



GRAND TRUNK PATHWAY MASTER PLAN



Prepared for the City of Terrace



by Boulevard Transportation Group Ltd.



With financial assistance from the
Real Estate Foundation of British Columbia
and the Greater Terrace Beautification Society



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EXECUTIVE SUMMARY

The Grand Trunk Pathway Master Plan sets out a detailed overall design vision and course of action for the successful completion of the Grand Trunk Pathway from Kalum Street, adjacent to the downtown, to the Kitsumkalum River to the west of the City. The completed pathway will provide the Terrace community with a significant linear parkway spanning the City and act as a link between a number of existing and proposed recreational trails.

The Grand Trunk Pathway ties in to an existing portion of trail completed in 2000, known as the Millennium Section. This 1.6-kilometre portion of the pathway occupies a linear gap between the Yellowhead Highway and the CN Railway its entire length. Consideration was given to alternative routings, but the presence of the highway and considerable natural constraints preclude this. The completed pathway will be 4.8-kilometres in length.

The Master Plan contains a general design concept for the entire pathway, which adopts the general character of the existing Millennium Section. The Master Plan includes discussion on appropriate construction standards and outlines design specifications for items such as lights, benches, garbage bins, signs and landscaping. Certain locations along the pathway require more detailed design consideration, which have been highlighted in the Master Plan.

An implementation plan is included in the Master Plan, which divides the development of the Grand Trunk Pathway into three (3) sections:

- Section 1 is the portion from Kalum Street to Eby Street;
- Section 2 is from Kalum Lake Rd/Braun Street to Frank Street;
- Section 3 is from Frank Street to the Kitsumkalum River.

The total cost to complete the Grand Trunk Pathway is estimated in the order of \$1.9-million, not including utilities/drainage, land acquisition and the construction of bridge structures that may or may not be necessary in the later stages.

1.0 INTRODUCTION

In 2000, the City of Terrace developed a 1.6-kilometer multi-use trail between Eby Street and Kalum Lake Road, which is referred to in this report as the Millennium Section. The trail was developed using funds made available from the Millennium Bureau of Canada. The developed trail includes extensive landscaping, pedestrian amenity areas with benches and garbage bins, stonework, textured surfaces, and lighting with hanging baskets. The development of the initial section of this linear park system has provided Terrace with a recreational amenity in close proximity to the downtown, one which is frequently used by bicyclists, joggers, hikers and dog walkers. The existing developed trail, however, is relatively short in length which has limited its connections to the rest of the park and trail network in the City and restricted its effectiveness as a viable transportation alternative.

In response to the success of the Millennium Section, the City, with assistance from the Greater Terrace Beautification Society and the Real Estate Foundation of British Columbia, have set out to develop a Master Plan for the completion of the Grand Trunk Pathway. The completed pathway is to be a continuous multi-use trail between the George Little House, adjacent to the downtown core, and the Kitsumkalum River and Fisherman’s Memorial Park at the western edge of the municipality. The pathway will be developed with a character that is consistent with the existing trail and incorporates a surrounding linear parkway and public spaces that aid in the effective functioning of the system. At its completion the Grand Trunk Pathway will be approximately 4.8-kilometres in length, will connect the Kitsumkallum First Nation Reserve with the Downtown and provide a high quality recreational/commuter linear park and pathway that links to the citywide trail network.



Photographs of the existing Millennium Section.

The Grand Trunk Pathway Master Plan is intended to serve as an implementation document containing the necessary planning and design basis for the successful development of the Grand Trunk Pathway. The Master Plan includes...

- background discussion of the existing Millennium Section and the new portions that will complete the Grand Trunk Pathway;
- plans illustrating the proposed pathway route and how it fits with the existing transportation and recreational networks;
- design guidelines for the development of the pathway, including pathway dimensions, surface details, signage and gateways, lighting, landscaping, and furnishings;
- detailed design concepts for critical locations along the trail (ie. roadway crossings, parks, etc);
- an implementation plan containing cost estimates and construction phasing recommendations; and
- a guide to successful long-term maintenance of the pathway and associated spaces.

2.0 BACKGROUND

2.1 What's in a Name?

The Grand Trunk Railway was an eastern-based railway venture established in 1852, originally connecting Toronto and Montreal. The Grand Trunk quickly acquired a series of established railway companies and, by the late 1880s, expanded its service from Sarnia, Ontario to Portland, Maine. To benefit from the expanding railway market in Western Canada, the Grand Trunk established the Grand Trunk Pacific Railway, which connected Winnipeg to Prince Rupert, via Terrace, and completed a continuous link from coast to coast. The Grand Trunk Pacific line was only complete for five (5) years before it went in to receivership and was acquired by the federal government. Four (4) years later, Canadian National Railways System (CN Rail) acquired Grand Trunk Railway and consolidated a nation-wide network. The rail corridor through Terrace has been operated by CN Rail ever since. Since its 1914 inception, the Grand Trunk Pacific Railway has provided a backbone for development in Terrace and defined the southern extent for the Downtown.

2.2 Project Objectives

While keeping in mind the general goals, objectives and policies of the City's Official Community Plan (OCP) and the principles of sustainable development, the objectives of the Grand Trunk Pathway Master Plan are as follows:

- explore/identify solutions to significant challenges to the cost effective construction of the incomplete pathway sections;
- involve key stakeholders – the City and the Beautification Society – throughout the planning/design process;
- produce a Master Plan document to guide future capital investment in the development of the Grand Trunk Pathway.

2.3 Project Approach

The City of Terrace, with financial support from the Greater Terrace Beautification Society and the Real Estate Foundation of British Columbia, set out to prepare the Grand Trunk Pathway Master Plan. The development of the Master Plan involved coordination between the various groups, with the City organizing the process, the Beautification Society providing guidance and vision throughout the process and Boulevard Transportation Group of Victoria, BC undertaking the detailed planning and conceptual design of the pathway. More specifically, the development of the Master Plan involved the following steps:

- refinement of project goals and objectives;
- undertake directed stakeholder interviews;
- consult with the Canadian Department of Fisheries and Oceans, BC Ministry of Transportation, and CN Rail;
- review existing trail design standards;
- develop and refine pathway route based on location of natural features, topography, and property availability;
- develop general pathway design criteria, including cross-section, landscaping and amenity features;
- develop detailed design concepts for specific locations critical in the overall functioning of the pathway;
- prepare order-of-magnitude cost estimates and a phased implementation plan for development of pathway;
- submit final Grand Trunk Pathway Master Plan summarizing planning/design process.

2.4 Benefits

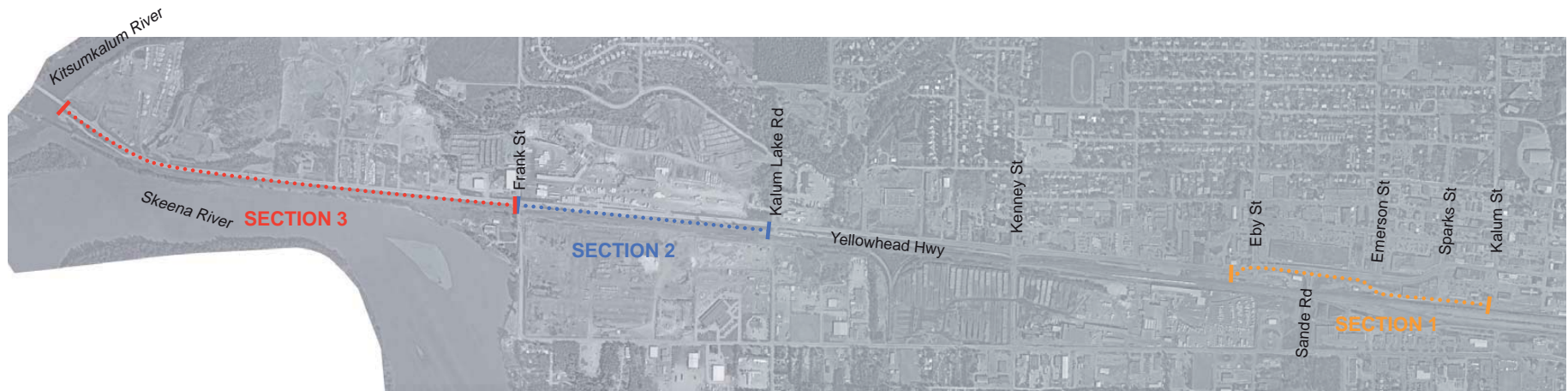
The benefits of parks and trail development to a community are well documented – increased opportunity for recreation, increased value of adjacent properties, preservation of natural habitats, etc. However, it is anticipated that the development of the Grand Trunk Pathway, because of the coordination with adjacent public spaces and the sheer length of the pathway, will provide Terrace with additional benefits, including:

- provide a recreational amenity to the community, encouraging community recreation and active living;
- reduced vehicle demand by promoting walking and bicycling as a travel mode;
- improve connectivity in the City's parks and trails network, and between existing public/community facilities;
- promotion of the downtown through increased connectivity and design of public spaces;
- provide opportunity for civic improvement through the concurrent development of critical public spaces;
- increase opportunities for tourists to explore the community;
- repair natural habitats through the improvement of park/natural areas;
- reclamation of significant property for public use.

3.0 PATHWAY ROUTING

The completion of the Grand Trunk Pathway will provide a continuous 4.8-kilometre non-vehicular connection between Downtown Terrace and the Kitsumkalum River, seen in Figure 1. The route follows a linear gap between the Grand Trunk Pacific Railway and the Yellowhead Highway (Hwy 16), which run roughly parallel to one another. The route transitions from predominantly commercial/retail-oriented land uses in the east, to a mixture of low-intensity industrial and suburban residential uses to the west. This natural corridor provides an ideal linear route for locating the pathway, but limits flexibility in responding to natural or property constraints.

Figure 1 - the three (3) proposed sections of the Grand Trunk Pathway



The chosen route is well integrated with identified pedestrian, bicycle and recreational routes within the City, seen in Figure 2. The sidewalks/walkways plan in the OCP shows the pathway intersecting with either existing or future sidewalks at Kalum Street, Sande Road, Eby Street and Kenney Street, Munroe Street, Brooks Street and Kalum Lake Road. The western-most portion of the pathway connects to the proposed future Kitsumkalum Greenway, and is connected to the partially-complete Howe Creek Greenway via a proposed sidewalk link on Kalum Lake Road. The City's OCP highlights existing and future bicycle connections at Sande Road, Kalum Lake Road, Kenney Street and Frank Street.

Figure 2 - Adaptation of Terrace OCP maps showing connectivity with Grand Trunk Pathway



For ease of design and implementation, the pathway has been divided into three (3) sections.

- The Downtown Gateway (Section 1) is approximately eight hundred (800) metres in length, beginning at the George Little House, at the base of Kalum Street, and running through a combination of CN Rail and City-owned properties, tying into the eastern end of the existing Millennium Section at Eby Street (negotiations for land acquisition from CN is ongoing).
- The Grand View Walk (Section 2) begins at the western-most end of the existing pathway, at Kalum Lake Rd, and runs approximately eight hundred-fifty (850) metres to Frank Street.
- The Skeena River Walk (Section 3) begins at Frank Street and runs west approximately one-thousand four-hundred fifty (1,450) metres, ending at the Kitsumkalum River and Fisherman's Memorial Park.

3.1 Downtown Gateway (Section 1)

The Downtown Gateway (Section 1) portion of the Grand Trunk Pathway provides a vital connection between the Sande Overpass, the main highway connection to the downtown, and the downtown itself. Essentially, this corridor is the face that greets visitors as they enter the City. The Downtown Gateway design outlines not only a plan for the development of the pathway, but a plan that incorporates public spaces that are integrated with the pathway and with the concept of inviting both vehicular and non-vehicular travellers into the downtown through the improvement of associated public spaces.

As shown in Appendix A, the chosen route begins at the George Little House, at the base of Kalum Street. Kalum Street has recently undergone a streetscape redesign process, in which new brick paver sidewalks, as well as street trees and furniture have been installed. As a result, this street is attractive as a pedestrian route and is an ideal link between the beginning of the pathway and the downtown. West of the George Little House, the pathway runs through a three (3) metre property concession required from CN Rail, immediately south of the Staples property. It then jogs northwest through the adjacent parcel, recently acquired from CN Rail and previously under lease to the Greater Terrace Beautification Society. This previously landscaped area has been redesigned to incorporate a plaza and seating area. The pathway travels westward through a pocket park area and intersects Sande Road at the existing crosswalk. After crossing Sande Road, the pathway proceeds westward, adjacent to the Yellowhead Highway, before intersecting Eby Street and connecting to the existing Millennium Section.



Photographs of Section 1.

