

**Monuments of the Kettle Valley Railway: Reviving a Network  
within Extreme Landscapes**

by

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## **Abstract**

This thesis examines the abandoned Kettle Valley Railway which extends 600 kilometres across the extreme topography of southern British Columbia, Canada. The Kettle Valley Railway is recognized as the most challenging railway built in world history. Abandoned since the mid 1900s, nothing remains of the railway except a path and the monumental infrastructure ruins. The abandoned railway is revitalized by adding architectural interventions that highlight the characteristics of specific railway monuments through their unique historical narratives and tremendous engineering feats. Located on a site that already has a high density of every infrastructure typology, the Othello Bathhouse tests a set of design criteria for future interventions along the railway. Eventually, the entirety of the railway would be punctuated with architecture that follows a consistent language, offering travellers a place for pause that reinvigorates a network that once provided us with one of the most sensory experiences in the world.

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## Chapter 1: Introduction

Around the world, since the peak of railway production in the early 19th century, railways have slowly been disappearing. To this date, approximately 100,000 kilometers of rails have been ripped up and recycled (Atlas Obscura 2019). In the resource-rich west, where copper, lead, coal and lumber were in abundance, railways boomed when the mines were profitable. Railways quickly became the largest mode of transporting people and resources across the world. The gradual mobility in automobiles and airplanes paired with the exhausted mine industry caused many railways to shut down as they were no longer profitable (Ferretti and Degioanni 2017, 29). Reusing abandoned network corridors, such as railways, have been successfully reintegrated into urban fabric through redesign and new programmatic interventions, but quite often railways in rural landscapes are reduced to an ordinary walking and biking path, where they fail to celebrate the complex relationships between people, nature, and resources, that the railway used to provide. This thesis seeks to understand the complexities of the Kettle Valley Railway and what makes it unique in order to develop a method for architectural interventions along the line. A method of designing architecture at specific moments that compliments the characteristics of the Kettle Valley Railway and heightens the sensory experience of the inaccessible landscapes that the railway offers.

The Kettle Valley Railway (KVR) was first conceived in the 1880s. Routes for the future railway had been surveyed multiple times, but most people found it unfeasible to build a railway through a region of such aggressive topographies and climate. The railway line would have to cut perpendicular

to three mountain ranges that run parallel to the coast of British Columbia. Not only did it have to travel through three mountain ranges, but every winter these regions received a high amount of precipitation resulting in numerous wash outs and large accumulations of snow. In 1910, against the wishes of his board of directors, Thomas Shaughnessy, decided that the KVR needed to be built, connecting the resource rich Kootenays in southern British Columbia and to the port city of Vancouver.

The construction of the KVR, and other railways, creates rural and urban network corridors. These scars in the landscape connect people to nature, to each other, and provides ample space for recreation. When inserting program along rural network corridors, the length of the railway is an essential quality to consider. Long corridors allow vast users the ability to experience the railway over varying locations, providing the opportunity to appreciate a variety of ecologies and histories. Similarly, the length of the line determines the frequency of architectural interventions so they can ease the limitless space of rural landscapes and allow it to be inhabited (Pallasmaa 2012, 35).

In the mid-twentieth century, British Columbia saw a decreased demand for minerals and, therefore, a decline in the profitability of mines. The decreases in the mining industry eventually lead to the closure of numerous mines across the province. In conjunction with the mine closures, the creation of the Hope-Princeton Highway created a more efficient route for traffic. In 1964, the directors of the Canadian Pacific Railway decided to abandon the KVR and divert traffic north to a less extreme topography and climate (Sanford 2010, 248). Ironically, the extreme landscape that

made the KVR such a phenomenological experience also ended it.

The decaying infrastructure of the abandoned railway are recognized as network ruins. However, the embedded memories associated with the network ruins suggests that they are monuments in the landscape. The monuments are ingrained with the historical narratives and building processes that recollect constructing a railway through challenging landscapes. The monuments also give access to inaccessible landscapes and symbolize extreme changes in topography.

Threading all the monuments together on the KVR is a path that is a consistent datum throughout the network. Along the path, each typology of railway infrastructure has a different set of architectural languages and phenomenological characteristics that are tied to them. The analysis of the tunnel, steel plate bridge, wood trestle bridge, and snowshed, begin to reveal methods for integrating architecture into extreme, rural corridors.

The Othello Tunnels, located near the end of the KVR, is used as a test site for future architectural interventions along the railway. The site is chosen for the density of monuments required to navigate the imposing landscape of the Coquihalla Canyon. Saturated with phenomenological characteristics, the site's dynamic and static qualities pair well with a bathhouse program. The bathhouse is designed using a set of criteria that would be used for future architectural interventions along the railway. The bathhouse tests the design criteria, providing a place for pause to reflect on the memories of the monuments and gives people

a sense of Being by connecting them to the landscape that was previously inaccessible.

Eventually, the entirety of the railway would be punctuated with architecture and program that is site specific based on the analysis of the monuments and their relationship to the landscape. By designing the whole railway with a consistent language using the design criteria outlined, the architecture highlights the embedded memories of the Kettle Valley Railway through the building processes and unique historical narratives of each monument. The architectural interventions rejuvenate the abandoned railway as a network, providing users with year round activities, avoiding its reduction to a fragmented, seasonal bike path. The highly sensory feeling of travelling the original Kettle Valley Railway will be revived by new occasions that provide users with profound new experiences that are strangely familiar.



## Chapter 2: One of the Most Expensive Railways Ever Built

### The Kettle Valley Railway: An Engineering Feat

The Kettle Valley Railway (KVR) was conceived in the late 1880s, but it was not until 1910 that construction would actually take place. The KVR had been surveyed multiple times, but most people found it unfeasible to build a railway through a region of such aggressive topographies and climate. Against the wishes of his board of directors, Thomas Shaughnessy, decided that the KVR needed to be built, connecting the resource rich Kootenays in southern British Columbia to the port city of Vancouver.



Myra Canyon Trestle Bridge 6, 1918; photo courtesy Andrew McCulloch Foundation (Sanford 2010, 96)

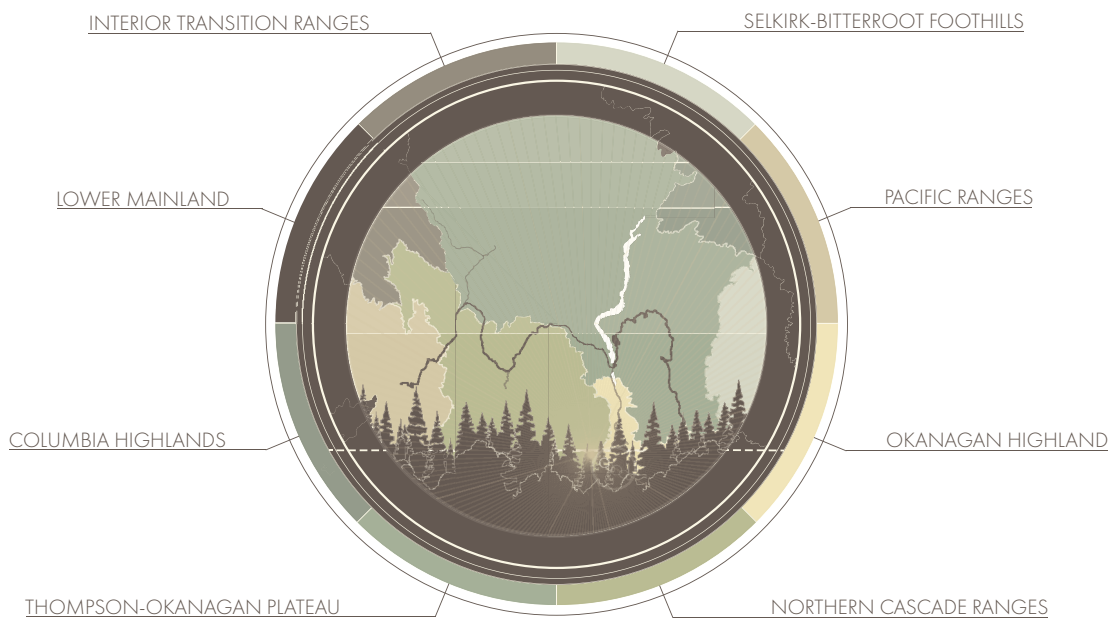
Providing a connection to the coast from the Kootenays required approximately 190 interventions of infrastructure over 600 kilometers of railway. One of the highest frequencies of infrastructure along the railway is located in Myra Canyon, just east of Penticton, where eighteen wood trestle bridges and two tunnels were needed to cross a seven-kilometer stretch. Just down the line, outside the city of Summerland, a 619-foot-long, 241-foot-high bridge – the highest on the KVR, was constructed to connect Summerland to the railway network (Sanford 2010, 138). The Ladner Creek Bridge was constructed of steel plate girders and was the sharpest curve among 234 curves required to navigate the Coquihalla section (Sanford 2010, 181). The final stretch of the KVR near the city of Hope, named Othello Station, was one of the most challenging for the KVR engineers that required a dense amount of infrastructure. The Coquihalla River cut a sharp horseshoe path through a 91-meter-deep, straight-walled, narrow canyon. Surveyors and engineers

would have to repel the granite canyon walls in baskets and ropes to find a tangent line through the serpentine canyon. This section of railway was named the 'Quintette Tunnels' because of the five sequential tunnels carved out of the earth and later changed to 'Othello Tunnels' (Langford and Langford 2002, 179). The sharp juxtaposition of a straight line through a twisting canyon makes the Othello Tunnels one of the most breath-taking sensory experiences and provides the best example of the friction between human-made infrastructure and nature.

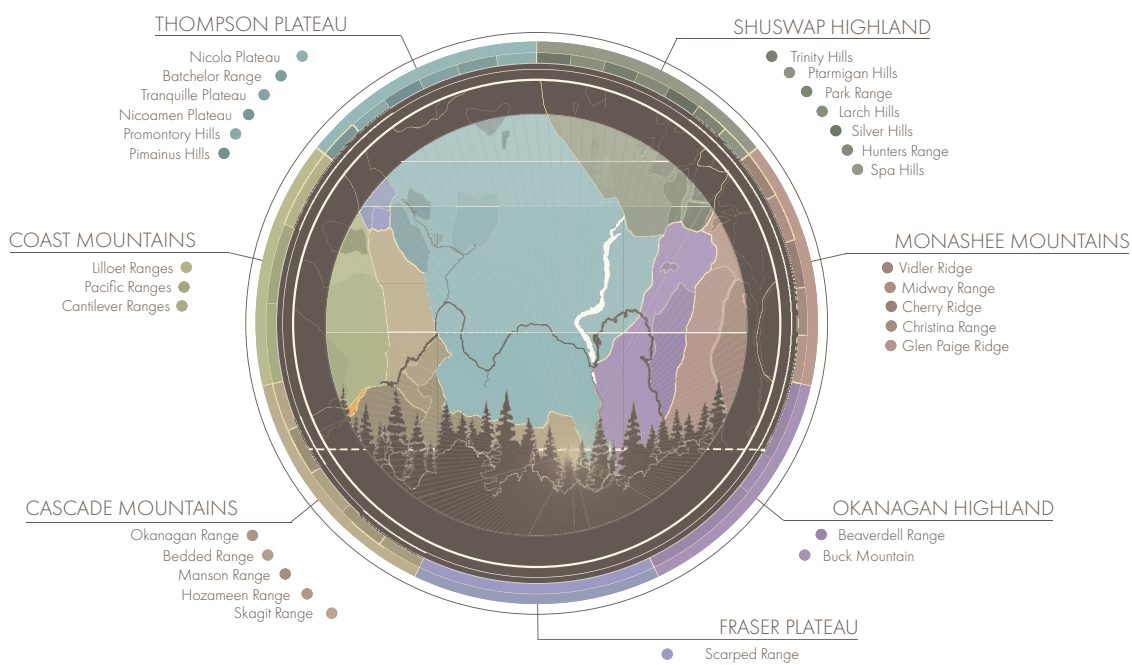


Piercing the granite canyon walls, Othello Tunnels creates a perfect tangent alignment through the landscape; photo courtesy Andrew McCulloch Foundation (Sanford 2010, 96)

The KVR quickly became recognized as one of the most challenging and expensive railways ever built (Sanford 2010, 160). The distinctive geographic features of navigating through three prominent mountain ranges in Southern British Columbia provided a variety of micro-climates that challenged the construction of the KVR (Sanford 2010, 15). The topography was harsh, and the heavy snowfall and rain during winter continually plagued the profitability of the railway. The extreme climate and topography that made the KVR impossible to maintain also provided an unparalleled sensory experience.



### SOUTHERN BRITISH COLUMBIA ECOREGIONS



### SOUTHERN BRITISH COLUMBIA PHYSIOLOGY

Southern British Columbia ecoregions and physiology diagrams (base map from Government of British Columbia 2020)

Southern British Columbia is primarily rough terrain in the form of ranges, hills, ridges, and mountains, with a central ecoregion of slightly less dramatic topography in the Thompson Plateau area.

Norberg-Schulz describes 'topography' as 'place-description,' where the qualities of landscape are characterized through extension. It is how the nature of the ground extends that allow landscapes' capacity for receiving human-made elements (Norberg-Schulz 1980, 32). The basin or valley has a macro or medium scale, and the steep ravine or gorge creates a feeling of being enclosed and brings the earth closely towards us. As a result, "mountains are spatial complements to valleys and basins, and function as primary space-defining "things" in the environment" (Norberg-Schulz 1980, 40). The steep valleys in the Cascade and Monashee Mountains of the KVR are a delimited and directed space. The variety in the extension of the landscape along the KVR helps develop program locations and their scale along the railway; this analysis locates more intimate program, such as bathing, which focuses the senses to pair well with mountainous landscapes and spaces built on views and the sky to be located in plateaued areas.

The KVR was especially challenging because most of the line runs 'against the grain.' Generally railways and other transportation networks follow the gentle sloping of riverbeds formed at the valley of mountains. The KVR followed this logic when it could, but it had to make exceptions because in British Columbia, the mountain ranges are formed with their axis parallel to the province's coastline (Sanford 2010, 15).



**CARVING THE CASCADES**

December 1913  
11 Miles of track tunneled and bridged through the cascade mountains east of Hope



December 1915  
A massive snow slide in the Coquihalla Pass covered the tracks in 50' of snow. Snow and rock slides would continue to plague the Coquihalla line every winter subdivision was open



**POST-WAR BOOM**

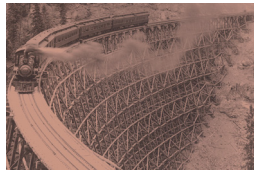
Coal, Lumber, and fruit experience substantial post-war growth and provided much of the traffic for the KVR



1910

October 4, 1910  
Construction begins in Merritt and Midway

1912



1914

July 28, 1914  
World War I crippled the labour force and slowed down production

October 2, 1914  
18 Wood Trestles built to traverse Myra Canyon

1915



1916

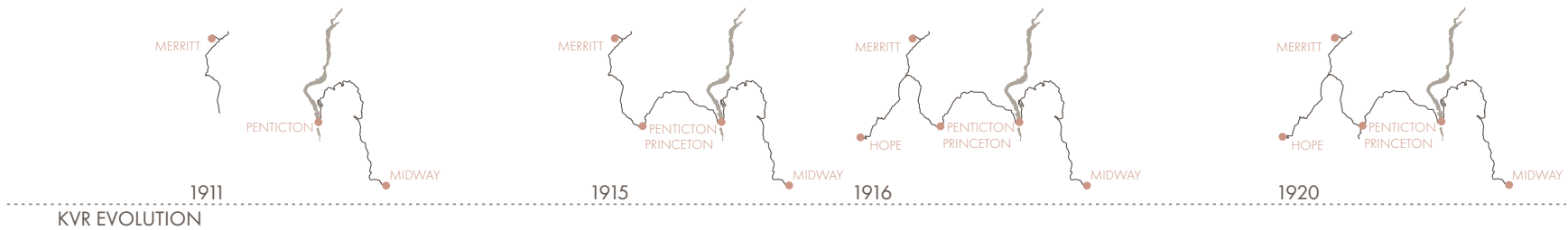
June 11, 1916  
Ladner Creek Bridge completed. 560' in length, the bridge is the sharpest of the 234 curves on the Coquihalla line.

