**Mountainside Housing:
A Modular Counterpoint to Erickson's Mountaintop Campus.**

by

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0.1 ABSTRACT

This thesis proposes a mountainside housing ensemble as counterpoint to the Erickson-designed monumental Simon Fraser University campus atop Burnaby Mountain. Simon Fraser's resolutely horizontal Brutalist architecture comprises a constructed landscape and an architecture of finality. Might the flanks of Burnaby Mountain welcome an architecture of un-finality, adjustability, and change, as balancing counterpoint to the formal campus? Availing itself of an armature and modular building system, *Mountainside Housing* imagines a student village that will evolve over time. Premised on the idea of a Gondola station to connect Burnaby Mountain with the Vancouver Lower Mainland, the settlement will provide flexible and affordable student housing. Inspired by the treehouse dwellings students have built in the woods on Burnaby Mountain and by Erickson and Jeffrey Lindsay's tensegrity structure at Convocation Mall, the architecture reconciles finality and ephemerality while constructing the space generated by the slope's falling ground plane, between ground and sky.

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I thank Gordon Harris, President and CEO of SFU Community Trust, for meeting with me and encouraging me to be bold with the intentions of my research.

To my parents.

To my grandparents.

To the 1964 construction of Simon Fraser.

The ruminations are mine, here, now, in the aftermath of meaning. I hope that this thesis might dismantle some of the assurances that you live by now just as it has done with my own.

Slán go fóill,

Slán go fóill,

Meaghan

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An "Island in the Sky," Matt Lum photography.

1.1 SIMON FRASER: UTOPIC CAMPUS

Google Satellite imagery digitally manipulated by the author.

Image by the author.

Google Satellite imagery digitally manipulated by the author.

Simon Fraser University Burnaby Campus is located atop Burnaby Mountain in British Columbia; the main campus's central mall and five buildings were designed by Arthur Erickson and Geoffrey Massey in 1963 and constitute a landmark of post-war campus design in Canada. The project won a Massey Medal in 1967 largely due to its unconventional approach to university campus design. The campus atop the mountain is a centrally located retreat. However, the campus stands as an isolated commuter campus atop the mountain, surrounded by forest overlooking the farthest reaches of Metro Vancouver. In his 1975 book, Erickson remarked that "the light on the West Coast was greyer, and more atmospheric."¹ And while it is true that the fog and mist native to the greater Vancouver Lower Mainland can awaken the imagination,² the harsh reality of a concrete architecture set in a grey sky environment is that the campus is most known as looking relentlessly glum under grey skies by Vancouverites.³

¹ Arthur Erickson. *The Architecture of Arthur Erickson*. (1975), 43.

² Juhani Pallasmaa. *The Eyes of the Skin: Architecture and the Senses*. (2005), 46.

³ The Province. "50 little-known facts about 50-year old Simon Fraser University." (2016).

Burnaby Mountain's majestic and atmospheric qualities played a decisive role in Simon Fraser University's foundation. Hugh Johnston remarks that Dr. Gordon Shrum, who was the man tasked with selecting Simon Fraser's location, was overtaken by the site's beauty and driven by an emotional experience with the landscape, when he finalized the position for the new institution.⁴ Interesting foundation rites marked Simon Fraser's beginnings that recalled those employed for Romans towns. According to Joseph Rykwert, the "rite of founding a town" under the Romans was linked to a commonplace feeling of religious experience that was connected to the landscape.⁵ The choice of site was discovered through ritual acts sanctioned by the gods in contrast to Plato and Aristotle's more logical City of Ethics,⁶ explains Rykwert.⁷ Moreover, Simon Fraser's beginnings were poetic in nature, guided by a strong emotional connection to the landscape, in opposition to

4 Hugh Johnston. *Radical Campus: Making Simon Fraser University*. (2005), 123.

5 Joseph Rykwert. *The Idea of a Town: The Anthropology of Urban Form in Rome, Italy and the Ancient World*. (Faber & Faber: 1976)

6 Further study on the foundation rites of Simon Fraser can be found in SFU Archives, with special attention to *Speeches By Arthur Erickson*.

7 Kevin Lynch. *A theory of good city form*. (1981), 65.

Erickson and Massey competition perspective of the connected megastructure.

the traffic-reliant and heavily pragmatic planning methods that all too often dictate buildings' positions and shapes in modern urban planning.

Arthur Erickson and Geoffrey Massey's 1963 scheme presented an inventive approach to university design and construction. Typically, university campus construction occurs over time as the campus develops, so the parameters of building an entire university campus under a compressed timeline was an unusual circumstance.⁸ Additionally, the design was required to stay within a 65 hectare footprint as the rest of Burnaby Mountain would be classified as Wildlife Conservation Area.⁹ The design response from Erickson and Massey largely favored modernism's desire for change through an inventive approach to university construction. Erickson and Massey rejected traditional examples of educational institutions which separated departments in tall, discrete buildings. Instead, Erickson and Massey maintained a

⁸ Taylor Ian. *Future Campus: Design Quality in University Buildings* (2016) 67.

⁹ SFU. "Simon Fraser University: Five Year Capital Plan 2018 - 2023." (2017).

low building profile across the entire scheme in consideration of its mountain top setting. The scheme avoided separating faculties into individual buildings, and instead positioned several departments within the same building. By doing so, the architects created spaces for interdisciplinary studies and a closer relationship between Faculty and student body.¹⁰ The design concept offered an architectural translation of the philosophical ideal of education: universality.

Erickson and Massey's utopic vision required an organic and interconnected form to convey the philosophical ideal architecturally. The result was a constructed landscape without any architectural boundaries to set individual Faculties apart intellectually.¹¹ Additionally, the architects chose not to draw perspective drawings of the internal classrooms and lecture halls spaces. Instead, all perspective drawings — many of them bird's eye views in addition to perspectives of students navigating

¹⁰ Simon Fraser University. "Interview with Erickson and Massey on the Design of Simon Fraser." (Youtube: 2009).

¹¹ Nicholas Olsberg. Arthur Erickson: Critical Works. (2006).

campus — for the competition emphasized outdoor spaces and the connections between constructions. This was because the team believed that a great deal of learning at university occurs in the spaces that are outside of formalized learning spaces.

Erickson and Massey competition perspective of East Gym.

Erickson and Massey competition perspective of Convocation Mall.

Erickson and Massey competition perspective of Academic Quadrangle.

AQ stands as a Modern-Day Acropolis

Convo Mall was inspired by the Al-Azhar in Cairo

Images courtesy of SFU Archives.

