Bridge as Anchor:
Connecting Neighbourhoods, the City, and the Ravine in Toronto's Rosedale Valley

by

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CONTENTS

ABSTRACT

Toronto is a city characterized by the rich dichotomy between its urban fabric and the natural environment which shaped the city. Ravines are a primary contributor of open space, and a source of social and urban infrastructure for the city. A parallel exists between the city's diverse and ever-changing neighborhoods and their relationship to this common green space. The network offers residents a place of refuge, and is celebrated as a shared public amenity. This thesis explores Toronto's connectivity to the ravine network. It specifically investigates the Rosedale Valley Ravine, and the Glen Road Pedestrian bridge which spans it. This infrastructure is explored as an anchoring point between urban fabric and ravine network. In addition to providing access to the ravine, the bridge is studied as an opportunity to programmatically engage and connect the communities of St. James town and Rosedale on either side of the ravine.

ACKNOWLEDGEMENTS

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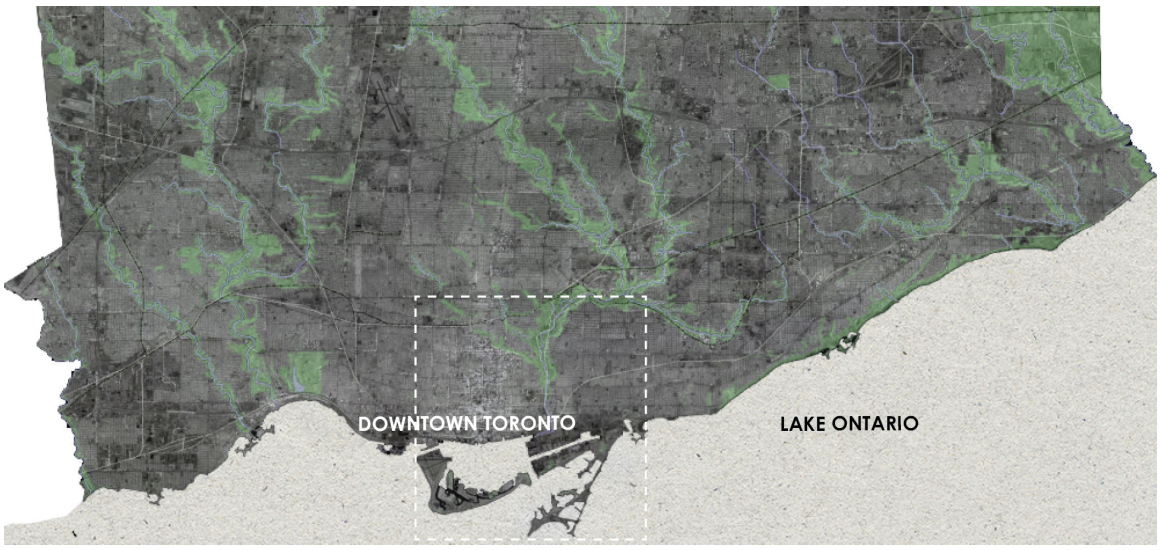
Olivia, for always believing in me and for the countless hours of support.

CHAPTER 1: INTRODUCTION

Thesis Question: How can the Glen Road Bridge spanning Toronto's Rosedale Valley Ravine improve the urban and social conditions of adjacent communities while providing access to the city's outdoor space network?

The Ravine and Urban Life

The ravines, places of retreat and connection to nature, gradually evolved alongside the city that they defined. There was and continues to be a cultural dependence on these spaces as social infrastructure within Toronto. Before official parks were established within the city, the population turned to the ravine network and waters that ran through their base as a means of leisure and place of activity.[1] A trend of public and recreational programs being developed alongside the ravines still exists to this day. Public pools, botanical gardens, farmer's markets, and community centers have taken shape along the edges between ravines and the city; functioning as a recreational and natural network. However, there is still opportunity for the city to develop this typology further, particularly through the urban infrastructure which intersects with the ravine network and enables connectivity between the urban and natural.



Toronto's ravine network; base from *Ravine Strategy Open House*

1 Robert Burley, Anne Michaels, Michael Mitchell, Leanne Betasamosake Simpson, Alissa York, George Elliott Clarke and Wayne Reeves, *An Enduring Wilderness: Toronto's Natural Parklands* (Toronto, ON: ECW Press, 2017), 221.

The anatomy of the ravine, a cut in the geological formation of the land caused by the long-standing movement of water, has manifested in a lengthy network of valued outdoor spaces within the city. Toronto's natural environment and parklands have been defined by these cuts that the ravines have left in the landscape, and they still offer a unifying experience for the differing social groups and neighborhoods within the city. As Toronto continues to grow, the ravines transform alongside it. The tension between the urban and the natural has become a defining characteristic of the experience of life in Toronto, specifically for the neighborhoods which line this extensive network of outdoor space. The city recognizes the value of this natural system, and has made efforts to protect it while ensuring that it is accessed and enjoyed by the entire community.[2]

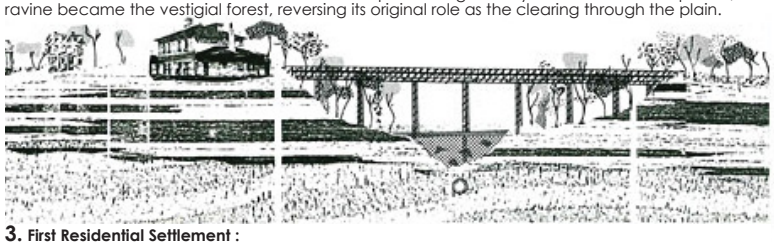
2 City of Toronto, "Toronto Ravine Strategy" (public consultation document, Toronto, ON, 2017), 5.

1. Original Landscape formed by ancient receding glaciers:

The creek meandered down to the lake shore, part of a network of creeks and ravines that score the plain running from the Oakridge Moraine to Lake Ontario. Set in the densely forested plain, the length of the ravine, although forested as well, would have been used as a comparative clearing and way through the natural landscape to the lake

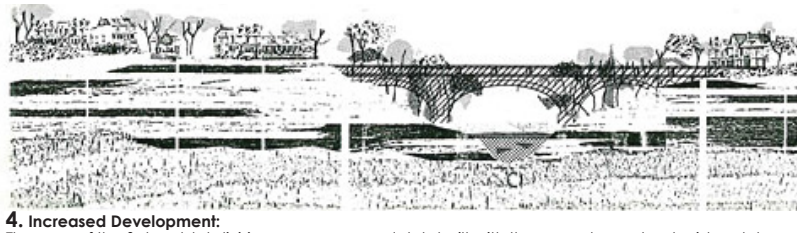
2. Initial European Settlement :

The surveyors of Lord Simcoe divided the countryside between Bloor Street and Lot Street (now Queen) into park lots, the forerunners of the Toronto grid, which were given to the new aristocracy of Upper Canada. While the park lot divisions did not acknowledge the natural landscape, the villas built by the landowners were often sited on significant bends on the banks of the ravines with axial views to the lake. Closer to the lake, small industries were built to take advantage of the water resources of Garrison Creek. As the forest of the plain was gradually cleared for development, the ravine became the vestigial forest, reversing its original role as the clearing through the plain.



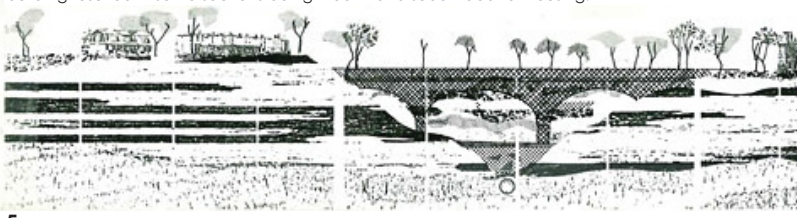
3. First Residential Settlement :

As the city grew, the Western edges of the city became desirable locations for suburban settlements, and the beauty of the Garrison Ravine, also called a "parkway", was cited as an encouragement to buy residential lots. By this time, the creek had become polluted by the settlement and by industry, and the burial of the creek into a brick sewer, ten feet in diameter, was seen as a positive step in providing a safe and controlled environment for development. As the creek was buried, the ravine was cleared, and the base of the ravine, where the creek had been, was filled. New streets were made, and wooden and steel bridges were built to allow the streets to pass over, and to allow the ravines to travel undisturbed to the lakeshore.



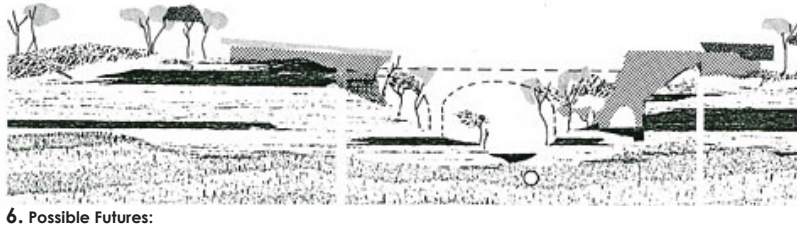
4. Increased Development:

The area of the first park lot division was now completely built with the more dense street grid and dense residential development. The original wood bridges were sometimes replaced with more substantial concrete structures. The ravine, now essentially cleared, partially filled, became once more the clear route, but now it was through a "forest" of development, and pressure to increase available lots for building resulted in some sections being filled in and subdivided for housing.



5. Degradation of the System:

The Garrison Ravine was largely filled in during this period, possibly because of its new attraction to builders as a landfill site. During the construction of other areas of the city, and new infrastructure networks, such as the subway, the ravine disappeared; whole bridges were buried with the fill. These lost sites for "ravine levelling" tended to be used either for the construction of large building types, such as schools and apartment buildings, or remained as open spaces and developed into city parks.



6. Possible Futures:

Growing community awareness of the Garrison Creek Ravine has started a movement towards the excavation of the original landform and revealing the bridges where they occur on public park land. The considerable inventory of open space on the ravine route suggests the potential of a connected open space system that could knit the Garrison communities to Fort York on the original mouth of the creek and Lake Ontario. Illustrated here is a condition of the ravine and the city in a new balance, with new ponds recalling the original creek, excavation to the original ravine elevation, and the revealing of the connecting infrastructure of the bridge, that allows both the city and ravine to co-exist.

The sectional history of the Garrison Creek Ravine; from *Brown and Storey Architects*

The Structure of Toronto's Outdoor Space

The history of the Garrison Creek is one example of the evolution of Toronto as co-evolving urban and natural systems. Similarly to several other of Toronto's ravine creeks, the incorporation of the Garrison into a combined sewer network meant that the ravine no longer needed to fulfill its topographical and hydrological functioning; as a water management path.[3] Although, at first, there was still a relatively stable balance between the two systems, the ravines began to be considered an infrastructural conduit to service the urban needs of the city rather than as outdoor space. The vision of Toronto's ravines as service space for the city still exists, and is explicitly endorsed today. The city places infrastructure second in its hierarchical frame work of intersection between urban and natural; ahead of parks and open spaces, and experience.[4] The almost complete infill of Garrison Creek illustrates an extreme outcome in which the functionality of a ravine becomes enclosed in brick and mortar within the surface of the city. Even once the urban system has overwhelmed the natural, artifacts in the form of curved streets and dimensional variations to the city grid indicate what exists beneath the surface.[5] The ravine was being viewed solely as a piece of urban infrastructure, rather than as a social anchor for the city.

Toronto's natural parklands and ravines are meaningful beyond their temporal impact on the development of the city. They are explicitly celebrated as being a source of escape, well-being, and the soul of the city.[6] In other words, part of their value to the character of the city is in providing a web of social infrastructure. Toronto has established a unique relationship between the natural and the built. On one hand it must maintain the dichotomy between the natural system which predates settlement, and the urban fabric that continues to develop. This manifests from a necessity of protecting the more sensitive ravine system and contributing to the health of the city. The previous example highlights the vulnerability of these lands if ecology becomes dominated by economic pressures. This lopsided growth led to the complete dissimulation of some ravines by the urban fabric

3 Brown and Storey Architects, "Rain Water Ponds in an Urban Landscape: Garrison Creek Demonstration Project" (report for the Waterfront Regeneration Trust, Toronto, ON, 1996), 9.

4 City of Toronto, "Toronto Ravine Strategy," 3.

5 Brown and Storey Architects, "Rain Water Ponds in an Urban Landscape: Garrison Creek Demonstration Project," 6.

6 John Tory, foreword to *An Enduring Wilderness: Toronto's Natural Parklands* (Toronto, ON: ECW Press, 2017), 8.

of the city. On the other hand, physical connections between the city and these natural parklands are necessary. Such connections make it possible for Toronto's population to experience, celebrate, and learn from the landscape that exists adjacent to everyday life. The city has released a draft of the principles and actions regarding the future physical development and protection of the ravine lands. The draft lists connection as one of the guiding principles of future development, along with four others; protection, investment, partnership, and celebration. The intersections between these two systems are crucial to the realization of Toronto's manifesto of making green spaces a part of life in the city.

Toronto: A Manifesto of Balance

Beginning in 2015, Toronto has been developing a ravine strategy for the development and protection of its natural parklands. A draft of the strategy was released in June 2016, and in October 2017 city council unanimously adopted the draft.[7] Beyond a series of principles for the development and protection of Toronto's natural outdoor space, the draft also includes a more precise framework for developing the intersections between nature and the city. The idyllic overlap is described as an hierarchical approach, with the health of the ravine network as the foundation for future steps. The successful integration of infrastructure within the network is the second phase, again emphasizing the ravine as a type of necessary service conduit within the city. Within this second infrastructural piece of the hierarchy, exists large potential to improve the relationship between city and nature through architecture. It introduces the overlap of the ravine as a conduit not only for city services but also for social infrastructure.

The Unstructured City

As is already recognized by the city, Toronto's ravines also offer much more than urban infrastructure. The sense of wilderness and the affective separation these outdoor spaces provide from everyday urban life have given them an almost fictional persona within the city. Their topographical position below the constructed surface of the city, also contributes to the sense of mystery that they bear within Toronto. Robert Fulford documents the use of ravines by local writers and artists as a powerful setting, especially

7 "Ravine Strategy: Timeline," *City of Toronto*, 2018, https://tinyurl.com/y8krh2st.

when characterized in parallel to the adjacent urban network.[8] Their topography and position below the urban datum give patrons an opportunity to experience the city from a new perspective. Toronto's ravines have an iconic impact on the city. Mohsen Mostafavi writes, in response to Elias Canetti, of the Alps in Switzerland as being the nations's crowd symbol.[9] This relationship is in parallel to that held by England to the sea, Germany to the forest, and France to the revolution. These temporal or historic symbols have the power to unify the population of a nation, despite the various geographic position of its citizens, or the languages they speak.[10] This analogy can be extended to the scale of a city, as is the case with Toronto's relationship to its ravines. In his novel, *In the Skin of a Lion*, Michael Ondaatje uses the construction of city infrastructure along the edge between natural and urban as a setting for interactions between various populations in the city. His descriptions of the construction of the R.C. Harris Water Treatment Plant on the edge of Lake Ontario, and the Prince Edward Viaduct over the Don Valley are examples which illustrate the power and mystery of outdoor space and infrastructure in establishing a commonality between otherwise disparate elements in the city.[11]

The Don River Watershed

The ravines and valleys which make up the Don River watershed contribute largely to Toronto's outdoor space, and reveal some of the conditions which are most characteristic of the dichotomy between natural and built. The creeks which twist towards and feed the Don river are lined by natural parklands. These green spaces cut through the urban city fabric; or rather characterize and limit the development of these adjacent areas. The level of urbanity of the Don Valley's tributaries varies, with the Castle Frank Brook housing some of the most urban examples of natural green space within the city. Toronto has grown to the edges of these ravines, and the two systems have become incorporated primarily through the infrastructure that exists within and across the valley. The result is a multitude of edge conditions which mediate between the built and the natural.