June 11, 1916  
Last spike nailed in Coquihalla Pass, which completes the mainline of the KVR



1920

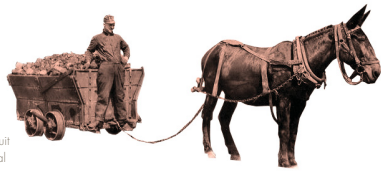
September 1, 1939  
World War II caused the demand for copper, lead, coal and lumber to skyrocket. Since the Canadian west had become a significant industrial centre, all these resources were shipped to Vancouver along the KVR.



Historical timeline of the Kettle Valley Railway, part 1

**POST-WAR BOOM**

Coal, Lumber, and fruit experience substantial post-war growth and provided much of the traffic for the KVR.



**A LEGEND IS LOST**

December 13, 1945 Andrew McCulloch, the KVR's chief engineer, the man behind the most difficult railway ever built, passes away

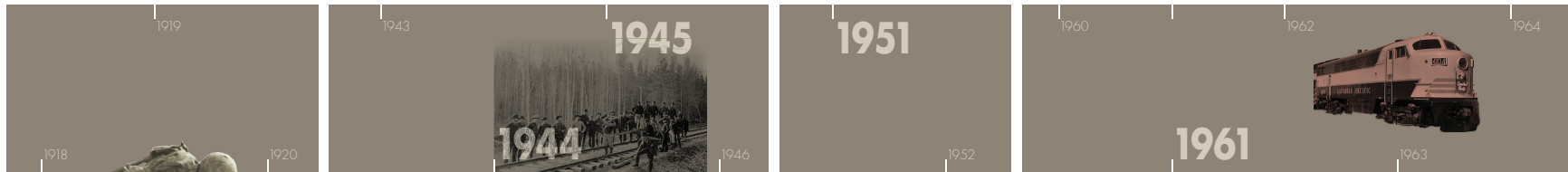
**RISING COMPETITION**

The automobile and the opening of the new coquihalla highway creates a more desirable mode of transportation



**END OF THE LINE**

January 17, 1964 The final passenger train operates on the KVR



September 1, 1939 World War II caused the demand for copper, lead, coal and lumber to skyrocket. Since the Canadian west had become a significant industrial centre, all these resources were shipped to Vancouver along the KVR.

**THE LAST SPIKE**

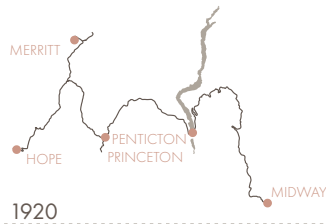
December 28, 1944 The KVR is completed after the last spur of track is laid from Oliver to Osoyoos

**1961**

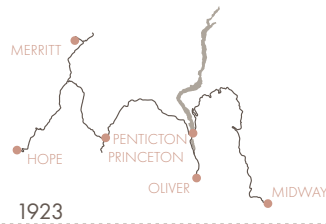
**CURTAIN CALL**

January 6, 1961 The Coquihalla Subdivision is abandoned as a result of the CPR deciding to move traffic through their Windermere Subdivision mainline

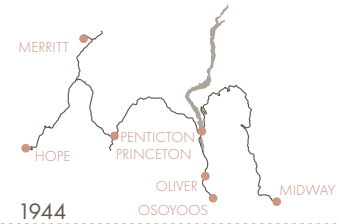
June 21, 1990 The KVR is officially abandoned with authority of the National Transportation Agency and all of the track was removed except for a 7 mile portion near Summerland for tourism



1920

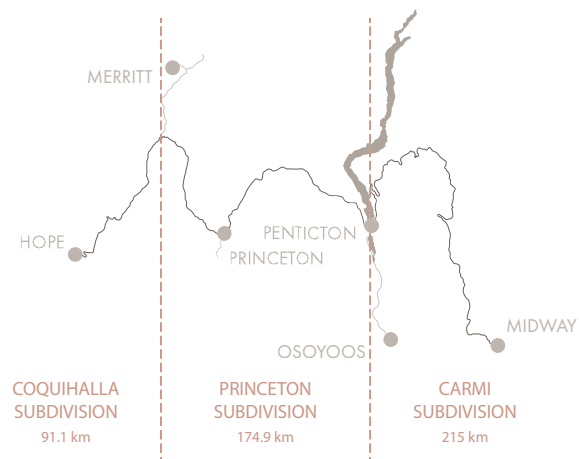


1923



1944

Early survey reports revealed serious engineering difficulties that required enormous expenditures of money (Sanford 2010, 60). Several directors of the Canadian Pacific Railway (the parent company that funded the KVR) strongly opposed the construction of the railway because of the three mountain ranges it would have to cross and the “35-mile long toboggan ride down one of the most rugged river canyons on the continent” (Sanford 2010, 121). Among these mountain ranges, the Coquihalla River Canyon, near Hope, B.C., proved to be the most challenging where monetary costs would average \$136,000 per mile, five times the average cost for Canadian railways. One section of the railway in the Coquihalla Subdivision cost a staggering \$300,000 per mile, making it one of the most expensive miles of railway in history (Sanford 2010, 160).



Subdivisions of the KVR (base map from Government of British Columbia 2020)



The Kettle Valley Railway locomotive 4 arrives at Penticton's lakeshore station with the first passenger train into that community, 1915; photo courtesy Penticton Museum (Sanford 2010, 64)

### **Connecting the Coast to the Kootenays: The Kettle Valley Railway as Network Corridor**

Network corridors are human-made transportation routes for information and resources. Roads, railways, telephone lines, and electrical lines, are all network corridors that cut through the built environment and natural landscapes. Network corridors provide access to open spaces and link the rural and urban together, similar to an extensive circulation system (Oppido and Ragozino 2014, 424).

Urban corridors are more locally constructed and do not extend as far as rural corridors. As a result, urban corridors create smaller networks within a built landscape of less variety and access to nature. As urban centers continue to densify and the loss of open green areas reduces, there is an increasing desire among individuals in the city for outdoor recreation (Cawood Hellmund and Somers Smith 2006, 3).

Rural corridors have different qualities than urban corridors. The long-distance of rural corridors allows them to pass



through a greater variety of ecologies, topographies, communities, and histories. The length of rural corridors provides the opportunity for exploration and adventure that is not far from urban centers (Cawood Hellmund and Somers Smith 2006, 190). Although rural network corridors are human-made, they are typically informed by a natural corridor in the landscape, like the rivers and streams that lie at the bottom of valleys. The length of rural network corridors plays a vital role in the communities that they connect (Cawood Hellmun and Somers Smith 2006, 4). The railway provides a physical and symbolic cultural link between urban and rural centers, it “can tie diverse neighborhoods together in ways that increase civic interaction and expand and deepen people’s sense of community” (Cawood Hellmund and Somers Smith 2006, 4). As technologies developed, the railway lines became the hub for a variety of cultural industries. The corridors not only provide a physical connection between communities, but it also doubled as a route for telegraph lines, and later on, telephone lines and postal services (Qviström 2012, 259).

Rural, network corridors can be further broken down into sub-categories of extreme landscapes and calm ones. Extreme landscapes are unique because rail lines built within them require a high degree of human-made infrastructure to navigate them. The physical characteristics of the landscape inform the type of infrastructure (tunnel, bridge, snowshed) required of the landscape. As a result, these railway monuments have different phenomenological qualities that participants experience along the line, cutting through mountains, valleys, and plateaus. The diverse range of mountains and valleys naturally develops a multitude of microclimates along the line. Extreme, rural corridors rarely

engage with other network corridors, due to the landscapes' inability to accept multiple transportation routes, which reinforces the adventurous qualities of traveling along them.

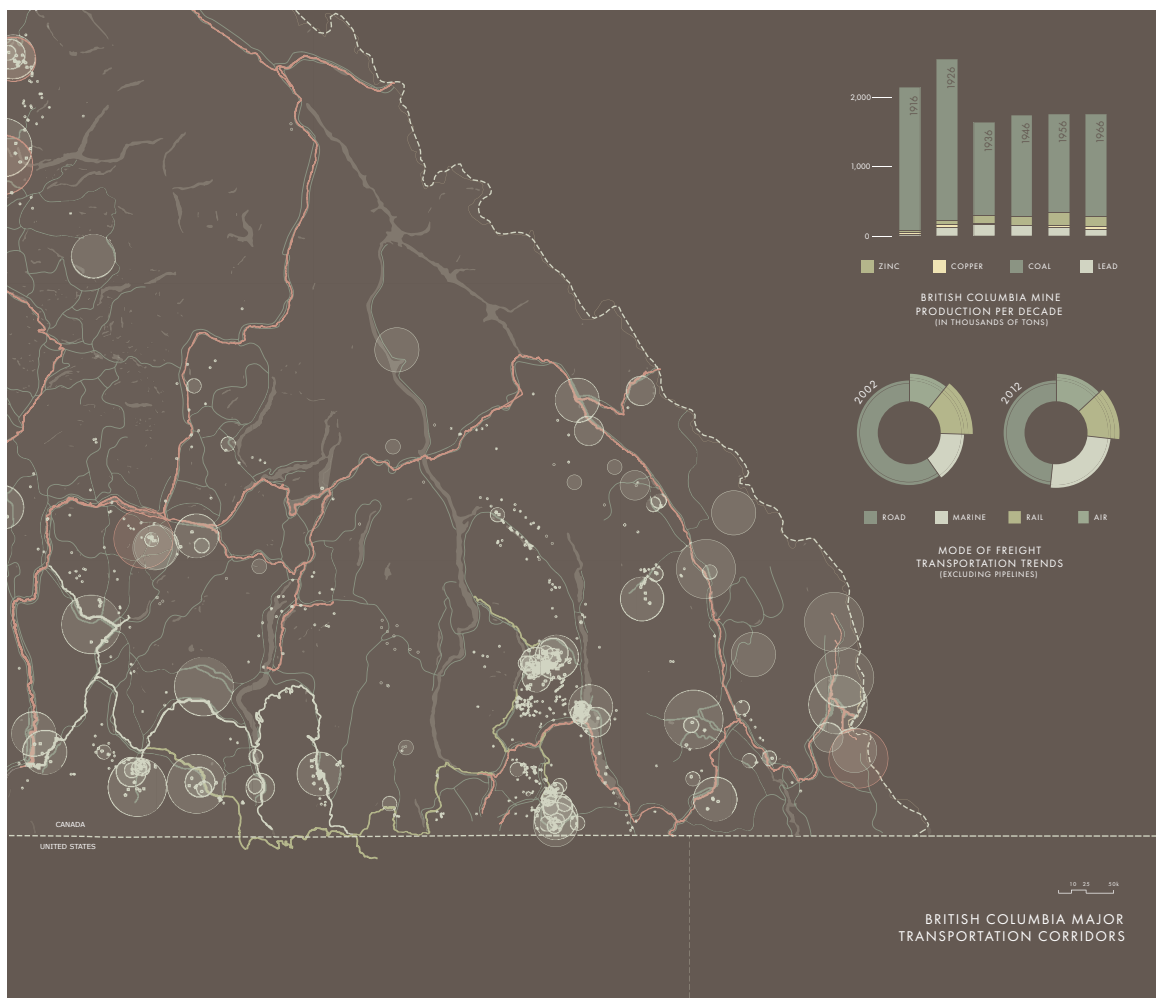
By the time the KVR had been completed, the interior of British Columbia was littered with communities built around the abundant supply of lumber, coal and copper ore, and fruit. The railway created a network that transported labour, supplies, and ideas. The KVR also defined a Canadian network. The new route diverted valuable trade to the port city of Vancouver instead of enriching the businessmen to the south of the border (Sanford 2010, 120).

### **The Fall of the Kettle Valley Railway**

The Similkameen Spotlight wrote nostalgically: "It is with deep regret that we say good-bye to the Coquihalla train ride. As a child the [KVR]... ride was just about the greatest delight there was. To ride down through the pass by train, looking down with awe at the gaping canyons, peering in the dark as the train passed through the tunnels and sheds, or just thinking what would happen if the train left the track at a certain point, was an adventure in itself. For a young lad to say that he had travelled over Coquihalla pass, was better than showing off a new pocket knife. All that is gone now. It is history. But for many Princeton people the closing of the Coquihalla pass will cause a tug at the heart. For over this pass was once the fastest means of transportation to the coast, and the nicest." (Sanford 2010, 243)

Like many of the railways across North America, the KVR did well when the mines were profitable. In the resource-rich west, where copper, lead, coal, and lumber were in abundance, the KVR thrived. In British Columbia, mine production peaked in the mid-1920s and slowly trickled off to 40% of its peak production 40 years later (Province of British Columbia 2019). Gradually the mines became exhausted and the communities and resources slowly disappeared, straining the sustainability of the KVR.

The introduction of the Coquihalla Highway allowed people to travel at their own convenience and in the privacy of their own vehicle. Traveling by train became less desirable as new highways, and air travel became more accessible. The decrease affected the transportation of people and the amount of freight that was hauled on the railways. The gradual increase in alternative private and public mobility caused the shutdown of the Coquihalla Section of railway because they were no longer profitable (Ferretti and Degioanni 2017, 29). In rare instances, such as with the KVR, some railways were abandoned due to challenges caused by climate and topography. Harsh environmental



British Columbia major transportation corridors, part 1 (base map from Government of British Columbia 2020, data from the Province of British Columbia 2019 and Tapp 2016)



British Columbia major transportation corridors, part 2 (base map from Government of British Columbia 2020, data from the Province of British Columbia 2019 and Tapp 2016)

conditions, typically associated with extreme landscapes of dramatic elevation gains and high amounts of precipitation, created treacherous landslides in areas that were accessible in one direction, making snow removal processes difficult. Southern British Columbian winters were extremely harsh and would continually shut down the railway, leaving locomotives stranded. One winter, in particular, the railway was covered in 50 feet of snow, trapping 35 work cars, and construction workers (Sanford 2010, 184). Constructing and maintaining railways in extreme landscapes reveals the reality of nature as an interacting process, that it is responsive to laws that limit, and in some instances, prohibit particular human use (McHarg 1969, 7). Rail lines built in these types of environments needed to be profitable enough to operate for only part of the year because they were usually deemed unsafe during the winter months.

Abandoned half a century ago, the KVR exemplifies what is required to create a network corridor in extreme landscapes. After years of operation, the railway did not come close to paying off the massive amount of capital investment it took to build it (Sanford 2010, 248). The high density of remaining infrastructure along the railway speaks to the challenges of connecting people and resources in southern British Columbia. Although parts of the railway have now been fractured by new highways and pipelines, the infrastructure can still be experienced.