The scheme has a classicist feeling through its veiled references to temples and cloisters; however, it uses a modern execution to generate its form. Erickson and Massey tried to find a relationship between built form and ideals, and to reconcile modernism's impulse for change with the need to be anchored in time and history.¹² For Simon Fraser, Erickson and Massey chose to make connections to the architecture of the past through abstraction, while using modern materials. An example of this is discovered through the Convocation Mall and heart of campus space. Erickson was inspired from the Al-Azhar University in Cairo during his travels in his youth.¹³ He imagined Convocation Mall as one day growing into a "marketplace of ideas."¹⁴ The design embodied the conviction that learning could occur when it was embedded into the fabric that people were already navigating during their daily commute. The Convocation Mall is the celebrated space of the campus, which effectively validates the

¹² Peter Gay. *Modernism the Lure of Heresy From Beaudelaire to Beckett and Beyond*. (2008)

¹³ Nicholas Olsberg. *Arthur Erickson: Critical Works*. (2006). 11

¹⁴ *Ibid.* 11

entire SFU megastructure.

In part, the architects' commitment to build timeless "ideals" about human learning illustrated their belief that buildings should not become so quickly outdated, nor fall prey to the generational whims of style and taste. Simon Fraser's monumental form shows that the architects believed that a public investment like a university should live as a monumental form to withstand the test of time.¹⁵ For Erickson and Massey, monumental form responded to people's desire for both confidence, familiarity, and social stability.¹⁶ Erickson's genius lay in his ability to reinterpret paradigms of classical design (and their tested and true forms) in a modernist language.¹⁷ Thus, Erickson and Massey veiled their references to architectures of the past through a method of modernist abstraction and modernist building methodology, thereby ensuring that Simon Fraser would live on as a monument atop the mountain.

¹⁵ Edward Hall. *The Hidden Dimensions*. (1990).

¹⁶ *A pattern language : towns, buildings, construction* (1977).

¹⁷ *Ibid.*

Imagery from Frank Zhao, West coast Artisan.

1.2 WEST COAST MODERNISM: DEVELOPMENT OF A VENACULAR

West Coast Modernism distinguishes itself from other Modernisms through an inextricable bond between architecture and landscape. Often more rugged than eastern Canada's more precious International Style works, West Coast modern buildings often celebrate raw and natural materials indicative of this expressive idiom. Modernism on the West Coast is exemplified by a diversity of regional expression but is linked by the aspiration towards a humanistic architecture that is in direct response to context.¹⁸ Arthur Erickson's masterful use of concrete and wood exemplifies this point vividly. From his early wood houses to his concrete campuses, Erickson explored the possibilities of an expressive post-and-beam construction both aesthetically and structurally. The post and beam system that stretches across the

¹⁸ Greg Bellery. *West Coast Residential: The Modern and the Contemporary*. (2007), 19

Arthur Erickson's Graham House. Original imagery from Arthur Erickson, digitally manipulated by the author. <https://www.arthurerickson.com/wood-houses/graham-house/1/>

Arthur Erickson's Smith House. Original imagery from Arthur Erickson website, digitally manipulated by the author. <https://www.arthurerickson.com/wood-houses/smith-house/1/caption>

site and involves it, is emblematic of West Coast modernism.

The west coast modern building is always one element of a larger landscape: the site often takes precedence over the building proper.

A dense forest or rocky terrain are given equal consideration to the built architecture in the final west coast modern composition. The harmonious relationship between the home and the surrounding landscape elicit an emotional connection to the world beyond its walls.

1.3 COMPARE & CONTRAST: SIMON FRASER UNIVERSITY, A MOUNTAINTOP ARCHITECTURE, WITH THE UNIVERSITY OF LETHBRIDGE, A HILLSIDE ARCHITECTURE

Erickson and Massey perspective competition drawing of Simon Fraser University.

Erickson perspective drawing of University of Lethbridge.

Erickson and Massey allowed for the landscape to inform many of their design considerations for both Simon Fraser and University Hall at the University of Lethbridge in Alberta. For both institutions, Erickson used the same Brutalist ethos and bridge structure. However, both architectures distinguish themselves from one another in regards to their relationship with nature. Erickson writes that the “light in Lethbridge, was clear and cast shadows, while at the West Coast, Simon Fraser was greyer, and more atmospheric.”¹⁹ And so, the two universities were inversions of each other.²⁰ While SFU’s structure is located on the mountaintop condition, University Hall is instead embedded within the coulée valley on its hillside.

Simon Fraser University possesses a long, narrow, and low building profile across the entire campus. By keeping building heights under thirty-seven meters,²¹ the structures would not obscure the natural landscape and mountaintop setting. In places

¹⁹ Arthur Erickson. *The Architecture of Arthur Erickson*. (1975), 43.

²⁰ Ibid. 43.

²¹ City of Burnaby. *Zoning By-Laws*, P-6 zoning classifications.

where the slope naturally flattened, the architects positioned large open terraces.²² The strategy of letting nature inform design, and indeed, of designing with fragility, with reverence for nature, responds to the elevational hierarchy of the mountaintop setting. More directly, the strategy is both sensitive to the landscape, and responds to the natural order of the mountaintop setting.

The influence of American architect Frank Lloyd Wright can be seen in both West Coast Modern architecture generally, and Simon Fraser campus specifically. Erickson and Massey embraced Wright's design strategy that organizes volumes such that they expand outwards from an established heart and center. The strategy is considerably organic and seeks to connect with the landscape and is as an extroverted architectural form. In Falling Water, Wright used the center and heart of the residence, the hearth fireplace, as a spatial center and anchor for all other volumes to expand out from, towards nature.²³ Wright's central

²² Gene Waddell. "The Design for Simon Fraser University and the Problems Accompanying Excellence." (1998).

²³ Edgar Kauffman. *Fallingwater: A Frank Lloyd Wright Country House*. (1986), 45.

Image by the author, June 2017.

idea of the wall as screen organizes a horizontal continuation of the space into the landscape. Further to this idea, circulation is used as the main organizing principle and device upon which volumes attach. For SFU, the Convocation Mall and heart of campus is a large void space under a glass roof canopy to which all pedestrian roads on campus lead, and all other volumes expand away from and towards the mountain setting. The Convocation Mall space at Simon Fraser is a spatial anchor from which all other volumes expand towards nature.

While Erickson's design for University Hall uses the same conceptual strategy as SFU, the concept of universality was pushed even further in that all components of the university were to be housed under a single roof. The spatial design of the megastructure shows a completely different idea and arguably a more refined response to the concept of universality. Instead of the space expanding outward toward the site and environment like at SFU, University Hall absorbs the program into a linear bar. This

Arthur Erickson Section of University of Lethbridge. Image from University of Lethbridge Facilities, <http://www.uleth.ca/facilities/planning/content/campus-architecture>

Image by the author, June 2017.

integration is best understood through the famous cross-section drawing cutting through the bar's four floors.