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8 Robert Fulford "The Invention of Toronto: A City Defined by its Artists" (William Kilbourn Lecture, Toronto Historical Board, June 12, 1996).

9 Jurg Conzett and Mohsen Mostafavi, *Structure as Space: Engineering and Architecture in the Works of Jurg Conzett and his Partners* (London, England: Architectural Association, 2006), 13.

10 Ibid., 14.

11 Michael Ondaatje, *In the Skin of a Lion* (London: Picador, 1988), 25-35, 111-121.

Don Valley and tributaries; base from *Google Maps*; linework from "Toronto Centerline" *Open Data Catalogue*

Castle Frank Brook

Within the Don River's watershed, the Castle Frank Brook includes three of the city's most urban ravines; the Cedarvale Ravine, the Nordheimer Ravine, and furthest Southeast the Rosedale Valley Ravine.[12] These green spaces all cut through the urban fabric of the city roughly in a West-East direction, physically separating and distorting Toronto's grid. They are roughly connected through walking trails but the green space has become discontinuous through years of urban development. Connections between the city grid and ravine network occur at various points along the network; typically where the overlap between topography and streets allows easy access. Due to the urban vicinity of this stretch of ravines, there is a rich potential in creating connections between the people of the city and the outdoor spaces available in Toronto.

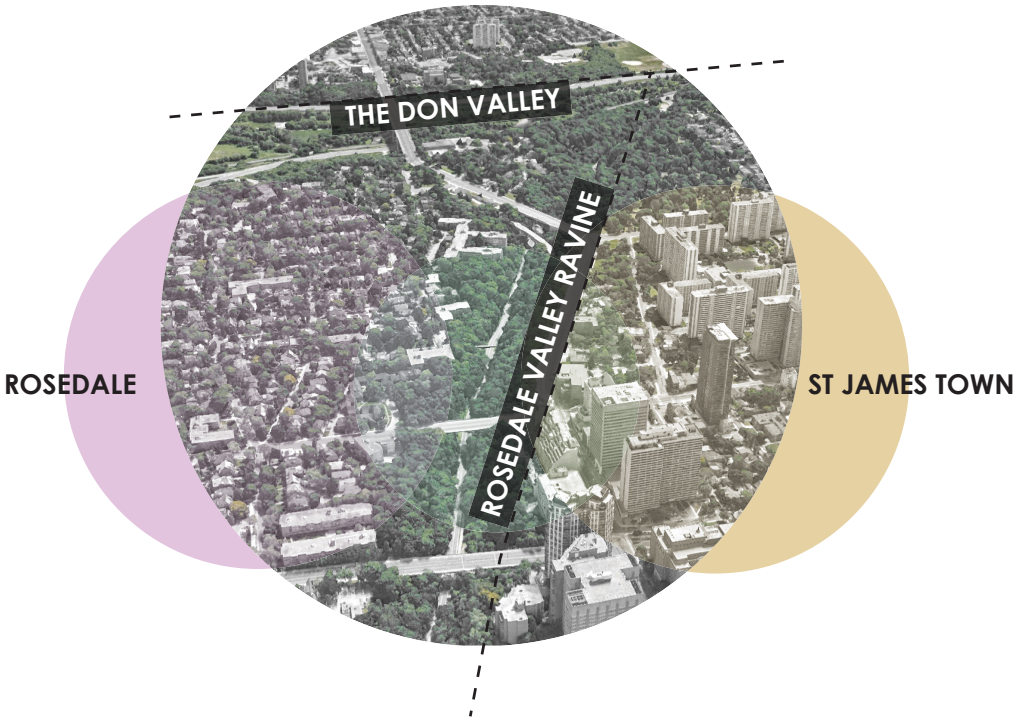
12 "Castle Frank Brook," Lost Rivers, Accessed October, 2017, http://www.lostrivers.ca/content/castllfrankbrook.html.

Toronto adjacent to the Castle Frank Brook; data from “Toronto Centerline” and “Forest and Land Cover” *Open Data Catalogue*

CHAPTER 2: SITE

Rosedale Valley

The Rosedale Valley naturally defines the Northeast boundary of Toronto's downtown core, while connecting to the Don River and Valley to the East. This Southeastern most ravine in the Castle Frank Brook is one of the most urban examples of outdoor space in the city, while maintaining a sense of wilderness and separation from the city datum above. The valley's primary function within it's urban context is as an infrastructural link running East-West and connecting the downtown core to the Don Valley Parkway. Officially, this stretch of landscape is a significantly large part of the city's outdoor park space. However, there is currently minimal effort at creating a meaningful physical connection between the population and the ravine landscape. Fences at the top of the valley attempt to restrict human engagement with the ravine's floor, and access is limited to the few existing formal entry points. Land use priority is given to vehicle infrastructure, showing the city's tenancy towards efficiency at the cost of ecological and urban fragmentation. Structures exists not as a means of improving the lives of citizens or embracing the unique beauty of the ravine landscape, but rather as a civic necessity.



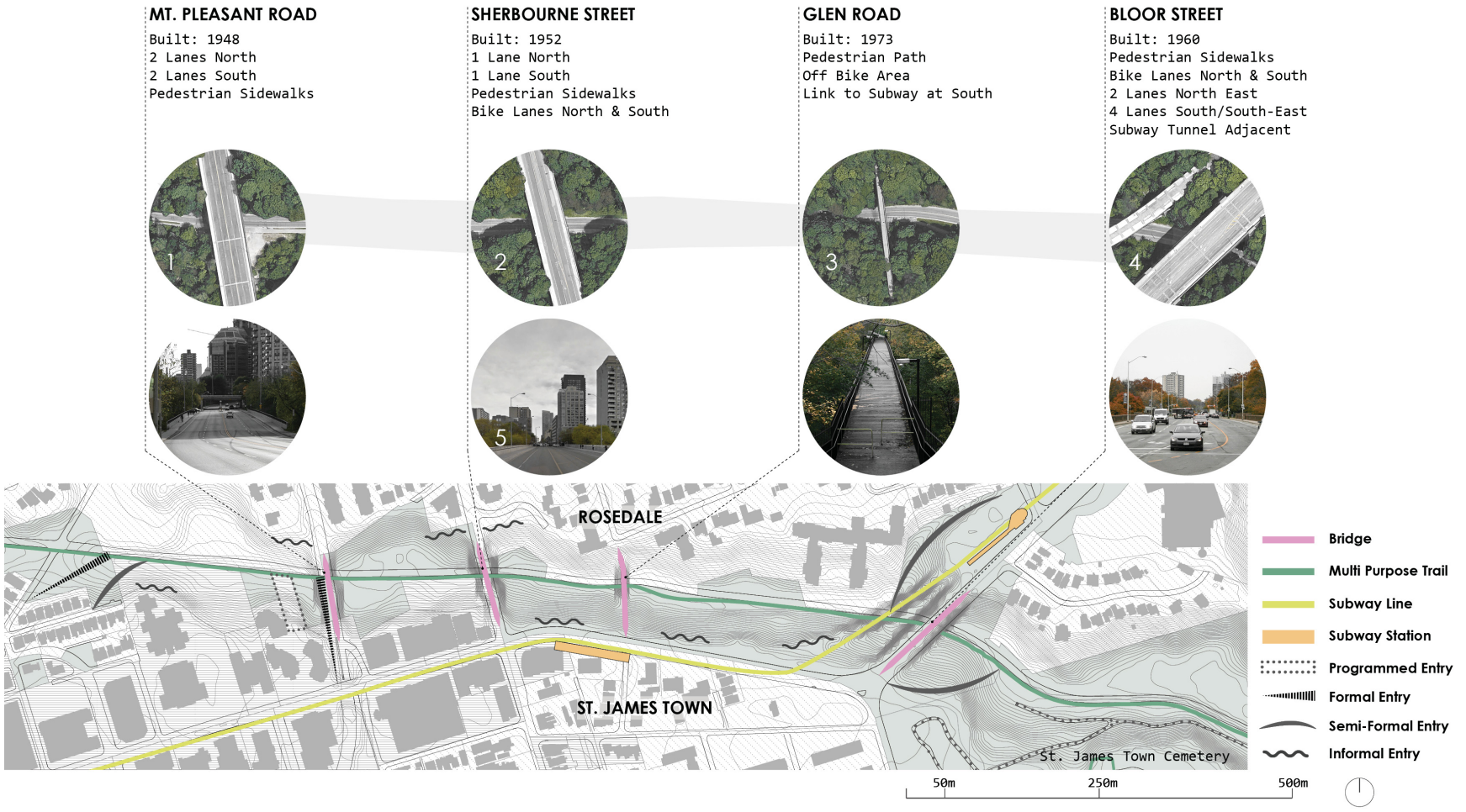
Aerial view of Rosedale Valley facing East; base from *Google Maps*

Overlaps Between City and Ravine

The dominant connection between the Rosedale Valley Ravine network and the built city are a series of bridges which efficiently extend the downtown core Northward over the ravine. These extensions of the urban grid, although the most characteristic overlap with the ravine, do not contribute to the city's manifesto for creating links into the vast network available. Nor do the bridges contribute to any meaningful engagement between the portions of the city that they serve. Three of the four bridges which span the ravine are designed to handle high volumes of traffic, each extending the downtown core into a different portion of the city. The Glen Road bridge is the only one which is solely built for pedestrian use, but it merely maintains the intent of moving the population across the ravine valley efficiently. One of the primary destinations for users of this bridge is the Sherbourne Subway station directly to the South.[13]

Due to its proximity to the dense downtown core of Toronto and the eclectic nature of its surrounding communities, the Rosedale Valley has potential to connect a large portion of the city to the rest of the vast Don Valley parklands, while also serving as a meeting place. Current pedestrian access is limited to the sidewalk along Rosedale Valley Road, and to the bridges currently linking St. James Town to Rosedale at Glen Road, Sherbourne Street, and Mount Pleasant Road. These bridges encourage and enable only passive human interaction with the ravines, rather than engagement with the landscape. They serve as a means of moving across the ravine efficiently, treating the landscape as an obstacle rather than a valued piece of the urban surface.

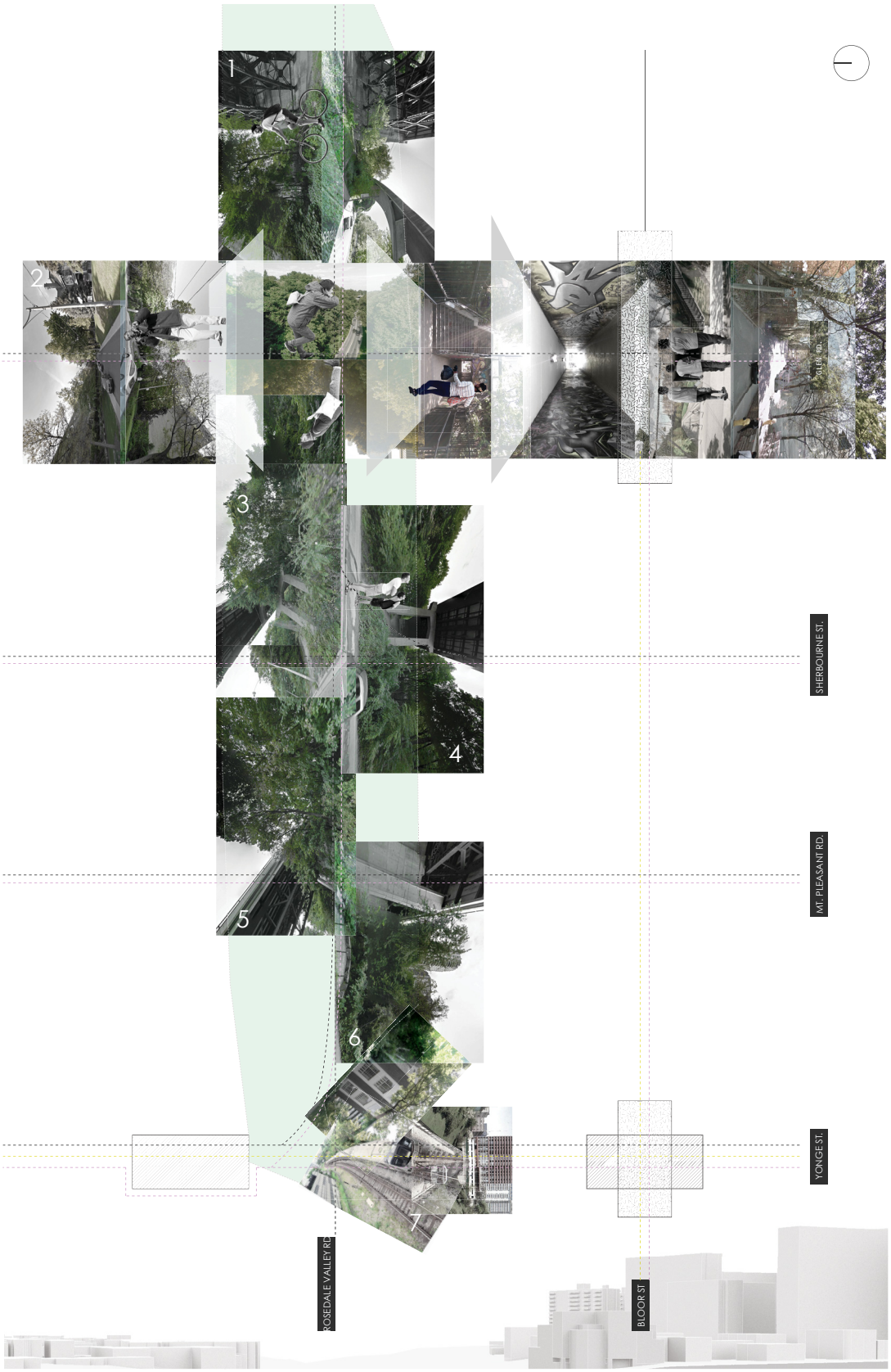
13 City of Toronto Transportation Services, "Glen Road Pedestrian Bridge Environmental Assessment Study: Public Information Center #1" (public consultation presentation, Toronto, ON, 2016), 18.