## Chapter 3: Abandonment as Opportunity

### Network Corridor to Network Ruins

The abandonment of network corridors re-establish continuity in the environmental system. After years of environmental separation due to maintenance and frequent transportation use, the linear boundary is blurred and slowly returns to the natural environment (Oppido and Ragozino 2014, 424). The name 'network ruins' suggests that these types of ruins cannot be treated in isolation. As such, they need to be viewed as part of a whole system. A thorough analysis of the whole network of ruins, their history, and the communities that are linked by the old railway needs to be understood in order to recreate the nature - culture divide that the network once bridged. Network corridors that are converted to ordinary biking paths fail to adequately celebrate



Ladner Creek Bridge collage

the qualities of the abandoned railways and reduces them to a shadow of their former self, where nothing is left except for its trajectory and spatial connectivity (Qviström 2012, 258).

### **The Imbedded Potential of Abandoned Rural Network Corridors**

The diverse range of ecologies and flora and fauna in these scenic rural, network corridors creates the perfect opportunity for various activities for hikers, cyclists, horseback riders, skiers, snowshoers, birdwatchers, anglers, and photographers (McHarg 1969, 61).

In an age of increasing urbanity, rural corridors offer an escape from the noise and grounds individual's place in the world by returning them to nature. The reuse of abandoned network corridors, such as railways, has successfully been integrated into urban fabric through the redesign and new programmatic interventions.

Greenways also enhance connectivity between people and nature – typically more so than other forms of greenspace – because of their linearity, high ratio of edge to interior area, and thus greater accessibility. This, of course, creates opportunities for recreation and the experience of aesthetic beauty, but also can have a more profound significance because bringing nature into people's daily lives influences how they think about and experience their home environment. (Cawood Hellmund and Somers Smith 2006, 160)

Quite often, railways in rural landscapes are reduced to normal walking and biking paths. Over the last 35 years, the Rails-to-Trails Conservancy estimates that 20,358 km of abandoned railroad tracks have been converted to rail-trail greenways in the United States (Cawood Hellmund and Somers Smith 2006, 20). Converting abandoned railways into ordinary biking paths fails to celebrate the complex relationships between people, nature, and resources, that the original railways were built on. This thesis seeks



Concept bathhouse sketch  
- taking advantage of  
the unique opportunities  
presented by tunneling  
railways through  
mountainous terrain

to understand the complexities of railroads in extreme landscapes in order to develop a method for punctuating architecture along the line that complements the unique characteristics of the KVR. If implemented correctly, abandoned railways projects can facilitate the conservation of landscape connections and uphold the functioning of landscapes while celebrating the rural network corridor's unique qualities (Cawood Hellmund and Somers Smith 2006, 4).

### **Punctuated Interventions**

Mircea Eliade writes: "The most primitive of the "sacred places" we know of constituted a microcosm: a landscape of stones, water and trees". Moreover, he points out that "such places are never chosen by man, they are merely discovered by him; in other words, the sacred place in some way or another reveals itself to him". In the environment the sacred places function as "centres"; they serve as objects of man's orientation and identification, and constitute a spatial structure. In man's understanding of nature we thus recognize the origin of the concept of space as a system of places. Only a system of meaningful places makes a truly human life possible. (Norberg-Schulz 1980, 27)

The path is the backbone of the reuse of railways. It is the one thing that is constant throughout the extreme landscape. Therefore, the path is the relentless thread for travellers to follow that links all the monuments. The relationship between horizontal and vertical, between "above" and "below" serves as the unifying force for placing architecture along the line (Norberg-Schulz 1980, 85). The monuments provide a frame for going "above" or "below" the path. This method of locating architecture strengthens the characteristics of the path. The path becomes the balance between order and freedom, where one can follow the path or discover a new space, continually being seduced to follow, or wander and stroll around (Zumthor 2010, 86). The path and specific



qualities of the monuments encourage movement and the architecture encourages places for pause (Tuan 1977, 6).

Designing the line provides perceptual spaces within an existential space that heighten the senses and triggers emotional responses. The architecture provides perceptual spaces of character and identity that are associated with the historical narratives of each monument and the inherent qualities of each landscape. The designed space stimulates feelings and memories when they are encountered for the first time, or multiple times. Outside of the architecture, the line and the monuments are part of an existential space. Existential spaces are defined by boundaries that produce meaning, intention and outline areas of societal significance. Characteristics of the landscape – rivers, mountain ranges, rock outcrops, and ravines, are significant for determining the choice of locales and the original railway through the landscape (Tilley 1994, 16).

Long distance greenways seem to grab the attention of recreationists and greenway promoter because they appeal so strongly to the imagination. Their symbolism is not unlike what McQuillan described as the “mythology” of wilderness trails. “The essential claim of this mythology is continuity... One is led to believe that...there is no fracturing of the landscape into city and country, public and private, wasteland and Eden:...one can still walk 2,015 miles in the woods.” (Cawood Hellmun and Somers Smith 2006, 190)

The length between architectural interventions takes into account the overall length of the line so it is balanced with architecture that facilitates long-distance activities and more local ones. This way the line can be used in a few hours, a few days, or a few weeks. The location of each architectural intervention is based on the density of monuments within a given area along the line, significance of the monument (historical narratives and the unique characteristics of the monument), proximity of urban centers, and the comfortable

distance for travellers before needing a rest. Layered on top of these requirements for punctuating architecture, a few pieces of architecture would also be designed to celebrate the variety of ecologies of each region the line passes through. Program in specific ecoregions highlights industries that flourish as a result of each microcosm. The punctuation of program is balanced between the feeling of going deeper in the woods, further from urbanity, and coming across an architectural 'trail marker' that immediately makes one feel at ease. As the monuments are discovered along the path, so is each new piece of architecture. The excitement of what may lie in each monument is similar to turning the bend on the road before arriving at each new city (Calvino 1974, 28). A multi-scalar approach to the architecture on the line is necessary in a way that recognizes that the line will be used by different individuals with different capabilities (Oppido and Ragozino 2014, 426).

## Chapter 4: Phenomenology and the Kettle Valley Railway

### Human Connection to Nature

Rural landscapes become spaces of increasing importance in understanding human place in the world. As the urban landscape continues to rapidly develop, they become “[more] dehumanising because they are excessively humanised...there is almost nothing in them that can happen spontaneously, autonomously or accidentally, or which expresses human emotions and feelings” (Relph 1981, 104). When the city is removed and left behind, and we are confronted with nature, we “return to things” – this is the definition of phenomenology (Norberg-Schulz 1980, 8). Nature has a way of slowing time that is different from the city. Architect, Peter Zumthor said, “Time is big in the landscape while in the city it is condensed, just like the city’s space” (Zumthor 2010, 96).



Othello Tunnels collage - bathhouse concept proposal

Nature teaches us some of the greatest lessons in phenomenology. Experiencing the landscape inspires transcendental thoughts where we recognize that we belong to living nature, that we come from it and that we will return to it (Zumthor 2010, 95). The landscape reminds of our position within nature, it reminds us that only through human consciousness and reason is our position revealed to us, and only through method can we engage with it (Cosgrove 1989, 122).

The landscape consists of several types of characteristics, such as “expansive” and “rugged,” “calm,” and “dangerous.” The characteristics that are specific to each landscape experience subtle temporal changes through time. Time interacts and influences these characteristics recognized through the changing seasons, time of the day, and the weather. The light conditions dynamically shape the character of the landscape based on time (Norberg-Schulz 1980, 14). When there is no light, the landscape transforms; one experiences the sounds and tactility of the landscape due to the loss of visual senses. The thermal qualities of the sunlight and earth also create mysterious images that stimulate the imagination (Pallasmaa 2012, 50). As the sun warms up the earth, steam slowly rises from the vegetation. Alternatively, the earth creates a thin layer of fog when it cools down the moist air immediately above it.

The way architecture spatially inserts itself in different types of landscapes changes the perception of the horizon and visual boundaries, which influences our understanding of the world (Pallasmaa 2012, 44). The diverse characteristics of extreme landscapes provide compressive and expansive spaces where the depth of the visual boundaries is minimized and maximized. These characteristics have a profound

influence on the connection to space. Peripheral vision in expansive landscapes connects people to space. Within the thick-walled forests and enclosed tunnel, the viewer's vision focuses and pushes them to the perimeter of the space, like a spectator (Pallasmaa 2012, 15).

Norwegian architect, Christian Norberg-Schulz, describes the marriage between heaven and earth as the point of departure for the differentiation of concrete natural elements. He describes the mountain as a part of the earth that extends toward the sky. The peak of the mountain is the closest point that the earth touches the sky and the heavens, it is the meeting point between the two basic elements. Mountains were recognized as the centre where one passes from one cosmic zone to another – the axis mundi. Mountains therefore provide places of Being (Norberg-Schulz 1980, 24-25).

As the landscape across the KVR changes, so does the balance between earth and heaven. The railway remains the

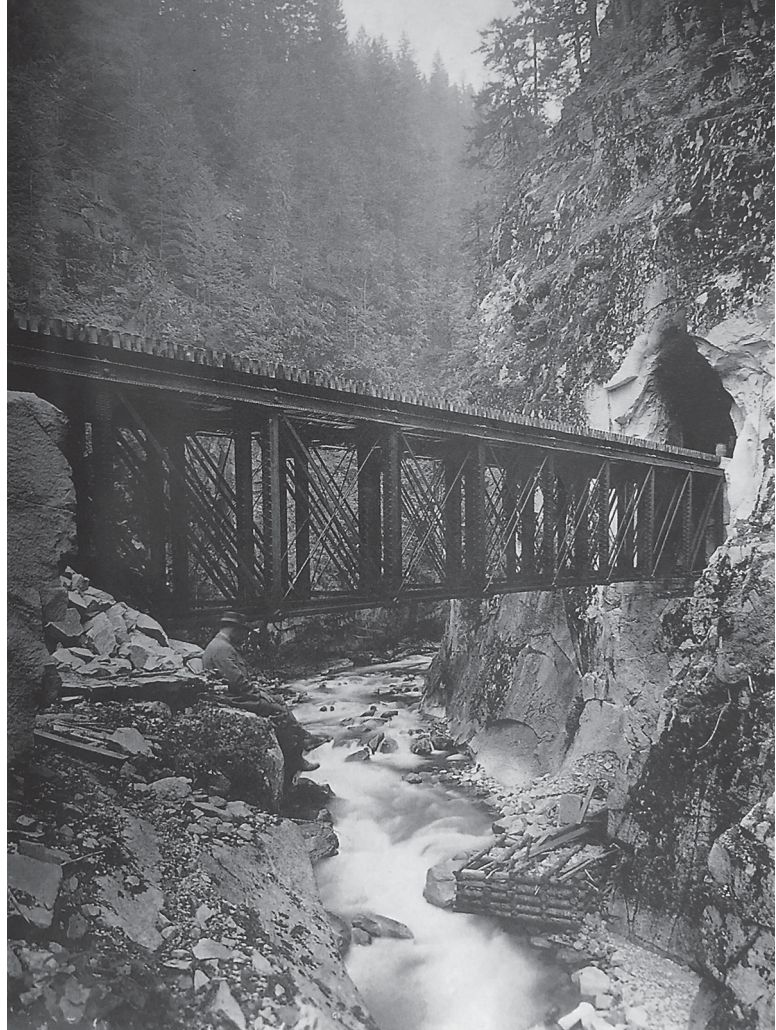


Coquihalla Pass on the Kettle Valley Railway where the mountains extend towards the sky, 1916; photo courtesy Andrew McCulloch Foundation (Sanford 2010, 96)

constant datum between these two and the infrastructure signifies the effort to maintain a consistent datum as the earth and heaven oscillate upwards and downwards. Travelling the line in the landscape helps us understand the battle between earth and sky and appreciate the unique landscape of each ecological region that the KVR passes through. Creating spaces that allow for pause in these profound locations of extreme change of balance between earth and sky provide places of Being, where people can reflect on their place in nature.

### **Monuments as a Tool for Memory**

Monuments are not just purely architectural forms; they have different meanings for those who were instrumental in building them and those who journeyed along them (Rossi 1966, 115). The monuments are physical connections of topographies as well as symbolic connections of people, industry, and resources. The historic railway tracks no longer exist in the scarred landscape, but what remains are the monuments of the railway: the tunnel, the wood trestle bridge, the steel plate bridge, and the snowshed. The abandoned infrastructures speak to when economies were booming and help to understand the passage of time (Rossi 1966, 127). These railway monuments of the Kettle Valley Railway illuminate the human effort to subdue the earth, and they are a celebration of man's ability to conquer nature (McHarg 1969, 44). As these monuments are left to decay in the landscape, they symbolize the cycle of life and death (Edensor 2005, 11). The ruins inevitably pass away as nature flexes its resiliency, reminding humans of their puny attempts to control nature by reclaiming the ruins through weathering and new vegetative life (Edensor 2005, 167).



Steel Girder Bridge over the Coquihalla River, entering Othello Tunnel 12 on the Kettle Valley Railway. Below the bridge, temporary cribbing is used to construct the bridge using materials from the site, n.d.; photo courtesy Andrew McCulloch Foundation (Sanford 2010, 96)

Redesigning abandoned railways provides opportunities to celebrate the qualities that made them unique while in operation. Railways in rural areas not only provide access to nature (which is especially true in extreme areas), but they also create cultural landscapes by connecting human-made settlements and infrastructure along a “path” (Norberg-Schulz 1980, 10). Tracing the relationship between network ruins helps to understand the spatial values of the leftover infrastructure, its cultural heritage, and its ability to reinvent



**1 OTHELLO TUNNELS**

Five consecutive tunnels and two bridges slice straight through a 91 m deep, straight-walled canyon



**2 LADNER CREEK BRIDGE**

Last piece of infrastructure to complete the Kettle Valley Railway and the tightest curve in the Coquihalla Section

Monuments of the Kettle Valley Railway significant for their historical importance and exemplary engineering when confronted with challenging landscapes (base map from Government of British Columbia 2020, data from Sanford 2010)