Erickson embeds University Hall within the coulee valley to reveal the landscape. The simple rectangular form allows the undulating coulees to read clearly in elevation below the structure's mass. The coulee landscape becomes a key component in the composition of University Hall's elevation. However, Erickson marks a special moment through a void in the hulking mass. The void entitled the Breezeway allows the structure to float above the coulees and reveal the bridge structure so that the connection to the ground is unveiled. More directly, the Breezeway is a celebratory moment where the connection to the ground appears as a light and ephemeral spatial condition. It is in this moment that the structure reveals itself as both straddling and embedded within the undulating coulee landscape.

When it comes to Simon Fraser, the relationship to the ground establishes the architecture as a constructed landscape

that terraces away and into the ground. There is a blurring between what is natural ground plane and Erickson and Massey's constructed "normalized ground" plane. This is a sensible treatment of the mountaintop setting, while at University Hall, Erickson exposes the contours of the land to establish the architecture as sensitive to the coulée valley.

PART 2

Towards an Alternative Living Arrangement

Image by the author.

2.1 BURNABY MOUNTAIN: DRIVERS' FOR CHANGE TODAY

2.1.1. VANCOUVER HOUSING CRISIS

Maps were generated from Census data and google satellite imagery was digitally manipulated by the author.

Establishing mass student housing could help ease some of the tension on the current housing crisis that plagues the greater Vancouver Lower Mainland of today. Simon Fraser only provides student housing on the Burnaby Mountain campus for 5.4% of its student body. Making the housing challenge yet more critical, with the exception of the University of British Columbia, no other colleges in the region offer any student housing options whatsoever. Students seeking low-rent housing options constitute a large portion of the current pressure on the rental market in Vancouver.²⁴ If there was an opportunity to create mass low-income housing for students that was open to all schools in the region, this option could potentially help ease a portion of the competition within the current Vancouver rental market. There is a dire need for affordable housing across the Vancouver region, and student housing remains a central and pressing problem.

²⁴ Kenneth Chan. "How student housing could solve Vancouver's rental crisis." (October 25, 2016).

2.1.2. SIMON FRASER: THE ENGAGED UNIVERSITY

Diagram of Vancouver Lower Mainland's Transit network in consideration of SFU's three Satellite campuses. Diagram by the author.

Today, Simon Fraser boasts a student population of 34,990, but in spite of its growth in size and changing ideals over the decades since its founding, the original Burnaby Mountain construction of 1965 remains largely unchanged today. Simon Fraser as institution has grown to include two urban satellite campuses which have revitalized their communities. Both SFU Surrey, and SFU Vancouver campuses are situated within large urban centres that are transit served, and easily accessible across the region, and this, is in stark contrast to the original iconic mountaintop campus and its bounded territory located far apart from the urban fabric. It is only by leaving the mountaintop setting that students can engage with the world beyond its walls. What is more, Burnaby Mountain campus's bounded separation from urban life is in direct contrast to Simon Fraser's strategic vision of today, "The Engaged University: Engaging Students. Engaging Research. Engaging Communities."²⁵

²⁵ Simon Fraser University. "Simon Fraser University: Strategic Vision." (SFU, 2016).

SFU Surrey, <https://www.sfu.ca/surrey/welcome.html>.

SFU Surrey, <https://www.sfu.ca/surrey/welcome.html>.

Location: Surrey Central City, Surrey, BC.

Completion: 2004

Architect: Revery Architecture (Formerly Bing Thom Architects)

SFU Surrey:

Simon Fraser's Surrey campus grafted an unusual mix of SFU's mechanics and technical programs with office towers onto a dying, transit-served mall. The dynamic atrium space and Galleria roof, structured in tensegrity, of Surrey Central City, where the shopping mall, university campus, and office buildings all converge, serves as a centrifuge for shoppers, students, and office workers. Surrey Campus is considered as an optional starting point to the SFU university career as most Faculties of the university — Faculty of Applied Sciences, Arts and Social Sciences, Business Administration, Communication, Art, and Technology, Education, Environment, Health Sciences, and Science — offer first year course offerings at SFU Surrey with further study to continue at the Burnaby campus location.

SFU Woodward, 2018. <https://www.sfu.ca/sfuwoodwards.html>

Location: East side Hastings, Downtown Vancouver, BC.

Completion: 2009

Architect: Henriquez Partners Architects

SFU Vancouver, Woodward's Redevelopment:

The project reconfigures the nostalgia of Woodward's into low-income housing and SFU Contemporary Arts on the east side of downtown Vancouver. Woodward's Cultural campus offers Dance, Film, Theatre, and Visual Arts courses. The campus also supports professional partnerships with artists and engages with its "immediate inner-city community through unique cultural, employment, and public initiatives."²⁶

²⁶ Simon Fraser University. "SFU Vancouver Woodward's website". <https://www.sfu.ca/sfuwoodwards/about-sfu-woodward-s.html>

2.1.3 ACCESSIBILITY TO BURNABY MOUNTAIN - THE GONDOLA PROPOSAL

Google Satellite imagery digitally manipulated by the author.

While the position of the campus atop Burnaby Mountain is indeed iconic, an unintended consequence of the Burnaby campus location is its reliance on automobiles as the sole means of travel up the mountain. During the 1960s on the North American West Coast, the car surpassed the streetcar and walking as the main modes of transportation in cities and altered patterns of urban growth. The early twentieth century viewed the automobile as the future of travel. Today, however, concern for carbon emissions and environmental consciousness in general, shape a different attitude towards the car. Instead, the west coast lifestyle values more sustainable travel options. The pedestrian has gained back the priority position on the street, and low-cost travel options like public transit and bicycles are increasingly gaining popularity on the road.

Reliable transit service to Burnaby Mountain today is a significant challenge that the university faces daily. With a daytime SFU population of 20,000 students, faculty and staff,

Imagery from Frank Zhao, West coast Artisan. Digitally collaged by the author.

and UniverCity — Currently home to 5,000 residents in 17 developments — everything from family-friendly townhomes to concrete high-rises, commercial and food services, an elementary school, and childcare centre — UniverCity has already received more than 30 major awards — locally, nationally and internationally — for best practices and achievement in planning and sustainability. By 1996, the City of Burnaby approved the Official Community Plan (OCP) and by 2005 UniverCity welcomed its first residents — the development is preparing for another 4,000 or more residents by the year 2021, which will continue to grow the need for sustainable transportation options up Burnaby Mountain.²⁷

In an effort to resolve the demand on the system, in 2009, an initial feasibility study commissioned by Simon Fraser University and SFU Community Trust, the authority developing the UniverCity community, indicated that a gondola as a transit alternative to diesel bus service could improve “travel time,