Bridge connections across the Rosedale Valley Ravine; images 1-5 from *Google Maps*; map from "Toronto Centerline" and "Forest and Land Cover" *Open Data Catalogue*

The Ravine as Divider

The underlying impact of Toronto's development as a factor of the ravine network becomes evident when a closer look is taken at the history of Rosedale Valley. The ravine historically separated two very different neighborhoods, and the ripples of their evolution alongside one another is still felt. Rosedale (to the North) and St. James Town (to the South) are formally and demographically disparate neighborhoods separated by the ravine. Both communities were designed with an intent of creating connections to outdoor space; the garden suburb on one hand, and the tower in the park in the other.



Experiential collage of the Rosedale Valley Ravine; images 1-6 adapted from *Google Maps*; image from flickr user wyliepoon, TTC Ellis Subway Portal, from *Hiveminer*

Rosedale: The Garden Suburb

The neighborhood of Rosedale is to the north of the Rosedale Valley Ravine. It is the first example of a garden suburb in Canada.[14] The planning of Rosedale was the product of first hand engagement and movement within the natural landscape. The characteristic winding streets have anecdotally been linked to the experience of traversing the ravine on horse back. The existing routes are traced back to the ad-hoc riding trails established by early residents along the ravine's edge.[15] Rosedale still feels much more closely connected to and effected by the adjacent ravine. Beyond sharing the nomenclature of "Rosedale", the neighborhood also maintains a sense of implied ownership of the ravine.

The garden suburb, Unlike Ebenezer Howard's garden city movement which inspired it, did not successfully develop public spaces as community magnets, and was in fact considered to be inverse to Howard's ideas of community making. The contemporary result is a neighborhood with a disproportionate number of privately owned dwellings; although luxurious, lacking a sense of inclusion within the community. Just North of what is considered Toronto's high density downtown core, Rosedale has become one of Canada's wealthiest neighborhoods[16].

St. James Town: The Tower in the Park

One of the immediate neighborhoods to the South of the Rosedale Valley Ravine is St. James Town. The contemporary urban form of this community was established in the 1960s following Corbusier's "towers in the park" model.[17] The neighborhood was projected to attract the modern middle class to a contemporary way of living within the city. However, the poorly built towers lacked the amenities needed to attract this demographic, and outdoor spaces at the heart of the master plan were not maintained. This resulted in a disinterest from the target buyers. Rather, the location and affordability of St. James Town appealed to low income and newly immigrated families. As a result, additional social housing towers were eventually built on the peripheral edges of the lots

14 "Rosedale Villa," *Toronto Historical Plaques*, accessed October, 2017, http://www.torontohistory.org/Pages/Rosedale_Villa.html.

15 "History of Rosedale," *Toronto Neighborhood Guide*. accessed November, 2017, http://www.torontoneighbourhoods.net/neighbourhoods/midtown/rosedale/history.

16 Ibid.

17 "History," *St. James Town*, accessed November, 2017, https://www.stjamestown.org/history/.

which was designated as green space.[18] The reduction of outdoor space in conjunction with the continual lack of investment and maintenance of the existing outdoor space has contributed to the contemporary troubles facing St. James Town. The neighborhood has gradually become one of the densest and most economically deprived in Toronto. Unlike the community of Rosedale, St. James Town is separated from the Rosedale Valley ravine by a hard edge created by Bloor Street Running East-West. As a result, the neighborhood relies on the limited green space at the base of the towers as a source of community space.

18 Ibid.

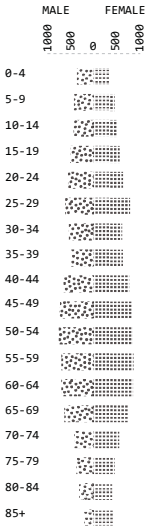
ROSEDALE

POPULATION 20 631

POPULATION DENSITY 4 437

POPULATION CHANGE 2011-2016 +0.2%

POPULATION BY AGE



CHILDREN 0-14 YEARS
12%

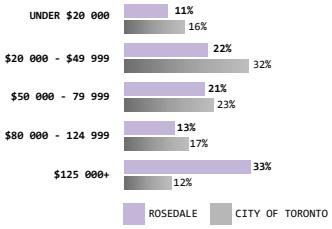
YOUTH 15-24 YEARS
11%

WORKING AGE 25-54 YEARS
40%

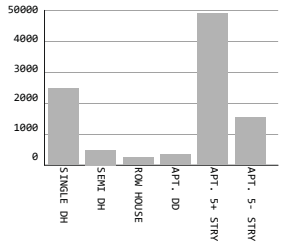
PRE-RETIREMENT 55-64 YEARS
15%

SENIOR 65+ YEARS
22%

AFTER TAX HOUSEHOLD INCOME



HOUSING TYPE



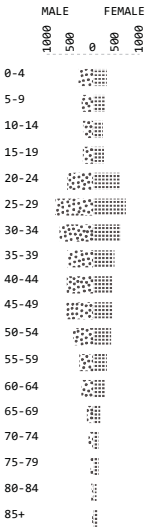
ST. JAMES TOWN

POPULATION 17 832

POPULATION DENSITY 42 457

POPULATION CHANGE 2011-2016 +4.2%

POPULATION BY AGE



CHILDREN 0-14 YEARS
13%

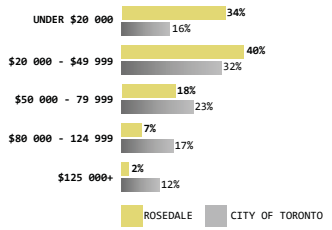
YOUTH 15-24 YEARS
13%

WORKING AGE 25-54 YEARS
56%

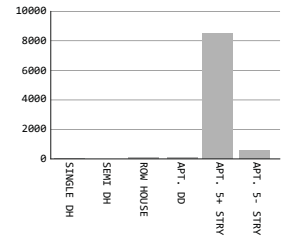
PRE-RETIREMENT 55-64 YEARS
9%

SENIOR 65+ YEARS
8%

AFTER TAX HOUSEHOLD INCOME



HOUSING TYPE



2011 Demographics of Rosedale and St. James Town; data from *Wellbeing Toronto Neighborhood Census 2011*

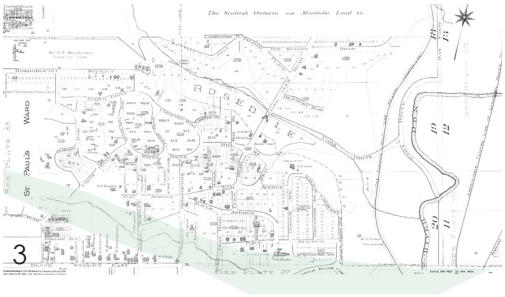
ROSEDALE **ST. JAMES TOWN**

1824

William Botsford, and Mary Jarvis Purchase 120 Acres of land for their private home, from what was originally a 200 Acre farm.

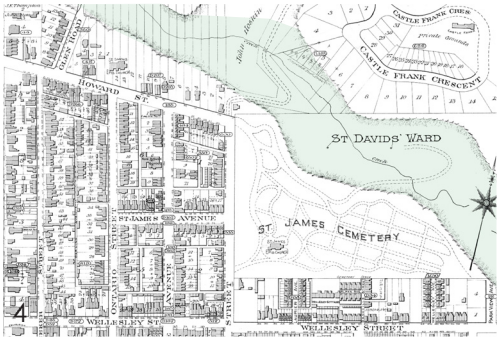
1884

The first record of a bridge over the Rosedale Valley; connecting Rosedale directly to the North Cabbagetown neighborhood through an extension of the downtown grid.



1899

The Jarvis estate was subdivided in 1854. The winding streets of Rosedale are the product of Mary Jarvis' exploration of the landscape on horseback. This pattern of streets officially became a characteristic feature of the "garden suburb"; a response to the landscape of the valley.



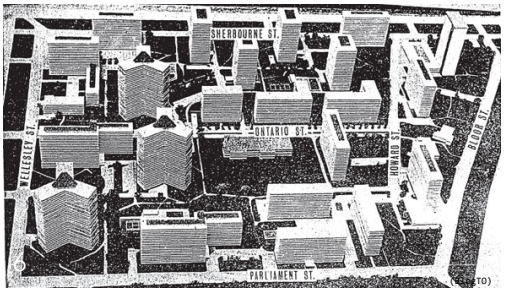
Current day St. James Town was part of the Cabbagetown neighborhood. Cabbagetown was located at the Northern edge of Toronto's city limit, a boundary marked by the linear urban grids being terminated by valley's topography. The neighborhood became one of the largest Anglo-Saxon Slums outside of the UK

Timeline of Rosedale and St. James Town part one; 1 James Hamilton, The Residence of William Botsford Jarvis, 1835, from *Virtual Reference Library;* 2 James Victor Salmon, Glen Rd., bridge between Howard St. & Dale Ave., looking s. from Dale Ave., 1951, from *Toronto Reference Library*; 3 & 4 City of Toronto Fire Insurance Plans, 1899, from *City of Toronto Archives*

By the 1920s and 30s, most of Roesdale was built up. Homes were private on generously sized lots, and the winding streets , as a factor of the landscape and "garden suburb" was maintained.

1920

5



1965

A majority of the North Cabbagetown neighborhood that is now St. James Town was purchased and the existing homes demolished to make space for towers.

1990

8

9

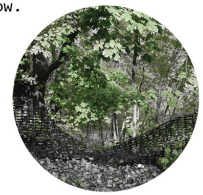
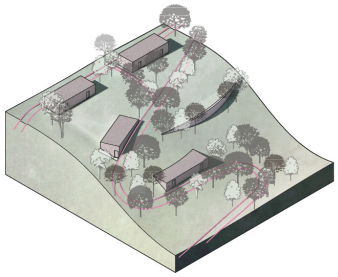
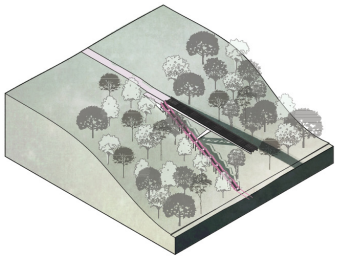
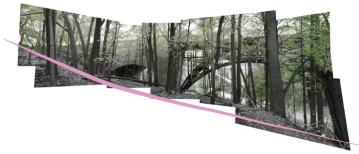
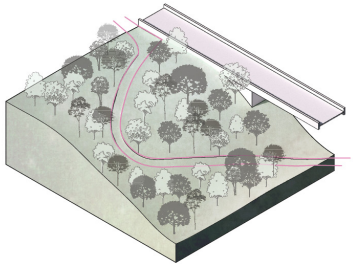
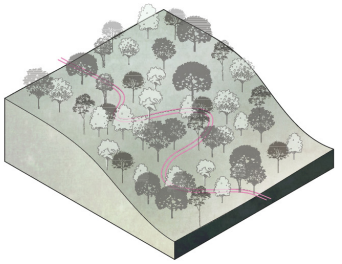
Timeline of Rosedale and St. James Town part two; 5 City Architect's Department, Rosedale Shelter, 1924, from *City of Toronto Archives*; 6 & 7 St. James Town during 1960s, from *BlogTO*; 8 Harvey R. Naylor, View of House on Crescent Road in Rosedale, 1976, from *City of Toronto Archives*; 9 Harvey R. Naylor, St. James Town building, 1972-1986, from *City of Toronto Archives*

Connectivity and Use

The existing connections between the Rosedale Valley Ravine and the bordering neighborhoods range from programmed buildings to informal paths. This thesis classifies the variety of access routes as programmed, formal, semi-formal, and informal connections. On one side of the spectrum are programmed engagements between the city and the ravine. One such example is the St James Town Cemetery which engages with the valley as a series of paved switchbacks and tombs embedded into the earth. This approach blends the landscape of the ravine into the city, although manicuring it through the process. The area supports an increase in public interaction with the valley, but does not benefit from a direct connection to the multipurpose trail at the base of ravine or an adjacency to any other high volume urban programs. Furthermore, public access is limited to working hours.

ENTERING THE ROSEDALE VALLEY

Existing Typologies for Urban Access to the Rosedale Valley

	PROGRAMMED ENTRY	FORMAL ENTRY	SEMI-FORMAL ENTRY	INFORMAL ENTRY
EFFICIENCY	Efficient entry into the ravine, yet the path and programming encourage meandering.	Most efficient entry into the ravine.	Moderately efficient entry into the ravine.	Inefficient entry into the ravine.
BASE CONDITION	No formal connection to path at the base of the ravine.	Connects directly to the road and trail at the base of the ravine.	Connects directly to the road at the base of the ravine, but due to extended use.	Trails snake to the road at the base of the ravine.
TOP CONDITION	Entry is gated and limited to working hours. 	Only formal access into the ravine along the edge. Non obvious path from Bloor Street. 	Wide path adjacent to bridge is an example of a clear entry point into the ravine. Characteristic of an ad-hoc park. 	Access points from the top of the ravine edge are at holes in the fence corresponding to manageable topography below. 
TOPOGRAPHY	Swept and roughly paved switchbacks follow the topography of the ravine, and are well maintained.  	Does not engage with the topography, and is not maintained between November and March.  	Unmaintained Large landscape sweeps, possibly the product of adjacent construction.  	Meandering switchback trails through the ravine, which are a product of repeated use of the easiest topographical access.  

Typological survey of the overlaps between city and ravine

Formal connections are classified as stairs which link the city into the ravine. This type of connection only occurs at one instance within the Rosedale Valley; adjacent to the Mount Pleasant Road Bridge. Although it is the most efficient tie between the two systems, the formal access point from Bloor Street is not clearly marked, and a lack of winter maintenance means that the staircase is only seasonally available.

Semi-formal and informal connections are more common, but they do not offer an ideal connection. These paths can be difficult to locate and the topography of the ravine makes them challenging and dangerous to traverse. Semi-formal entry offers moderately less efficient connection into the ravine. These wide sweeps in the landscape are found adjacent to the Bloor Street Bridge, and they appear to be residual to the construction process of the structure. The result are unofficial, unmarked trails which are visible from both the top and base of the valley, appearing to follow the most easily traversable topographical route.

Informal entry points are the most common type of interaction between the city and the ravine. Like semi-formal paths, they are also a product of human engagement with the landscape, but at the scale of an individual rather than that of construction. These are ad-hoc trails which meander into the ravine based on repetitive use and manageability of the terrain. Access points at the top edge occur at breaks and folds in a plastic and metal fence, and are not immediately visible. Again, these are access routes which are potentially dangerous both for the user, and damaging to the ravine. At the base of the ravine, informal paths eventually converge with the multipurpose trail along the edge of Rosedale Valley Road.