**3 BROOKMERE WATER TOWER**

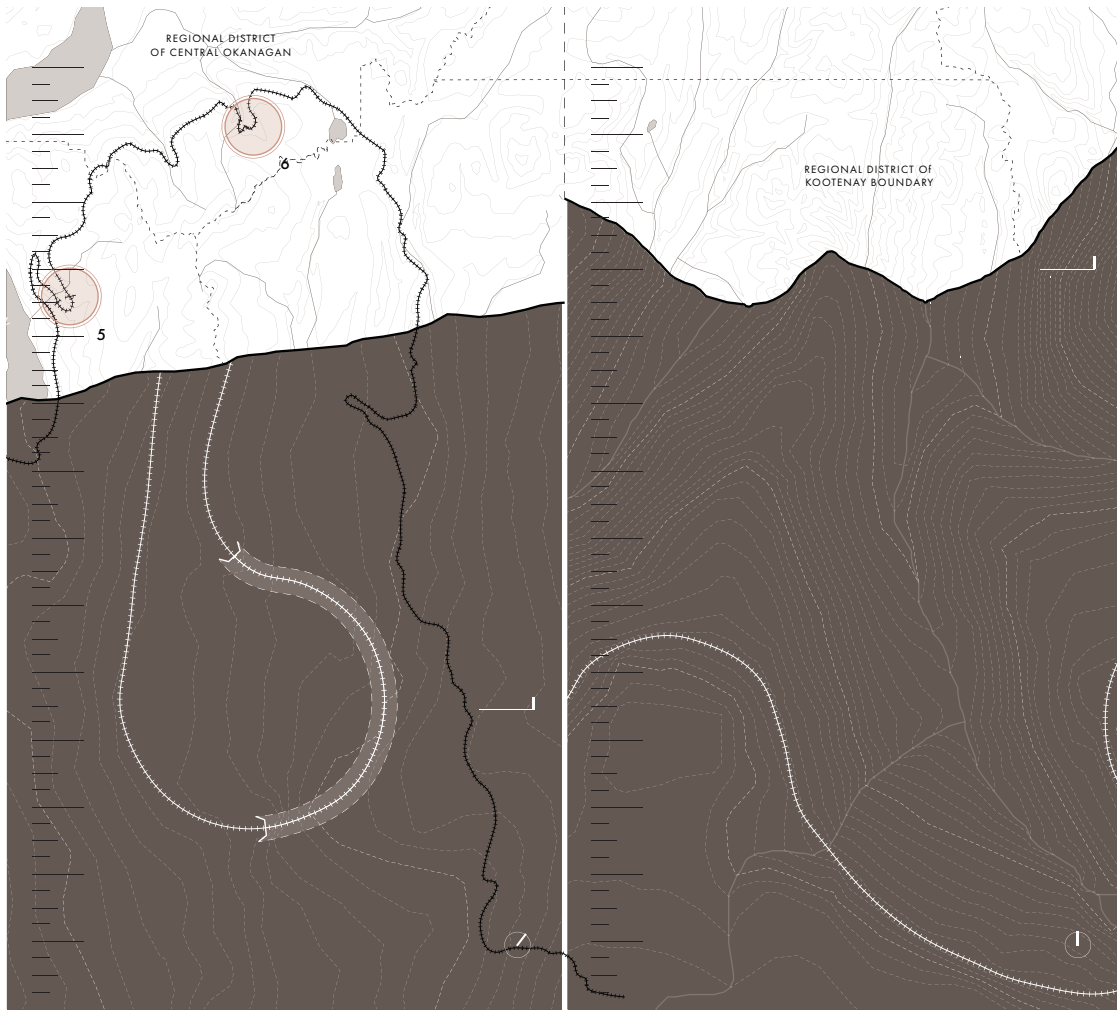
Last remaining water tower along the Kettle Valley Railway



**4 TROUT CREEK BRIDGE**

The highest bridge on the Kettle Valley Railway and the third-highest in British Columbia

Monuments of the Kettle Valley Railway significant for their historical importance and exemplary engineering when confronted with challenging landscapes. The water tower is the only ruin that occurs at regular intervals, suggesting that it should be used for a regular program (base map from Government of British Columbia 2020, data from Sanford 2010)



5 ADRA TUNNEL

489 meters in length, Adra Tunnel is the longest tunnel along the Kettle Valley Railway



6 MYRA CANYON

18 wood trestle bridges and two tunnels connect the railway over eight kilometers of rough terrain

Monuments of the Kettle Valley Railway significant for their historical importance and exemplary engineering when confronted with challenging landscapes (base map from Government of British Columbia 2020, data from Sanford 2010)

thoughts on nature and culture (Qviström 2012, 258). The integration of architecture should show an understanding of the cultural landscape to make any site along it become a place in order to uncover the meanings provided by the surrounding context (Norberg-Schulz 1980, 18).

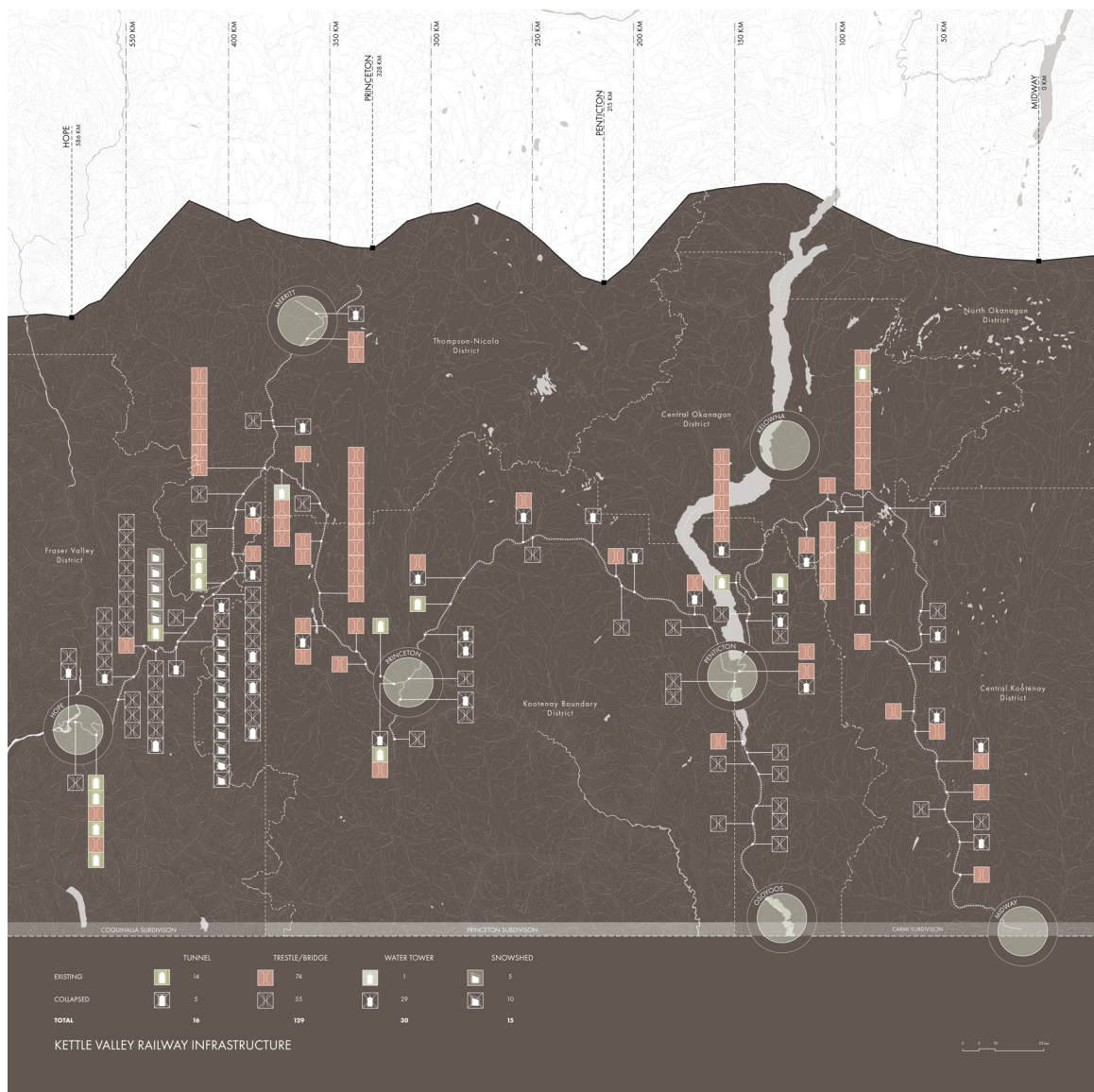
Ruins against a backdrop of remote, rugged landscapes create a dramatic scene, where the stillness of the lifeless ruin contrasts the dynamic living forests and streams that they pass through (Edensor 2005, 125). Estranged sites, such as extreme, rural landscapes, are particularly rich in exercising future potentials of ruins. Ruins in this type of landscape may bring about moments of recognition in spatio-temporal forms that are entirely new, yet strangely familiar (Perez-Gomez 2003, 278). When new architecture is integrated into these spaces of fantasy and wonder, it articulates the experience of our being-in-the-world and strengthens our sense of reality and self (Pallasmaa 2012, 12). Ruins inherently embody the past; the weathering exerted by natural forces continually age their forms. Ruins also point towards the present and future as the remains of their structures are both dystopian and utopian. Ruins cause the critique of their past through a present perspective and make people dream of future potentials (Edensor 2005, 15).

### **Monuments of the Kettle Valley Railway**

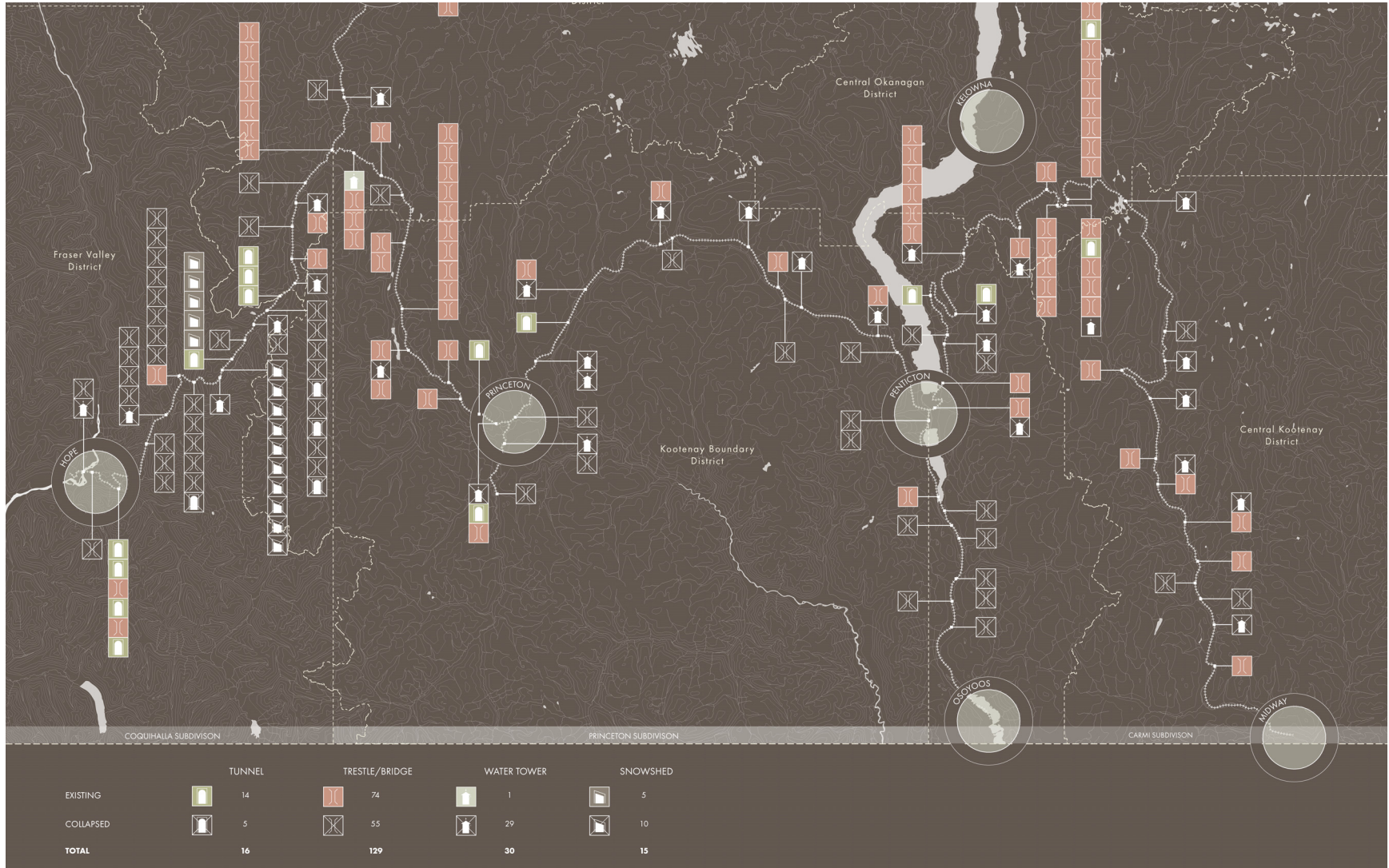
As long as I can remember, I have always experienced the beauty of an artifact, an object created by man as a special presence of form, as a self-evident and self-confident hereness that is intrinsic to the object. Sometimes when such an object asserts itself in nature, I see beauty. (Zumthor 2010, 75)

The following section provides an analysis of the different typologies of railway ruins. These railway ruins are monuments of the Kettle Valley Railway, which speak to the tension between human and landscape. They signify an

abrupt change in topography and symbolize the Canadian Pacific Railway’s faith and dedication to the service of the people of southern British Columbia (Sanford 2010, 125). Embedded in the monuments are the memories of those that have travelled this magnificent line and the KVR personnel who battled harsh weather and triumphed over impossible engineering feats. The section drawings of the path, tunnel, steel plate bridge, and snowshed, are meant to depict the



Kettle Valley Railway Infrastructure - locating railway monuments and their relationship to urban centers (base map from Government of British Columbia 2020, data from Langford and Langford 2002)



Kettle Valley Railway Infrastructure - locating railway monuments and their relationship to urban centers (base map from Government of British Columbia 2020, data from Langford and Langford 2002)

oil landscape paintings that were trending during the railway boom.

During the late eighteenth century, like many appreciations of 'nature', the representation of ruins in art conformed to specific aesthetic 'picturesque' conventions about which features should be foregrounded. Ideally, such representations should stress 'variety and contrast of forms, lively light and dark interplay, rough textures, and above all, rather busy foregrounds with assorted irregular trees or rambling shrubbery in one or both corners of the picture, between which a few figures and/or animals appear'. (Edensor 2005, 11)

Tying all the monuments together like a thread in the landscape, the path becomes the relief between monuments, a neutral territory. The path suggests a route, something to follow. It leads to a destination where movement is arrested and time becomes permanence (Norberg-Schulz 1980, 56). Walking along a path in the forest is invigorating and healing as things slip away and something is continually gained, causing the constant interaction of all the senses (Pallasmaa 2012, 44). The path encourages movement and



Path collage - building anticipation for what lies beyond

reminds us of our collective life adventure. When travelled for the first time, the path builds anticipation for what lies beyond, but it is also a place of comfort, reaffirmed by the numerous human activities that shaped it. As the path is more frequently used, it become increasingly important in routing social relations and imbedding spatial impressions with temporally inscribed memories (Tilley 1994, 31).



Tunnel sketch

### The Tunnel

The architecture of a tunnel is a subtracted void from the earth's rock. Which is described as stereotomic and monolithic. The tunnel has mass and weight that is felt without touching its material. "The sense of touch is the



Section through the Othello Tunnels near Hope, British Columbia



Othello Tunnels collage

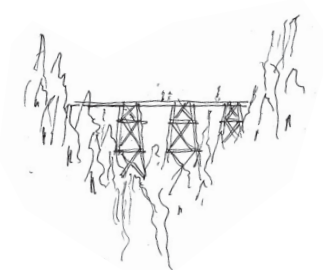
unconscious of vision, for vision reveals what touch already knows” (Pallasmaa 2012, 46).

Tunnels are spaces of refuge and enclosure; they are more about the feeling of the earth than the sky. The sky is minimized to only a small amount of daylight at the end of the tunnel, that instinctively draws one forward. The entrances to tunnels are thresholds between exterior and interior, because of this contrast, tunnels heighten the experience of being in the open landscape. Juhani Pallasmaa said, “Deep shadows and darkness are essential, because they dim the sharpness of vision, make depth and distance ambiguous, and invite unconscious peripheral vision and tactile fantasy” (Pallasmaa 2012, 50).