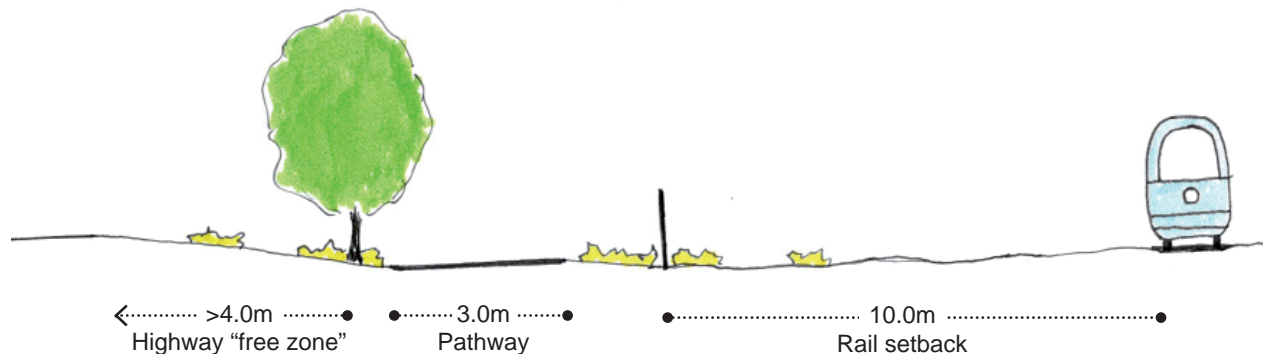
3.2 Grand View Walk (Section 2)

The Grand View Walk (Section 2) is the central portion of the Grand Trunk Pathway, seen in Appendix A. It utilizes a linear gap between the Yellowhead Highway and the CN Railway. This area is largely unimpeded by natural or physical conditions, making route choice a straight-forward task. Planning/design of this section has been done on the assumption that a possible Kalum Lake Road/Braun Street overpass has not been developed at the time of pathway construction. Should the overpass materialize, plans would have to be adjusted accordingly.

Section 2 begins at Kalum Lake Road, where the existing Millennium Section ends. It proceeds westward from Kalum Lake Road to Frank Street, utilizing the gap between the Yellowhead Highway and the CN Railway that ranges from almost twenty (20) metres in the east to under twelve (12) metres in the west. Key in the detailed concept plan for this section is the treatment of the pathway where it crosses a spur rail line approximately one-hundred fifty (150) metres west of Kalum Lake Road, which is outlined in detail in Section 5.6.



Section 2 currently consists of a great deal of sparse vegetation and unused former rail beds.



Typical cross-section of Section 2.

3.3 Skeena River Walk (Section 3)

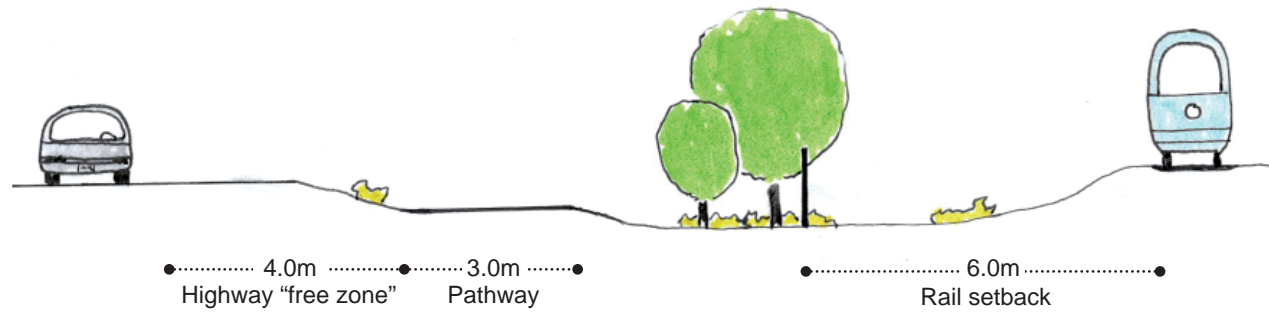
As shown in Appendix A, the Skeena River Walk (Section 3) of the Pathway presents a significant challenge in planning and design. Approximately one-hundred fifty (150) metres west of Frank Street, Howe Creek runs through a culvert beneath the Yellowhead Highway and continues to run westward, occupying the gap between the Highway and the Railway. To avoid having to accommodate both Howe Creek and the pathway in this stretch, consideration was given to having the pathway cross to the northside of the Yellowhead Highway at Frank Street, or possibly earlier in Section 2. It was determined, however, that the crossing of a provincial highway would be detrimental to the character of the pathway and that the numerous driveway crossings on the north side of the Yellowhead Highway would prove unsafe and inconvenient for pathway users. Accordingly, this Master Plan assumes a design of Section 3 with the pathway occupying the southside of the highway.

Two (2) routing scenarios are presented that give consideration to the challenge posed by Howe Creek. The first option proposes an elevated causeway that leaves Howe Creek exposed; the second involves diverting Howe Creek upstream and continuing the pathway between the Highway and Railway per the status quo. Since Section 3 is slated to be the final section of the pathway to be developed, it is suggested that the City make the most appropriate decision regarding the treatment of Howe Creek at a later date. This Master Plan provides a general design concept applying to both scenarios, with differing cost estimates.

Under both options, the pathway begins at Frank Street, where Section 2 ends. The initial segment is either elevated or at grade, depending on the chosen treatment of Howe Creek. The western-most eight-hundred (800) metres of the pathway will fill the linear gap between the Yellowhead Highway and the CN Railway, as it has in other sections. It would route through Fisherman’s Memorial Park in the west, and link underneath the Kitsumkalum Bridge, connecting with the sidewalk on the northside of the Bridge and the proposed future Kitsumkalum Greenway to the north.



Section 3, as it currently exists, is occupied by Howe Creek for a section, and is generally characterized by dense brush, uncurbed highway shoulders and the raised rail bed to the south.

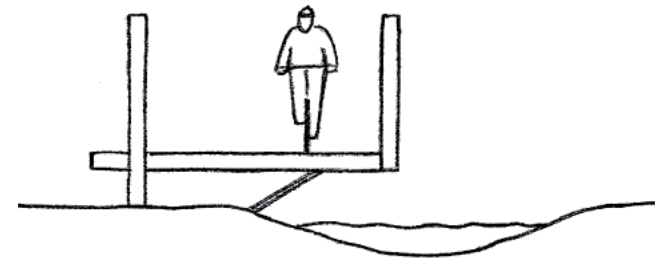


Typical cross-section of Section 3, showing the relation between the pathway and the surrounding highway and railway.

3.3.1 Option A – Elevated Causeway

Option A involves leaving Howe Creek untouched, and routing the pathway along an elevated causeway. The elevated causeway would run for approximately six-hundred (600) metres, adding significantly to the cost of this section. Adding some of the desired pedestrian amenities, such as benches and garbage bins, would prove problematic on this section.

The Canadian Department of Fisheries and Oceans (DFO) was consulted in planning this section. They noted that Howe Creek is a fish-bearing stream and that any construction along this stretch should be done in a way that is sensitive to fish habitats. DFO noted that the causeway structure should be constructed of steel and should have a surface that may be penetrated by light. Constructing the causeway of steel would prove costly, but would incur the least impact on the natural habitat. A wood structure is a suitable alternative, and should include a surface that light can penetrate and should be made of wood that has not been chemically treated.

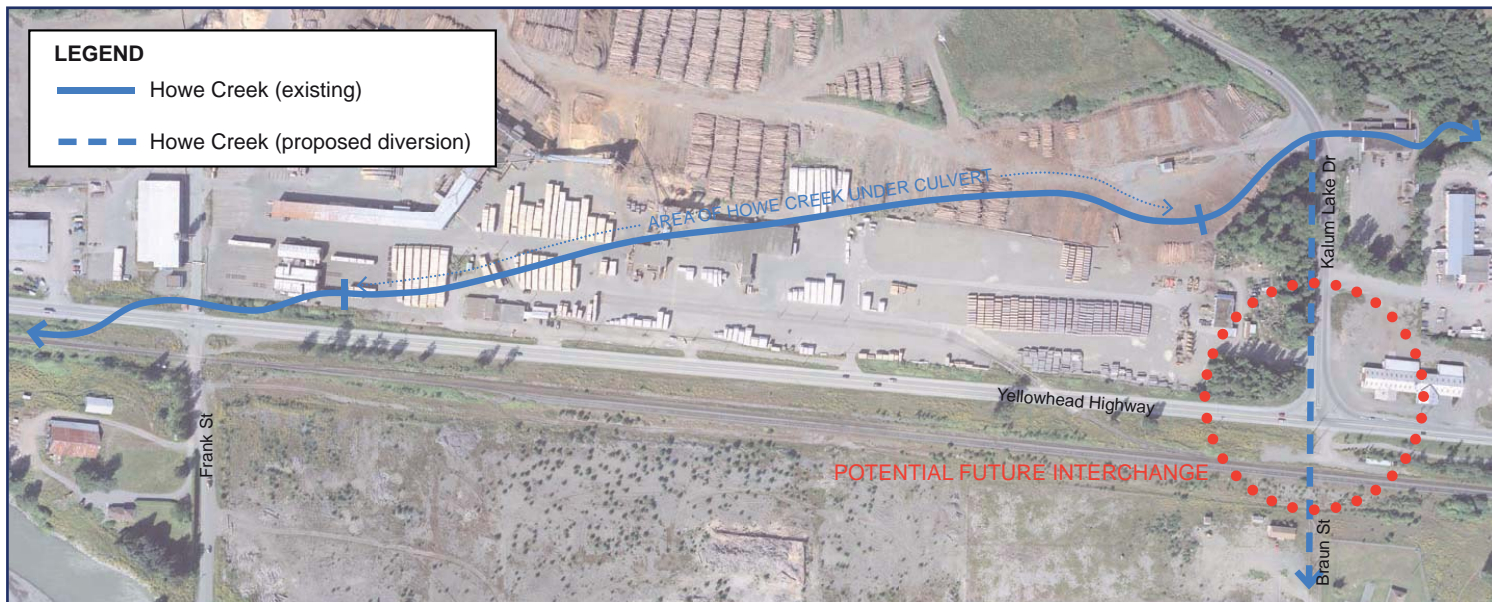


Concept sketch showing a section for the elevated causeway option for Howe Creek. The causeway is 2.5 - 3 metres in width and should have a surface that allows light to penetrate.

3.3.2 Option B – Howe Creek Diversion

DFO conceded that Howe Creek is presently a poor fish habitat - it runs parallel to a major highway, is culverted for almost a kilometre and its outfall to the Skeena River is elevated over five (5) metres when Skeena water levels are low. DFO has made it known that an upstream diversion of Howe Creek is a preferred alternative to the present routing of the Creek, and would prevent a conflict with the Grand Trunk Pathway west of Frank Street. The diversion would involve rerouting the Creek southward where it intersects Kalum Lake Road and continuing along Braun Street, until it eventually meets the Skeena River, as shown in Figure 3. This would require property acquisition from a number of landowners along Braun Street and should be integrated into the potential future construction of a highway overpass at Kalum Lake Road, but is thought to be achievable in the long-term. This rerouting allows the daylighting of Howe Creek over a greater length and will likely permit the reintroduction of Coho Salmon spawning into the Creek, which would be a significant contribution to the natural habitat. If an overpass is constructed at Kalum Lake Road/Braun Street adequate right-of-way lands should be acquired to allow the future rerouting and ‘day-lighting’ of Howe Creek.

Figure 3 - Highlights the Howe Creek diversion option considered in Section 3.



4.0 PATHWAY DESIGN ELEMENTS

The design of the existing Millennium Section has proven successful in that it is widely used by the surrounding community. As such, it will serve as a model for the planning and design of the remainder of the Grand Trunk Pathway.

The Millennium Section begins at Eby Street as a formalized, urban walkway. The pathway surface is three (3) metres in width and has street lights and a number of points of interest, including a small plaza at the base of Munroe Street and a number of interpretive signboards depicting local history and culture. Landscaped areas are formal and include species that require regular maintenance. On the west-side of Kenney Street the Grand Trunk Pathway transitions into a less-formal, suburban-feeling trail. There are no street lights or benches, signage is reduced, and landscaping is hardier, portraying a rural, natural feel. Through the design of the Grand Trunk Pathway, it is the intention of this Master Plan to use the design cues of the existing Millennium Section and develop the Pathway to an urban standard in Section 1, complete with lighting, amenities and intensive landscaping, and to a more naturalistic standard in Sections 2 and 3.

4.1 General Design Criteria

4.1.1 Pathway Cross Section

The existing Millennium Section is three (3) metres wide over its entire length. Accordingly, the Grand Trunk Pathway has been designed with a typical three (3) metre cross-section. Exception has been made where physical or property constraints exist. A linear parkway surrounds the pathway for its entire length, which varies in width from 0.5 metres to over ten (10) metres. The linear parkway includes areas of landscaping, benches, lights, garbage bins and plaza areas.

The Ministry of Transportation requires that the pathway meet their clear zone requirement of four (4) metres for the subject road classification. The clear zone is measured as the distance between the outside of the travel lane and the nearest permanent object, which includes natural landscape elements such as rocks and trees, as well as built infrastructure. This requirement is adhered to in the Master Plan for the entire subject portion of the Yellowhead Highway.

As the Pathway runs immediately adjacent to the CN Railway its entire length, a chain link fence one-hundred eighty (180) centimetres in height will be installed to prevent trespassing onto CN property. A fence will not be located where a sufficient natural barrier exists between the pathway and the Railway (ie. thick vegetation, steep slope). The fence is to be of an attractive black vinyl-coated finish on Section 1, while all fencing on Sections 2 and 3 will be typical galvanized steel. Access points will be provided in the fence where CN Rail requires them for emergency access to the railway.