The forms of interaction between the city and ravine vary in their success, but non offer an ideal relationship. The survey of these spaces along the Rosedale Valley brings to light the necessity for a new type of connection. Selective aspects of these existing site conditions can be adapted in the development of a new connective typology for the valley.

Connection: Glen Road as a Hinge

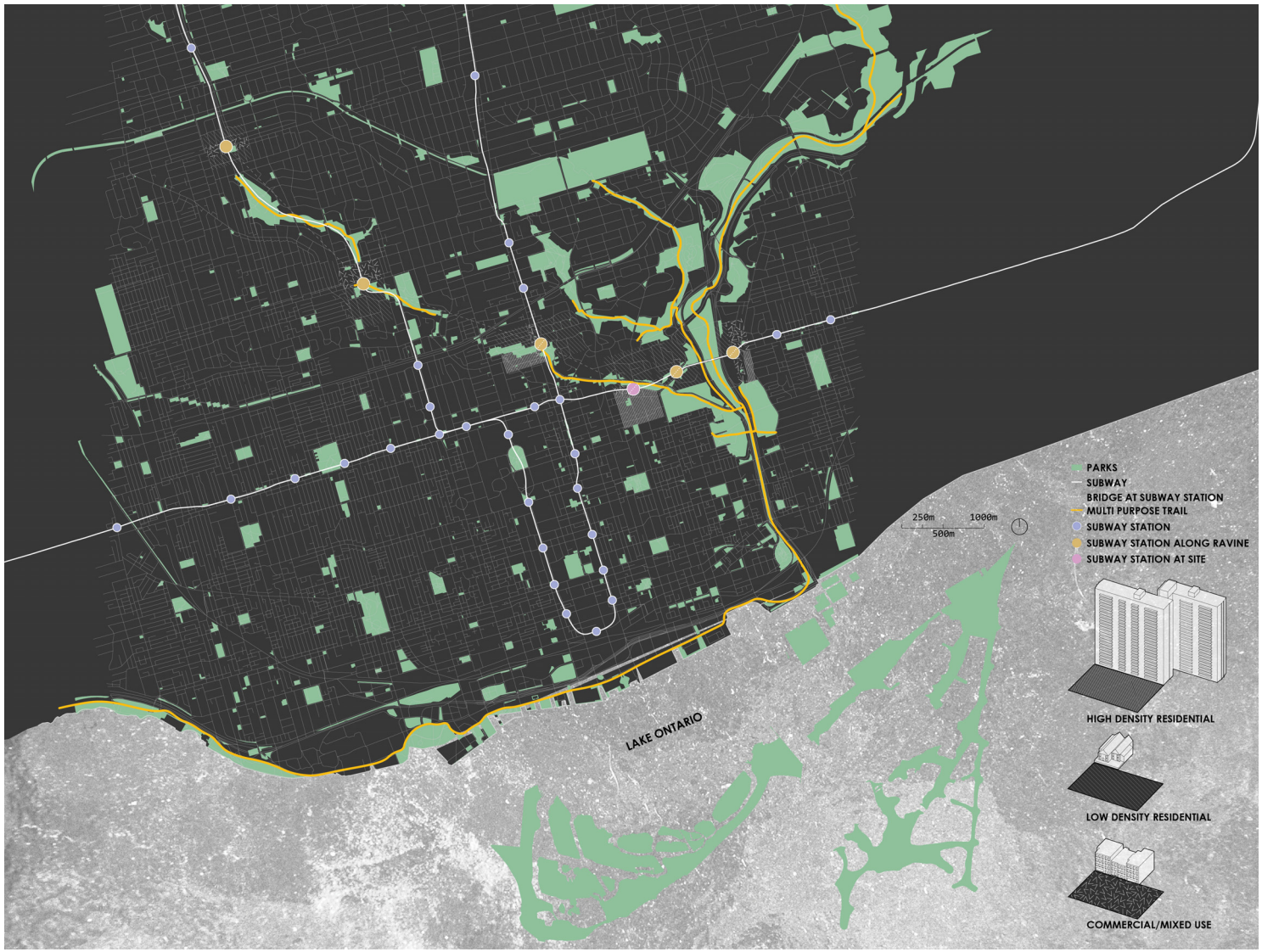
Toronto’s Ravines are valued as spaces that offer the city an opportunity for reflection and connection to nature. Access points between the city and ravine network

are an important aspect in ensuring that the need is met, and Toronto is striving to improve and increase the number of these physical junctions. Establishing formal access points from the city into the ravine network is an important step in minimizing our impact on the deterioration of the landscape, while maximizing the access and enjoyment of the users.[19] In keeping with the city's manifesto, access points would ideally be located in areas that offer the maximum potential for Toronto's population to engage with the network, while having a minimum influence in the ecological functioning.

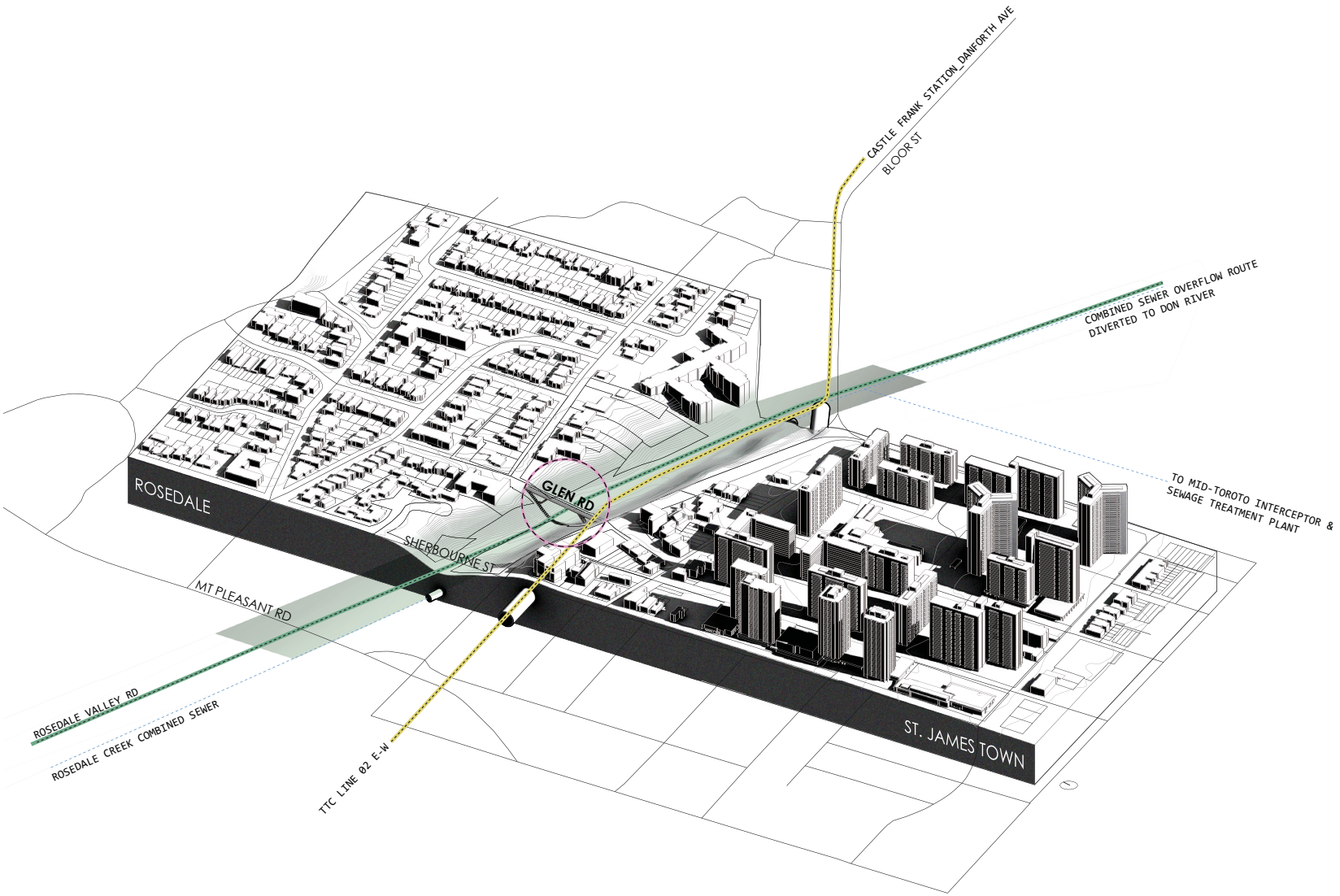
Intersections between high volume urban routes and the ravine are a valuable starting point in fulfilling this criteria. Running parallel to the ravine, the underground Bloor Subway line is a major route of urban movement adjacent to the Rosedale Valley Ravine. Along this edge between city transportation and nature, subway stations have potential to function as connecting hinge points between different experiential datums and activity.

The Glen Road Bridge is a site condition that offers an opportunity for exploring and testing the relationship between city and ravine, while taking advantage of the high volume subway corridor that runs adjacent to it. Beyond being one of the major pieces of infrastructure that engages the urban grid with the ravine, it is also directly adjacent to the Sherbourne subway station at its Southern access point. While linking the neighborhoods of Rosedale and St. James Town on either side, this bridge also has an opportunity to draw a larger portion of the city into the ravine network. The site offers a base to test a number of layers that influence, and are influenced by the connective relationship between urban and natural.

19 City of Toronto, "Toronto Ravine Strategy," 28.



Toronto's subway network and outdoor space; data from "Toronto Centerline" and "Forest and Land Cover" *Open Data Catalogue*



Systems grain at Glen Road in the Rosedale Valley: urban North-South, ecological East-West; base from “3D Massing”, *Open Data Catalogue*

CHAPTER 3: DESIGN METHODOLOGY

Anchoring: Programmatic to Formal Implications

The concept of anchoring is introduced in reference to the connection that exists between a building and the forces, both current and historical, which define a site. Steven Holl's definition describes architecture's role in revealing and engaging the concealed layers that a site can offer.[20] Although program is one tool used by Holl in exposing the potential relationships between building and site, formal and structural examples are applied as well. The Berkowitz house in Martha's Vineyard is one example of his work in which architecture anchors into a history that is otherwise hidden within the site. The exposed structure references traditions of dwelling inside of whale skeletons, while the stepping floor levels within the home explicitly articulate the topography of the site.[21] The result is a project that is bi-laterally informed by the site, while also contributing to our understanding of the historic and existing context.

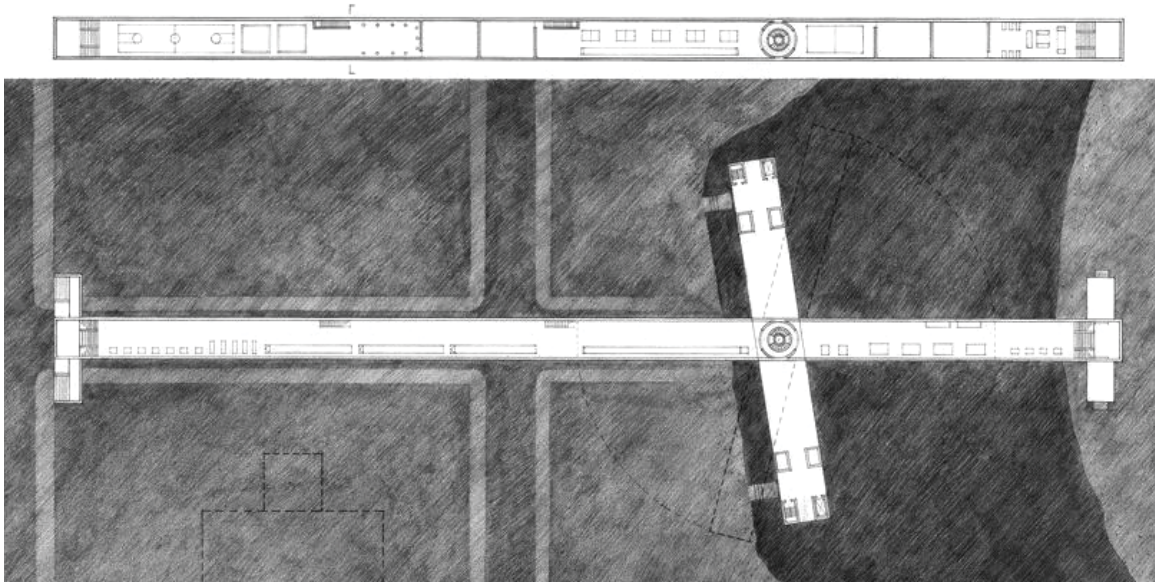
Steven Holl's Berkowitz house. An example of anchoring to the historic and existing conditions of a site; from *Anchoring: Selected Projects*

Holl's Bronx Gymnasium project reveals the potential of social programming within the same anchoring framework. The project responds to the social needs of the economically struggling neighborhood adjacent to the site. The bridge is programmatically designed as a space for competitive recreation between residents, and offers built-in

20 Steven Holl, *Anchoring : Selected Projects*, 1975-1991 (New York, NY: Princeton Architectural Press, 1991), 9-10.

21 Ibid., 75.

economic opportunities as a means of community reintegration.[22] In this example, the concept of anchoring a building to a site is extended to include a response to current conditions resolving in an idealized condition. It embraces the reality of the urban context in which the project is designed; leading to architecture which is informed by its site, while contributing to its understanding and improvement.



Steven Holl's Bronx Gymnasium; from *Anchoring: Selected Projects*

Both a formal and social interpretation of anchoring can be applied to the design of a new bridge spanning the Rosedale Valley Ravine at Glen Road. Its position within the city, acting as the hinge between diverse urban conditions, and outdoor space, means that the site has a rich history from which it can draw from and anchor into. The result is a project which intends to connect these elements historically, programmatically, and through social engagement. The programmatic development of the project comes from a critical translation of the historic uses of the ravine, and the activities that were important in defining and uniting the character of this part of the city. The structure is a critical response to the significant steel bridge currently on the site. In some cases, the marks of past events are no longer visible or have been altered dramatically. The new bridge is informed by the site, but also uncovers hidden memories that can become revealed through architecture.