## The Bridge

### *The Steel Plate Bridge*

Bridges have contrasting qualities to tunnels. The bridge is an additive element to the landscape. The tectonics of bridges evoke lightness by touching the ground in as few places as possible. Bridges gently touch the earth and elevates one



Steel plate bridge sketch





Sectional model of Ladner Creek Bridge, which is constructed of nine steel plate girders. It is the sharpest curve on the Kettle Valley Railway in the Coquihalla Subdivision



Section through the Ladner Creek Bridge near Hope, British Columbia

toward the sky. As a result, the boundaries of the horizon are broadened and our view extended, which juxtaposes the narrow physical boundaries of the bridge itself. If the tunnel is about refuge, then the bridge is about prospect. Unlike the tunnel, the bridge does not focus the senses; it engages all of them and links the senses to different feelings of solidarity. Sight heightens the solidarity of the observer, and hearing evokes a sense of connection (Pallasmaa 2012, 54). In the extreme landscape, bridges are often used to connect landmasses separated by a river or stream. A relationship is created between bridges and water – where bridges are encountered, so is water – which adds a certain micro-scale to landscapes. Nature becomes mobile and dynamic when water is present, which is heightened by the stillness of the bridge (Norberg-Schulz 1980, 35).

Compared to the other railway monuments, bridges are exposed to the most significant amount of light, especially

in plateaued topography. This means they are also exposed to the weather. Steel bridges are better suited to tolerate harsh climate conditions because of their durable material. The inherent qualities of steel allow structural members to span large distances with thin dimensions to increase the sense of light and airiness.

### ***The Wood Trestle Bridge***

The structural material of the wood trestle bridge is produced from the surrounding forest; in a way, the wood trestle bridge becomes an extension of the landscape. Pragmatic approaches to building in extreme landscapes are exemplified in the wood trestle bridge where access to



765-foot long wooden frame trestle built from the surrounding forest, 1920; photo courtesy Andrew McCulloch Foundation (Sanford 2010, 96)

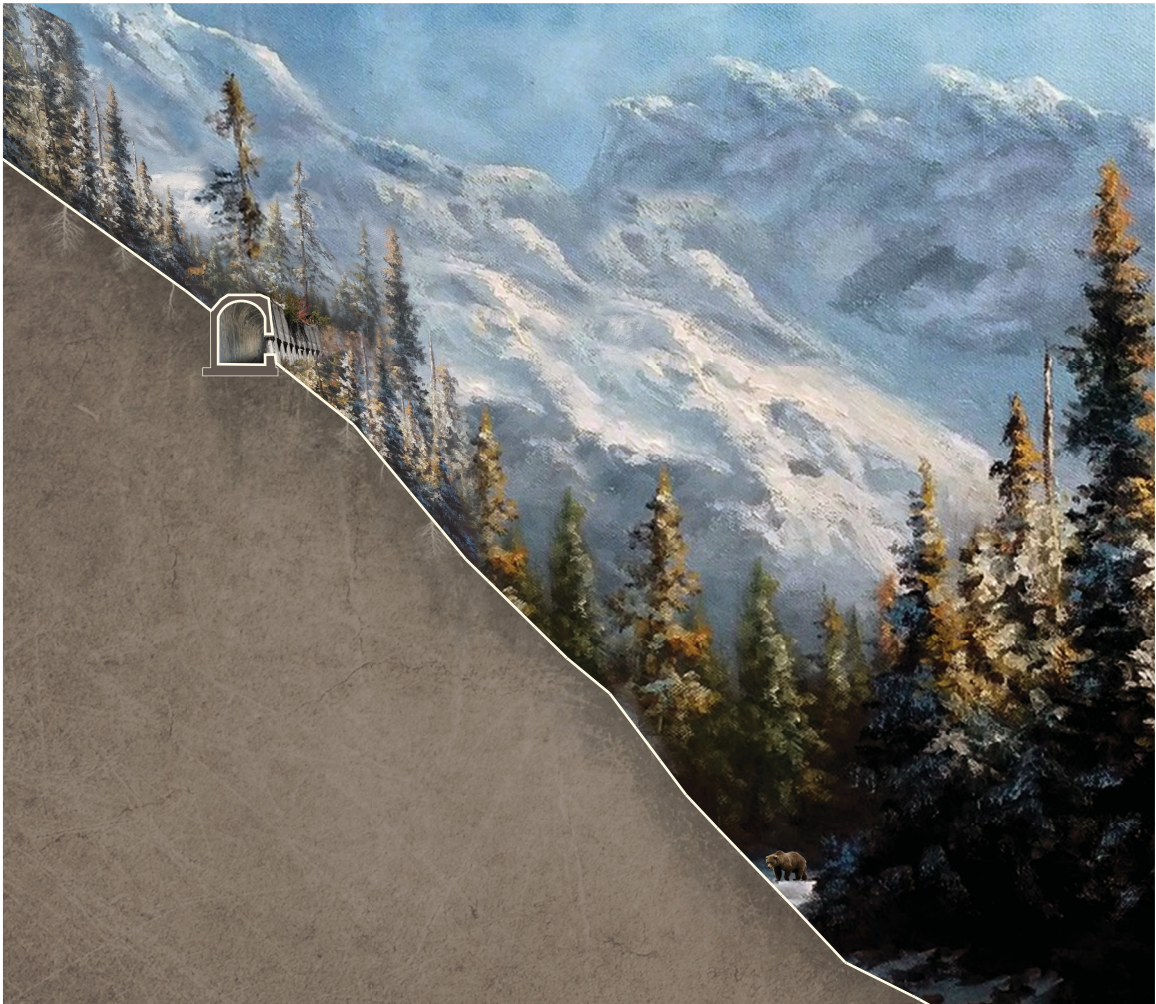
alternative resources is scarce. The wood trestle bridge is identified in its material and translates the succession of events that took place around it, the minds of its makers, and speaks to the place in which it was built (Rossi 1966, 113). An alternative to the cold, static-ness of the manufactured steel plate bridges, the wood material of the trestle evokes a sense of living and dynamic-ness.



Snowshed sketch

## The Snowshed

The snowshed is a hybrid architecture, it is partially subtracted and additive. The snowshed is a monolithic structure which is seated in the mountainside. It is the porous version of the tunnel, where the rhythm of its columns frame views and let in light from one side as you move through it. Unlike the tunnel, the snowshed's punctuated apertures of light make you want to briefly stop inside before continuing through. It's shed like form is pragmatic, but it also pushes you toward the mountainside where the volume is greater. This is naturally where you want to be, with your back against the comfort of the earth, and the wild landscape out in front of you.



Section through Snowshed 15 in the Coquihalla Pass



Snowshed 15 collage - climbing wall concept

## Criticism

The abandonment of extreme, rural network corridors allows people to engage with extreme landscapes that were not previously accessible. The monuments that confront, and deal with extreme landscape conditions are opportunities for new architectural interventions that foster one's connection to the landscape. The monuments also provide opportunities that create a sense of place by celebrating the incredible historical narratives that are imbedded in them.

The name 'network ruins' suggests that these types of ruins cannot be treated in isolation. As such, they need to be viewed as part of a whole system. A thorough analysis of the whole network of ruins, their history, and the communities that are linked by the old railway should be understood in order to recreate the nature/culture divide that the network once bridged. Network corridors that are converted to ordinary biking paths fail to effectively uphold the phenomenological

and historical qualities of the abandoned railways and reduces them to a shadow of their former self, where nothing is left of the complexity except for its trajectory and spatial connectivity (Qviström 2012, 258).

### **Thesis Question**

How can architectural interventions revive the abandoned Kettle Valley Railway as a network while enhancing the phenomenological and historical narratives specific to it?

## **Chapter 5: Architecture and the Line**

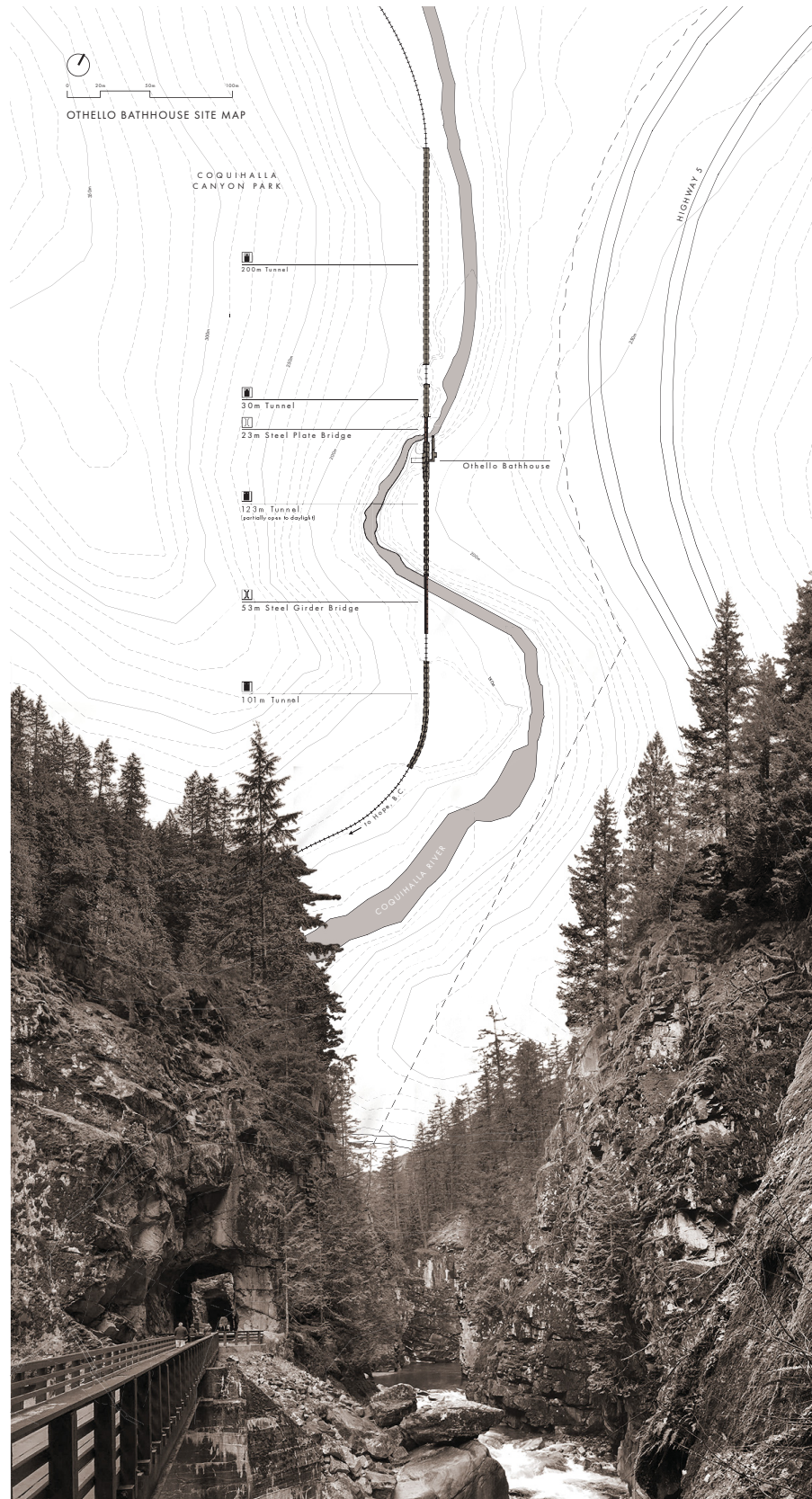
### **Locating a Test Site**

The Othello Tunnels is the test site for designing punctuated architecture along the railway. Located near Hope, BC, and within the boundary of the Coquihalla Canyon Provincial Recreation Park, the proximity of urban population and government financing helps support the scale and program. The site is strategically chosen due to its density of KVR monuments. Along the 530-metre portion of the railway, the site hosts three tunnels, a snowshed - tunnel hybrid, and two steel bridges. Each monument is consecutively aligned along a tangent through a deep canyon that serpentine its way around it, accentuating the linear qualities of the line. The unrelenting adjacencies of monuments is a result of navigating one of the most extreme landscapes along the Kettle Valley Railway. As a result, there is no relief from the path in this section, where movement is constantly encouraged.

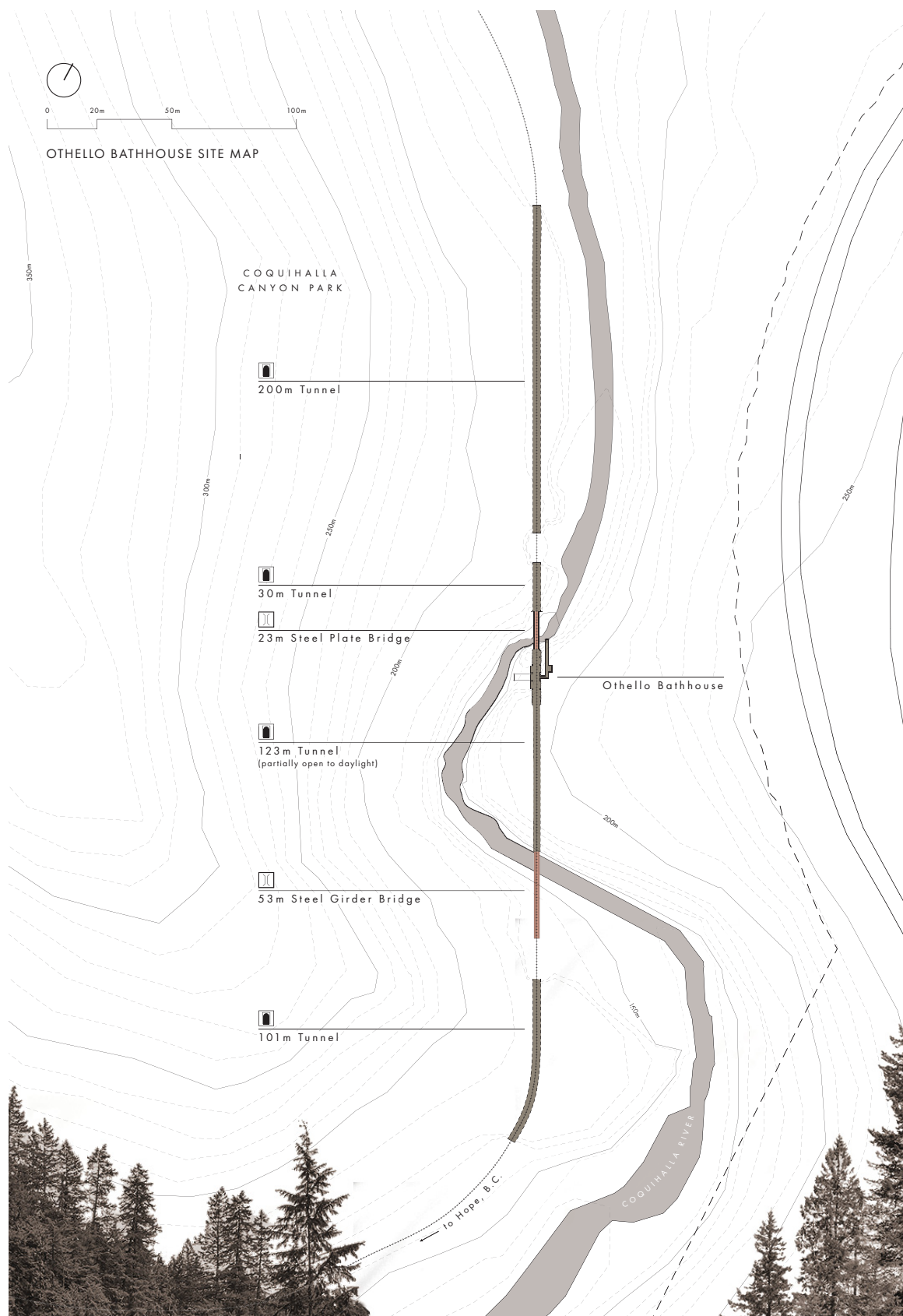
### **Situating Othello Bathhouse**

The bathhouse program was chosen for this site because of the phenomenological qualities of landscape and monuments. The deep canyon walls mute the shadows and light, while the monuments heighten what little shadow and light there is. The horizon is removed and views are shortened. This is an enclosed micro-climate, one that focuses the senses and makes each shadow and ray of sun extremely profound.