²⁷ CH2M HILL. “Burnaby Mountain Gondola Transit Feasibility Study.” (Translink, 2018), ES-1

service frequency, reliability, and reduce greenhouse gas (GHG) emissions.”²⁸ Today, the transit system generates more than 25,000 trips each day with 12,600 daily transit riders funneling through the overcrowded bus route. According to the study, peak-hour travelers report that “as many as four full buses pass them by before they can board – which results in a 15-minute bus journey becoming a more than 30-minute trip.”²⁹

The diesel buses also have difficulties operating the vertical climb of nearly 300 metres and “emit an estimated 1,700 tonnes of GHGs per year, including a range of Criteria Air Contaminants (CACs).”³⁰ The winter snowstorms on Burnaby Mountain halt transit service altogether for an average of 10 days per year.³¹ This disrupts classes, exams and research at SFU, as well as strands both SFU students and the residents of the UniverCity community at considerable inconvenience and cost. These challenges will

28 Ibid ES-1

29 Ibid ES-1

30 Ibid ES-1

31 Ibid ES-1

Google satellite imagery of Production-Way University Skytrain station's relationship to Burnaby Mountain. Digital collage by the author.

continue to grow over the coming decade as SFU enrollment to Burnaby campus is anticipated to rise to an estimated 30,000 students and the full 10,000 resident community of UniverCity is established.

On the basis of the findings from the initial 2009 report, in 2011, the South Coast British Columbia Transportation Authority (TransLink) commissioned CH2M HILL Canada Limited (CH2M) to conduct a full business case on the feasibility of a Gondola transit system. The 2011 report identified a preferred solution: a station that grafts itself onto the Production-Way University Skytrain Station with a terminus station alignment being 2.7 km to the SFU Town Square and transit loop. The preferred terminus station option would be sited along the edge condition of Simon Fraser campus and UniverCity community, and the preferred gondola system would use 3S gondola technology. Following the business case report, in 2014, the Mayors' Council developed a 10-Year Vision for Metro Vancouver Transit and Transportation

which confirmed that “a high-capacity connection from Burnaby Mountain to a nearby SkyTrain station may be required,” and that further investigation and consultation was needed.³²

In 2017, TransLink retained CH2M to conduct a feasibility study and confirm whether the findings of the 2011 business case remained valid, and to assess an alternative alignment strategy. This updated 2017 assessment finds that there is “still a compelling case for replacing current diesel bus service with a gondola transit alternative up Burnaby Mountain.”³³

³² CH2M HILL. “Burnaby Mountain Gondola Transit Feasibility Study.” (Translink, 2018), ES-1

³³ Ibid, ES-1

“The Option 1 alignment is 0.7 km (20 percent) shorter and 3-minutes-per-trip faster. The Option 1 alignment traverses over approximately 0.5 km of the Burnaby Mountain Conservation Area compared to approximately 1.2 km for Option 2 leading to a greater impact for Option 2 from an environmental and approval standpoint...”³⁴

Figure 5-1. Alternative Alignments: Option 1 (left) and Option 2 (right)
CH2M, 2017

However, in spite of the fact that the reporting largely favors the implementation of a Gondola transportation network, the project still remains in the idea and research phase today on the proper alignment of the gondola transit system.

³⁴ CH2M HILL. “Burnaby Mountain Gondola Transit Feasibility Study.” (Translink, 2018), ES-1

Figure 5-1. Alternative Alignments: Option 1 (left) and Option 2 (right)
CH2M, 2017

And while the mountaintop communities of Simon Fraser and UniverCity largely support the proposal of a gondola transit system, the proposal has received strong opposition from the Forest Grove community on Burnaby Mountain's hillside.³⁵ This is the case because the hillside community would likely only experience the project as being visually intrusive to their environment. With terminus stations at either Mountaintop and Production-Way University, over 1 km distances in either direction to Forest Grove, this community would be stranded in-between both stations with no hope of accessing the benefits of a gondola transportation system. However, wouldn't it be beneficial if there was an additional stop heading up and down the mountain? If this were the case, the Burnaby Mountain community would be able to experience the benefits of a gondola transportation system to connect with the services provided on the mountaintop, as well as connect to the urban fabric of Metro Vancouver.

³⁵ I discovered this during my meeting with Gordon Harris, the President and CEO of SFU Community Trust.

2.1.4 BURNABY MOUNTAIN CAMPUS MYTHS

“All too often, I felt as though I craved colour in SFU’s grey environment, and it was only by leaving Burnaby Mountain that my sensibilities could be restored.”³⁶

Today, the Brutalist ethos material palette of Simon Fraser Many architectural historians and members of the public ascribe to what has come to be know as “Brutalism” – and its large-scale, abstract, and often sculptural, modernist buildings rendered in concrete and built between the 1950s and the 1970s – as having oppressive and “authoritarian” qualities. In the case of Erickson and Massey’s Simon Fraser design, this authoritarian description stands in opposition to the sensitive narrative that generated the megastructure’s form: a large and democratic collector of people and ideas.³⁷

³⁶ Personal memory of my experience on campus during my undergraduate degree, September 2008 – June 2013.

³⁷ Mark Pasnik. *Heroic: Concrete Architecture and the New Boston*. (2015), 153.

“It just looks so sad. And when you’re on campus everyday you don’t want it to look sad. You want to feel excited coming to campus.”³⁸

“It’s kind of modern, but I’ve also heard that it’s designed by a guy who designs prisons.”³⁹

The characterization of SFU’s architecture as depressing and prison-like, as captured in both quotes, is not uncommon, and the campus’s isolation does not help matters. Yet Simon Fraser’s “brutalist” description is in many ways an oversimplification that demands a closer and more critical look. We note there that SFU campus has been a preferred location for many films and television shows: clearly, some see the campus as beautiful.⁴⁰ Rarely is a

38 Cynthia Yip interviews students on campus to see how they feel about SFU Burnaby Mountain. “SFU’s High Suicide Rate: Truth or Myth?” (Youtube: 0:38)

39 The Peak (SFU) discusses Erickson as architect as well as interviews students about whether they believe Erickson designed prisons. “Did SFU’s Architect Also Design Prisons?” (Youtube: 0:03)

40 “The Best and Worst Movies EVER Filmed at SFU Burnaby” by the Peak (SFU) discusses a sample of the movies filmed at SFU.

radical architectural work such as SFU considered to be beautiful and liked by all. Taste changes from generation to generation, and thus, the generational whims regarding how styles are assessed should not be over-valued. Rather than reject – and radically “renovate” – SFU’s architecture based on changed tastes, might an architectural counterpoint be proposed that would “soften” the campus and improve its performance and integration into Vancouver’s urban fabric? Might a project on the hillside flanking SFU, and leading to it, not be the best way to bring SFU into the present, and reinstate the majesty of the Erickson Massey campus?