22 Ibid., 20.

Bridge as Typology

Bridge designs that strive to be dynamic pieces of their urban context have existed through history. A particularly responsive typology is that of the inhabited bridge. Although the design and cultural attitudes regarding these structures has varied dramatically through their history, they have typically remained civic hubs, contributing to the urban quality of a city.[23] Likewise, the bridges spanning the Rosedale Valley and particularly the Glen Road Bridge have high potential of being spaces that improve the urban quality and cohesion of the city's vision. The overlap between the city grid and ravine network means that these bridges can function as gateways; supporting the city's desire for establishing a greater number of controlled access points. Furthermore, programming these structures will contribute to the coherence of Toronto's urban experience. The Rosedale Valley has potential to become an area of the city which supports connectivity rather than maintaining its current characteristic as a zone of separation. Similar to Middle Age examples of inhabited bridges such as the Regata a Rialto, The Glen Road Bridge represents a vitally important urban site as a transfer point. Not between land and marine travel as is the case in the Italian example, but in a uniquely Torontonian sense; between urban surface, subway network, and ravine system.[24]

Francesco Guardi, Regatta at the Rialto Bridge, 1770s; from *Wikipedia Commons*

23 Jean Dethier, "Past and Present of the Inhabited Bridge," in *Inhabited Bridges*, ed. Jean Dethier and Ruth Eaton (Bologna, Italy: CIPIA srl, 1991), 10.

24 Ibid.,11.

This thesis develops the typology of the inhabited bridge in context to the edge between Toronto's urban and natural outdoor space. Due to the variability in context between other bridged ravine sites within the city, a specific list of formal design rules does not emerge from the development of the thesis project. Rather, general guidelines which can be applied and which have helped anchor the project to the specific site have surfaced during the process. These refer to site specific historic relationships between the city and ravine, as well as a consideration of the urban character on either side and below the bridge. Likewise, a closer look at the development of the inhabited bridge typology through history has been a valuable step in the development of the project. The nature of these structures is site specific; accommodating the urban fabric on either side. The revival of the inhabited bridge typology represents a recovery of lost urban values.[25] In the classical bridges of Italy the revival suggested new social, formal, and programmatic outcomes. In Toronto an introduction of the typology reveals the potential for the bridge to become a site for social activity and a tool for re-organizing the relationship between urban and natural.

Glen Road Bridge: Iterative Though Time

The pedestrian bridge at Glen Road, spanning the Rosedale Valley Ravine between Rosedale and St James Town has a rich history. The first iteration of the crossing was built in 1884, but was re-programmed to eliminate vehicle traffic and cater solely to pedestrians in 1951. The current bridge replaced the original in 1973. In 2014 it was discovered to have severe structural deterioration in the inclined steel legs.[26] After several public consultation meetings, the City of Toronto is proposing to replace the existing bridge in late 2018 or 2019. The bridge is a meaningful part of the daily lives of many Torontonians. It was re-named in honor of Morley Callaghan, who lived in Rosedale and found refuge in both the bridge and ravine.[27] The crossing symbolizes a threshold between distinct urban conditions, yet provides a sense of solidarity through its common service to each community and resident. A survey of uses of the bridge has shown that it is almost equally

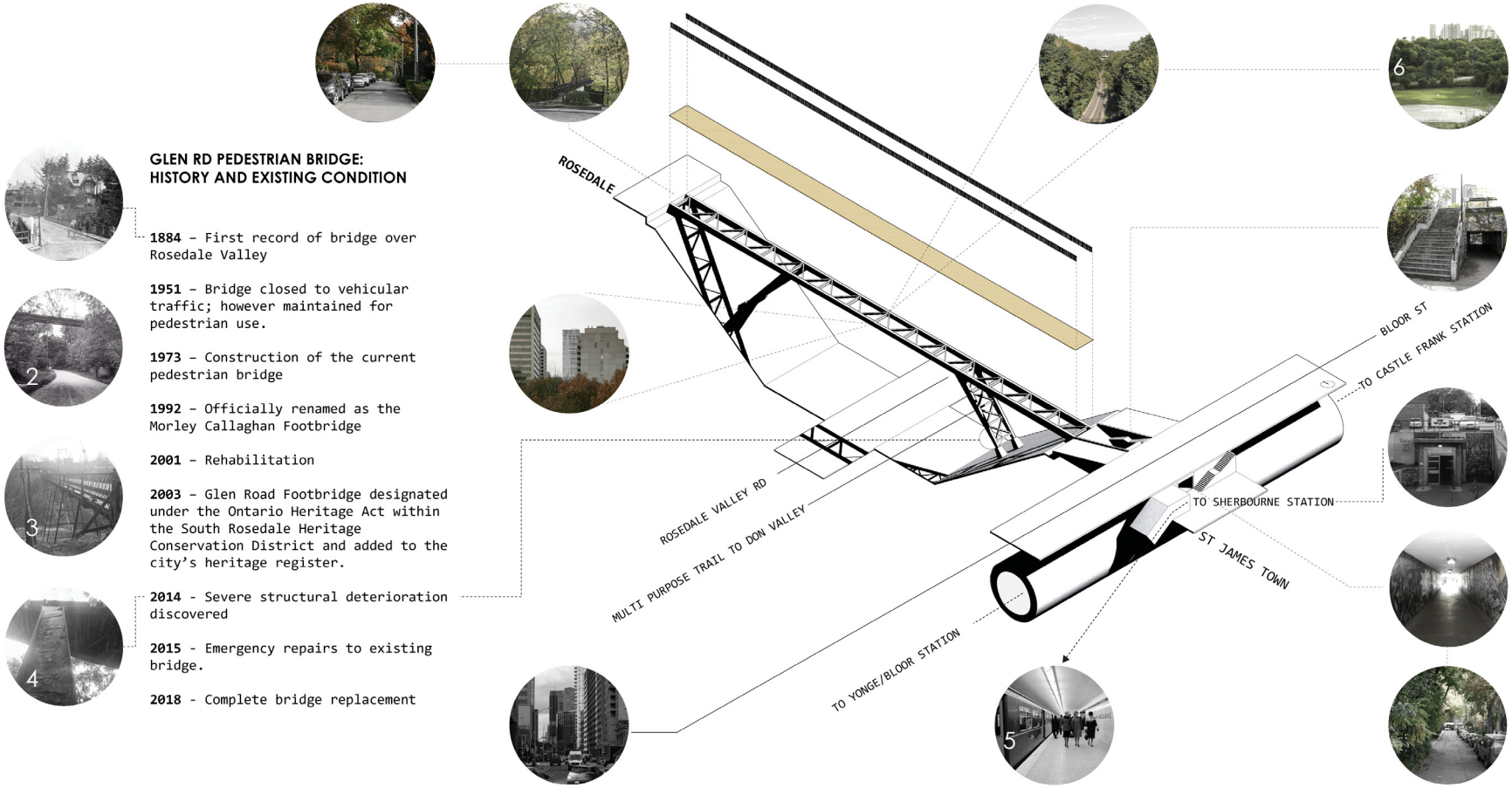
25 Vittorio Gregotti and Dario Matteoni, "Introduction," In *Inhabited Bridges*, ed. Jean Dethier and Ruth Eaton (Bologna, Italy: CIPIA srl, 1991), 5.

26 "Glen Road Pedestrian Bridge EA Study - PIC #1 Text Only," City of Toronto, accessed April 30, 2018, https://www.toronto.ca/community-people/get-involved/public-consultations/infrastructure-projects/glen-road-bridge/glen-road-pedestrian-bridge-ea-study-pic-1-text-only/.

27 "Glen Road Footbridge - Where Writer Morley Callaghan Walked His Dog," *Toronto Savvy*, last modified April 30, 2012, https://torontosavvy.me/2012/04/30/glen-road-footbridge-where-morley-callaghan-walked-his-dog/.

traversed as a recreational path as it is one of essential commuting.[28] The seemingly normal piece of infrastructure has shown to hold a greater potential for the city than merely serving two distinct neighborhoods. Rather than a being conceived as a discontinuity in the urban structure of the city, or one between the ravine and the city, the Glen Road Bridge has potential to become a structure which mediates and celebrates the rich context in which it exists.

28 “Glen Road Pedestrian Bridge Environmental Assessment Study: Public Information Center #1,” *City of Toronto Transportation Services*, (public consultation presentation, Toronto, ON, 2016), 13.



Glen Road pedestrian bridge: through history and existing condition; images 1-4 from *City of Toronto Transportation Services*; 5 photograph by Eric Trussler, Castle Frank and Sherbourne stations, 1965, from *City of Toronto Archives*; 6 photograph by Robert Burley, from *Enduring Wilderness*

Form and Structure

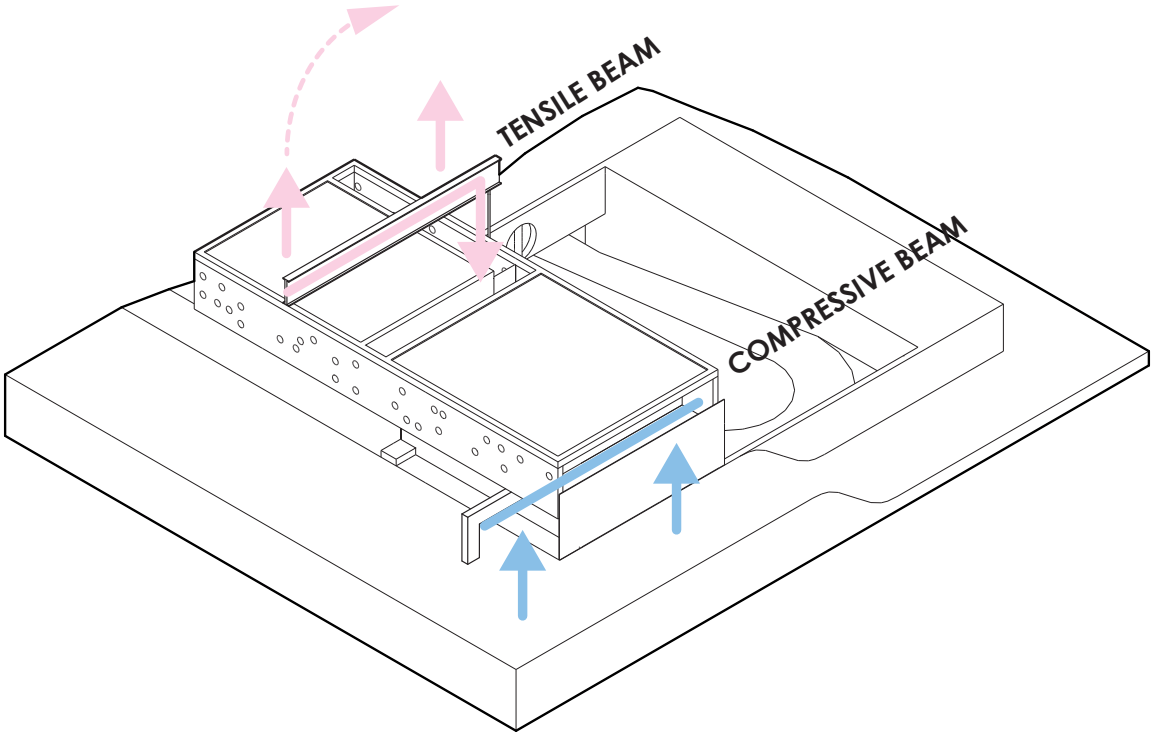
As an intention of the project, the new bridge aims to unify the adjacent communities through a shared novelty of experience and an anchoring into the history of the ravine. Contributing to this vision, the structure of the new bridge makes reference to the previous links between Rosedale and St. Jamestown, but creates a new circumstance which actively supports engagement of the community. By paying homage to the historic pedestrian connection that has existed on the site, the project uses steel as a medium for exploring new ways of bridging the Rosedale Valley. Rather than viewing the bridge as a singular system, the critical use of steel will integrate the new structure not only into the urban fabric, but also the life of the city, and ravine beneath it. The infrastructural potential of steel is explored beyond its existing use to include social, historical, and ecological implications. In parallel to the programming of the new bridge and the outdoor space of the ravine, the structure also intends to create a sense of mystery and affective departure from urban life. This novelty contributes to the bridge as a place of transition between multiple elements in the project.

An analogy of the mechanics behind stage illusions was one method used in the development of the structural system. Descriptions of operable curtains suspended and controlled by tensile cables were a starting point which developed the concept of using tension and compression in harmony as a balanced structural system; pushing the critical use of steel as a structural material.[29] The analogy of illusion also supports the design's role in creating a space which connects community members; in this case even through a shared disorientation and sense of mystery. This experiential aspect of the structural system parallels the escapist qualities of the ravine network relative to the city.

The advantages of steel's strength in both tension and compression are utilized in order to create a structural system which contributes to the intent of the project. Rather than using solely compressive members as a means of bringing loads to the ground, tension is used as a way of balancing the loads. This is particularly important considering the potentially imbalanced arrangement of program relative to the structure. The Maison Bordeaux by OMA was a case study used in developing the structural system of the

29 Albert A. Hopkins, *Magic: Stage Illusions and Scientific Diversions Including Trick Photography* (New York: Arno Press, 1967), 269.

bridge. Cecil Balmond uses a compression member to support one end of the primary volume. To create an illusion of floating or taking off, a tension member connects to the top of the rectangular form at the opposite end; pulling upward. The result, although an unconventional method of support, balances the structure and gives the home a sense of taking flight from the landscape.[30]



Maison Bordeaux structure diagram. The use of tension, compression, and illusion; base model from Koen M., *3D Warehouse*

Likewise, the sculptures of Santiago Calatrava are another example of work which generates a sense of illusion through material arrangement. Compressive members work in harmony with tensile cables to support and stack volumes in unconventional ways. The sculptures, although refined beautiful objects, can also be envisioned as a means for Calatrava to explore and test architectural ideas. The work brings together unique forms through the process of balancing.