The Othello Tunnels site is injected with dynamic qualities juxtaposed by static ones. The constant movement of the



Contextural site map of the Othello Bathhouse



Contextual site map of the Othello Bathhouse



Coquihalla River and the swaying Hemlock trees reinforce the dynamic heat and cool cycle, while the stillness of the monuments against granite, canyon walls, behaves similar to the rest cycle. The Othello bathhouse is also located at the end of the railway, where weary travellers can rejuvenate after being on the path for some time.



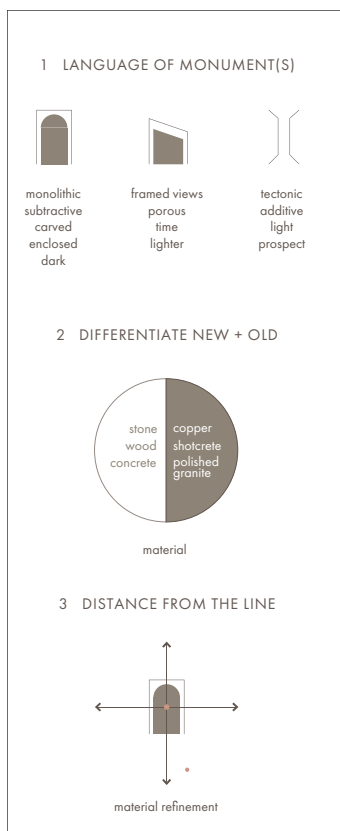
Othello Bathhouse location on the KVR

In the larger context of the railway, the bathhouse is the final piece of architecture on the line, offering weary travellers a resting point and a rejuvenation of spirit before they continue on their journey.

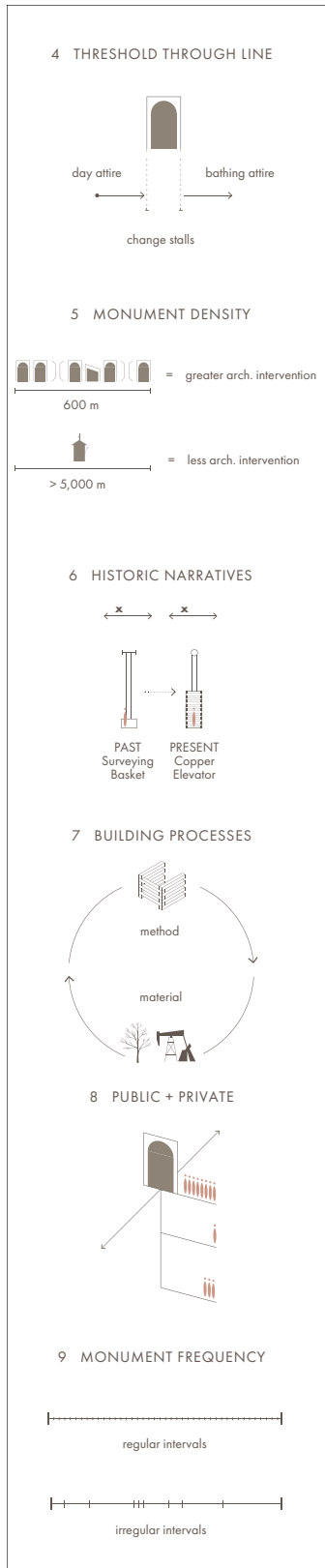
### Design Criteria for Architecture Along the Line

It is important to design the railway with a consistent feel so users travelling the line recognize the punctuated architecture as pieces of a whole. The design criteria places value on the history of the monuments and their relationship to topography, as well as strengthen the relationship between users and the path.

1. The architecture should speak to the language of the monument. The analysis of each monument should



Kettle Valley Railway design criteria



Kettle Valley Railway design criteria

be represented in the design. For example, the carving strategies of the tunnel.

2. Material elements of the architecture should be noticeably different than the monument to differentiate the new from the old, like refined copper plate contrasting the rough concrete of the snowshed.

3. The distance between users and the line should be experienced through the architecture. Materials and their tactility should change to signify the separation from the line and strategic views back towards the line helps register one's distance.

4. Transitioning across the line or below the line should be signified by a strong threshold to acknowledge the importance of the datum in the landscape.

5. Extreme areas of monument density are areas that require greater architectural intervention. Alternatively, sparse areas of monument density require less architectural intervention.

6. The architecture should build on the historic narratives of each location.

7. The architecture should speak to the challenging building processes of each monuments.

8. Moments of public and private areas should be designed to provide relief from the path so it can be enjoyed by groups of different scales and travelling requirements.

9. Program should be suited to the regular and irregular patterns of monuments along the line. Infrastructure that is spread across the line consistently should pair with consistent programming. For example, water towers appear

at regular intervals along the line and should be used as amenity locations (washrooms, sleeping huts, rest stops) for travellers.

## Othello Bathhouse Design

The Othello Bathhouse builds on the historical narrative of the site. The Coquihalla Subdivision of the railway originally had five stations named by chief engineer, Andrew McCullough. The original stations were named after his affection for Shakespearean characters – Juliet, Romeo, Portia, Lear, and Othello. The Bathhouse is located near the old Othello Station - which no longer exists.



Approach render of the Othello Bathhouse - the prospective language of the bridge offers the first glimpse of the bathhouse architecture



Othello Bathhouse plans

Before reaching the Othello Bathhouse, users experience the complete darkness of the first, and longest, of four tunnels on the site. The removal of sight foreshadows the bathing experience ahead and focuses people's senses to smell and touch. Exiting the mouth of the tunnel and onto the bridge that spans the Coquihalla River, the language of



Othello Bathhouse plans - entry level

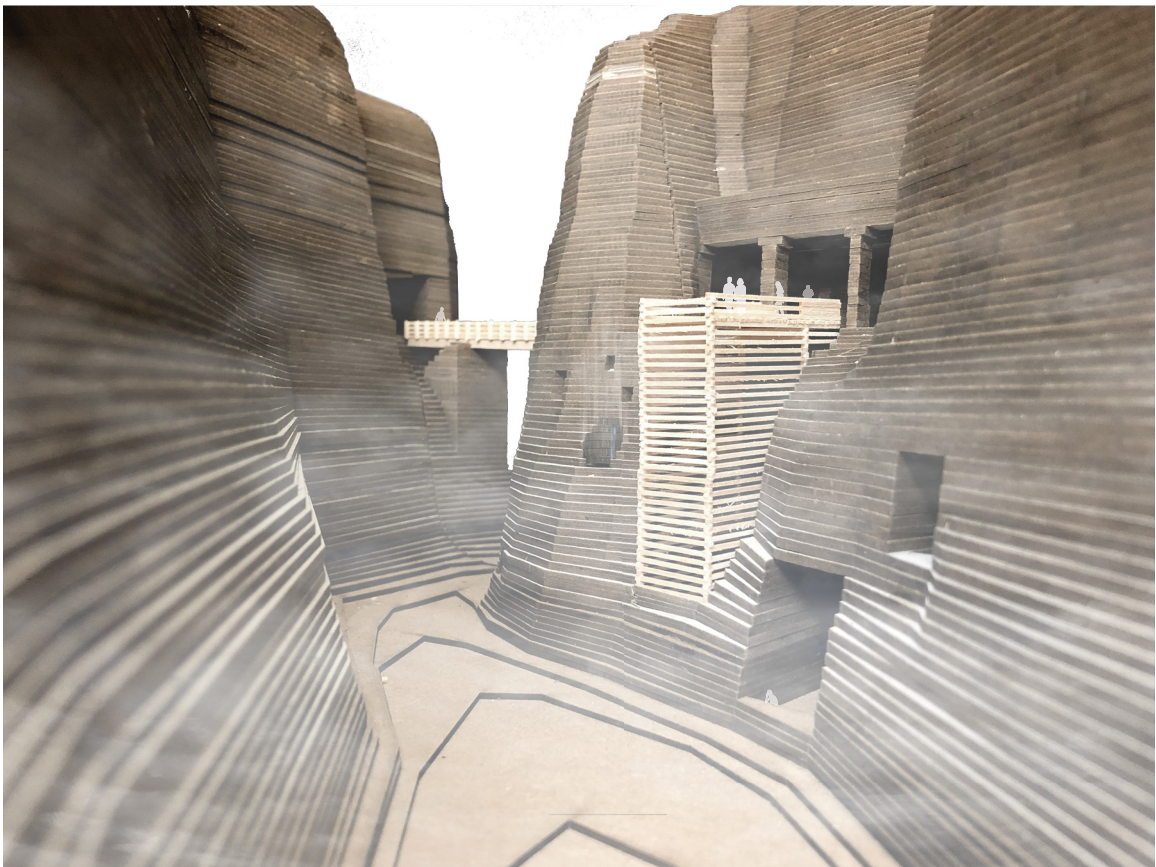
the bridge provides prospect, allowing the first glimpse of the architecture ahead. Entering back into the earth ahead, the porousness of the snowshed allows light to reach the back wall, highlighting the entryway to the bathhouse. The material of the path in the snowshed is a polished granite that highlights the characteristics of the snowshed by reflecting light further into the back wall of the snowshed. The polished granite links the bathhouse entryway to the viewing platform and is a threshold between old and new, existing and intervention. The material choice of polished granite speaks to the pragmatic building approaches in extreme topographies by using materials that exist on the site.



Viewing deck render - stepping onto the wood viewing deck, the public moves past the framed views of the snowshed and fully into the landscape

A viewing platform across from the bathhouse entryway is extended from the path, playing with the framed views the snowshed provides. Stepping out onto the wood viewing platform, the concrete columns of the snowshed move behind one's periphery as users become fully embraced by the landscape. In this way, the architecture of the bathhouse offers the public a space for relief from the path as well as vertical circulation for the users of the private bathhouse.

At the end of the compressed entryway, a glow of light illuminates a copper plated elevator through wood cribbing. Materially, the copper plating of the elevator also differentiates old from new and speaks to the historical narratives of the mining industry that the railway was originally built on.



Othello Bathhouse physical model - the tectonic wood viewing deck extends from the snowshed and plunges down the canyon walls to provide vertical circulation like the scaffolding and cribbing used in 1912

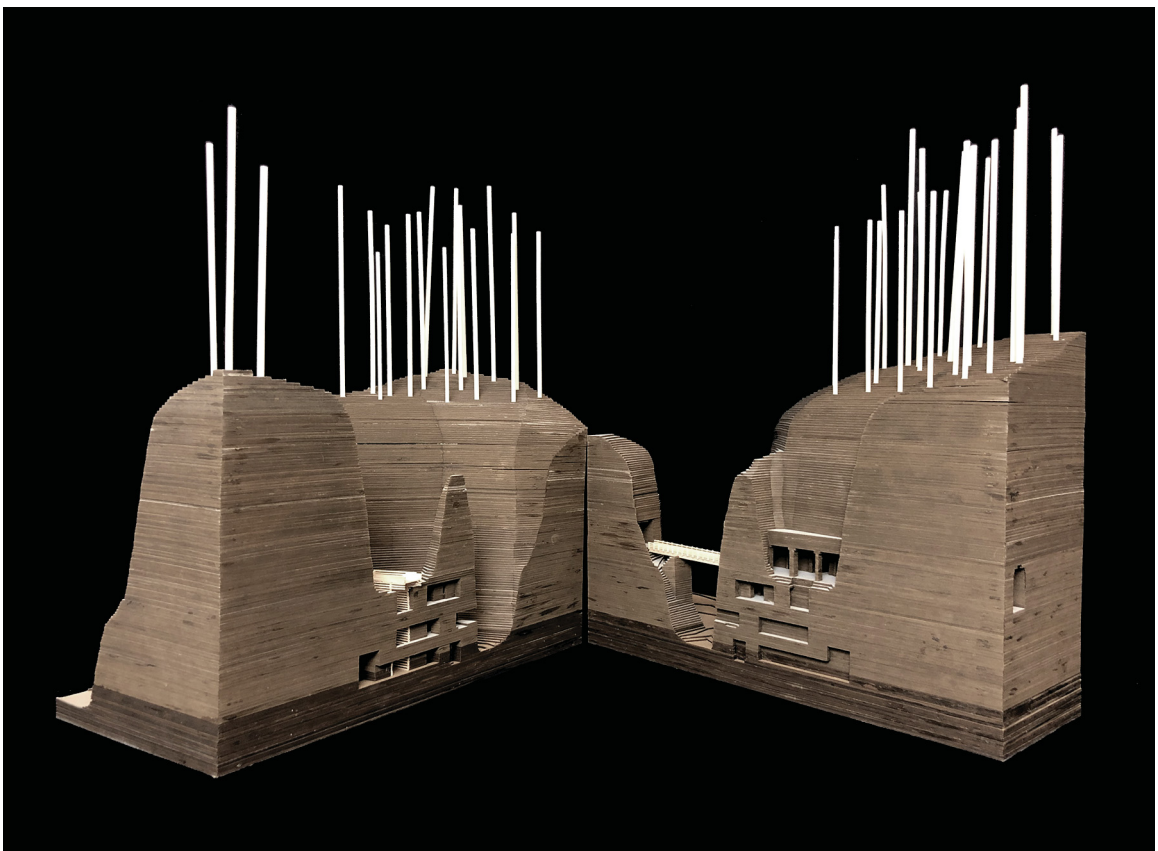
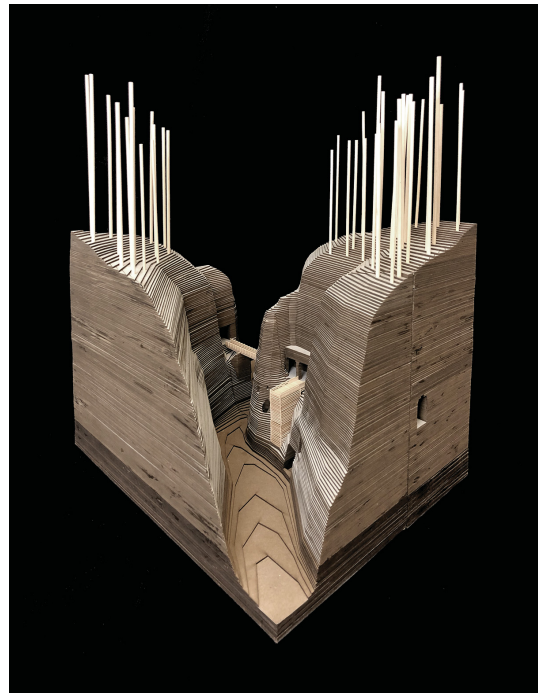
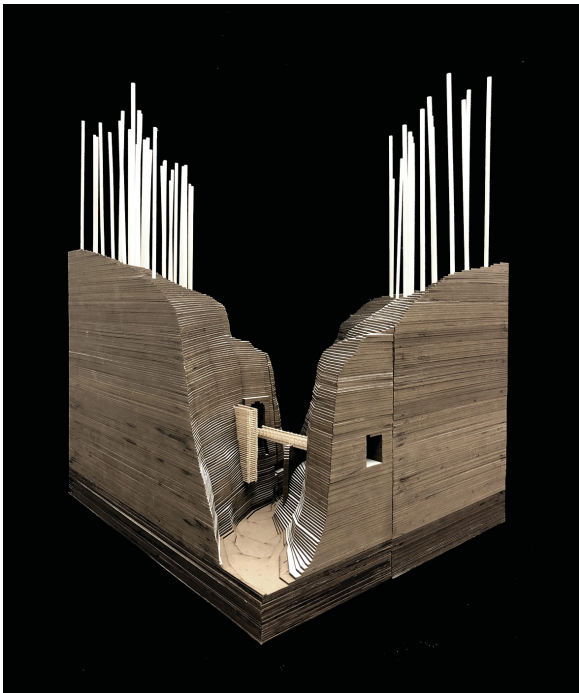
Descending down the elevator, one experiences the same feeling as the original surveyors of the line who were repelled down the canyon in baskets to set up their instruments in that exact location.