4.1.2 Surfacing

The pathway shall have a medium mix asphalt surface with a granular sub-surface base. Brick pavers are used to identify entrance to significant points in the Pathway, in a similar fashion to the existing Millennium Section. Pavers signify public space and parks, road and railway crossings, and changes in pathway width, and should correspond with signage and gateway treatments. They typically appear in a varied hexagonal shape, with autumn-coloured bricks arranged in a basket weave pattern in the centre of each space and charcoal-coloured bricks in a stacked arrangement at the edge. The use of brick pavers and the colours selected are consistent with the Downtown Plan’s guidelines for sidewalk design.

4.1.3 Acceptable Grades

Acceptable grade refers to both the vertical slope and horizontal cross-slope that may occur on any portion of the pathway. The comfort and safety of the pathway are greatly affected by the steepness of grades, length of sustained grades and the quantity of uphill, downhill and level portions of the pathway. Accordingly, the pathway has been designed with a desired maximum grade of 5%, where grades as high as 10% have been designed over short distances. Construction should incorporate a cross-slope of approximately 2% to aid in drainage. A cross-slope in excess of 4% becomes problematic for mobility-impaired users and should be avoided.



Examples of the black vinyl chain-link recommended for Section 1.

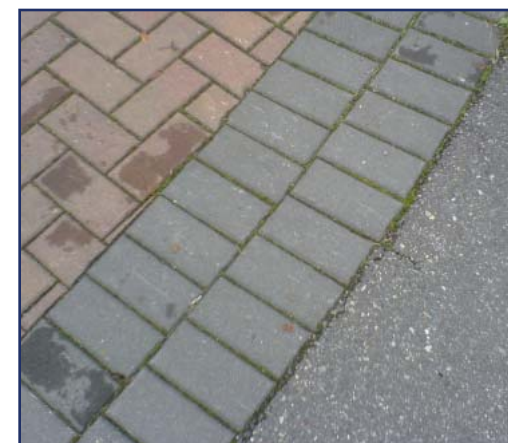


Photo from the existing Millennium Section showing the asphalt surface (right), charcoal-coloured pavers (centre), and autumn-coloured pavers (left).

4.1.4 Horizontal Curves

Wide, gentle curves with good forward sight lines are essential to a safe, aesthetically pleasing pathway. In designing the pathway, care has been given to ensure that all horizontal variation is gradual and that curves are not located at the base of a hill or in high-traffic areas. Minimum forward sight distances of twenty-five (25) metres are sought, and in locations where this is unattainable, appropriate warning signage is provided.

4.2 Signage and Trail Markers

For signage to be effective, it must provide information in a manner that is quickly and easily comprehended, as well as presented in a manner that is consistent throughout the pathway network. While signage from the Millennium Section will be used as a format for the Grand Trunk Pathway, it is felt that there are additional signs that are necessary for safe and comfortable use of the pathway.

4.2.1 Regulatory Signs

Regulatory signs are important in maintaining the integrity and safety of the pathway, ensuring it is used as intended. They alert users to specific activities that are permitted or not permitted on the pathway, and are placed at important trailheads to ensure that users are aware of the pathway regulations on entry. Regulatory signs typically contain pictographic images that are universally understood to convey a specific message. It is recommended that all regulatory signage on the Grand Trunk Pathway is based on guidelines set out in the Manual of Uniform Traffic Control Devices for Canada (MUTCDC).

4.2.2 Warning Signs

Warning signs are intended to alert users to specific hazards, such as an upcoming roadway crossing or abrupt changes in the pathway. They contain information displayed using minimal wording or simple pictographic messages. Warning signs offer a high degree of visibility, with messages typically being black on a vivid yellow background. Warning signs are to be designed based on the MUTCDC, which typically outline standards for signs that are to be observed by highway motorists. As applied to the



Existing regulatory signage on the Millennium Section.

pathway, however, the MUTCDC guidelines may be scaled to approximately one-third the intended size, with a typical sign scaled from 600mmx600mm to 200mmx200mm. This will bring the sign to an appropriate scale for slower pedestrian/bicycle users and clearly differentiate pathway warning signage from vehicular warning signage.

4.2.3 Pathway Identifier Signboards

Pathway identifier signboards are key in signalling entrance to the Grand Trunk Pathway and in directing users to select destinations. The existing Millennium Trail does not include identifier signage. It is suggested that identifier signboards are included in the future development of the Grand Trunk Pathway, and that the existing Millennium Section may be retrofitted to include identifier signboards at major entrance points. Identifier signboards should be designed in a style consistent with the overall vision for the pathway. They should include the Grand Trunk Pathway logo, and directions and distance information for key bicycle and pedestrian destinations. Destinations to be listed on signboards may include, but should not be limited to, Downtown Terrace, the George Little House, the Foreman’s Residence, the Howe Creek Greenway, and Fisherman’s Memorial Park.

4.2.4 Interpretive Signage

The existing Millennium Section contains a number of interpretive signboards that provide a glimpse into the rich history and culture of the area. These signboards tell stories of interest to both locals and non-local users of the pathway - such as a short history of the area’s First Nation Kitsumkalum and Kitselas people, while another explains the construction of the Yellowhead Highway during World War II. The area is rich in culture and has stories that should be told. It is felt, however, that the existing interpretive signs are a specific and unique feature of the existing Millennium Section and represent a character that is associated with that portion of the Grand Trunk Pathway. Accordingly, the rest of the Grand Trunk Pathway has not been designed to include these interpretive signboards.



Proposed identifier signboard design.



Sample interpretive sign.

4.3 Lighting

The existing Millennium Section has standard overhead lights east of Kenney Street, but is unlit to the west. Section 1 will be lit using the same light standards used on the Millennium Section, and will be located at a similar spacing of approximately forty (40) to forty-five (45) metres apart. In keeping with the more rural feel of the western portion of the pathway, Sections 2 and 3 will not be lit.

Low-level bollard lights are also recommended for certain portions of Section 1 with specific pedestrian emphasis. Bollard lighting should be between 1.0 and 1.2 metres in height and spaced approximately six (6) to eight (8) metres from one another, depending on the intensity of light of the chosen bollard. The bollards will be located in areas where highway snow removal may occur, therefore they must be durable and rust resistant. In selecting an appropriate bollard, the City should consider a style that is consistent with lighting and signage for the rest of the pathway. Consideration may give given to selecting a solar-powered bollard of appropriate design.

4.4 Landscaping

The concept plans provide guidelines for the location and type of landscaping that will occur along the pathway. It is the intention of this Master Plan to outline the spaces that plantings should be placed, but that detailed planting plans will be completed by a qualified landscape professional for each location. When preparing landscape plans, designers should consider the following guidelines:

- Landscaping should relate to the existing Millennium Section plantings, utilizing similar arrangements and species;
- Landscaping should utilize hardy species that limit maintenance;
- Landscaping should be chosen to reflect the context and climate of Terrace.



Examples of the existing lights along the Millennium Section, which will be used in developing the rest of the Grand Trunk Pathway.



Examples of the possible low-level bollard lights the City may select in developing the pathway.

4.4.1 Preferred Species

As part of the preparation of the existing Millennium Section design of the Grand Trunk Pathway, a planting list was created that included a number of trees, shrubs and perennials. To maintain consistency in planting over the entire pathway, it is suggested that consideration is given to using as many of the following species as possible in preparing detailed planting plans when developing the pathway.

Trees

| | |
|------------------------|--|
| Upright European Aspen | <i>Populus Tremula Erecta</i> |
| Norway Spruce | <i>Picea Abies</i> |
| Patmore Green Ash | <i>Fraxinus Pennsylvanica Lanceolata</i> |
| Red Oak | <i>Quercus Rubra</i> |
| Red Maple | <i>Acer Rubrum "Morgan"</i> |

Shrubs

| | |
|------------------------|---|
| Royal Meidiland Rose | <i>Rosa Meidiland Bonica "Royal"</i> |
| Anthony Waterer Spirea | <i>Spirea x Bulmada "Anthony Waterer"</i> |
| Redosier Dogwood | <i>Cornus Stolonifera</i> |
| Yellowtwig Dogwood | <i>Cornus Stolonifera Flaviramea</i> |
| Rose | <i>Rosa Meidiland Bonica</i> |

Perennials and Ferns

| | |
|------------------|------------------------------------|
| Virginia Creeper | <i>Parthenocissus Quinquefolia</i> |
| Dwarf Day Lily | <i>Hemerocallis Stella D'oro</i> |
| Male Fern | <i>Dryopteris Felix-Mas</i> |



Examples of typical landscaping from the existing Millennium Section.

4.5 Furnishings & Amenities

Furnishings and amenities considered include benches and garbage bins. The existing Millennium Section was developed with a standard bench and garbage bin, both of which are to be used in subsequent sections.

4.5.1 Benches

Benches are provided to ensure the pathway is a comfortable and inviting space, with the hope that they will encourage users to linger and add to the sense of social gathering and security that the pathway aims to portray. The Millennium Section was developed with benches made of solid wood planks that have been sealed with a clear preservative, and are fastened to a finished steel frame. The bench is approximately one-hundred eighty (180) centimetres in length, eighty (80) centimetres in height, and sixty (60) centimetres in depth. Benches should be spaced no more than five-hundred (500) metres apart, with additional benches located at specific areas of gathering or public interest.



An example of the benches that were used on the existing Millennium Section, which are to be used in the development of the Grand Trunk Pathway.

4.5.2 Garbage Bins

Garbage bins are provided in the hope that users will choose to use the provided bins to discard their refuse, not the pathway and surrounding park areas. The garbage bins used in the Millennium Section are clad with solid finished wood slats on a steel frame, and are cylindrical in shape. They are approximately one (1) metre in height and seventy (70) centimetres in diameter. Garbage bins are to be located where they are most likely to be used, such as main entrances to the pathway or in areas with concentrated amenities.



An example of the garbage bins on the existing Millennium Section, which are to be used in the development of the Grand Trunk Pathway.

5.0 CRITICAL DESIGN LOCATIONS

Certain locations along the pathway are critical in the design and functioning of the pathway. Below are more detailed design concepts to guide the development of particular spaces along the Pathway.

5.1 Downtown Gateway

The most significant of the critical design locations is the Sande/Greig intersection and surrounding areas. The objective in designing this area is to signify the entrance to the downtown so that highway traffic is enticed to visit.

5.1.1 Gateway Park

The objective of the redesign of the space at the Sande Road/Greig Avenue intersection is two-fold. First, consideration is given to the space as a focal point in the overall pathway design, as it is at one of the City's major road junctures and the volume of pedestrian traffic over the Sande Overpass necessitates a re-working of the existing space. Secondly, and perhaps more importantly, the space's location at the entrance to the downtown and its current lack of prominence requires a redesign as a downtown gateway.

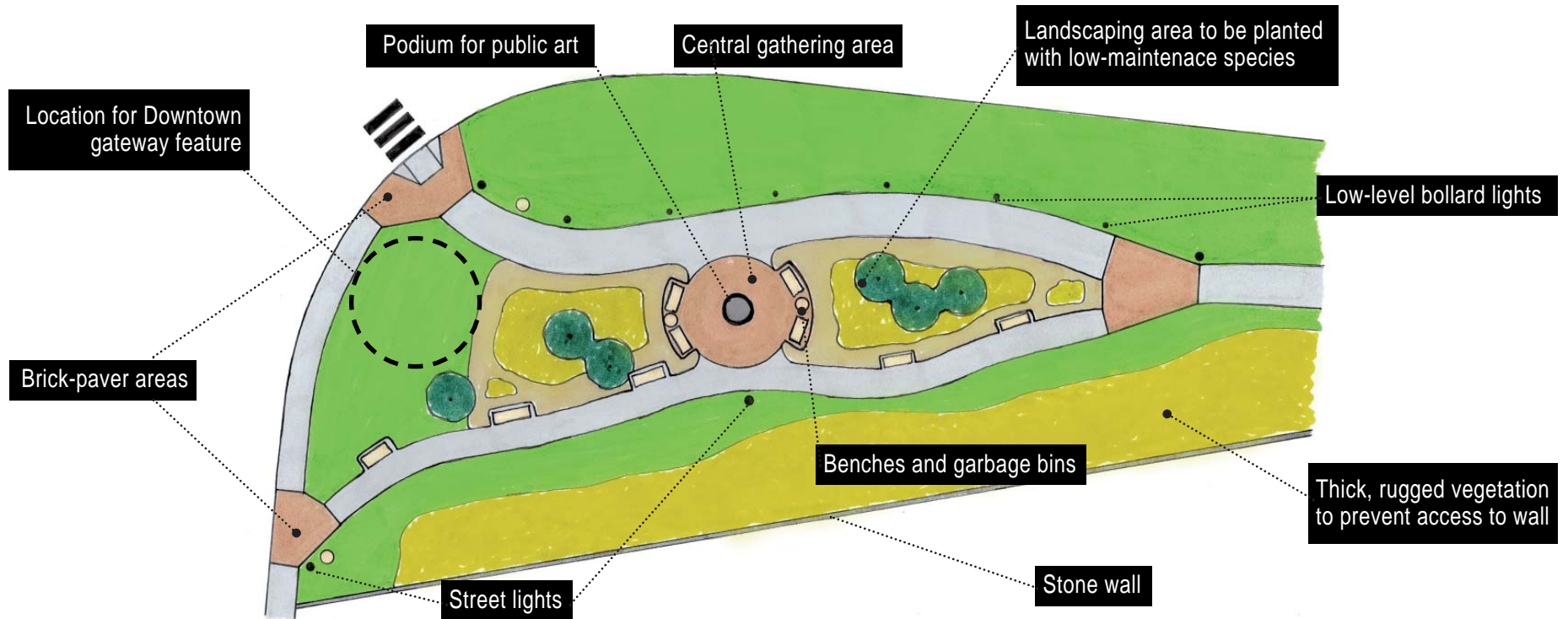
The design of Gateway Park, seen in Figure 4, includes a central rosary. The rosary has a podium in the centre for public art with benches, garbage bins and lighting at the edges. The pathway continues through the space along the north edge, and a sidewalk connects users of the Sande Overpass to the north and east via direct routes. Benches have also been provided along the south of the space, encouraging users to prolong



View from the benches proposed for Gateway Park.

their stay in the space and view the impressive mountain/railway scenery to the east and south. The spaces at the centre are envisioned as planting areas, while the area to the north would be grass and the area to the south would be a thick brush that restricts pedestrian access to the retaining wall. The space created at the far west of the Park is to be used for the placement of a gateway sign feature that alerts vehicle travellers to the presence of the downtown to the east. The design concept for the gateway feature should incorporate many of the same elements found throughout the pathway and in the design of this particular intersection.