30 Cecil Balmond, Jannuzzi Smith, and Christian Brensing *Informal* (Munich; New York: Prestel, 2002), 27.

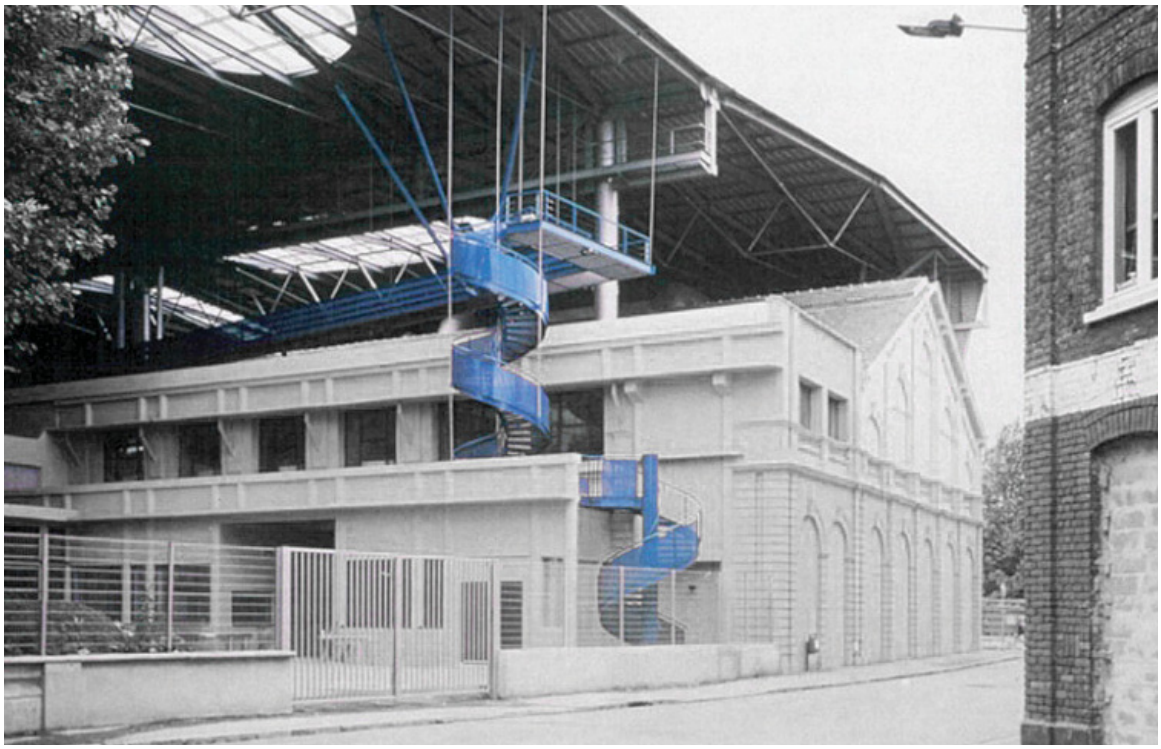
Santiago Calatrava, Untitled, NO:_035, series b, 1994; from *Santiago Calatrava Architects and Engineers*

A Light Touch

An important connecting element between the city and ravine trail network are the wooden boardwalks and stairs that meander through portions of the forest floor.[31] These paths are important to establishing marked walking trails, and eliminating direct foot traffic along the ravine floor; in support of the protection of these ecological areas. These wooden passages create separation between pedestrian foot traffic and the floor of the ravine while offering a prescribed path and maintaining the experience of the forest. Although seemingly commonplace, these boardwalks are an important controlled overlap between the city and ravine network. This existing circulation element acts as a starting point, and is developed further in the new design of the pedestrian bridge. Rather than making direct contact with the forest floor, a path which connects the city into the ravine is tested in a new orientation. The tensile properties of the primary steel structure are utilized to suspend stairs. These new elements maintain the experience of descending from the city to the landscape beneath, and vice versa, while leaving the forest floor untouched. The suspended stair also connects more closely, and threads the events taking place on the bridge.

31 Jason Ramsay-Brown, *Toronto's Ravines and Urban Forests: Their Natural Heritage and Local History* (Toronto, ON: James Lorimer & Company, 2015), 60.

This strategy is similar to one employed by Bernard Tschumi in the renovation of Le Fresnoy, in which a massive new roof is added to enclose a series of abandoned recreational buildings.[32] Catwalks are suspended from the structure of the canopy into the interstitial space between the contemporary addition and the historic buildings beneath. Tschumi's addition integrates the old with the new through a novel experience made possible through cross-programming, while functionally protecting the vulnerable portions of the old buildings. A parallel can be drawn between Tschumi's suspended link between new and old, and the proposed connection between urban and natural that exists in this thesis. The concept of utilizing the tension between the city and ravine, and of the structure is explored to include more implications for space. Stairs hung in tension from the bridge contribute to the structural function of the project, while providing the link between city and ravine and offering visitors a novel way of experiencing their city.



Stair suspended from new structure above existing building at Le Fresnoy; from *Le Fresnoy: Architecture In/between*

32 Joseph Abram, *Tschumi, Le Fresnoy: Architecture In/between* (New York: Monacelli Press, 1999), 39.

Uncovering Program

Historic Development

Anchoring defines the starting point of the historical approach used in developing the program for the new bridge at Glen Road. Memories of water, art, literature, and outdoor space exist in the boundary between the city and ravine. These memories are made to resurface, and applied to the design of the bridge.

Water

Top Left: Children playing in ravine, 1900, from *Toronto Public Library*; Top Right: Rosedale Valley Road below Glen Road pedestrian bridge, Toronto, 2017; Bottom Left: photograph by Norman James, Pool at St. James Town apartments,1967 from *Virtual Reference Library*; Bottom Right: St James Town Pool in neglect, Toronto, 2017

The outdoor space provided by the ravine is still an inherent source of well-being and recreation for the city, although some aspects of its use have disappeared over time. The first theme is the memory of water. The grounded creek that once flowed at the base of the Rosedale Valley towards the Don River is now encompassed by the combined sewer which runs beneath the floor of the ravine. The presence of running water at the base of the ravine has been replaced with Rosedale Valley Road; an automobile connection

between downtown and the high volume Don Valley Parkway. Prior to the introduction of the new road infrastructure, The Don Valley's tributaries, including Rosedale Valley, were places for recreation rooted in the experience of water. The adjacent communities also have a history of swimming. Rosedale with its multitude of private backyard pools, and St. James Town being in the process of planning a new public pool to replace the severely deteriorating one built in the 1960s with the towers. In response, the design proposes to elevate the once grounded water as a swimming pool on the new bridge. The intent is to bring back to the ravine a source of recreation that once defined it. The introduction of a public program also has the benefit of drawing in citizens from either neighboring community, engaging and celebrating the bridge as a public space.

The Studio Building

Left: A.Y. Jackson working in one of the six studios in the studio building from *Art Gallery of Ontario;* Right: Studio Building, Toronto, 2017

The studio building has become a formal and programmatic symbol along the edge of natural and urban in the Rosedale Valley. The rectilinear brick building, reminiscent of factory construction of its time, was built in 1914 after being co-financed by Group of Seven artist Lawren Harris.[33] Despite contemporary residential and transportation infrastructure developments adjacent to the studio, it still sits in contrast to the lush bordering ravine. The form is defined by a functionality of use; offering artists indirect natural light while they work. The studio's siting within the city offered a metaphor to the landscape painting that took place inside. Through its position on the bank of the ravine, the building turns its back on the city and embraces the landscape beneath and to the North. It is fitting

33 Andrew Waldron, "The Studio Building, 25 Severn Street, Toronto, Ontario," *Journal of the Society for the Study of Architecture in Canada* 31, no.1 (2006): 66. https://tinyurl.com/y9ra5e4u.

that Group of Seven artists moved into the studio building when returning to Toronto to complete the paintings envisioned during their trips into the wild Northern regions of the country.[34] In a sense, the building became a transition between wilderness and city life for the artists, while becoming a symbol of the tension between urban and natural for Toronto. The building offers refuge from the city, while also contributing as an important piece of its urban fabric.

During its use as an artist's studio, the studio building was a singular, programmatically enclosed building. The structure no longer houses artists and is no longer the setting for work which pushes boundaries of Canadian Art. As part of the narrative of this thesis project, I am proposing that the historically designated building maintain its original function as a studio space for emerging Canadian artists. The six original studios in the building, corresponding to each of the large North facing windows,[35] would be used for a rotating residency of various artists. In contrast to the solitary identity of the studio, the work of these artists would be displayed as part of six separate galleries placed along and adjacent to the new inhabited bridge at Glen Road.

Literature

The history of literature as a product of the relationship between city and ravine is another element that this thesis anchors into. The ravine has been celebrated as a setting and source of inspiration for local writers, specifically around Rosedale.[36] Morley Callaghan, Margaret Atwood, and even Ernest Hemingway during his time in Toronto found inspiration in Toronto's Ravines.[37] These spaces have offered intangible support during the process of creating for authors.

Michael Ondaatje's In the *Skin of a Lion* highlights the potential power of Toronto's ravines and its infrastructure as a setting for bringing different people together. A theme which arises within the novel is a series of descriptive meetings between diverse community groups at the construction of various Toronto landmarks. In one particular

34 Ibid., 66.

35 Ibid., 68.

36 Robert Fulford, "Toronto & Margret Atwood," *The National Post*, August 24, 2000.

37 Jason Ramsay-Brown, "Transcript of Don Dialogue Remarks" (opening remarks to Evergreen's Don dialogue, Toronto, ON, 2016).

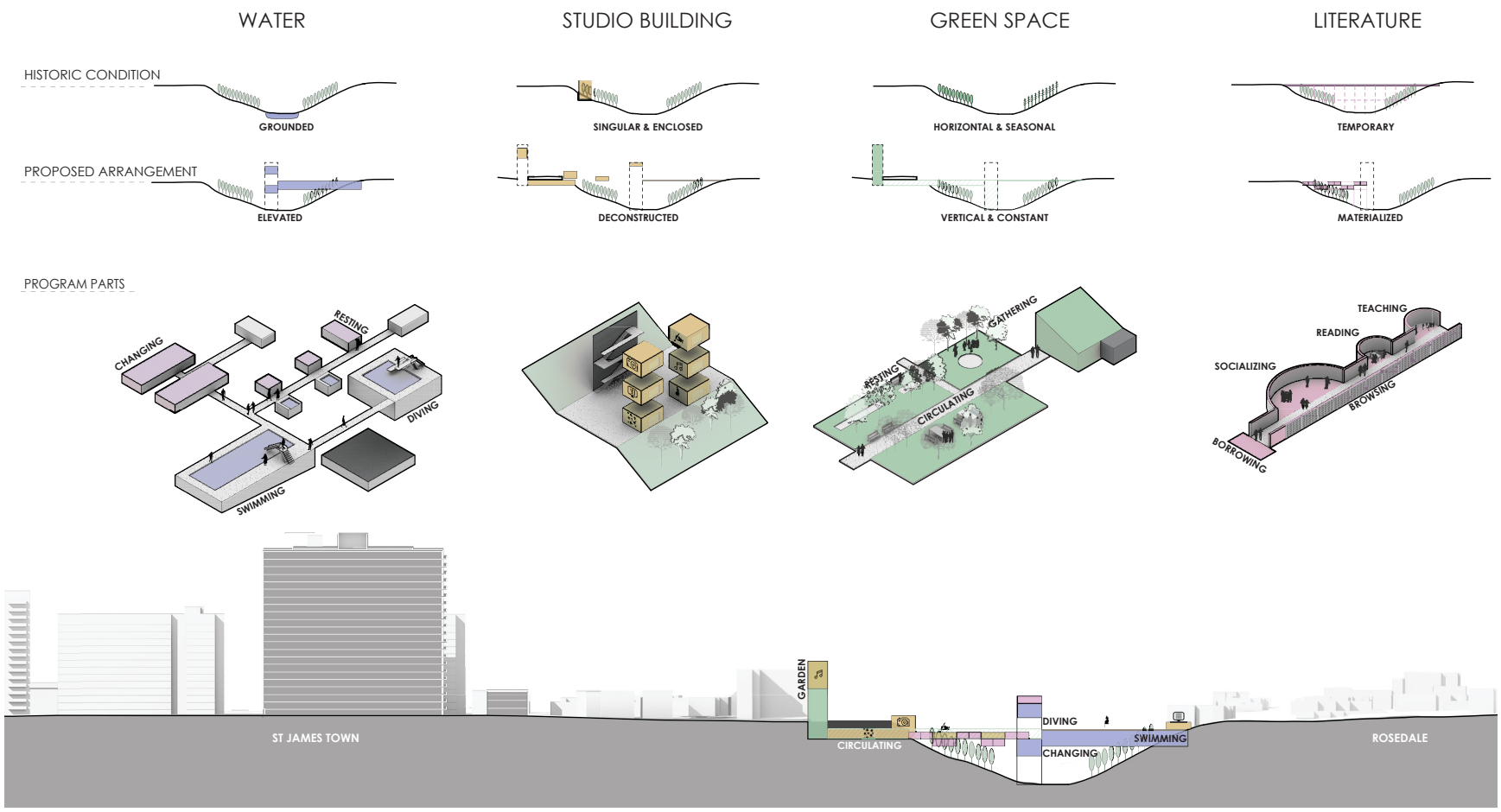
scene, the construction of the Bloor Viaduct across the Don River becomes a setting for the engagement of characters from around the city.[38] Specifically, the scene takes life through the maze of the temporary supporting structure used during the bridge's construction. Like the influence of the ravine on the authors, these supporting spaces eventually become an intangible memory of the process of building.

In the scene that Ondaatje describes, and to the authors who have taken inspiration from them, ravines are places of mystery and escape from the every day life that exists along Toronto's urban datum. The new bridge, while it will also function as a transition into the vast freedom offered by the Don Valley, also intends to embody a sense of escape and mystery within the transition from city life. As a programmatic outcome, the inclusion of a library on the new bridge offers visitors an affective buffer. Within the structure of the bridge, guests are also given an opportunity to read stories inspired by Toronto's natural landscape. Supporting the city's vision for the ravines as a source of escape,[39] the inclusion of a library fulfils the role as a programmatic transition. In further keeping with Toronto's ravine strategy principles, the library will provide valued additional space for education and encouragement of community stewardship of the ravine network[40].

38 Michael Ondaatje, *In the Skin of a Lion* (London: Picador, 1988), 25-35.

39 City of Toronto, "Toronto Ravine Strategy," 28.

40 Ibid., 32.



Anchoring to history through program parts analysis

Composition and Overlap

A working method used in re-imagining the Glen Road Bridge parallels the work of photographers Robin Collyer and Robert Burley. Both have explored the ravines of Toronto as a subject in their body of work. Robert Burley's photographs capture the reality of outdoor space in Toronto. His work illustrates the characteristic contrast between urban development and natural parkland that exists in many parts of the city. Burley's methods of developing and processing the photographs appear conventional by contemporary standards, however it is the composition of his work that reveals something unique about the defining character of Toronto. Urban and natural scenes converge; at times complementary to one another and other times exposing a stark contrast.[41]

Robert Burley photographs of Toronto; 2017, from *Enduring Wilderness*

Robin Collyer photographs of Toronto's ravines; left, Rosedale Valley Road Dormers, 2006, from *Center for Contemporary Photography*; center, Rosedale Valley Road Plastic, 2006, from *National Gallery of Canada*; right, Don River Bridge, 1997, from *Center for Contemporary Canadian Art*

Similarly, an overlying theme within Robin Collyer's work is in revealing new ways of seeing everyday spaces.[42] A particular series of his photographs employs post production overlapping to photographs of Toronto and its ravines. The resulting images,

41 Robert Burley, Anne Michaels, Michael Mitchell, Leanne Betasamosake Simpson, Alissa York, George Elliott Clarke and Wayne Reeves, *An Enduring Wilderness: Toronto's Natural Parklands* (Toronto, ON: ECW Press, 2017), 125-138.

42 Robin Collyer, Catherine Grout and Philip Monk, *Robin Collyer Photographs* (Toronto, ON: Art Gallery of York University, 1999), 29.

although more abstractly, generate similar results to the compositions of Robert Burley. The photographs accentuate the often messy or beautiful reality that exists in the overlap between two subjects, and provides a new way of looking at this particular dichotomy within Toronto. Each of the images resulting in the final product can be isolated and evaluated separately. However, the method of overlay reveals something new that each image in isolation would be less successful in expressing on its own.