Four surveyors pose on wood scaffolding for a photo that illustrates the challenges of constructing the Othello Tunnels (Sanford 2010, 64)

Both the elevator shaft and the viewing deck are constructed of local Hemlock material that respects the pragmatic building processes of temporary cribbing for the bridges in this location. The wooden, vertical circulation elements protrude from the canyon walls as a more refined 1912 - scaffolding approach. These vertical circulation elements contrast the carving strategies of the bathhouse and are architecturally defined by their additive, light, and tectonic qualities similar to the language of the bridge. The wood cribbing strategically reveals the edge of the mountainside through the wood slats, so users recognize when they are leaving the earth and returning back to it. The horizontal datums of the cribbing also heightens the feeling of descending down from the line, as each gap in the wood screen reveals the landscape with every step downward.



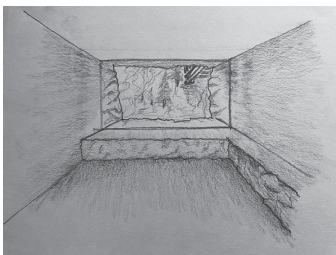


Othello Bathhouse sectional model - illustrating the light, tectonic, vertical circulation elements in the language of the bridge, against the carved, stereotomics of the bathhouse and the tunnels



Change stalls render - a threshold from one side of the line to the other. An opening in the canyon wall reveals the underside of the bridge, orienting users to the path.

Located directly beneath the railway line on the Amenity Level, the change stalls are a strong threshold between one side of the line to the other. As you move from one side with your clothes on, you transition to the other side in your bathing wear. Views back to the bridge from either side of the change stalls reinforces the movement through the threshold beneath the line, as well as the users' orientation to the line.



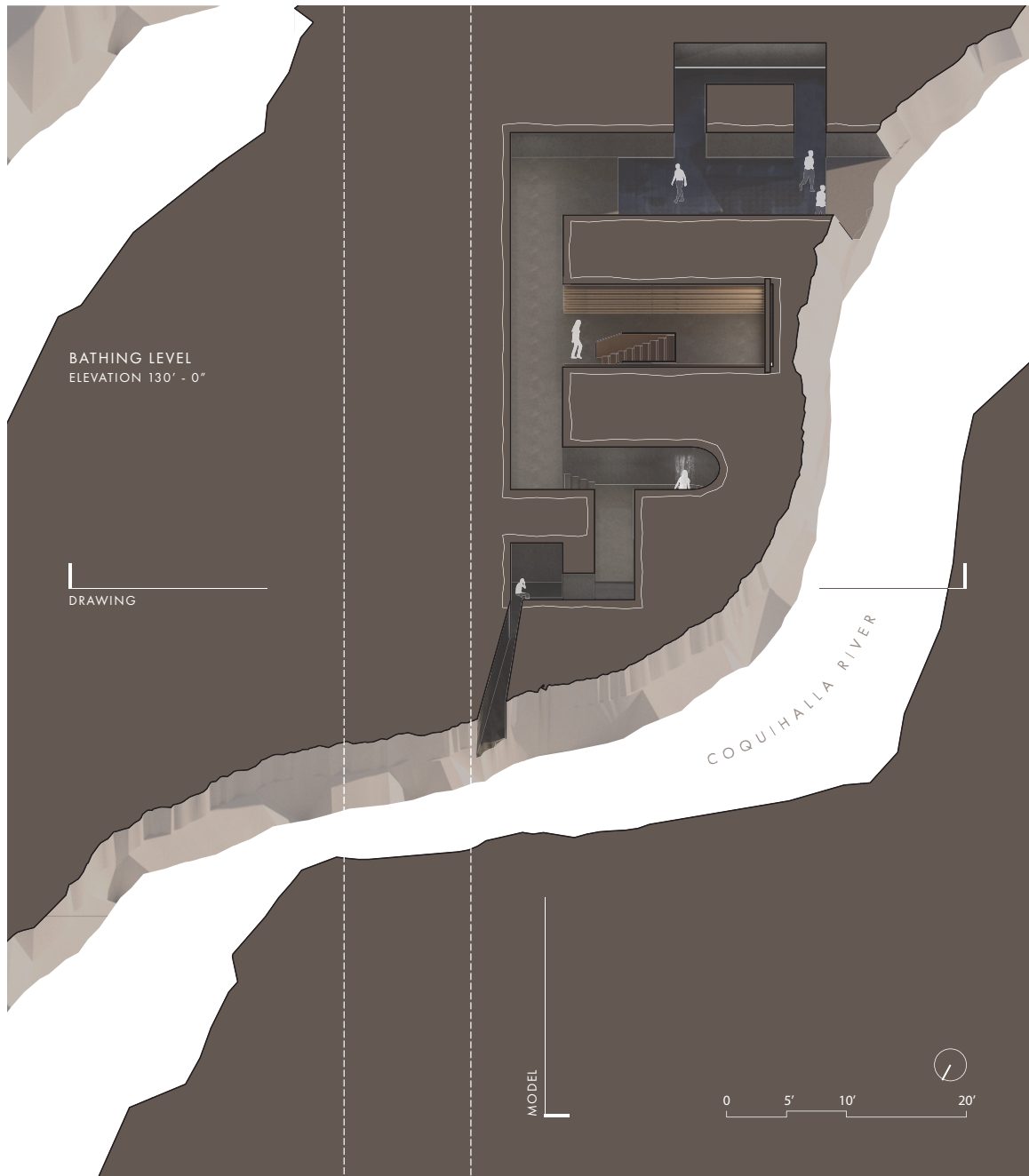
Warm resting room concept sketch

The next floor below is the Transition Level of the bathhouse. This level has a large, warm resting room that can be enjoyed at the beginning or the end of the bathing sequence. It orients users to the line by offering a large framed view back towards the bridge.



Othello Bathhouse plans - amenity level and transition level

The bottom level locates the heat, cool, and rest cycle of the bathhouse because it is situated closest to the river. Descending further from the line, the stone material of the walls become more refined, suggesting that they too have been gently sculpted like the stones in the Coquihalla River.



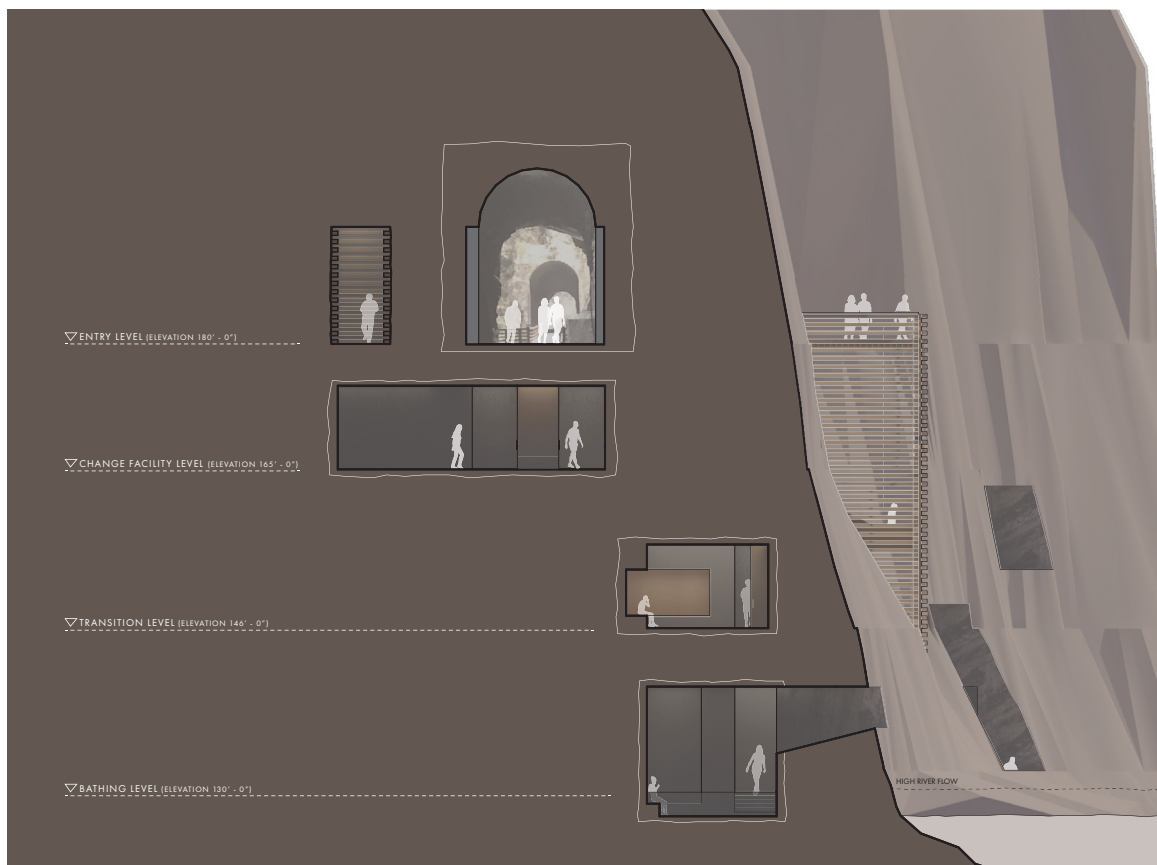
Othello Bathhouse plans - bathing level



Othello Bathhouse section

Parts of the bathhouse are carved out by controlled blasting to show the building process of tunnel-making by the railway engineers of the KVR. The carved out volumes are created by drilling holes closely together around the perimeter of the desired space. Loaded with a light amount of explosives, the holes are blasted simultaneously to reduce the amount of radial fracturing when carving out the rest of the space. The original Othello tunnels were blasted with less controllable measures, as a result, some fissures exist in the granite. To mitigate the compromised granite, reinforced shotcrete is used to stabilize any existing fissures and to keep them from expanding.

The hot bath is located on the north side, near the narrowest portion of the Coquihalla River. One opening in the west side of the mountain lets in minimal light to guide users into the



Othello Bathhouse section

hot bath, while another on the north side is directed towards the portion of the river that is the most dynamic. The hot bath focuses the senses to touch and hearing, similar to the language of the tunnel, as the sounds of the river echo off the walls.

Similar to the hot bath, the cold shower offers minimal views to the exterior. A small opening in the ceiling lets in light and water. Standing directly under the only vertical opening in the bathhouse, users are reminded of the small amount of sky that is experienced in a canyon.



Cold shower render - the only opening in the bathhouse towards the sky

The large resting pool is a noticeable contrast to the cold shower and hot bath. The resting pool is an expansive area carved out of the mountain that frames a view across the river of the canyon's granite walls. The resting pool allows users to experience the river and the lowest portion of the canyon in relationship to the line.

Transitioning back to the path, the shadows from the columns in the snowshed have shifted, reminding one that time does not rest. Travelling onward, the experience of the Othello Bathhouse renews users' appreciation for the neutrality of the path and the challenges of creating a line



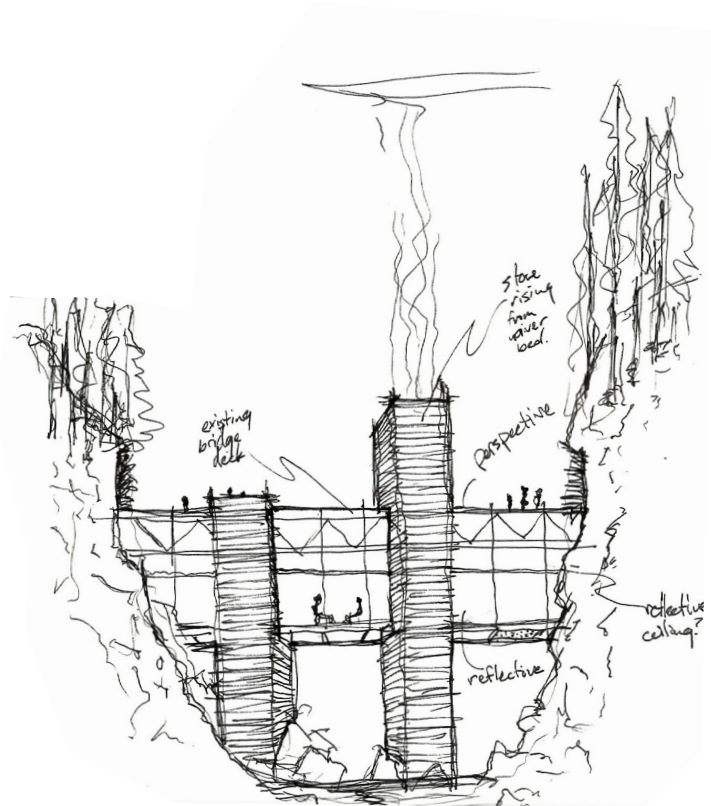
Large pool render - framing a view of the foot of the canyon and allowing users to experience the Coquihalla River