Figure 4 - Gateway Park design concept



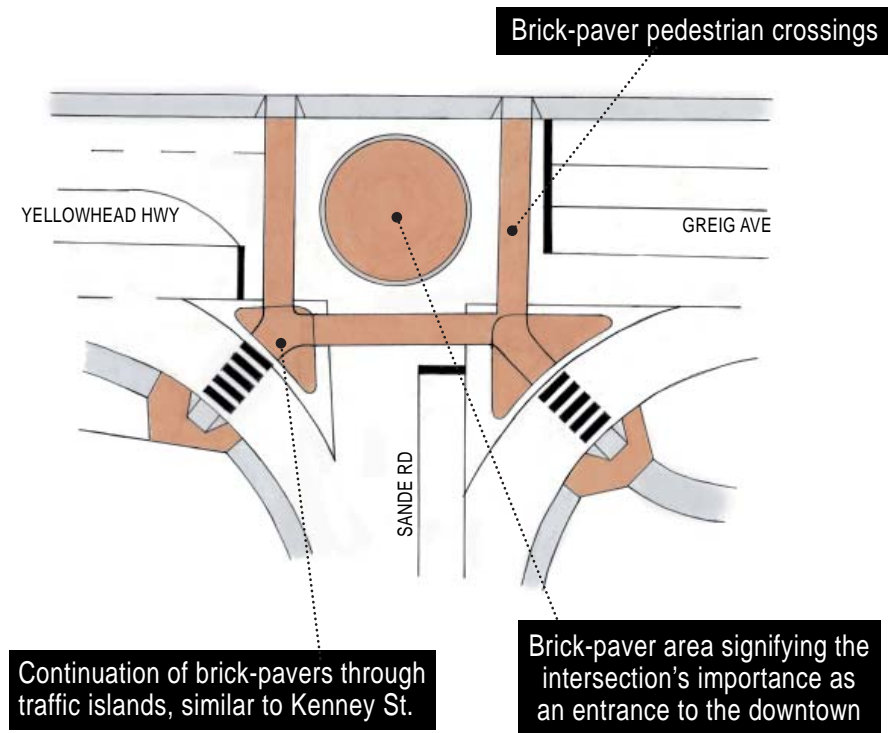
5.1.2 Sande/Greig Intersection

The Sande/Greig intersection is vital to the functioning of this area as a gateway to the Downtown. At present, vehicles are greeted by the roofscape of the Save-on-Foods building at the north of the intersection, a view which includes rooftop utility boxes and the tar and gravel roof. The intersection itself is designed to highway standards, and proves uninviting for pedestrian users. The redesign of the intersection includes two (2) key interventions.

To signify the entrance to the downtown, continue the pedestrian feel of the pathway corridor, and generally improve aesthetics at the intersection, pavement treatments shown in Figure 5 are recommended. The concept plan highlights a brick paver treatment in the centre of the intersection, in the pedestrian crossing points and the traffic islands. The paver treatment will signal to motorists that they are entering the downtown core and that this location has particular pedestrian importance, heightening their awareness and encouraging cautious driving. The pavement design consists of autumn-coloured pavers outlined with charcoal-coloured pavers, both of which are specified in the Downtown Plan.

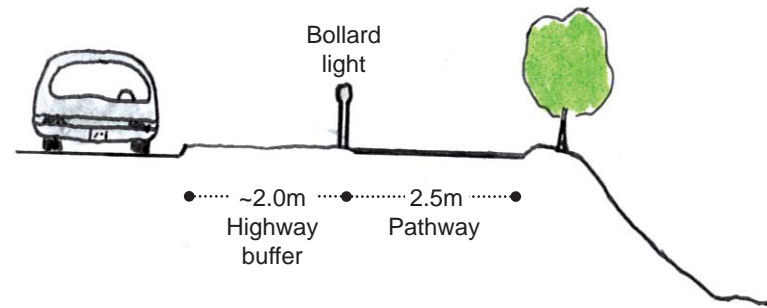
The second key point of intervention at the Sande/Greig intersection is a rethinking of the Skeena Mall rooftop. Its current location is at eye-level with the Sande Overpass so that as vehicles approach the City centre, they are greeted by the building’s rooftop HVAC equipment. To remedy this, it is recommended that a screen is extended along the rooftop edge to screen the HVAC equipment from view. An existing mesh screen is installed at one end of the rooftop as part of the Save-on-Foods corporate architectural character, which could be extended. However, out of fear that the extension of this screen may benefit a private corporation at the expense of the public realm, and that the screen itself is considerably industrial in appearance, an image should be designed into the portion of the screen directly adjacent to the Sande/Greig intersection. The Kermodi Bear etched into the screen may be appropriate, however the City should commission a local artist to design an image that best represents the entrance to the downtown.

Figure 5 - Sande/Greig intersection redesign concept



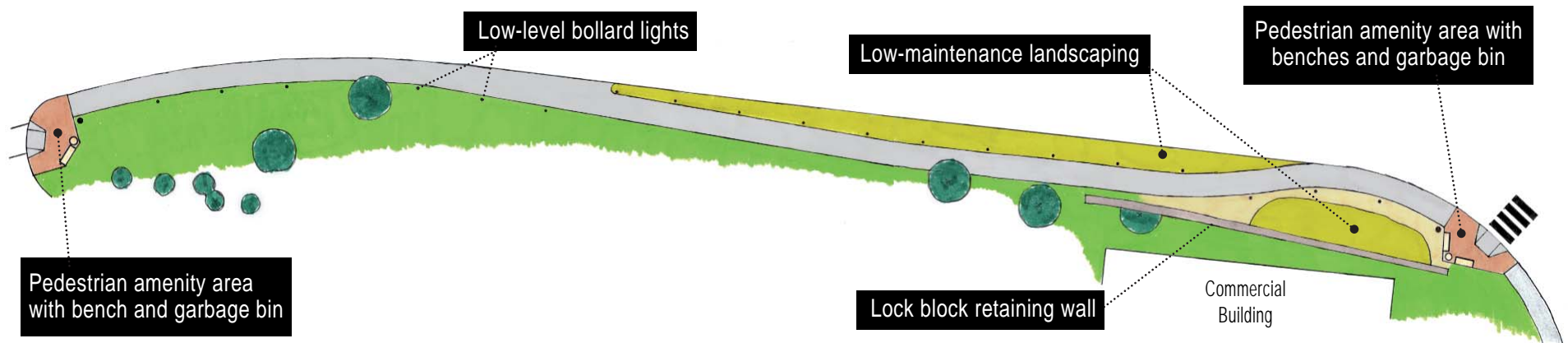
5.2 Eby-Sande Connection

The section between Eby Street and Sande Street has been given particular attention due to significant property constraints between the Yellowhead Highway and the commercial property to the south, as seen in Figure 6. The pathway has been designed with a small linear gap between the pathway and the highway for the majority of the segment, so that the overhead signage and lighting poles do not impede the pathway. This linear gap provides separation and a sense of security for pedestrians from the highway traffic. At the eastern portion of this section, a lock block retaining wall must be constructed to account for the large elevation change. The retaining wall will be approximately forty (40) metres from its intersection with the existing north-south retaining wall at the east of the Praxair property, and will be as high as 4.5 metres tall, decreasing to approximately one (1) metre height at the west. The pathway through this section has been reduced to 2.5 metres width and includes the low-level bollard lights described in Section 4.3. Brick-paver trailheads are located at either end of this segment, together with benches and garbage bins.



Typical section on Eby Street - Sande Road segment.

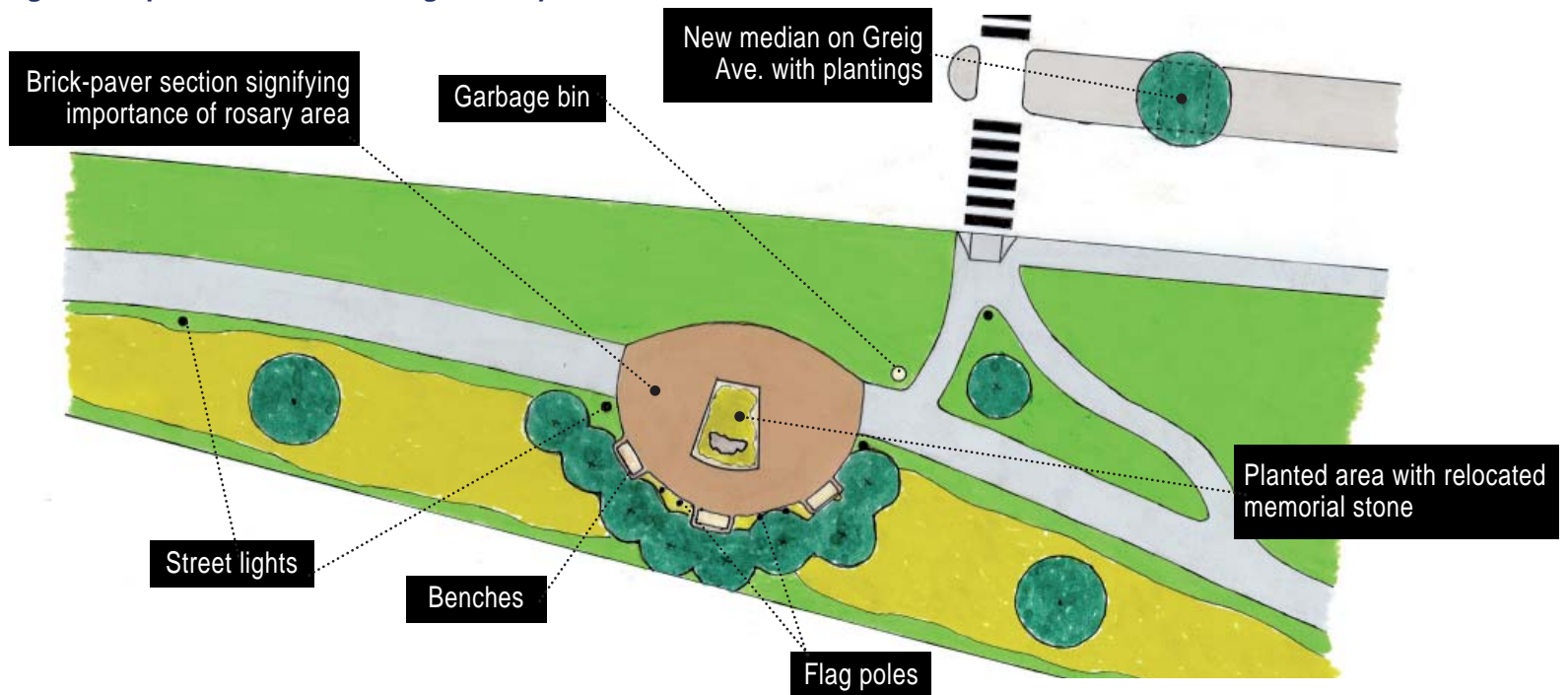
Figure 6 - Eby Street-Sande Road design concept



5.3 Sparks Street Park

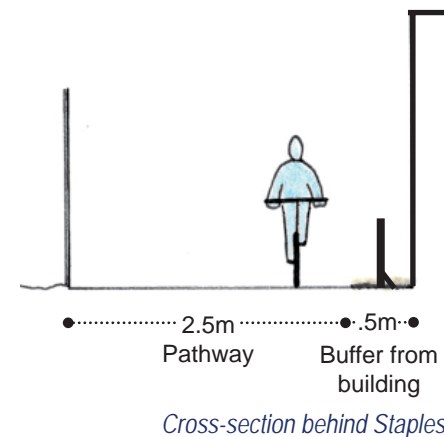
The base of Sparks Street is thought to be an ideal location to both provide an amenity area for users of the pathway and design a public space that grabs the attention of passer-bys as they enter/exit the downtown. This space has been designed similar to the existing rosary on the Millennium Section located at Munroe Street. Figure 7 shows that the main pathway travels directly through the space, with sidewalks intersecting that connect the path to Greig Avenue and the downtown to the north. The central rosary has been surrounded with landscaping, benches, garbage bins, lights, a series of flag poles, and is highlighted by the relocated stone commemorating George Clark and his contribution to Terrace as a volunteer with the Greater Terrace Beautification Society. Landscaping as shown on the concept plan makes use of the existing mature spruce trees that currently occupy the space. However, should they prove unfit for use in the redesigned space, new trees may be planted. It is anticipated that the view of the commemorative stone in the foreground, with flag poles, the CN trains and mountains in the background will frame an image that is representational of Terrace and is ideally situated as the view for vehicles exiting the downtown.