Application to Site and Program

As the programmatic and site elements of the thesis design developed, they were tested through an abstraction of the methods applied by Burley and Collyer. The new bridge draws from the history and communities on either side of the ravine, while offering a novel experience. An intent of the design is to create moments of inhabitation along the bridge where contrasting programs and community members engage with one another. At times these overlaps happen through visual connections and adjacencies, more similar to the compositional work of Burley. Other times through cross-programming and physical engagement with shared parts of the bridge structure, more along the lines of the overlapping methodology. As a starting point for developing and testing these conditions, a series of fictional characters from Rosedale, St. James Town, and beyond were created.

Bringing the Neighborhoods to Life

The shared novelty of an inhabited bridge would contribute to the synthesis between the daily lives of various community members from St. James Town, Rosedale, as well as the rest of the city. Character profiles were developed to map and compose the different routes and experiences along the bridge. The method also contributes to personifying the neighborhoods and bringing the urban character of the city to life. This approach accepts the personal differences within and between either neighborhood, but does not cater to one community or demographic. Rather, the design celebrates the ravine and bridge as common denominators, striving to create moments of programmatic and social overlap. The approach of developing and using these characters contributes to ensuring that the bridge is developed bi-laterally; maximizing the overlap of different conditions in which the characters engage.

ROBERT
7 YEAR OLD LIVING IN ST. JAMES TOWN
STUDENT AT ROSE AVENUE JR. PUBLIC SCHOOL

LILY
5 YEAR OLD LIVING IN ROSEDALE
STUDENT AT BRANKSOME HALL PRIVATE SCHOOL

TERESA
18 YEAR OLD ARTIST
ARTIST-IN-RESIDENCE AT THE STUDIO BUILDING

MADELINE
72 YEAR LIVING IN ROSEDALE
RETIREE AND AVID GARDENER

PAULO & TOMAS
36 AND 1 YEAR OLD LIVING IN ST. JAMES TOWN
WRITER WORKING FROM HOME

STEPHANIE
30 YEAR OLD LIVING IN ROSEDALE
LAWYER AT FIRM ON KING ST.

NORMAN
60 YEAR OLD LIVING IN ST JAMES TOWN
MECHANIC ON DUPONT ST.

RUBEN
16 YEAR OLD LIVING ON DANFORTH AVE.
STUDENT AT ROSEDALE SCHOOL OF THE ARTS

Character profiles

CHAPTER 4: A NEW BRIDGE AT GLEN ROAD

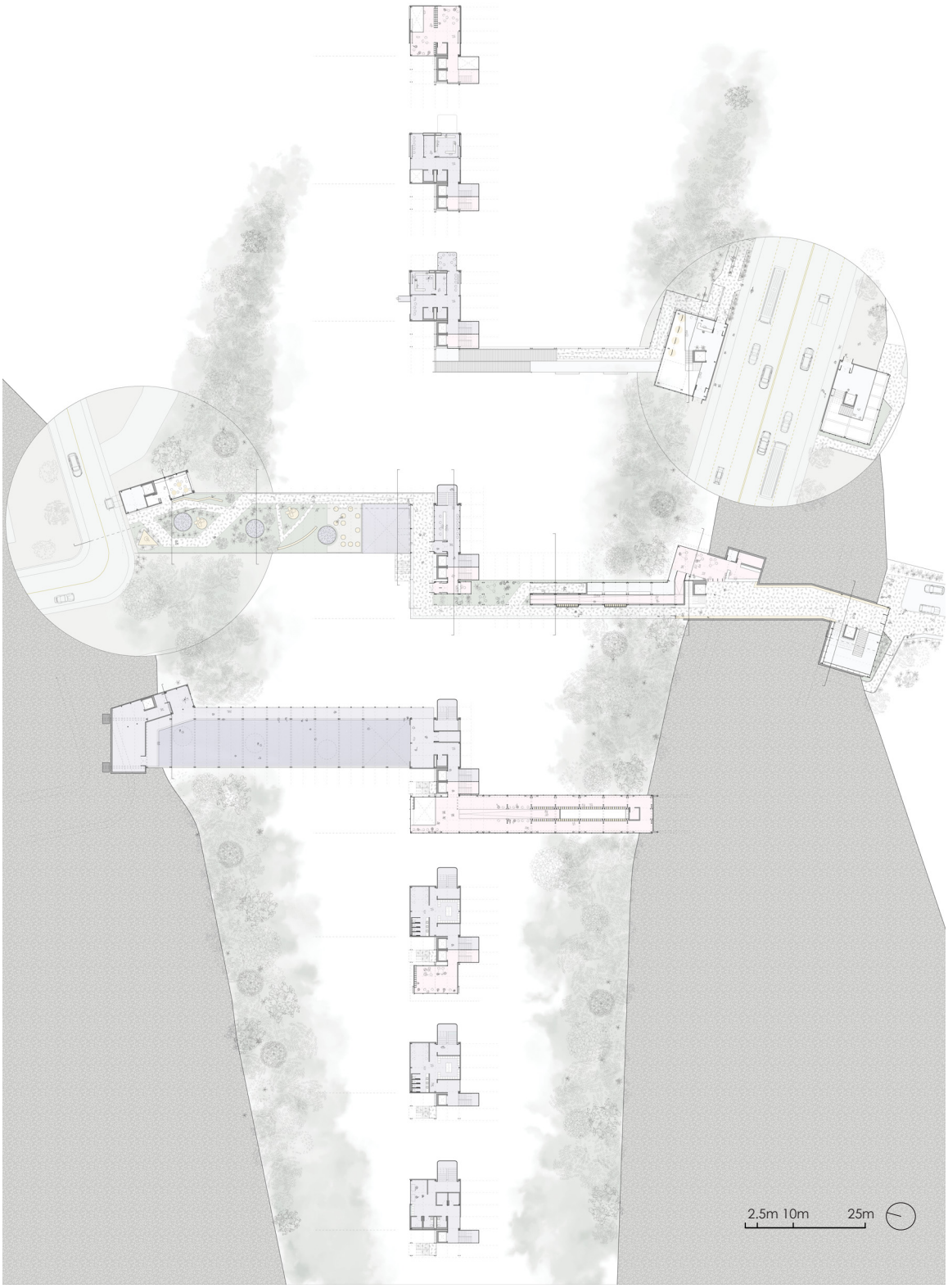
Arrangement of Parts

Overall Strategy and Composition

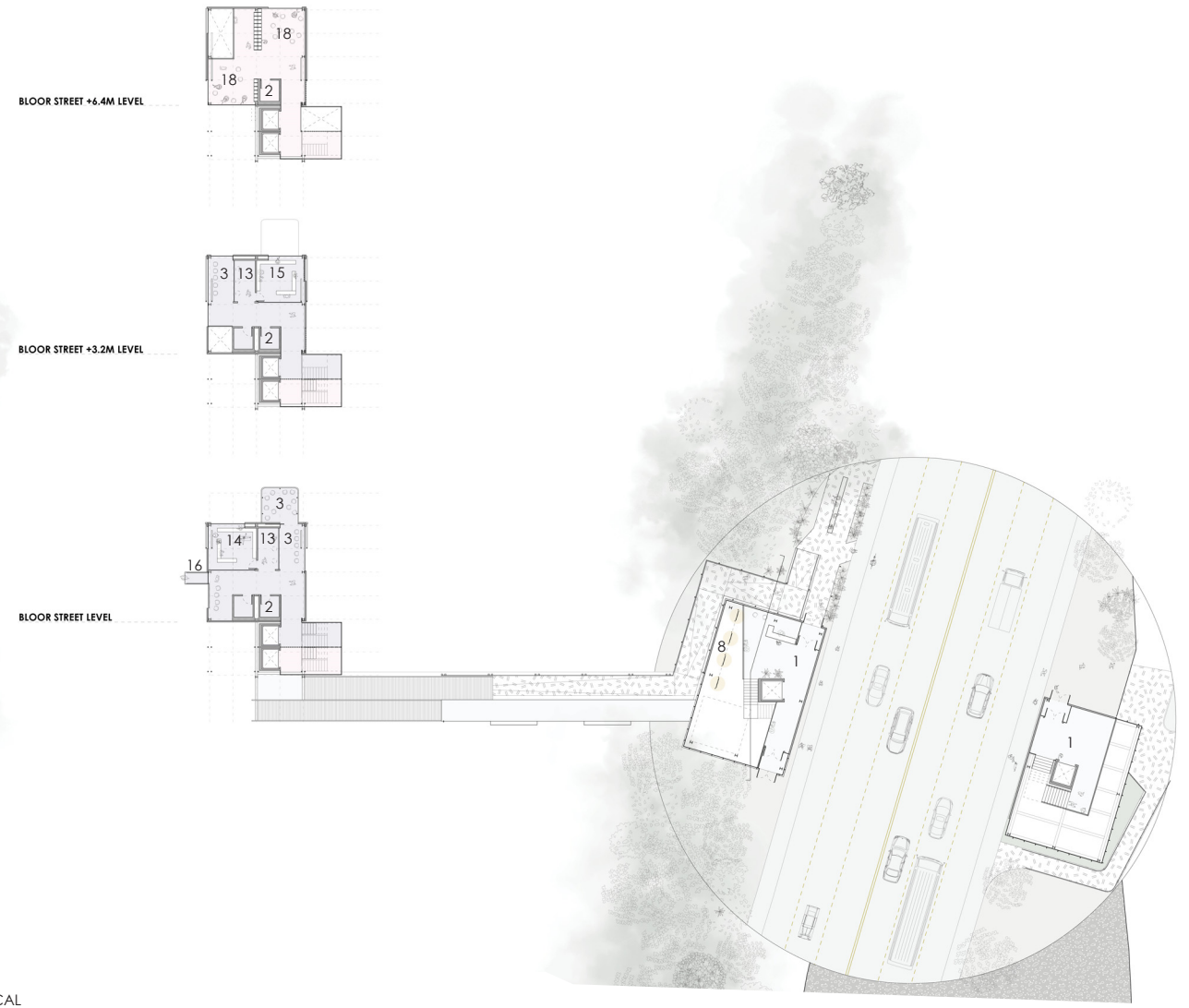
The primary programs developed through the historical analysis of the site are swimming, reading, and art. These pieces of social infrastructure anchor the bridge as a meaningful part of the city, engaging the communities and offering a space for the cultural celebration of the ravine. The intervention of a new inhabited bridge at Glen Road is one which finds opportunity in Toronto's infrastructure as a space for the cultural celebration of the ravine network, as well as a social anchoring point between communities. The arrangement of the new bridge is established bi-laterally; conceived as the growth of bridge arms from either neighborhood towards the center of the ravine, and then down towards the ravine.

Broadly, each of these two arms holds one of the larger program segments; swimming pool and library. Where these two elements meet is where the bridge becomes whole, marking a zone of transition; between the neighborhoods on either side, between the major programs giving life to the new bridge, between community members, vertically between the city and ravine, and between the primary structural elements. The art galleries, in response to the studio building, are being developed as a series of spaces which are not necessarily connected to one another. Rather, they augment different portions of the pool and library on the new bridge as well as the existing urban programs on either side of the ravine.

Formal arrangement of new bridge in urban context

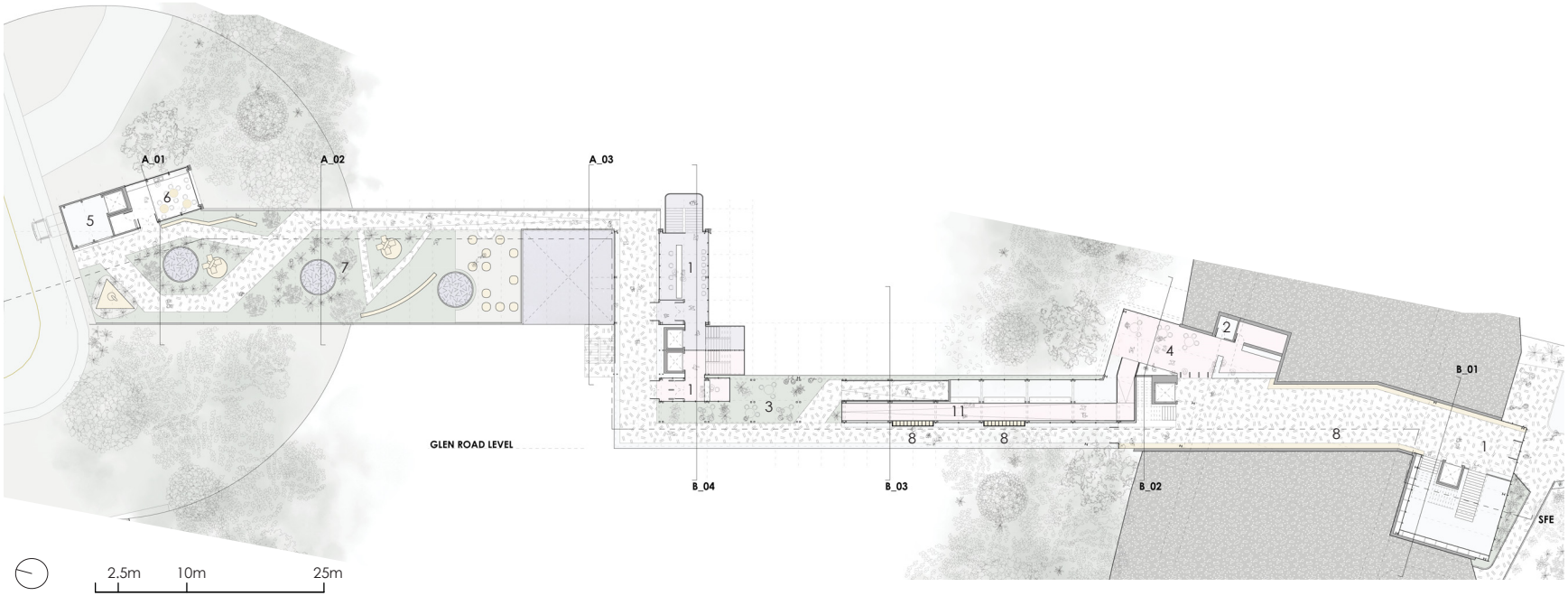


Building plans: overall view



1. LOBBY/ ENTRY
2. W/C
3. SEATING/ REST
4. CAFE
5. RECEIVING/ MULTIPURPOSE
6. CLASSROOM
7. SCULPTURE GARDEN
8. GALLERY SPACE
9. OFFICE
10. STORAGE
11. LIBRARY
12. SWIMMING POOL
13. SHOWER
14. SAUNA
15. STEAM
16. DIVING
17. CHANGING ROOM
18. READING ROOM
19. STORAGE/MECHANICAL