SFU students will readily encounter the two following myths during their studies: one, the architect’s designed prisons before SFU Burnaby; and two, the university possesses the highest suicide rate of all Canadian universities.⁴¹ In spite of the fact that neither of these statements are founded in fact, these two SFU myths widely circulate on campus and beyond. The student’s campus

⁴¹ I myself am SFU alumna and Vancouver native, and I often heard these rumours.

experience atop Burnaby Mountain, while navigating the original campus mall and buildings, is intimately tied to the weather. On a grey and rainy day, the grey-on-grey reality of the Brutalist palette evoked a negative presence over my senses. On these foggy days, I experienced the masses of grey concrete as imposing structures, while on sunny days I found the mountaintop to be one of the most spectacular settings within the Vancouver Lower Mainland. Given that it rains in Vancouver one hundred and sixty-eight days of the year, and students occupy the campus during the fall and winter semesters when the grey-on-grey reality of Burnaby Mountain is most frequent, the grey concrete campus is problematic from an experiential standpoint.

2.2 DEVELOPING A STRUCTURAL COUNTERPOINT TO THE MOUNTAINTOP

Image by the author.

TENSEGRITY—an architectural system in which structures stabilize themselves by balancing the counteracting forces of compression and tension— gives shape and strength to both natural and artificial forms.” —Kenneth Snelson ⁴²

As the engineer and architect Mario Salvadori writes, “we can detect tension easily if expressed in cable or truss system.”⁴³ However, as buildings are erected under classical building principle design, “its lower columns are compressed more and more by its weight of growing number of floors so we cannot see the shortening of its columns,” and tension is embedded within the columns so it is also not visible to the eye.⁴⁴ The stacked compression members describes the structural idea of the Simon Fraser megastructure. The megastructure’s integrity lies with the continuity of compression forces from roof down to foundations. The analogy of the human body is often used to understand the forces of a

⁴² Donald E. Ingber. “The Architecture of Life.” (Scientific American, 1997), 7

⁴³ Salvadori Mario. *Why Buildings Stand Up*. (W.W. Norton & Company 1980), 60.

⁴⁴ Ibid, 60.

building, especially those constructed under classic building principles. In this analogy, the structure of the body is carried by the skeleton as a stack of bones – a continuous compression structure – while individual muscles hang off each bone to provide mobility. And so, the compressional force path down to the ground is easily traceable, while tensional forces are hidden.

Donald Ingber writes that “people are not structured through stacked compression but are tension dependent.”⁴⁵ The integrity of the structure of the body is in the balance of soft tissues to hold the skeleton up in the air. No longer seen as a stack of bones, the tensegrity skeleton is instead a series of bones floating in soft tissues. Tensegrity is a structural opposite of design under classic building principles as it requires the perfect balance of both rigid compressive and tensile members. As Salvadori writes, “shear is equivalent to tension and compression forces acting at right angles and is not a separate force.”⁴⁶ Tensegrities are special case

⁴⁵ Donald E. Ingber. “*The Architecture of Life*.” (Scientific American, 1997), 6

⁴⁶ Salvadori Mario. *Why Buildings Stand Up*. (W.W. Norton & Company 1980), 83-84

Section of Convocation Mall's glass roof canopy structure. Image courtesy of SFU Building Facilities Management.

structures where the play of these two forces is visible in the design through isolated members in tension and compression.

What is intriguing about the architectural rhythm established at SFU is that although it is constructed predominantly of concrete, both Erickson and Massey recognized that the celebratory space would instead require a lighter and airier structural condition. The architects collaborated with the structural designer Jeffrey Lindsey in order to design a large glass roof canopy and termed the space Convocation Mall.⁴⁷

Convocation Mall is both multi-purposeful and the most dynamic space of the entire campus. Conceived as a roofed rectangular open plaza, and measuring 27 m X 70 m of unsupported span, the Mall is bounded by the library, theater, and student services building Maggie Benson Centre. The space frame construction for the glass roof opens up the covered space towards the sky so that this projection becomes a dominant part of

⁴⁷ McAtee, Carbone and Legault's *Montreal Geodesic Dreams* provides a comprehensive account of Lindsey's work with Erickson. (Dalhousie Architectural Press, 2017).

the experience within the mall. The materiality of the space frame consists of wood, cable, and steel elements to span across the mall without columns. Indeed, it is difficult to put into words the visual appeal of space frames: their lightness, their transparency, their geometry which changes depending on the vantage point.⁴⁸ Both tension and compression forces are revealed to the eye through isolated members. The structure thus becomes dynamic and vivid, mimicking the structure of the body. This lightness and dynamisms directly opposes the Brutalist material palette, which embeds tension forces within compression members so that only the compressive forces are experienced and visible to the eye. The Mall and its space frame roof balance the concrete buildings and completes the master plan: see-through and translucent, the space frame is an architecture of “un-finality” set against an architecture of finality. Were more to be built on the SFU campus, it is from the space frame that inspiration should be drawn.

48 Salvadori Mario. *Why Buildings Stand Up*. (W.W. Norton & Company 1980), 163-164.

Image by the author.

Given the challenge of isolation faced by SFU campus, and given the inflexible nature of the architecture, we ask: how might architecture answer to architecture? How, more specifically, might a new architecture, positioned next to the SFU campus, soften SFU campus and better connect it to Vancouver? How might a student hillside village complete the Erickson Massey mountaintop “temple”? This thesis imagines an architectural gesture, and more specifically, a Gondola station and an ensemble of modular housing, on the South East mountainside, between South Campus Road and University Drive East of Burnaby Mountain. In order to establish a lively architecture for the mountainside that does not fall victim to the same issues as the Brutalist architecture of the mountaintop, Convocation Mall provides formal inspiration for this new building ensemble. It will be important for the new architecture to isolate and reveal both tensile and compressive forces in order to capture airiness, changeability, lightness and even, a feeling of fragility and ephemerality, to contrast with the

concrete campus above. The forces can be revealed visually or through the senses by building with materials that have a level of give, so that tension can be felt. Additionally, an architecture that isolates forces provides the opportunity to optimize geometry in order to lighten the structure, in direct opposition to the stacked compression megastructure on the mountaintop.

2.3 BUILDING ON THE MOUNTAINSIDE

Image by the author.

“If you have ever ascended a high mountain, even by a well-defined path, you must have encountered many difficulties in crag and chasm, and other unforeseen obstacles, and have, at least poetically learned, that a short sentence of directions involved miles of toilsome labor.”

—Asher B. Durand⁴⁹

⁴⁹ William Stillman, James Durand. *The Crayon, a Journal Devoted to the Graphic Arts*. (Volume 2., 1855), 16.

Image by the author.