Figure 7 - Sparks Street Park design concept



5.4 Behind Staples

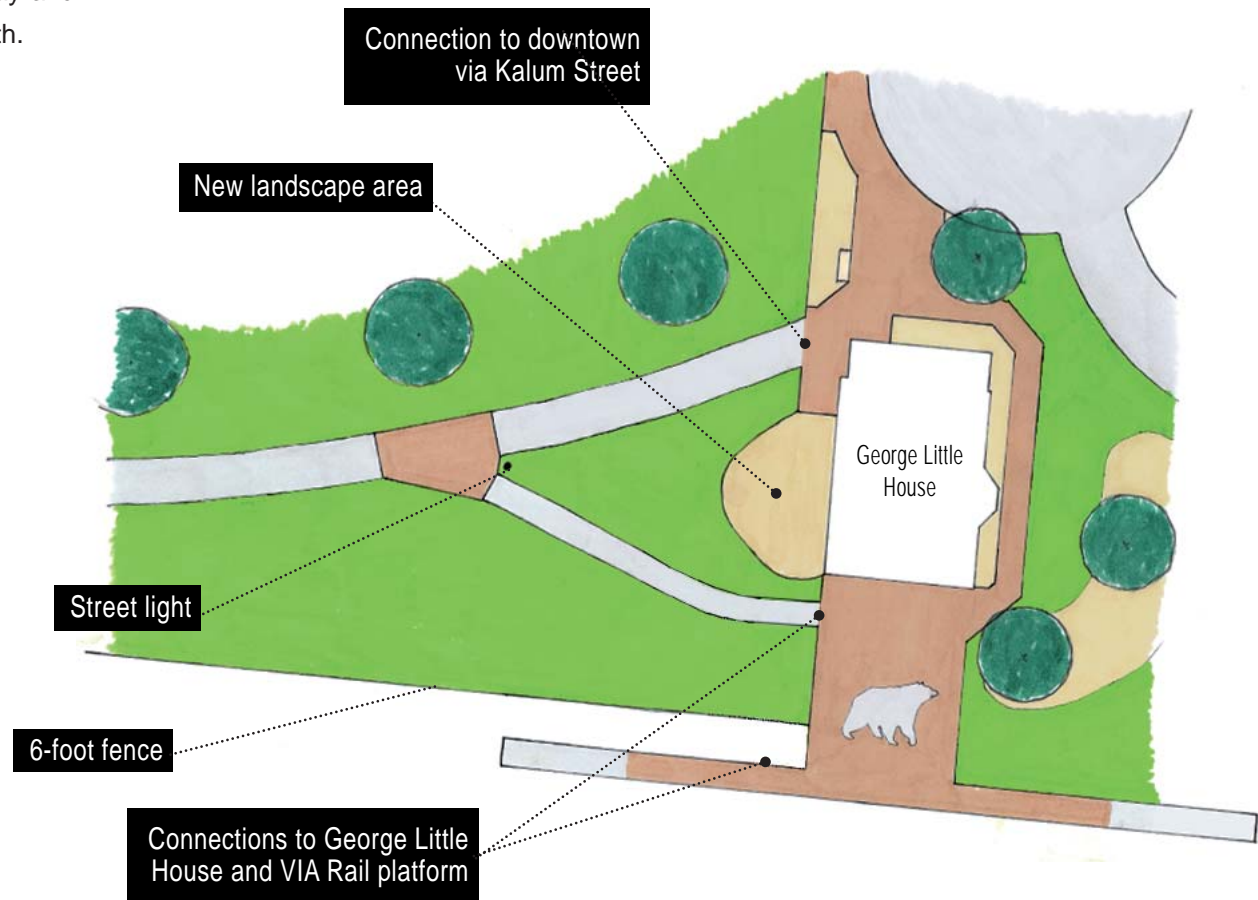
Particular attention has been given to the design of the space behind the Staples property, in Section 1. CN Rail has been approached to consider dedication or transfer of a three (3) metre property concession through this space, which permits the routing of the pathway, but makes the appropriate design of this space critical to ensure it does not deter pathway users. Particular attention has been given to ensuring that the space remains inviting by softening the edge of the pathway. The pathway width has been reduced to 2.5 metres through this section to allow for a fifty (50) centimetre buffer area between the pathway and the exterior of the Staples building. It is envisioned that this buffer would be filled with a series of public art installations. The public art should be no more than fifty (50) centimetres wide, so that it fits in the space provided, and should be designed in a style that is consistent with the other features found on the pathway. Initial concepts include a steel lattice installation that would profile the railway industry, as well as include some architectural elements from the immediate surroundings. Small brick paver sections with cautionary signage have been provided at both entrances to this section to signify to users that the pathway is narrowing.



5.5 George Little House

The space immediately west of the George Little House has been designed to allow a convenient tie-in with the western sidewalk on Kalum Street, as well as provide connection to the south of the George Little House and the VIA Rail Station platform, shown in Figure 8. The pathway has been designed with a row of large trees on the north side and includes landscaped areas to the south of the pathway and where it approaches the George Little House. The landscaped areas will buffer the pathway from the railway and industrial uses to the south.

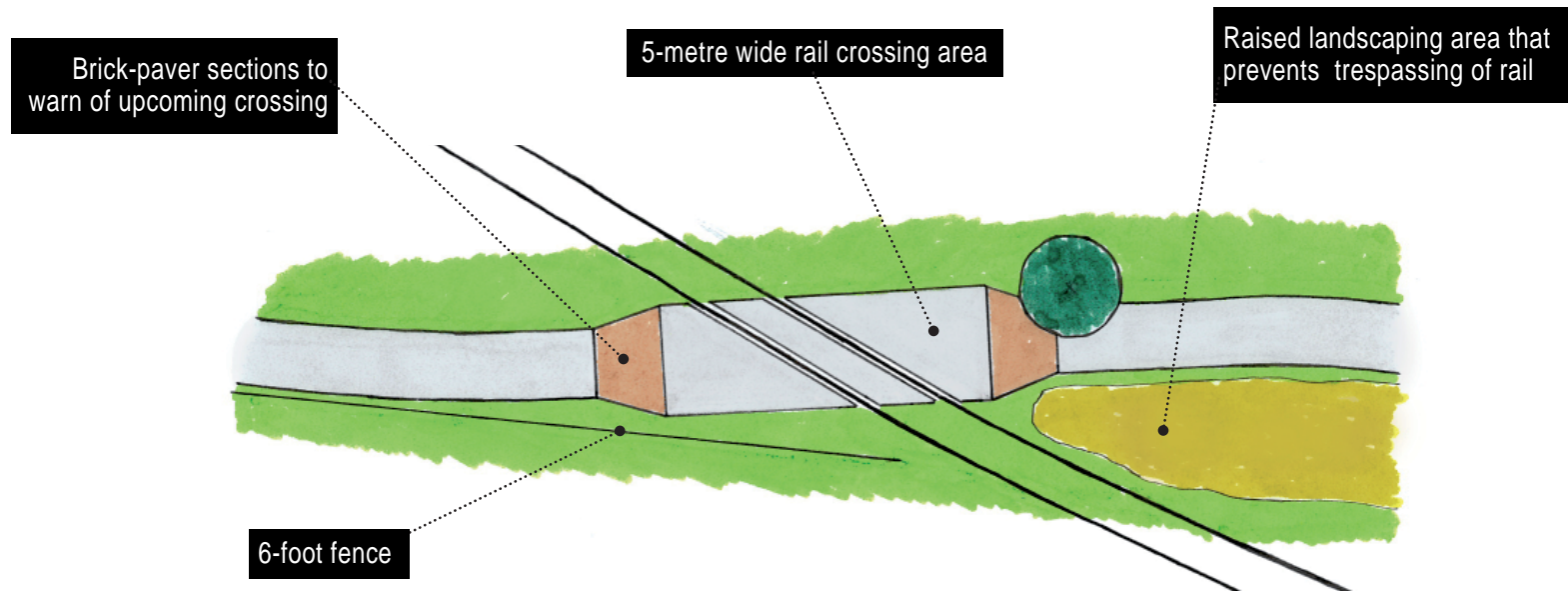
Figure 8 - George Little House design concept



5.6 Spur Rail Crossing

An occasionally-used rail line serving a saw mill veers northeast off the main CN Rail line approximately one-hundred fifty (150) metres west of Kalum Lake Road, seen in Figure 9. This line crosses the pathway route and continues across the Yellowhead Highway. The detailed concept plan for this crossing point outlines how this intersection should be designed to ensure safety for pathway users.

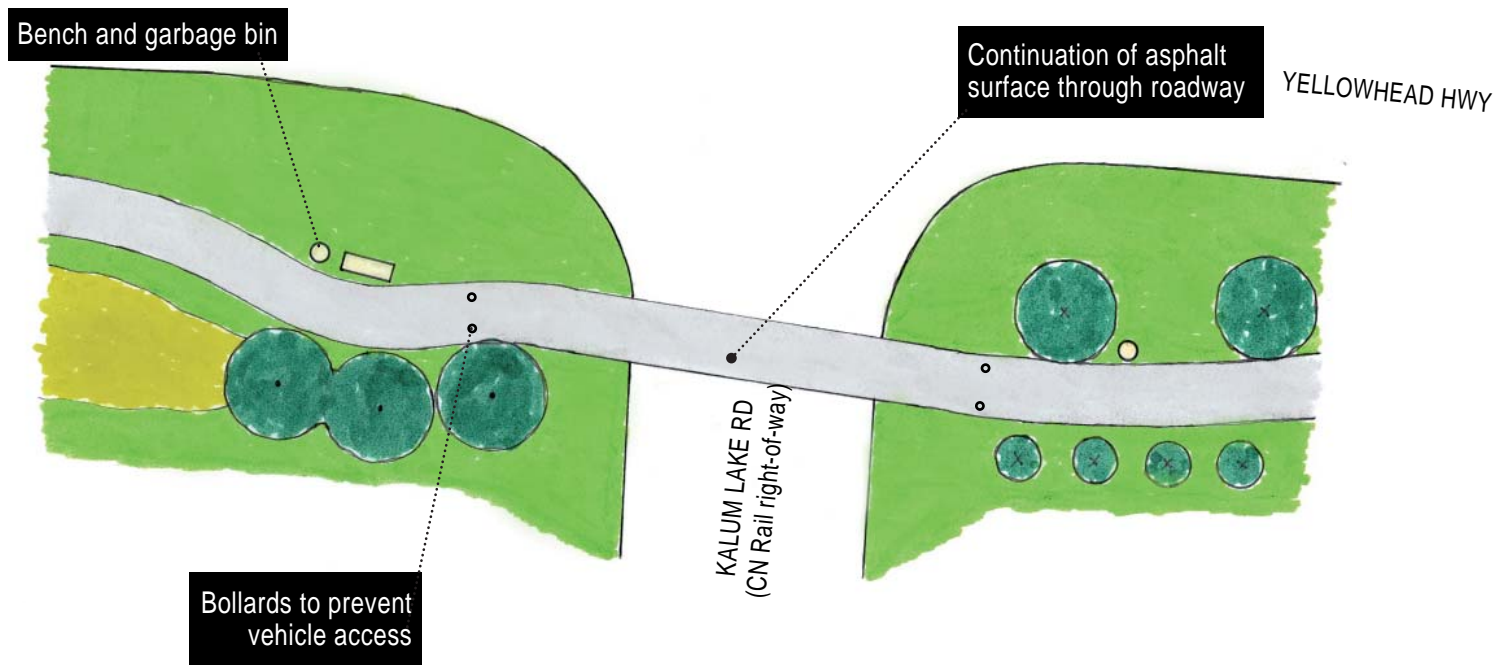
Figure 9 - Spur rail crossing design concept



5.7 Kalum Lake Rd Crossing Point

Special attention has been given to the location where the pathway crosses Kalum Lake Road, shown in Figure 10. The portion of Kalum Lake Rd south of the highway is only used by CN Rail employees to access CN maintenance buildings, it does not cross the railway and continue south. As a result, there is very limited vehicle traffic using this road. The asphalt pathway surface continues through the crossing, while the surrounding roadway remains unpaved. This signals that vehicle traffic functions secondary to pathway traffic through this area. Removable bollards have been placed on the west side of the crossing to prevent vehicle access to the pathway, similar to what exists on the east side.

