recommended for the Multi-use Pathway. However, application of surface materials can be reduced or eliminated for the Walking Path, if the trail is located on well drained and coarse textured soil, and in areas of reduced traffic.

8.2 Clearing and Grubbing

Requirements for clearing and grubbing largely depend on the pathway standard being implemented, the types of soil and vegetation present. Slope is not generally a significant factor unless slope exceeds a gradient of 50% and full bench cuts are required.

Trail dozers or excavators are generally designed to clear and grub trails that are 1.2m to 1.8m wide. Narrower pathways may need to be hand built, especially in and around environmentally sensitive areas where removal of vegetation should be minimized. In locations where trails are planned on flat terrain, additional fill may be required to ensure proper drainage and smooth surface.

8.3 Equipment

A variety of trail building machines are available which can reduce building costs. Trail dozers or excavators are suitable for constructing the Multi-use and Walking paths. Many machines have multiple attachments, including both blade and excavator arm, which can increase their versatility and eliminate the need for more than one piece of equipment. Operator experience is important to ensure that construction is safe, efficient and environmentally responsible.