The desire to retreat into the woods is a poetic thought, and the wilderness is thought to possess an uncontrollable quality that awaits exploration away and apart from the liveable city. However, the awareness that all people and things are interconnected and that “nature is not an untouchably vast and sublime essence outside of us”⁵⁰ challenges the preconceptions of what it means to be wild. Additionally, in the woods, there is an existing hierarchy much like the city today. The trees dictate where the sun will touch the earth, and where a path can be formed. In the woods, this existing hierarchy is one that people are not actually aware of because it happens naturally and over time, unlike in the built environment. interference and thus is not easily understood through an all-knowing Master Plan which assumes an awareness of all factors.

When building on the mountainside of a forest, there is an inextricable bond between landscape and the constructed

⁵⁰ Latour, Bruno. “Spheres and networks: Two Ways to Reinterpret Globalization.” (2009)

Image by the author.

ground plane of architecture. The incline of the slope is also where most developers are not interested in building because the terrain cannot be easily flattened. Hillside architecture must respond to specific and individual topographical conditions. There is an intimate relationship between architecture and landscape on the mountainside. Mountainside architecture must also be constructed on a number of levels because the slope is often steep and requires different sectional conditions in order to organize habitable spaces. The new “normalized ground” accentuates architecture’s fundamental question of its connection to the ground.

As explored in the comparison of SFU and University Hall above, the mountaintop and the mountainside present very different architectural conditions and beg for different responses. On the mountainside of Burnaby Mountain, the design proposition in this thesis considers the space of a mountainside, and the tension between grounded-ness and airborne expansion. Building on a hill implies anchoring and retaining wall, and cantilevers and reaching

Images by the author.

outward, that is, construction toward the hill and away from the hill. The project is organized around two main datum lines: the slope proper, and the Naheeno Trail that follows the mountain edge and rises gently. Modular student housing is organized in the lands between the boundary line of the Wildlife Conservation Area and developable lands of Burnaby Mountain. The student housing also marks the entrance to the Naheeno Trail, which leads through the woods to the university campus at its centre, the Convocation Mall space. As the hillside student village develops over time, the growth will adapt to specific conditions of the rocky terrain below and meander up the slope along the Naheeno Trail. Because the Naheeno Trail already marks the position of life and activity, utilizing this path as the main organizational artery is considered to be a sensitive treatment to the surrounding landscape.

Image courtesy of SFU Archives.

Image by the author.

Unlike the mountaintop condition, the hillside edge must be “architecturalized” with a retaining wall in order to construct the ground plane for living. In studying the connection to the ground plane, this thesis returns to a time when the prime object of architecture was not the proliferation of freestanding objects, but rather, the marking of ground.⁵¹

⁵¹ Lynch, Kevin. 1981. *A theory of Good City Form*. Cambridge, Mass: MIT Press.

“I shocked students into experiencing things freshly by approaching their cherished precepts in an unexpected way. Once, I invited a dance teacher to instruct the students in how to move their bodies for balance, rhythm and sense of space. Then I asked them to draw themselves in some position that they had been in and to support that position thoroughly with a structure. In only one week they came up with a marvelous range of devices. If I had simply asked them to design a piece of furniture for sitting or reclining, they would have been completely bound by their preconceived notions of a chair or lounge. Now they understood on a deeper level what furniture was all about.”

—Arthur Erickson⁵²

⁵² Arthur Erickson. *The Architecture of Arthur Erickson*. (1975).

2.4 A MODULAR SYSTEM FOR LIVING IN THE WOODS

2.4.1. PRECEDENT STUDY: CITÉ A'DOCKS

Location: Southern District of the City of Le Havre, France

Completion: 2010

Architect: Atelier Cattani

The A'Docks residence offers 100 residents for student housing in sea containers. The project contributed to the redevelopment project for the Docks district by the city of Le Havre, France. What is most notable about this project is that the structural frame is revealed and that sea containers are not stacked upon themselves, but instead placed within an armature.

Images courtesy of Divisare, <https://divisare.com/projects/199910-atelier-cattani-vincent-fillon-cite-a-docks>

2.4.2. SECRET TREEHOUSES: PERSONAL NARRATIVE

Images courtesy of SFU Secluded Sights, <http://www.fas.sfu.ca/Nsg/hebron/SFUsecludedSights/TreeHouse/>

On a personal level, one of my most cherished stories of my undergraduate degree at Simon Fraser was the legend of the student-built treehouse dwellings in the woods surrounding campus. During a lab for a Biology elective in my second year of study, my class and I went into the woods surrounding campus to explore fauna in its natural state. The TA for the class told the legend of a group of Masters students who constructed treehouse dwellings in the forest to live for free during their studies. When it snowed on the mountain, the TA mentioned that they would jump from tree to tree so that the snow would not reveal the location of their paths, and betray their illicit dwellings, thus protecting their secrecy.

During my archival studies for my thesis research, I discovered that during the 1970s, '80s, and '90s, Burnaby Mountain saw students building treehouse dwellings in the surrounding woods and Wildlife Conservation Area of the mountain.⁵³ Although

⁵³ I stumbled across this blog which notes that even into the 90's there was at least one student living in the treehouses "Secluded Sights at SFU: a Treehouse in the Woods."

many of the student-built treehouses have since been demolished due to campus building and parking expansion, at least one still remains on Burnaby Mountain today. Retreat into the woods embodies the spirit of the West Coast, and it is from here that I mark the site of departure towards an alternative living arrangement in the woods.

Inspired by the student-made treehouses, a flexible and infrastructure-based architecture is proposed here, in order to establish an ever-changing environment evoking fragility and lightness. Fragility in architecture is the ability to capture the positive qualities associated with that which is temporary and responds to the existing hierarchy of a system. In the case of Burnaby Mountain, the system would be the forest site. Architecture of fragility is a sensitive architecture that is fleeting, yet potent, and conditioned by aesthetic values that favour a transitory sensibility, as opposed to permanent and monumental forms. Fragility in architecture leaves space for growth.

The project thus organizes a frame and a series of small modular living units. More directly, the frame and root structure of the modular system makes it possible to organize living spaces on a sloped terrain; in turn, the dwelling units are modular and fit into the frame. A flexible architecture then consists of an architecture designed to change throughout its' lifetime with a minimal impact on the surrounding site. Additionally, a flexible and modular architecture is transportable to its site to make building easier on the slope. And lastly, the frame and module system has the potential be in flux and to change according to human habitation and movements. Thus, the mountainside student housing village proposed here is conceived as an ever-changing organism rather than a static and fixed monument, like the mountaintop condition.

The design of individual modules is to be considered as a batch that can be repeated across the mountain slope with only minor modifications to the layout and foundations. Any modifications are to depend on the unit's relationship to the ground

plane. Also, there's an idea of a repeatable drawing set which will help save the cost of services over a number of builds for this project.

PART 3

Mountainside Student Village

Image by the author.