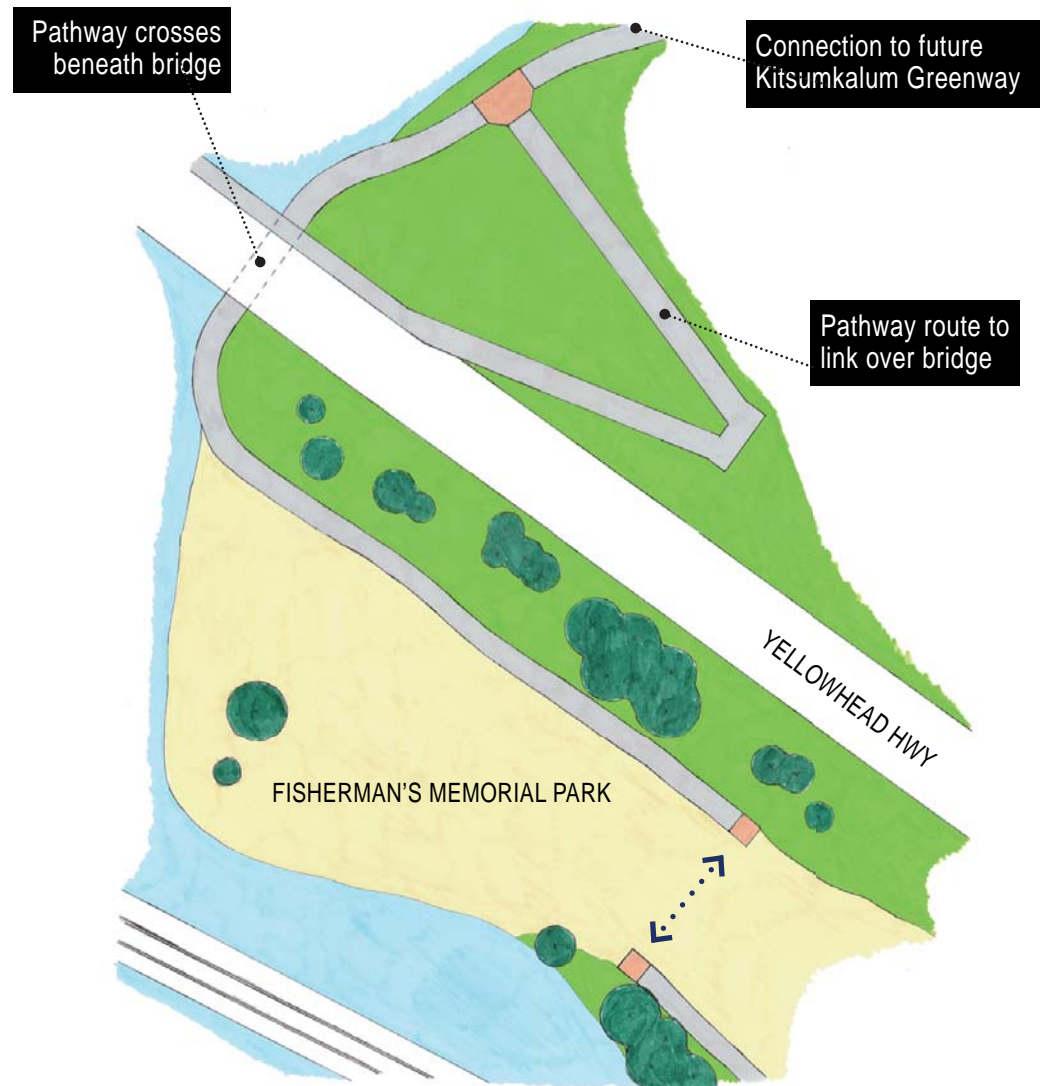
Figure 10 - Kalum Lake Road crossing design concept



5.8 Kitsumkalum Bridge and Fisherman’s Memorial Park

The western-most portion of the pathway is designed so that users can pass over the Kitsumkalum Bridge and also connect to a proposed trail that runs north along the Kitsumkalum River, shown in Figure 11. The Bridge currently has a sidewalk located on the north side, while the pathway is on the south side of the Yellowhead Highway. To make this link, the pathway will pass beneath the Bridge, via a suspended or cantilevered walkway above the River. The pathway will then meet at a three-way junction where it splits, allowing users to ascend to bridge-level to cross the River, or allows them to proceed north along the future Kitsumkalum Greenway identified in the OCP, once completed.

Figure 11 - Kitsumkalum Bridge and Fisherman’s Memorial Park design concept



6.0 IMPLEMENTATION

6.1 Phasing

The Grand Trunk Pathway is to be developed in three (3) phases. The phases proceed from east to west, and generally aim to develop those sections with the greatest community benefit first. The phases are as follows:

- The first phase – Section 1 Downtown Gateway - includes everything between the George Little House and Eby Street. For costing purposes, the intersection improvements at Sande/Greig have been considered separate from the development of the pathway. However, the addition of medians and sidewalks on Greig Avenue have been included in this section.
- The second phase – Section 2 Grand View Walk - includes all recommended improvements between Kalum Lake Road and Frank Street.
- The third phase – Section 3 Skeena River Walk - includes improvements between Frank Street and the Kitsumkalum River. Any addition to the Grand Trunk Pathway that would link to the future proposed Kitsumkalum Greenway is not included in the Master Plan cost estimates.

6.2 Cost Estimates

Cost estimates were conducted for each of the three (3) sections. In total, the development of all three (3) sections is estimated to cost up to \$1.9-million, excluding the cost of the elevated structures mentioned for Section 3, and underground utilities and drainage. A detailed breakdown of costs is included as Appendix B, with a summary of each section below.

6.2.1 Phase One

The estimated cost for the completion of Section 1 is \$1.1-million. The intersection improvements proposed for the Sande/Greig intersection and the public art/gateway feature suggested for Gateway Park have not been considered in pathway cost estimates. This cost is higher than the other two (2) sections largely due to the retaining walls on either side of Sande Street and the backfill required behind them, as well as the greater number of furnishings and design details proposed.

6.2.2 Phase Two

The estimated cost for the completion of Section 2 is \$345,000. Should Section 2 be constructed with a gravel surface rather than asphalt, the estimated cost is approximately \$200,000.

6.2.3 Phase Three

The estimated cost for the completion of Section 3 is approximately \$445,000 if the entire section is developed with an asphalt surface, and approximately \$245,000 if developed with a gravel surface. These figures do not include the cost of the possible raised causeway and elevated section beneath the Kitsumkalum Bridge, which would add significantly to the cost of this section.

7.0 MAINTENANCE

It is necessary that a pathway maintenance protocol is followed to ensure the pathway will be used in the future as it was designed. Generally, pathway maintenance priority should be first to correct unsafe conditions, then repair natural/environmental damage, and lastly restore the trail to desired conditions. Regular pathway maintenance ensures users safety, provides continued access to the pathway and ensures the surrounding areas, whether natural or built, remain in good condition. A high maintenance standard includes quick response to pathway deterioration and vandalism, as well as annual scheduled tasks.

7.1.1 Annual Maintenance

Annual pathway maintenance should be performed in April/May, prior to the high-use period and after the majority of winter weather has cleared. Annual maintenance should entail a standard audit/checklist that shows the date of inspection, the state of the trail, hazards, required repairs and the actions to be taken to correct any disrepair. Inspection records should be kept on file. The annual maintenance audit should include the following:

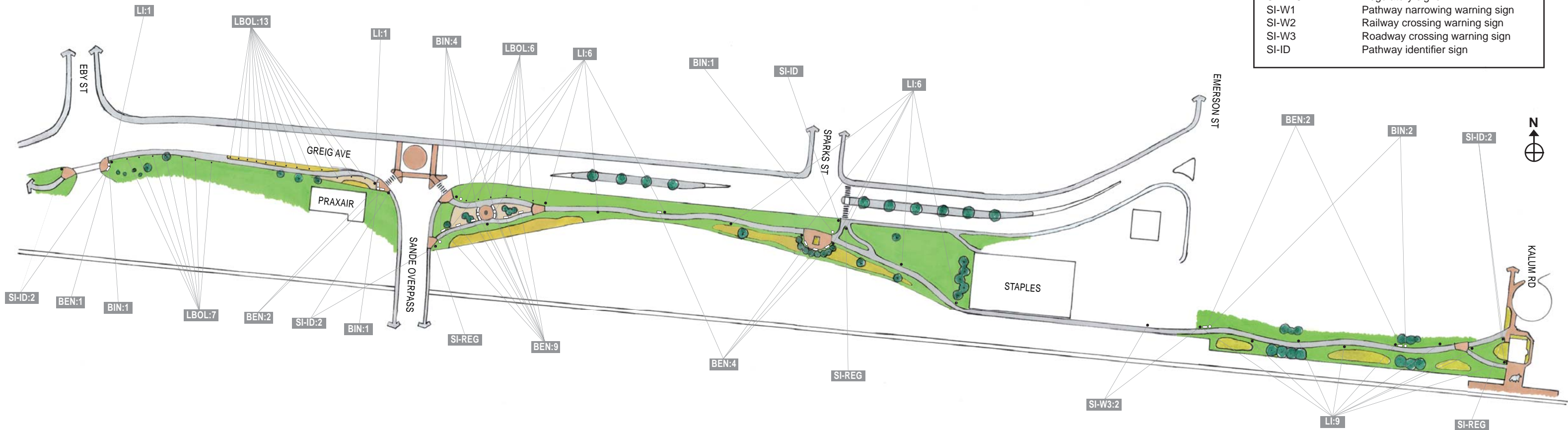
- Remove loose rocks and debris from tread surface
- Repair pathway washouts
- Remove unwanted plant growth
- Level pathway tread as necessary
- Restore pathway grade to original slope
- Repair ruts, holes, low spots and muddy areas
- Clear all drainage features
- Check and repair/replace signs and pathway markers

7.1.2 On-going Maintenance

In addition to an annual Spring maintenance, the City should ensure that staff are made available for short-term maintenance. This may include responding to potentially hazardous conditions, such as a fallen tree or a washed-out portion of the pathway. It may also include responding to disrepair or vandalism to infrastructure, such as signage, benches or garbage receptacles. It is important that on-going maintenance can be conducted on short notice.

APPENDIX A
Detail Plans

| LEGEND | |
|--------|--------------------------------|
| BEN | Bench |
| LI | Light standard |
| BIN | Garbage bin |
| BOL | Removable bollard post |
| LBOL | Bollard with light |
| SI-REG | Regulatory signs |
| SI-W1 | Pathway narrowing warning sign |
| SI-W2 | Railway crossing warning sign |
| SI-W3 | Roadway crossing warning sign |
| SI-ID | Pathway identifier sign |



| LEGEND | |
|--------|--------------------------------|
| BEN | Bench |
| LI | Light standard |
| BIN | Garbage bin |
| BOL | Removable bollard post |
| LBOL | Bollard with light |
| SI-REG | Regulatory signs |
| SI-W1 | Pathway narrowing warning sign |
| SI-W2 | Railway crossing warning sign |
| SI-W3 | Roadway crossing warning sign |
| SI-ID | Pathway identifier sign |



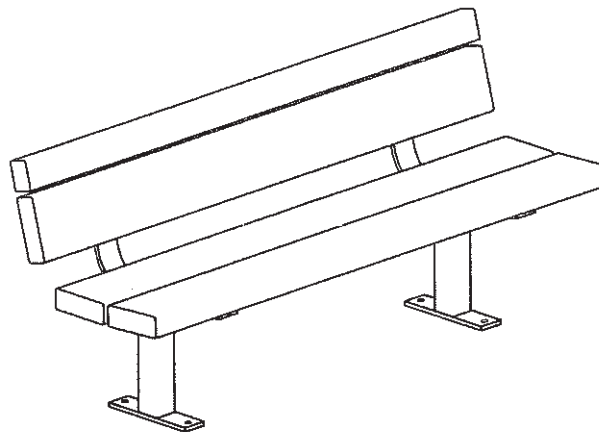
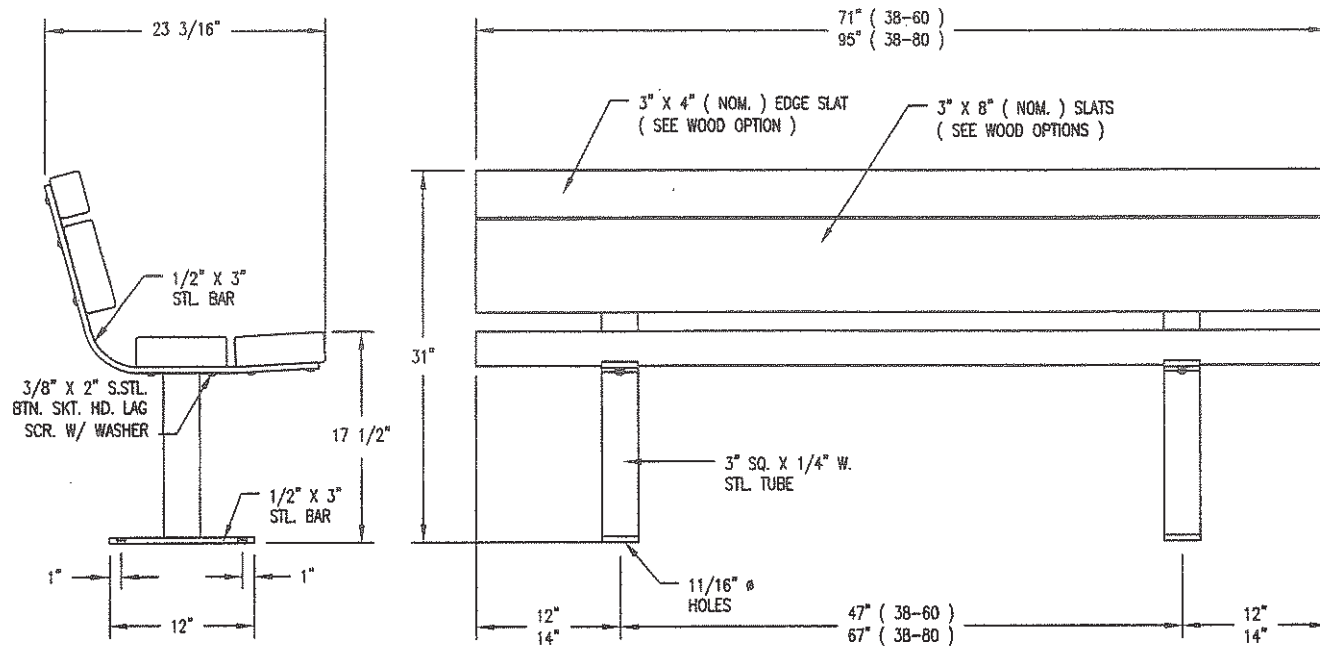