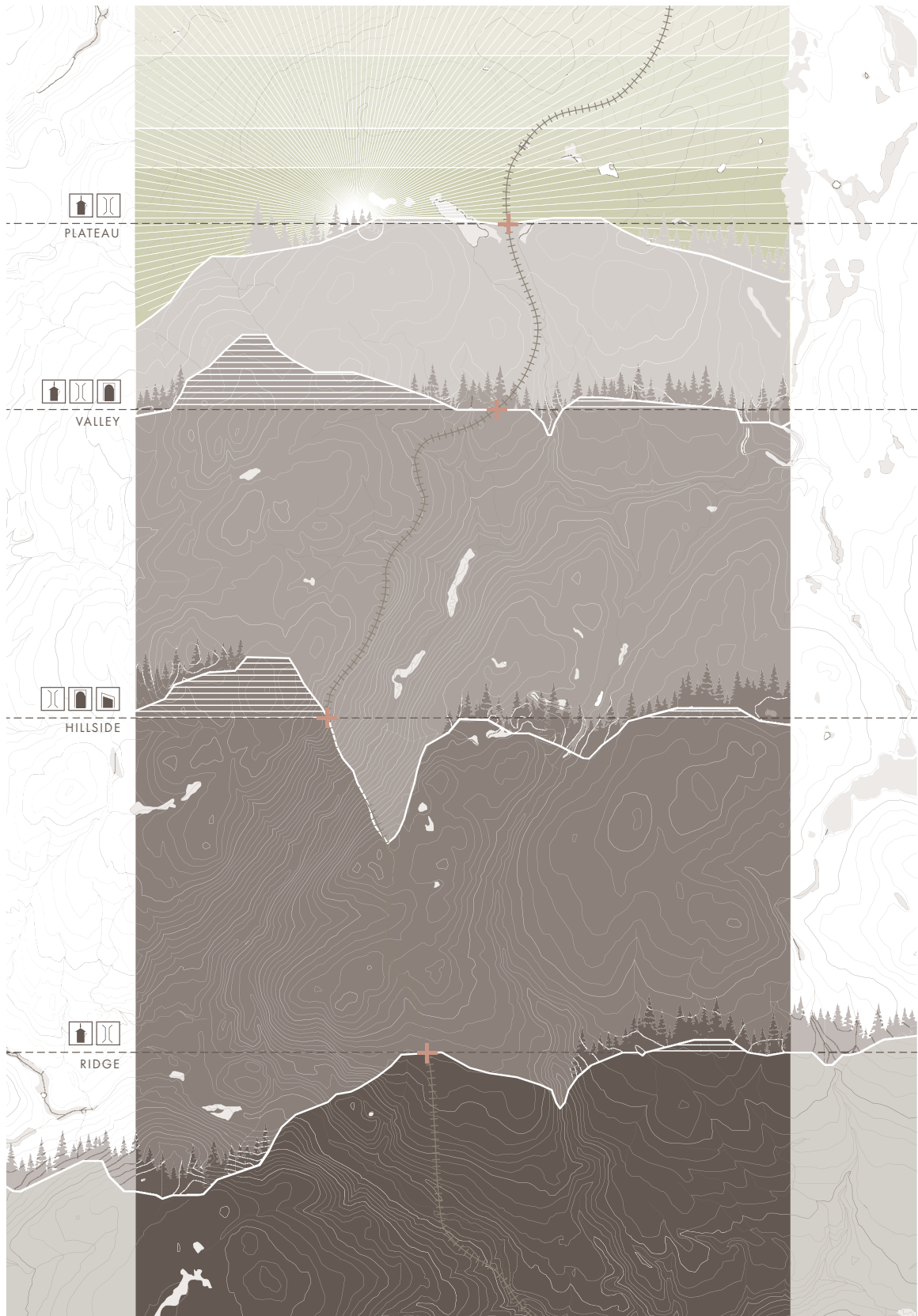
through such extreme topography. The monuments not only symbolize the past, but also the present, as memories are created every time people participate in the architecture that engages with them.

## Chapter 6: Conclusion

Abandoned network corridors within extreme, rural settings provides opportunities to experience the landscape that were not previously possible. By cataloguing Kettle Valley Railway monuments and their site specific relationship to landscape ecologies - the dry, desert plateau, the wet, forested valley, the low brushed hillside, and the snowy alpinics of the mountain ridge - a consistent design structure for reimagining future architectural interventions along the path begins to emerge. Within the catalogue of monuments and their relationship to landscape, specific monuments are utilized as areas for architectural interventions for their incredible engineering feats and significant historical narratives.



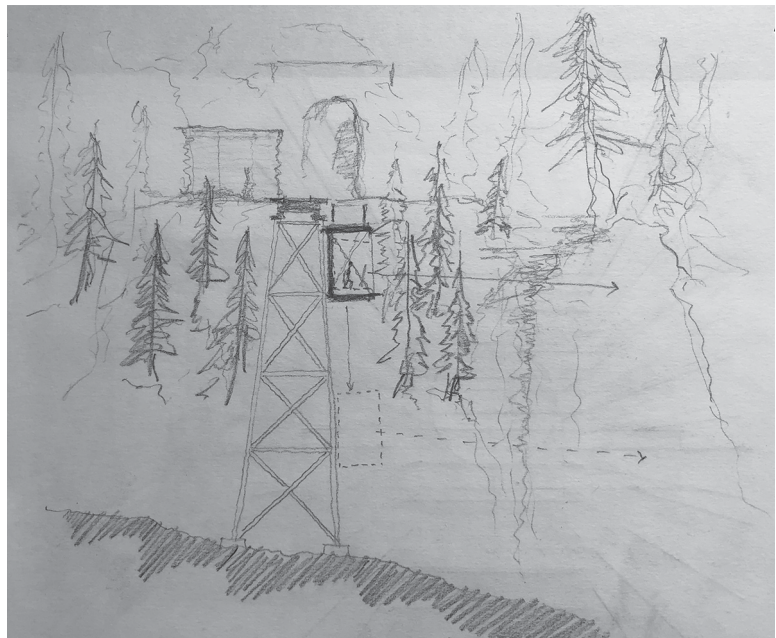
Concept sketch - exploring the opportunities of designing by utilizing the Kettle Valley Railway monuments



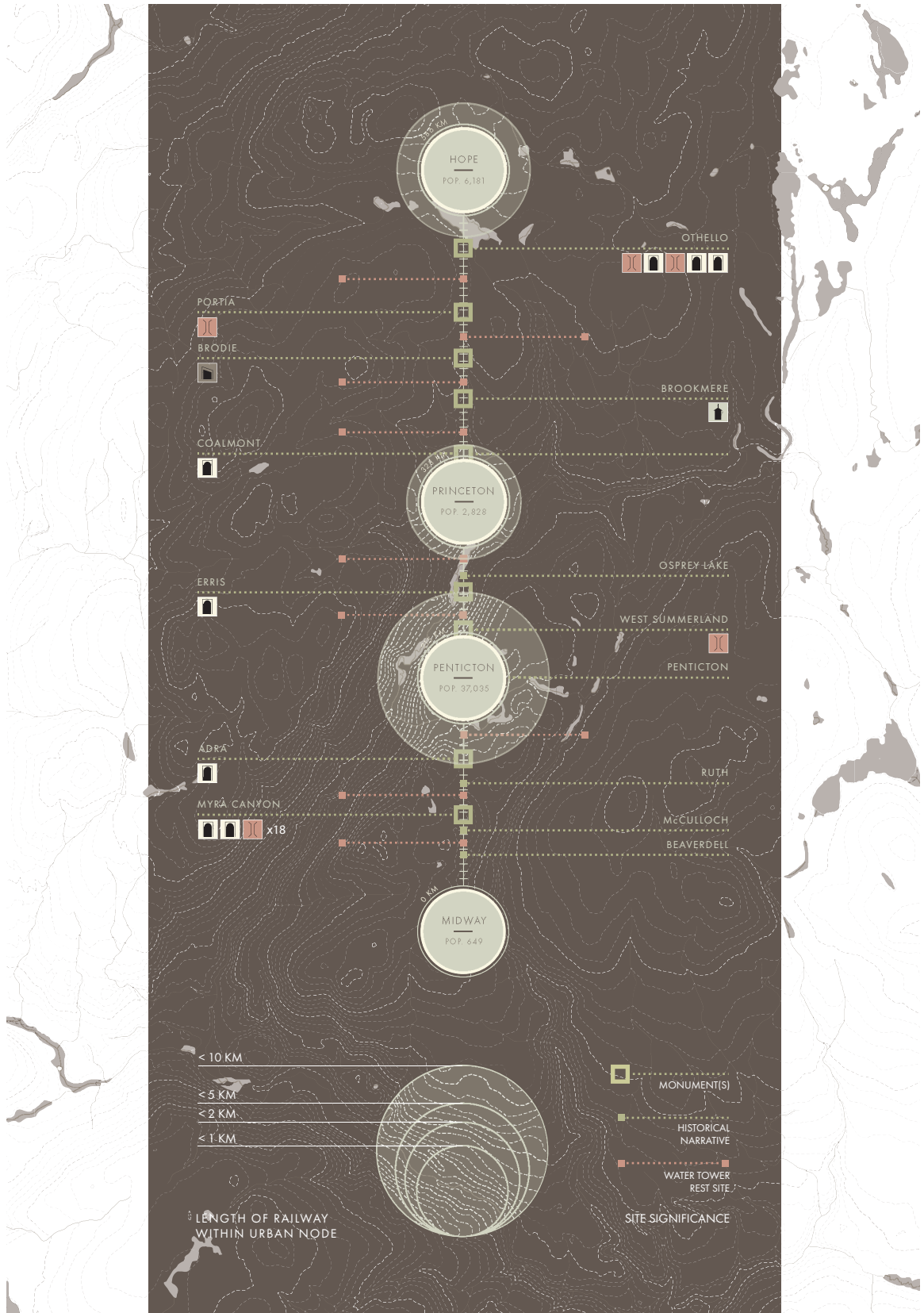
Monument typology relationship to landscape diagram - identifying sites where typical monument typologies emerge

Myra Canyon's high density of wood trestles provides a site of great architectural intervention that would celebrate the prospective qualities of skirting a canyon ridge. The wood trestles in this location were finely crafted by 200 carpenters using local Engelmann spruce and Douglas fir (Sanford 2010, 175). The program of the architectural intervention at Myra Canyon would build on the idea of craft and ingenuity and holistically represent the program by being constructed fully out of wood. New progressive technologies in the wood industry will differentiate the architectural intervention from the existing trestles.

The isolated historical narrative of the "last spike" at the remote Ladner Creek Bridge would be highlighted by a unique community meeting program where similar ceremonies could be hosted. The prospective qualities of the Ladner Creek Bridge offer a residency for landscape artists, while the tunnel located just before the bridge could be used as an exhibition for artists to display their art to travellers and share ideas with other artists.



Ladner Creek Bridge concept sketch



Potential locations for future architectural interventions based on engineering significance of the monument, historical narrative, and water tower amenity sites



Brookmere Water Tower - the only water tower along the KVR that has not been reduced to a foundation, n.d.; photo courtesy Doug Smith (Smith 2019)

The water towers that occur at regular intervals along the railway will serve travellers as a resting point. The regular intervals of water towers are nuanced by the amount of grade along the railway. As the grades increase, the amount of water towers increase along with it. The relationship between the landscape's grade and water towers is perfect for locating amenities. The water towers allow users to re-energize more often in steep mountainous areas and less in plateau areas before continuing along the path, similar to the original steam engines that used to replenish their water supply at these locations.

Using the design criteria described, each site-specific architectural intervention follows a set of rules that populates the railway with a consistent language, highlighting the incredible engineering of the Kettle Valley Railway. The architectural interventions avoid the railway's reduction to a fragmented, seasonal bike path, providing year-round use of the railway so it can be utilized by long distance travellers and daily users. By providing architectural occasions that honours the embedded memories of the Kettle Valley Railway's monuments, each piece of architecture will reinvigorate the network that once provided people with one of the most sensory experiences in the world.

## References

- Atlas Obscura. 2018. "Mapping the Ghostly Traces of Abandoned Railroads." Last modified January 9. <https://www.atlasobscura.com/articles/mapping-ghostly-traces-abandoned-railroads-interactive-crowdsourced-atlas>.
- Calvino, Italo. 1974. *Invisible Cities*. Orlando: Harcourt Inc.
- Cawood Hellmund, Paul, and Daniel Somers Smith. 2006. *Designing Greenways: Sustainable Landscapes for Nature and People*. Washington: Island Press.
- Cosgrove, Denis. 1989. "Geography is Everywhere: Culture and Symbolism in Human Landscapes." In *Horizons in Human Geography*, edited by Derek Gregory and Rex Walford, 118-135. London: Palgrave.
- Edensor, Tim. 2005. *Industrial Ruins: Space, Aesthetics and Materiality*. New York: Berg.
- Ferretti, Valentina and A. Degioanni. 2017. "How to Support the Design and Evaluation of Redevelopment Projects for Disused Railways? A Methodological Proposal and Key Lessons Learned." *Transportation Research Part D Online* 52: 29-48. [www.elsevier.com/locate/trd](http://www.elsevier.com/locate/trd).
- Government of British Columbia. 2020. *BC Provincial Boundary Lines, BC Rivers and Lakes, BC Transportation Lines, BC Water Lines, GBA Railway Tracks, BC Coastline Lines, BC Contour Lines, BC Basemap Lines, BC Major Cities, BC Manmade Lines, ADMS Regional Districts, ABMS Province, DBM BC Bathymetric, ERC Ecoregions, GNS Physiographic Areas*. Scale 1:1. Maps from DataBC, GeoBC, using *IMapBC*. Victoria: Government of British Columbia.
- Langford, Dan and Sandra Langford. 2002. *Cycling the Kettle Valley Railway*. Calgary: Rocky Mountain Books.
- McHarg, Ian. 1969. *Design with Nature*. New York: The Natural History Press.
- Norberg-Schulz, Christian. 1980. *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli.
- Oppido, Stefania, and Stefania Ragozino. 2014. "Abandoned Railways, Renewed Pathways: Opportunities for Accessing Landscapes." *Advanced Engineering Forum Online* 11: 424-432. [10.4028/www.scientific.net/AEF.11.424](https://doi.org/10.4028/www.scientific.net/AEF.11.424).
- Pallasmaa, Juhani. 2012. *The Eyes of the Skin: Architecture and the Senses*. West Sussex: John Wiley and Sons Ltd.
- Perez-Gomez, Alberto. 2003. "Spaces In-between". *Terrain Vague*: 274-279. Rotterdam: (unknown publisher).

- Province of British Columbia. 2019. "Annual Report to the Minister." <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/british-columbia-geological-survey/publications/annual-report-to-the-minister>.
- Qviström, Mattias. 2012. "Network Ruins and Green Structure Development: An Attempt to Trace Relational Spaces of a Railway Ruin." *Landscape Research* 37, no. 3: 257-275. <https://doi.org/10.1080/01426397.2011.589897>.
- Relph, Edward. 1981. *Rational Landscapes and Humanistic Geography*. London: Croom Helm Ltd.
- Rossi, Aldo. 1966. *The Architecture of the City*. London: MIT Press.
- Sanford, Barrie. 2010. *McCulloch's Wonder: The Story of the Kettle Valley Railway*. Vancouver: Whitecap Books.
- Smith, Doug. 2019. "Brookmere - Brodie - Coldwater in the Snow." *KamloopsCity.com*, November 4, 2019. <https://www.kamloopscity.com/columns/brookmere-brodie-coldwater-in-the-snow/>.
- Tapp, Stephen. 2016. "The Role of Transportation Networks in Moving Canadian Trade." *Redesigning Canadian Trade Policies for New Global Realities* 6. <https://policyoptions.irpp.org/2016/02/29/the-role-of-transportation-networks-in-moving-canadian-trade/>.
- Tilly, Christopher. 1994. *A Phenomenology of Landscape*. Providence: Berg Publishers.
- Tuan, Yi-fu. 1977. *Space and Place: The Perspective of Experience*. Minneapolis: University of Minnesota Press.
- Zumthor, Peter. 2010. *Thinking Architecture*. Basel: Birkhäuser.