3.1 THE DESIGN PROPOSITION

3.1.1. DESIGN STRATEGY

Image by the author.

Figure 5-1. Alternative Alignments: Option 1 (left) and Option 2 (right)
CH2M, 2017

The intention of this proposition is to weave both Simon Fraser’s memory and the intentions of the institution today, with respect to the mountainside. The design strategy builds on the opportunities presented by SFU’s social and physical contexts. Growing from the future of Gondola Transit development to connect the isolated mountaintop condition of Burnaby Mountain with Metro Vancouver, this student village will be a stopping point on the way up the mountain. The following lists important points and criteria for the proposal.

1. Due to rapid urbanization of the greater Vancouver Lower Mainland, Simon Fraser University’s continued growth and changing ideals, and the high costs of maintaining rapid bus travel up and down Burnaby Mountain, a Gondola Transit line is being proposed by Translink for Simon Fraser University and UniverCity. This line will connect Production-Way University Station with terminus station atop Burnaby Mountain.⁵⁴

⁵⁴ CH2M HILL. “Burnaby Mountain Gondola Transit Feasibility Study.” (Translink, 2018), ES-1.

2. This thesis proposal adds a middle Gondola Transit Station to the proposal, situated at the edge of the Wildlife Conservation Area, and to connect the mountaintop to the mountainside setting and connect the Lower Mainland with the mountainside trails.

3. The thesis proposal advances that the Vancouver Housing Crisis will continue to plague the region, and that new and varied strategies to accommodate growth and affordable housing for students across the Lower Mainland are called for urgently.
4. Programmatic elements will be coupled with major infrastructural additions to make the mountainside habitable.
5. Rapid urbanization across the Lower Mainland will increase the need for mixed-use urban spaces, and the improved sustainable travel option will provide accessibility to Burnaby Mountain as an urban park for the region.

This thesis proposition is designed to include public, commercial, hotel, and residential spaces. Additionally, the Gondola Transit line will travel above the new hillside settlement on its route up and down the mountain. The Gondola means of travel will include a platform station to allow passengers to hop on

and off the Gondola as a middle stop between the skytrain station that connects Metro Vancouver and the mountaintop condition of Burnaby Mountain. The hillside student housing is to be considered as a means for the Simon Fraser Burnaby campus and development UniverCity to connect with the surrounding urban fabric.

Image by the author.

Option 1, the preferred gondola alignment, is more likely to generate a culture shift on the mountaintop with an additional middle stop. Option 2 would require that the Wildlife Conservation Area, lands that are not developable, change its status in order to build a student village community within proximity to the middle station. Therefore, this thesis will focus on developing a middle stop as an addition to Option 1 so that the Mountainside Student Village is built on land that is already classified as developable, and that is also walkable to both mountaintop communities Simon Fraser and UniverCity.

3.1.2. THE SITE

The west campus vision of the 1964 Master Plan went largely unrealized - only a fragment of the student residences built and no west campus anchor - which has resulted in the polarization of life and activity towards the east campus anchor, AQ Garden, and UniverCity. This marks a need bring occupants towards both the centre of campus and west campus.

Images by the author.

Image by the author.

Image by the author.

Image by the author.

3.1.3. THE 3 MODULAR ASSEMBLIES

All modular assemblies are organized so that each individual unit has unobstructed views and access to a private deck.

MODULAR ASSEMBLY 1

Enclosed space between units to create skylights for the communal resident kitchen and living room below.

Pathway below units towards a public courtyard and access to the communal resident kitchen and living room.

Units above access the public space via a sloped ramp.

MODULAR ASSEMBLY 2

Modular Assembly 2 possesses both elevator
and stair access.

Ground condition. Pathway along retaining wall
edge for public use.

Third Floor with possibility for communal garden.

Second Floor.

MODULAR ASSEMBLY 3

Modular Assembly 3 only possesses stair access.

Ground condition. Pathway along retaining wall edge for public use.

Third Floor with possibility for communal garden.

Second Floor

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

Image by the author.

3.2 CONCLUSION

In searching for the appropriate architecture for a mountainside housing ensemble as counterpoint to the Erickson-designed monumental Simon Fraser University campus atop Burnaby Mountain, this thesis was brought to consider the questions of architectural language and materials, permanence and ephemerality, in the making of humane and enjoyable environments for students. Simon Fraser's resolutely horizontal Brutalist architecture proposes a constructed landscape and an architecture of finality. The mountainside housing instead avails itself of an armature and modular building system that welcomes adjustability and change over time. Inspired by the treehouse dwellings students have built in the woods on Burnaby Mountain since SFU's creation and by Erickson and Jeffrey

Lindsay's tensegrity structure at Convocation Mall, the architecture reconciles finality and ephemerality while constructing the space generated by the slope's falling ground plane, between ground and sky. Unlike the mountaintop condition, the hillside edge is "architecturalized" with a retaining wall in order to construct the ground plane for living. The architectural proposal in this thesis privileged connection to the ground plane over the proliferation of freestanding objects placed on the ground.

Given the challenge of isolation faced by SFU campus and given the inflexible nature of the mountaintop architecture, this thesis establishes a lively architecture for the mountainside that compliment Arthur Erickson's much more permanent and declarative architecture of the mountaintop. It seems appropriate that the language of student housing should differ from the

language of the university's education buildings; in line with this idea, the modular housing proposed here refers to and continues some of the themes in Convocation Mall, in particular its space framed canopy. The new architecture isolates and reveals both tensile and compressive forces in order to capture airiness, changeability, lightness, and even, a feeling of fragility and ephemerality, to contrast with the concrete campus above. The forces are revealed visually and through the senses by building with materials that have a level of give, so that tension can be felt. Additionally, an architecture that isolates forces provides the opportunity to optimize geometry in order to lighten the structure, in direct opposition to the stacked compression megastructure on the mountaintop.

While the mountainside housing was originally premised on the idea of a middle Gondola station addition to the Burnaby Mountain Gondola proposal, the alignment strategy of the modular

housing system to the Erickson-designed campus negates the absolute need for a gondola to be added to the proposal. Instead, the mountainside housing system could develop even without the addition of the Burnaby Mountain gondola provided the scheme be aligned to the mountaintop. The proposal for mass student housing thus came to respond more generally to the need to ease some of the tension associated with the current housing crisis that plagues the greater Vancouver Lower Mainland of today.

The fundamental design principle in the modular housing system of weighting interior and exterior environments equally, points to a more general position about making architecture, and departs slightly from Erickson and Massey's scheme. The prioritization of outdoor conditions was evident through the 1963 competition perspective submission where the architects showed only the outdoor connections of the project without any interior views. While this preference is loadable and sobering in our age

of adulation of private interiors, this thesis proposal for modular housing did consider different strategies for natural light of the interiors as a consequence of the exterior. Indeed, the varying ground plane demands unique relationships for each unit, and generates numerous opportunities for new interiors, and the design valued this fact.