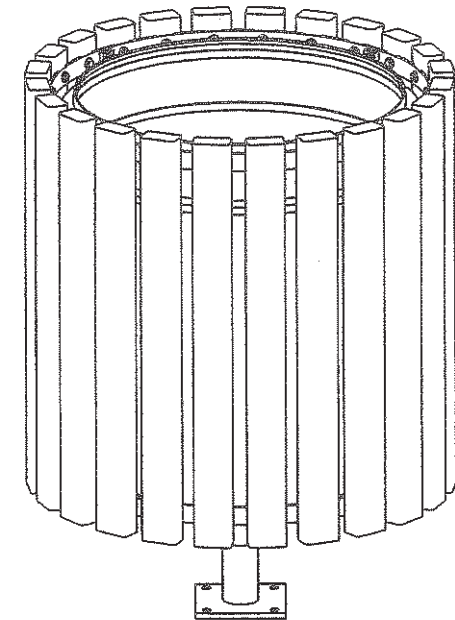
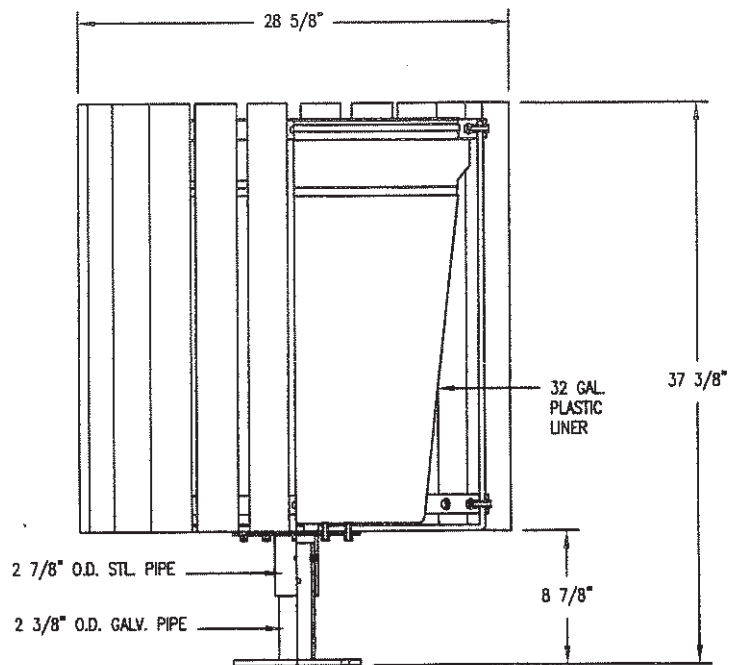
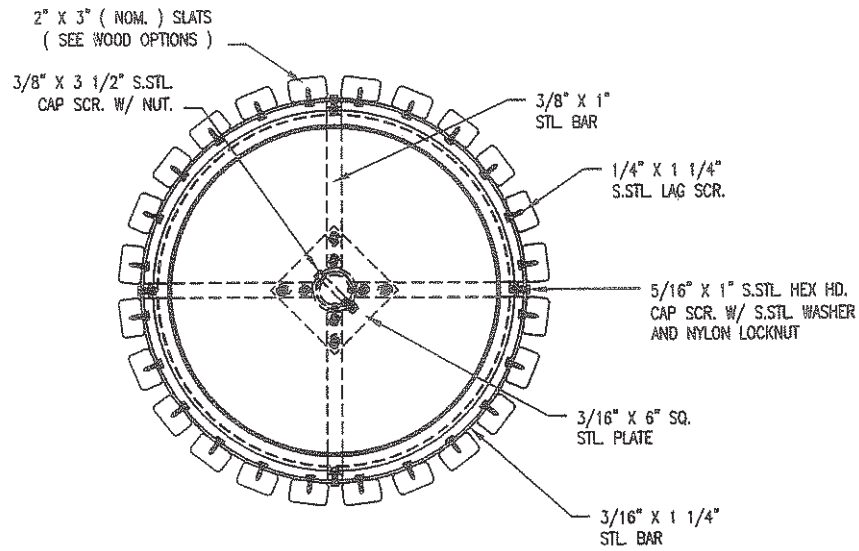
| LEGEND | |
|--------|--------------------------------|
| BEN | Bench |
| LI | Light standard |
| BIN | Garbage bin |
| BOL | Removable bollard post |
| LBOL | Bollard with light |
| SI-REG | Regulatory signs |
| SI-W1 | Pathway narrowing warning sign |
| SI-W2 | Railway crossing warning sign |
| SI-W3 | Roadway crossing warning sign |
| SI-ID | Pathway identifier sign |

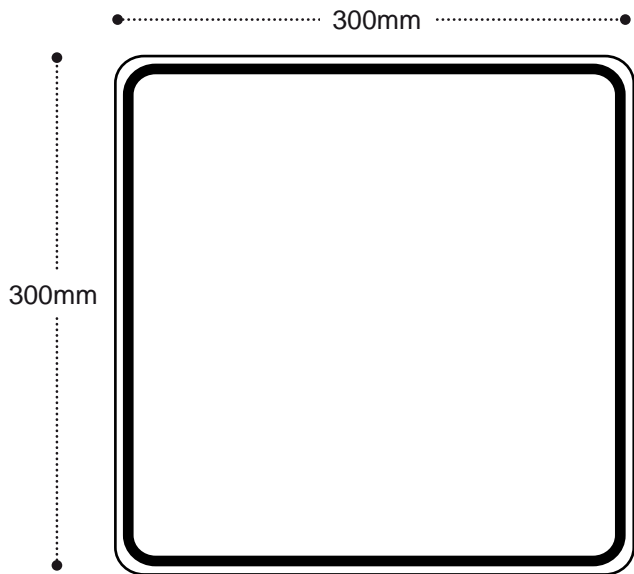
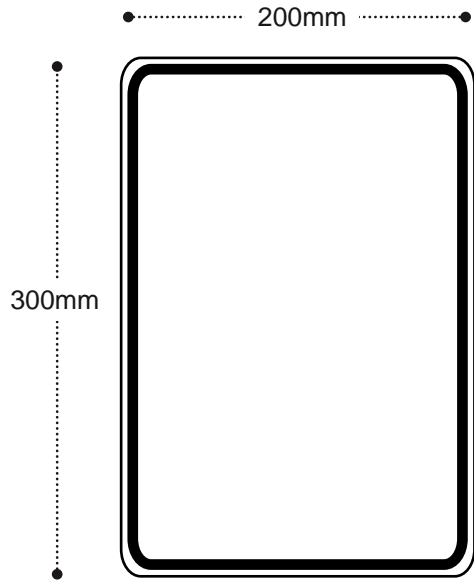


| CODE | TYPE | MODEL/DESIGN |
|---------------|--------------------------------|---|
| BEN | Bench | DuMor Inc, Bench 38 Series, |
| LI | Light standard | KIM Lighting SAS/SAL Era Series (SAS-12534-188A), |
| BIN | Garbage bin | DuMor Inc, Receptacle 41 (41-32), |
| BOL | Removable bollard post | Same as existing trail |
| LBOL | Bollard post with light | To be selected by City staff |
| SI-REG | Regulatory signs | Same as existing trail* |
| SI-W1 | Pathway narrowing warning sign | Based on MUTCDC standard* |
| SI-W2 | Railway crossing warning sign | Based on MUTCDC standard* |
| SI-W3 | Roadway crossing warning sign | Based on MUTCDC standard* |
| SI-ID | Pathway identifier signboard | Custom design* |

* design specifications included in Appendix







SPECIFICATIONS

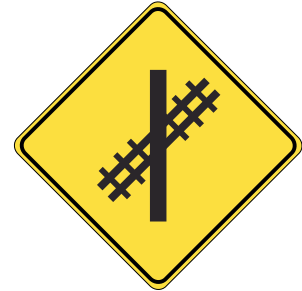
The existing Millennium Section includes regulatory signs to keep dogs on leash and that prevent motorcycles on the trail.

It is suggested that the same signage is located at major entrances to the pathway to ensure compliance with these regulations.

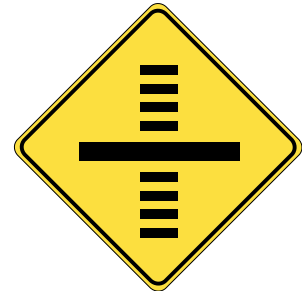
The following warning sign types are referenced on the signage plan.



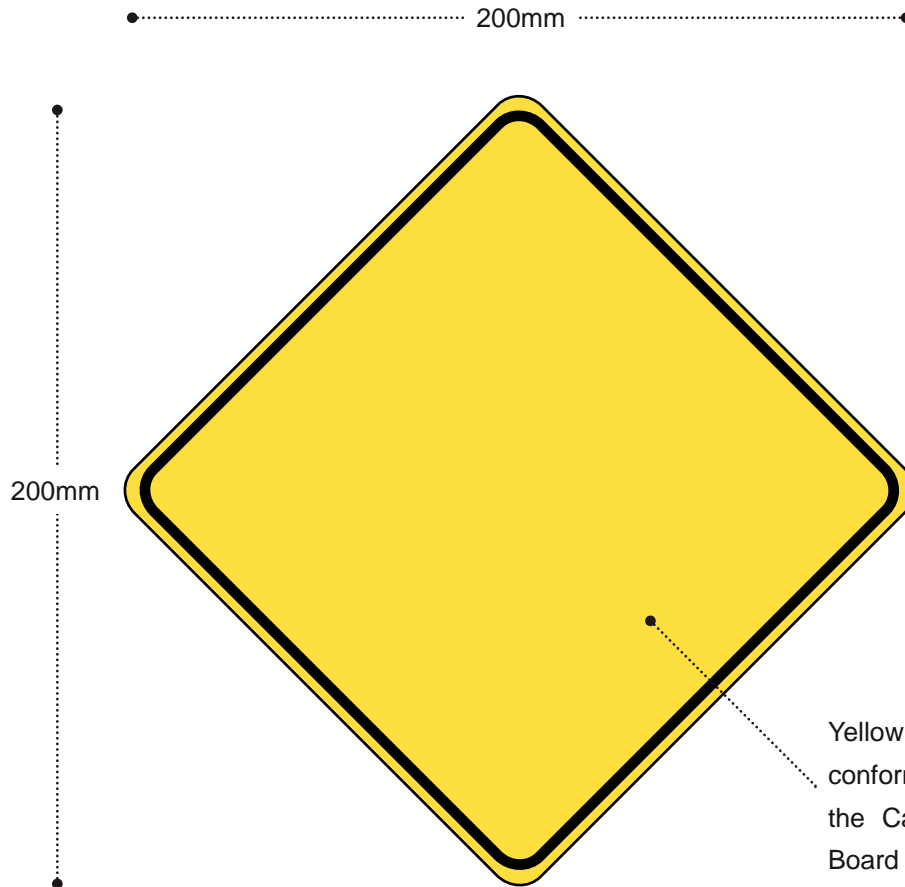
Sign W1
Warns of an upcoming narrowing in the pathway.