Additionally, in the spirit sustainable design practice, the modular system utilizes wood for wall assemblies and exterior cladding, iron and cable for its armature, and colour for improved experiential qualities. This palette compliments Arthur Erickson's concrete at SFU and responds to public criticisms of the latter as a material that, while beautiful on a sunny day, can appear depressing and prison-like.

This thesis began with the design inquiry that investigated why the general public and users of buildings so often deem the Brutalist palette and language as oppressive and prison-like. In the case of Erickson and Massey's Simon Fraser design, this negative

characterization stands in opposition to the sensitive narrative that generated the megastructure's form: a large and democratic collector of people and ideas. The architectural response of the thesis is an architecture that would "soften" the Brutalist campus and improve its performance and integration into Vancouver's urban fabric. The project sites itself on the hillside flanking SFU, leading to it, in an effort to bring SFU into the present, and reinstate the majesty of the Erickson and Massey campus today. In this sense, the modular housing situates itself as an interpretive preamble, even a preparation, for the canonic and majestic Canadian campus, and as an architectural continuation of the ephemeral elements already present in SFU. In building next to rather than replacing portions of SFU, this thesis endorses SFU's oft' misunderstood architecture with a view to expanding its public understanding, and hinting at approaches towards conservation and repair in the future.

A - WORKS CITED

- Alexander, Christopher. Ishikawa, Sara. Silverstein, Murray. 1977. A Pattern Language: Towns, Buildings, Construction. New York: Oxford University Press.
- Bellery, Greg. 2007. West Coast Residential: The Modern and the Contemporary. Vancouver: Simply Read Books.
- City of Burnaby. Zoning By-Laws, P-6 zoning classifications. Accessed January 20, 2018. online.
- CH2M HILL. 2011. "Burnaby Mountain Gondola Transit: Business Case Report." Translink: online.
- CH2M HILL. 2018. "Burnaby Mountain Gondola Transit Feasibility Study." Translink: Accessed May 15, 2018. online.
- Chan, Kenneth. 2016. "How student housing could solve Vancouver's rental crisis." October 25, 2016. Daily Hive. Accessed January 25, 2018. online.
- De Botton, Alain. 2006. The Architecture of Happiness. Toronto: McClelland &

Stewart.

Ditmars, Hadani. February, 2014. "Lethbridge University: The Spaceship-like Prairie School Comes of Age." *The Architectural Review*. Accessed June 15, 2017.

Erickson, Arthur. 1975. *The Architecture of Arthur Erickson*. Montreal: Tundra Books.

Erickson, Arthur. 1980 "The University – The New Visual Environment." *Speeches By Arthur Erickson*. Vancouver: University of British Columbia.

Erickson, Arthur. 1985. "The Architectural Concept for Simon Fraser University." *Simon Fraser University Archives: F-20-2-0-0-3*.

Gay, Peter. 2008. *Modernism the Lure of Heresy From Beaudelaire to Beckett and Beyond*. New York: W.W. Norton & Company, Inc.

Hall, Edward. 1990. *The Hidden Dimensions*. New York: Random House Inc.

Ingber, Donald E. 1998. "The Architecture of Life." *Scientific American*. Accessed April 25, 2018. online.

Johnston, Hugh. 2005. *Radical Campus: Making Simon Fraser University*. Douglas & McIntyre.

- Kauffman, Edgar. 1986. *Fallingwater: A Frank Lloyd Wright Country House*. New York: Abbeville Press.
- Latour, Bruno. 2009. "Spheres and networks: Two Ways to Reinterpret Globalization." A lecture at Harvard University Graduate School of Design. Accessed March 10, 2017. online.
- Leach, Neil. 1997. *Rethinking Architecture: A Reader in Cultural Theory*. London: Routledge.
- Lynch, Kevin. 1981. *A theory of Good City Form*. Cambridge, Mass: MIT Press.
- McAtee, Cammie. Carbone, Carlo. & Legault, Rejean. 2017. *Montreal's Geodesic Dreams: Jeffrey Lindsay and the Fuller Research Foundation Canadian Division*. Halifax: Dalhousie Architectural Press.
- Olsberg, Nicholas. 2006. *Arthur Erickson: Critical Works*. Washington: University of Washington Press.
- Pallasmaa, Juhani. 2005. *The eyes of the skin: architecture and the senses*. Chichester: Wiley Academy.
- Pasnik, Mark. 2015. *Heroic: Concrete Architecture and the New Boston*. Monacelli Press.

Province Newspaper. 2016. "50 little-known facts about 50-year-old Simon Fraser University." The Province. Accessed May 20, 2018. online.

Rykwert, Joseph. 1976. *The Idea of a Town: The Anthropology of Urban Form in Rome, Italy and the Ancient World*. London: Faber and Faber.

Salvadori, Mario. 1980. *Why Buildings Stand Up*. New York: W.W. Norton & Company.

Hebron, John. 2005. *Secluded Sights at SFU: a Treehouse*. Accessed October 26, 2017. online.

Simon Fraser Archives. 2001. "Arthur Erickson Transcription – Interviewer Ruth Sandwell." F-223-I-7-15.

Simon Fraser University. 2009. "Interview with Erickson and Massey on the Design of Simon Fraser." SFU. Accessed September 12, 2017.

Simon Fraser University. 2017. "Simon Fraser University: Five Year Capital Plan 2018 – 2023." SFU. Accessed January 25, 2018.

Simon Fraser University. "SFU Vancouver Woodward's." website. Accessed May 25, 2018. online.

Simon Fraser University. "Simon Fraser University: Strategic Vision." SFU.

Accessed April 20, 2018.

Stouk, David. 2013. *An Architect's Life: Arthur Erickson. Medeira Park: Douglas and McIntyre.*

Stillman, William James. & Durand, James. "The Crayon, a journal devoted to the graphic arts." Volume 2. 1855.

Taylor, Ian. 2016. *Future Campus: Design Quality in University Buildings.* Newcastle: Riba Publishing.

The Peak (SFU). 2016. "Did SFU's Architect Also Design Prisons?" Accessed September 26, 2017. online.

The Peak (SFU). 2016. "The Best and Worst Movies EVER Filmed at SFU Burnaby." Accessed May 28, 2018. online.

Translink. "Burnaby Mountain Gondola." website. Accessed May 25, 2018. online.

Waddell, Gene. 1998. "The Design for Simon Fraser University and the Problems Accompanying Excellence." SFU Archives. Accessed September 26, 2017. online.

Yip, Cynthia. 2016. "SFU's High Suicide Rate: Truth or Myth?" Youtube: Accessed September 26, 2017. online.