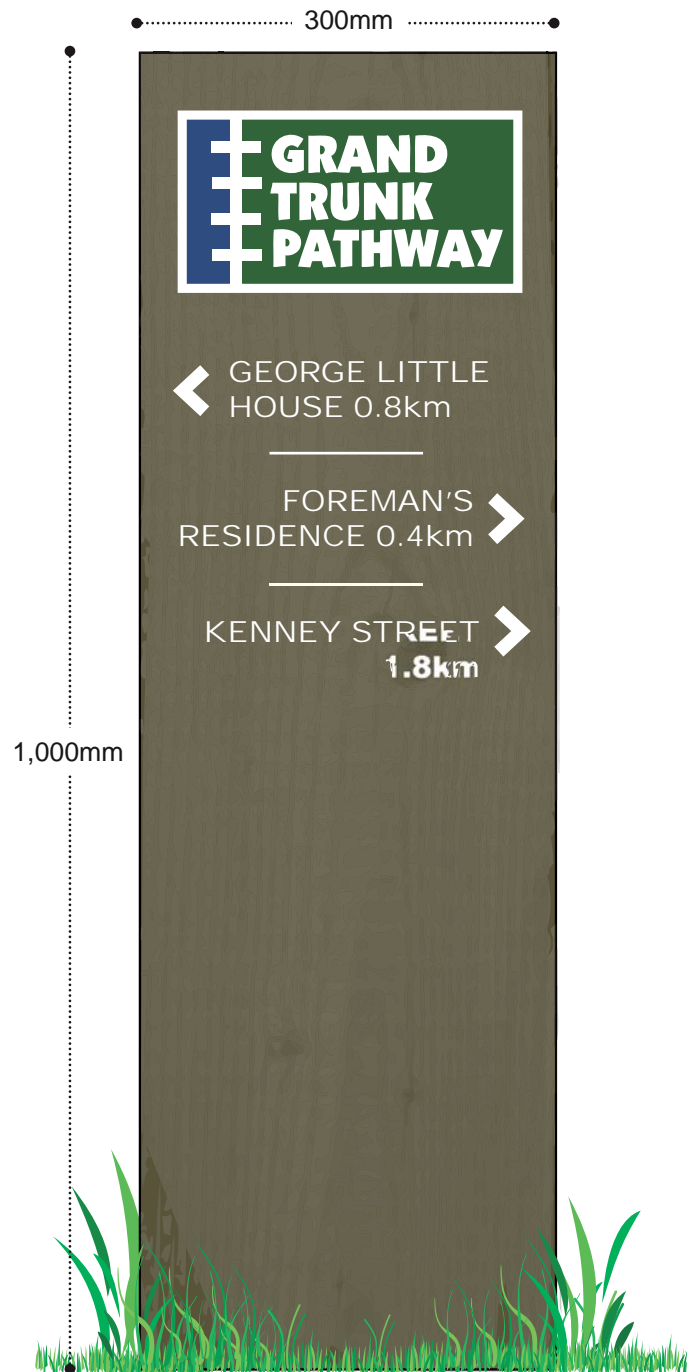
Sign W2
Warns of an upcoming railway crossing.



Sign W3
Warns of an upcoming intersection of the pathway with a roadway.



Yellow background colour should conform to most recent edition of the Canadian General Standards Board (62-GP-11M).



SPECIFICATIONS

In keeping with established themes along the Pathway, identifier signboards are to be constructed from solid cedar. It is envisioned that the text and logo on the signboards will be sandblasted into the surface and the recessed area painted.

Identifier signage is shown on the signage plan at key entrances and exits to the pathway. Each identifier sign should include reference points that are relevant to the context in which it is placed. For example, all identifier signs located in the eastern portion of the pathway should reference the distance to the George Little House.



APPENDIX B
Cost Estimates



Preliminary Cost Estimate - Off Site Works Only

Based: Preliminary Concept Plan
 Area:
 Prepared by:
 Drawing Name:
 Cost Estimate Class:

Section 1
 G.S.
 G:\Project Files\863 - Grand Trunk Trail Terrace\Drawings\Base_Des_Feb 01-08.dwg
 Class "D"

Date: March 12-08
 Project No.: 863

| ITEMS | Quantity | units | Unit Cost | units | Total Cost |
|--------------------------------------|----------|----------------|--------------|----------------|---------------|
| Removals: | | | | | |
| Sawcut | 266 | m ² | \$ 10.00 | m ² | \$ 2,660.00 |
| Milling | 35 | m | \$ 15.00 | m | \$ 525.00 |
| Asphalt | 816 | m ² | \$ 6.00 | m ² | \$ 4,896.00 |
| Concrete Curb & Gutter | 35 | m | \$ 15.00 | m | \$ 525.00 |
| Clearing & Grubbing | 6104 | m ² | \$ 5.00 | m ² | \$ 30,520.00 |
| Stripping & Excavation | 105 | m ³ | \$ 15.00 | m ³ | \$ 1,575.00 |
| Installation - Civil Works: | | | | | |
| Gravel - 25mm Crush at 150mm | 132 | m ³ | \$ 47.00 | m ³ | \$ 6,204.00 |
| Non-Mountable Curb (Central Garden) | 155 | m | \$ 160.00 | m | \$ 24,800.00 |
| Non-Mountable Curb (Grieg Ave) | 500 | m | \$ 160.00 | m | \$ 80,000.00 |
| Sidewalk (Concrete) | 120 | m ² | \$ 100.00 | m ² | \$ 12,000.00 |
| Sidewalk (Interlocking Brick Pavers) | 316 | m ² | \$ 180.00 | m ² | \$ 56,880.00 |
| Asphalt (Greig Ave) | 35 | m ² | \$ 40.00 | m ² | \$ 1,400.00 |
| Asphalt (Trail) | 2239 | m ² | \$ 40.00 | m ² | \$ 89,560.00 |
| Paint Markings | 1 | L.S. | \$ 3,000.00 | L.S. | \$ 3,000.00 |
| Bollards | 29 | each | \$ 1,000.00 | each | \$ 29,000.00 |
| Lock Block Wall | 1 | L.S. | \$ 30,000.00 | each | \$ 30,000.00 |
| Granular Backfill to Retaining Wall | 4840 | m ³ | \$ 20.00 | m ³ | \$ 96,800.00 |
| Chain link Fence (Vinyl Coated) | 610 | m | \$ 70.00 | m | \$ 42,700.00 |
| Soil | 28 | m ³ | \$ 70.00 | m ³ | \$ 1,960.00 |
| Seeding | 1892 | m ² | \$ 2.00 | m ² | \$ 3,784.00 |
| Landscape | 1 | L.S. | \$ 7,500.00 | L.S. | \$ 7,500.00 |
| Tree | 6 | each | \$ 500.00 | each | \$ 3,000.00 |
| Lighting | 23 | each | \$ 5,500.00 | each | \$ 126,500.00 |
| Bollards with lighting | 26 | each | \$ 1,200.00 | each | \$ 31,200.00 |
| Bench | 18 | each | \$ 2,000.00 | each | \$ 36,000.00 |
| Garbage Can | 9 | each | \$ 1,000.00 | each | \$ 9,000.00 |
| Signage | 5 | each | \$ 300.00 | each | \$ 1,500.00 |
| Identifier Signs | 7 | each | \$ 500.00 | each | \$ 3,500.00 |
| General: | | | | | |
| mobilization | 1 | L.S. | \$ 15,000.00 | L.S. | \$ 15,000.00 |
| traffic control | 1 | L.S. | \$ 5,000.00 | L.S. | \$ 5,000.00 |

| | | |
|-------------------|-----------|---------------------|
| Subtotal | \$ | 756,989.00 |
| Contingency - 30% | \$ | 227,096.70 |
| Engineering - 15% | \$ | 113,548.35 |
| Total | \$ | 1,097,634.05 |

Notes:
 Estimate does not include any underground utility relocations or drainage

Disclaimer:

Whereas any opinions of probable cost prepared by Boulevard Transportation Group ("the Engineer") will be based on incomplete or preliminary information, and will also be based on factors over which the Engineer has no control, the Engineer does not guarantee the accuracy of these opinions of probable cost and shall have no liability where the probable costs are exceeded.



Preliminary Cost Estimate - Off Site Works Only

Based: Preliminary Concept Plan
 Area:
 Prepared by:
 Drawing Name:
 Cost Estimate Class:

Section 2
 G.S.
 G:\Project Files\863 - Grand Trunk Trail Terrace\Drawings\Base_Des_Feb 01-08.dwg
 Class "D"

Date: March 12-08
 Project No.:

| ITEMS | Quantity | units | Unit Cost | units | Total Cost |
|--------------------------------------|----------|----------------|--------------|----------------|---------------|
| Removals: | | | | | |
| Clearing & Grubbing | 1370 | m ² | \$ 5.00 | m ² | \$ 6,850.00 |
| Stripping & Excavation | 428 | m ³ | \$ 15.00 | m ³ | \$ 6,420.00 |
| Installation - Civil Works: | | | | | |
| Sidewalk (Interlocking Brick Pavers) | 16 | m ² | \$ 180.00 | m ² | \$ 2,880.00 |
| Asphalt (Trail) | 2505 | m ² | \$ 40.00 | m ² | \$ 100,200.00 |
| Gravel - 25mm Crush at 150mm | 387 | m ³ | \$ 47.00 | m ³ | \$ 18,189.00 |
| OR | | | | | |
| Asphalt (Train Crossing) | 75 | m ² | \$ 40.00 | m ² | \$ 3,000.00 |
| Gravel - 25mm Crush at 150mm (Trail) | 387 | m ³ | \$ 47.00 | m ³ | \$ 18,189.00 |
| Paint Markings | 1 | L.S. | \$ 500.00 | L.S. | \$ 500.00 |
| Chain Link Fence | 690 | m | \$ 70.00 | m | \$ 48,300.00 |
| Landscape | 1 | L.S. | \$ 12,000.00 | L.S. | \$ 12,000.00 |
| Tree | 15 | each | \$ 500.00 | each | \$ 7,500.00 |
| Bench | 6 | each | \$ 2,000.00 | each | \$ 12,000.00 |
| Bollards | 4 | each | \$ 500.00 | each | \$ 2,000.00 |
| Signage | 4 | each | \$ 300.00 | each | \$ 1,200.00 |
| Identifier Signs | 2 | each | \$ 500.00 | each | \$ 1,000.00 |
| Garbage Can | 2 | each | \$ 1,000.00 | each | \$ 2,000.00 |

| | | | | | |
|-----------------|---|------|--------------|------|--------------|
| General: | | | | | |
| mobilization | 1 | L.S. | \$ 15,000.00 | L.S. | \$ 15,000.00 |

| <i>Gravel</i> | | | <i>Asphalt</i> | | |
|-------------------|-----------|-------------------|-------------------|-----------|-------------------|
| Subtotal | \$ | 138,839.00 | Subtotal | \$ | 236,039.00 |
| Contingency - 30% | \$ | 41,651.70 | Contingency - 30% | \$ | 70,811.70 |
| Engineering - 15% | \$ | 20,825.85 | Engineering - 15% | \$ | 35,405.85 |
| Total | \$ | 201,316.55 | Total | \$ | 342,256.55 |

Notes:
 Estimate does not include any underground utility relocations or drainage

Disclaimer:

Whereas any opinions of probable cost prepared by Boulevard Transportation Group ("the Engineer") will be based on incomplete or preliminary information, and will also be based on factors over which the Engineer has no control, the Engineer does not guarantee the accuracy of these opinions of probable cost and shall have no liability where the probable costs are exceeded.



Preliminary Cost Estimate - Off Site Works Only

Based: Preliminary Concept Plan
 Area:
 Prepared by:
 Drawing Name:
 Cost Estimate Class:

Section 3
 G.S.
 G:\Project Files\863 - Grand Trunk Trail Terrace\Drawings\Base_Des_Feb 01-08.dwg
 Class "D"

Date: March 12-08
 Project No.:

| ITEMS | Quantity | units | Unit Cost | units | Total Cost |
|--------------------------------------|-----------|-------------------|-------------------|----------------|-------------------|
| Removals: | | | | | |
| Clearing & Grubbing | 3736 | m ² | \$ 5.00 | m ² | \$ 18,680.00 |
| Stripping & Excavation | 1712 | m ³ | \$ 15.00 | m ³ | \$ 25,680.00 |
| Installation - Civil Works: | | | | | |
| Sidewalk (Interlocking Brick Pavers) | 16 | m ² | \$ 180.00 | m ² | \$ 2,880.00 |
| Asphalt (Trail) | 3443 | m ² | \$ 40.00 | m ² | \$ 137,720.00 |
| Gravel - 25mm Crush at 150mm | 561 | m ³ | \$ 47.00 | m ³ | \$ 26,367.00 |
| OR | | | | | |
| Gravel - 25mm Crush at 150mm (Trail) | 561 | m ³ | \$ 47.00 | m ³ | \$ 26,367.00 |
| Paint Markings | 1 | L.S. | \$ 500.00 | L.S. | \$ 500.00 |
| Chain Link Fence | 810 | m | \$ 70.00 | m | \$ 56,700.00 |
| Landscape | 1 | L.S. | \$ 15,000.00 | L.S. | \$ 15,000.00 |
| Soil | 15 | m ³ | \$ 70.00 | m ³ | \$ 1,050.00 |
| Tree | 2 | each | \$ 500.00 | each | \$ 1,000.00 |
| Bench | 6 | each | \$ 2,000.00 | each | \$ 4,000.00 |
| Signage | 4 | each | \$ 300.00 | each | \$ 1,200.00 |
| Identifier Signs | 3 | each | \$ 500.00 | each | \$ 1,500.00 |
| Garbage Can | 3 | each | \$ 1,000.00 | each | \$ 3,000.00 |
| General: | | | | | |
| mobilization | 1 | L.S. | \$ 15,000.00 | L.S. | \$ 15,000.00 |
| Gravel | | | Asphalt | | |
| Subtotal | \$ | 169,857.00 | Subtotal | \$ | 307,577.00 |
| Contingency - 30% | \$ | 50,957.10 | Contingency - 30% | \$ | 92,273.10 |
| Engineering - 15% | \$ | 25,478.55 | Engineering - 15% | \$ | 46,136.55 |
| Total | \$ | 246,292.65 | Total | \$ | 445,986.65 |

Notes:
 Estimate does not include any underground utility relocations or drainage
 Total estimate figure does not include elevated boardwalk or elevated structure beneath Kitsukalum Bridge.
 Both elevated structures are estimated at a combined \$1 to 1.5-million.

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