Building plans part 1 of 3: Bloor Street level and above



1. LOBBY/ ENTRY
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15. STEAM
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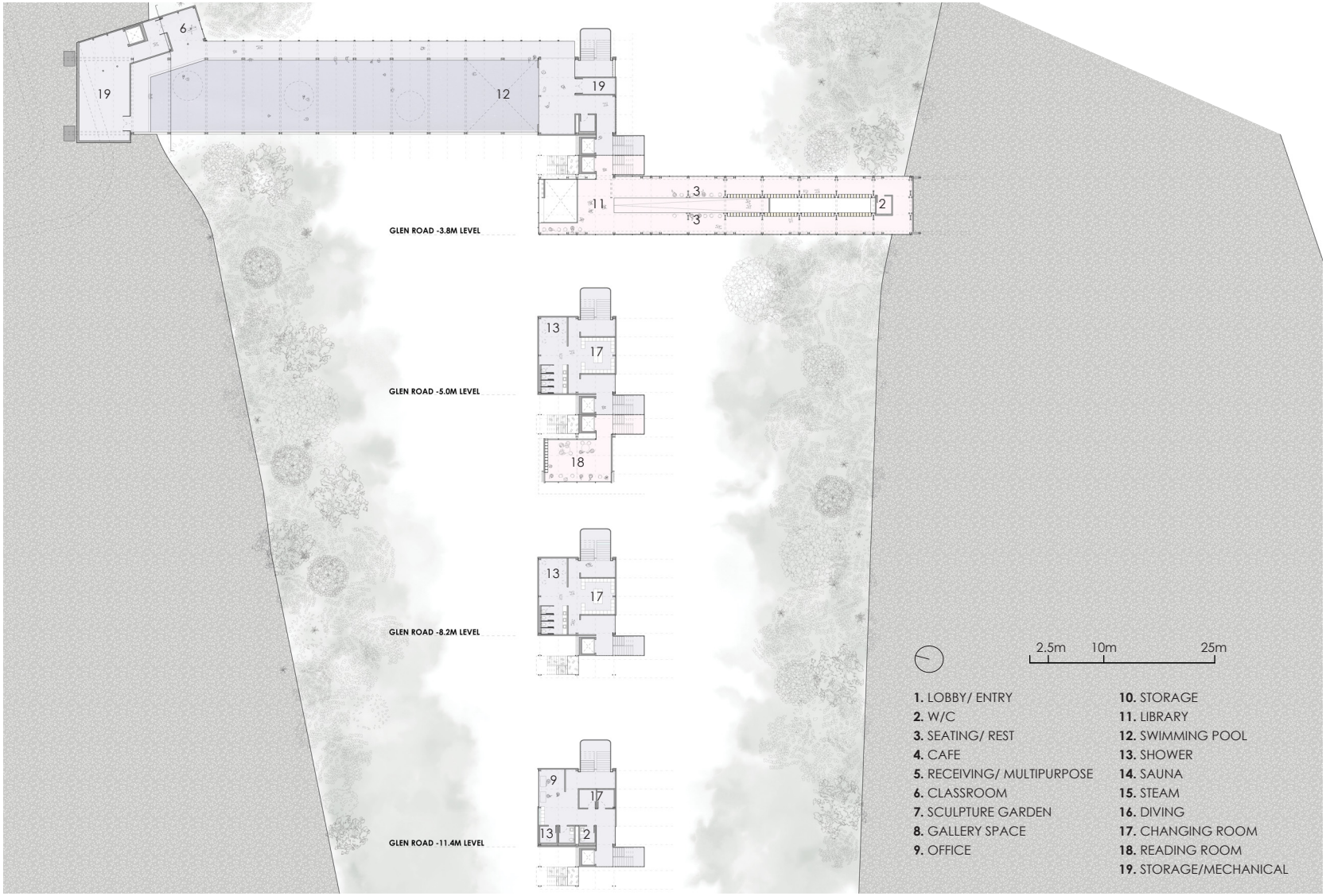
17. CHANGING ROOM
18. READING ROOM
19. STORAGE/MECHANICAL

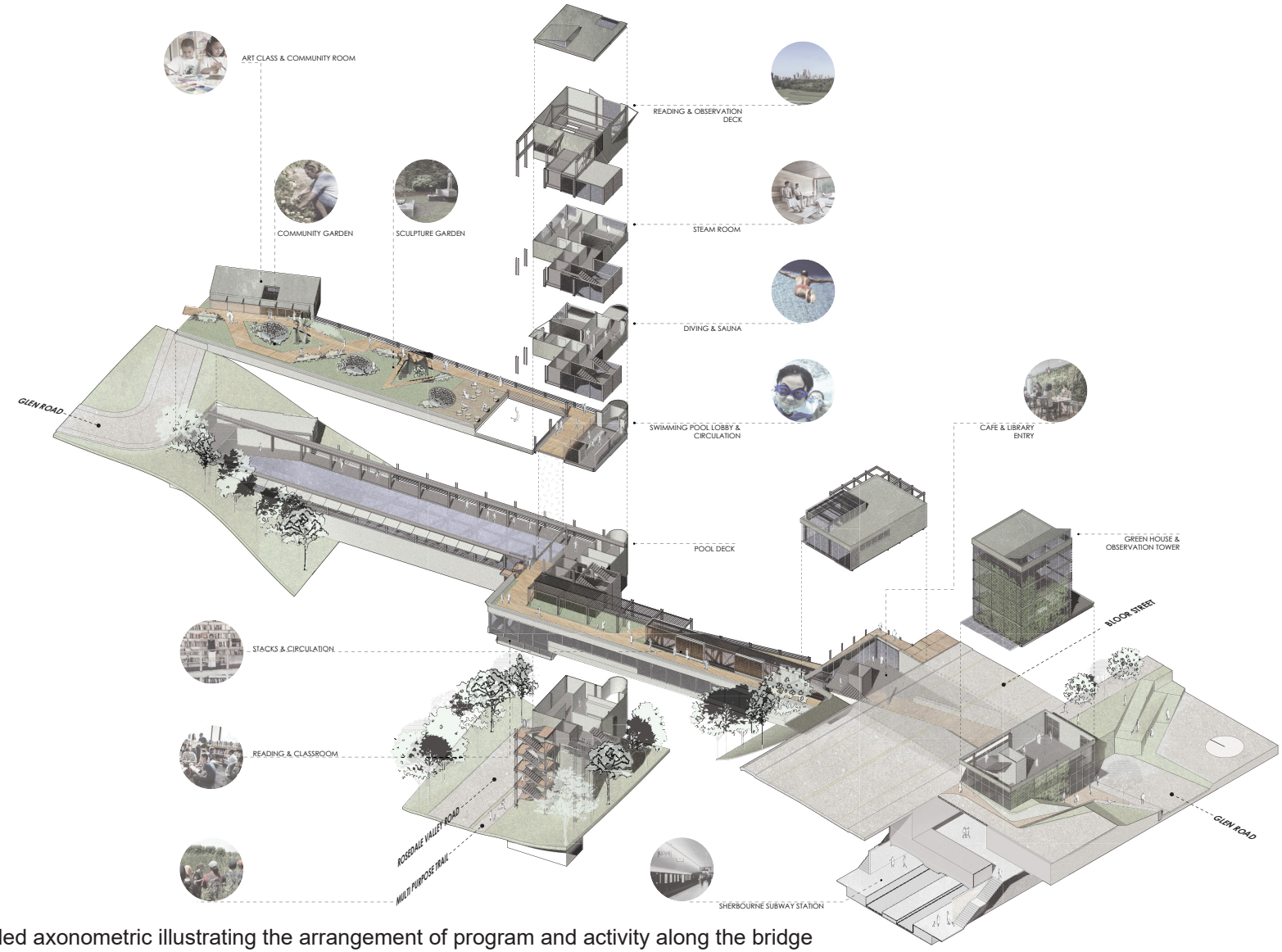
Building plans part 2 of 3: Glen Road level



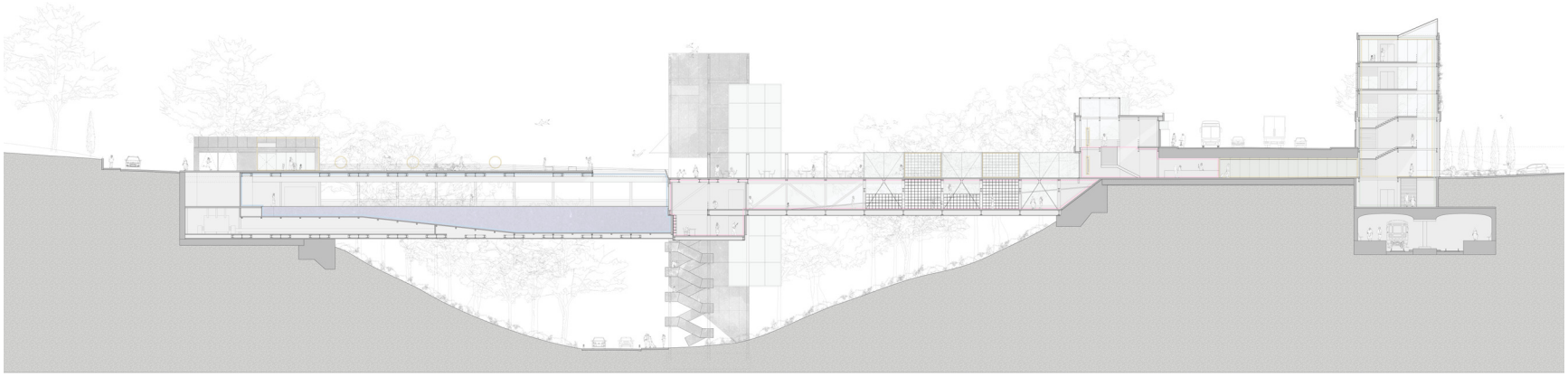
Building plans part 3 of 3: below Glen Road level

Gallery Space

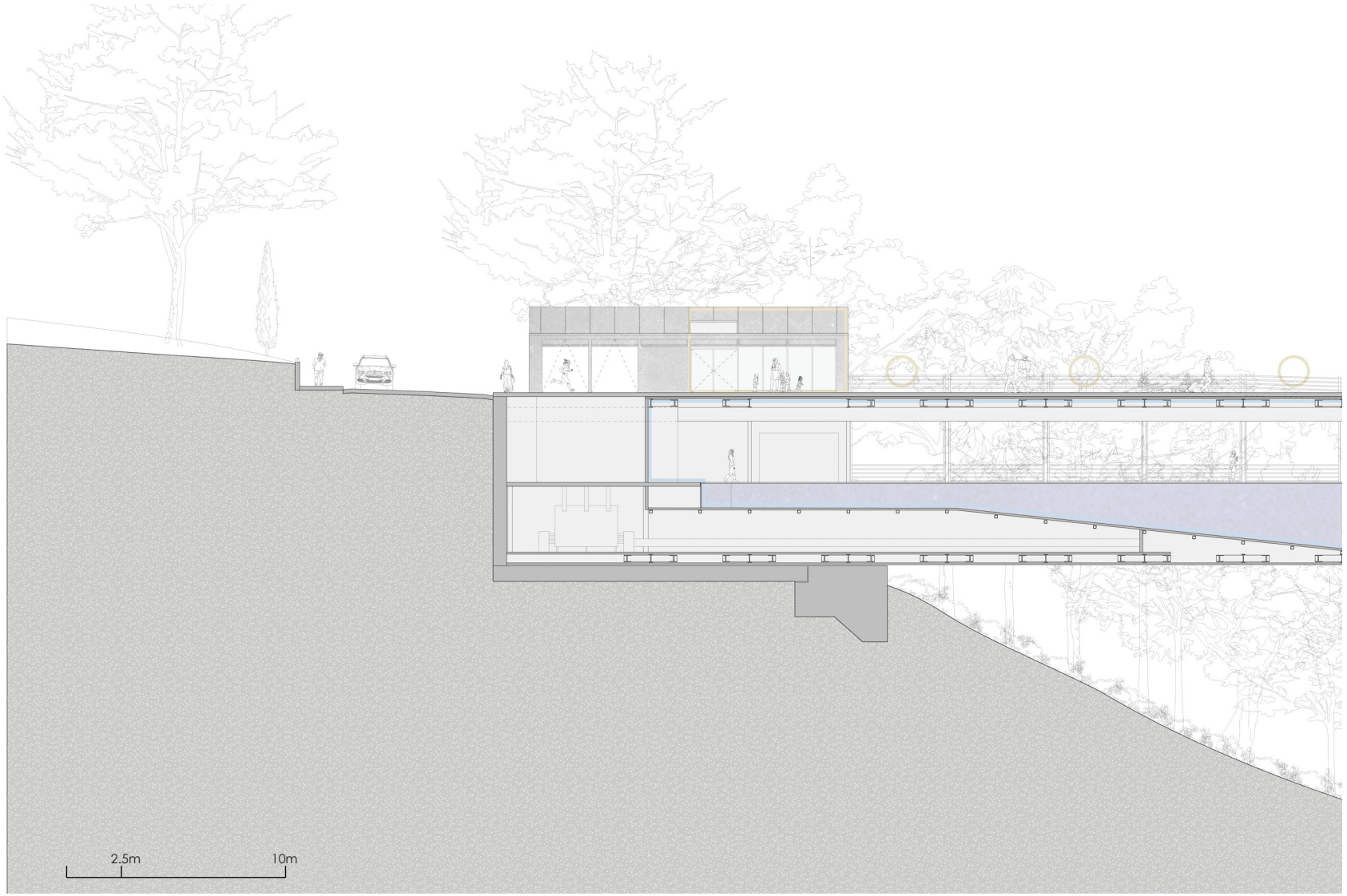
In response to the solitary identity of the studio building, the work of the artists in residency would be positioned in six separate gallery spaces along and adjacent to the new bridge. Teresa could teach art classes in the classroom overlooking the ravine to children from St. James Town and Rosedale, like Lily and Robert. Or her work might be displayed in the sculpture garden above the pool. Both of these spaces are active parts of the art programming, and encourage visitors from the St. James Town side of the project to cross the bridge, functioning as a primary piece of social infrastructure. On the other end of the bridge, other gallery spaces include an oversized vitrine adjacent to the walking path along the main bridge level. This glass display turns into stacks for the library beneath, where views between the two spaces encourage further inquiry by visitors from either direction. Works of art are also suspended in the entry pavilion and cafe to the North of Bloor Street. The tunnel that passes beneath Bloor Street and connects to Glen Road and the subway station would be used for light-art or videography. Finally, the entry and garden tower to the South of Bloor Street could exhibit original music compositions that respond to the rhythm and currents produced by the subway passing through the station.



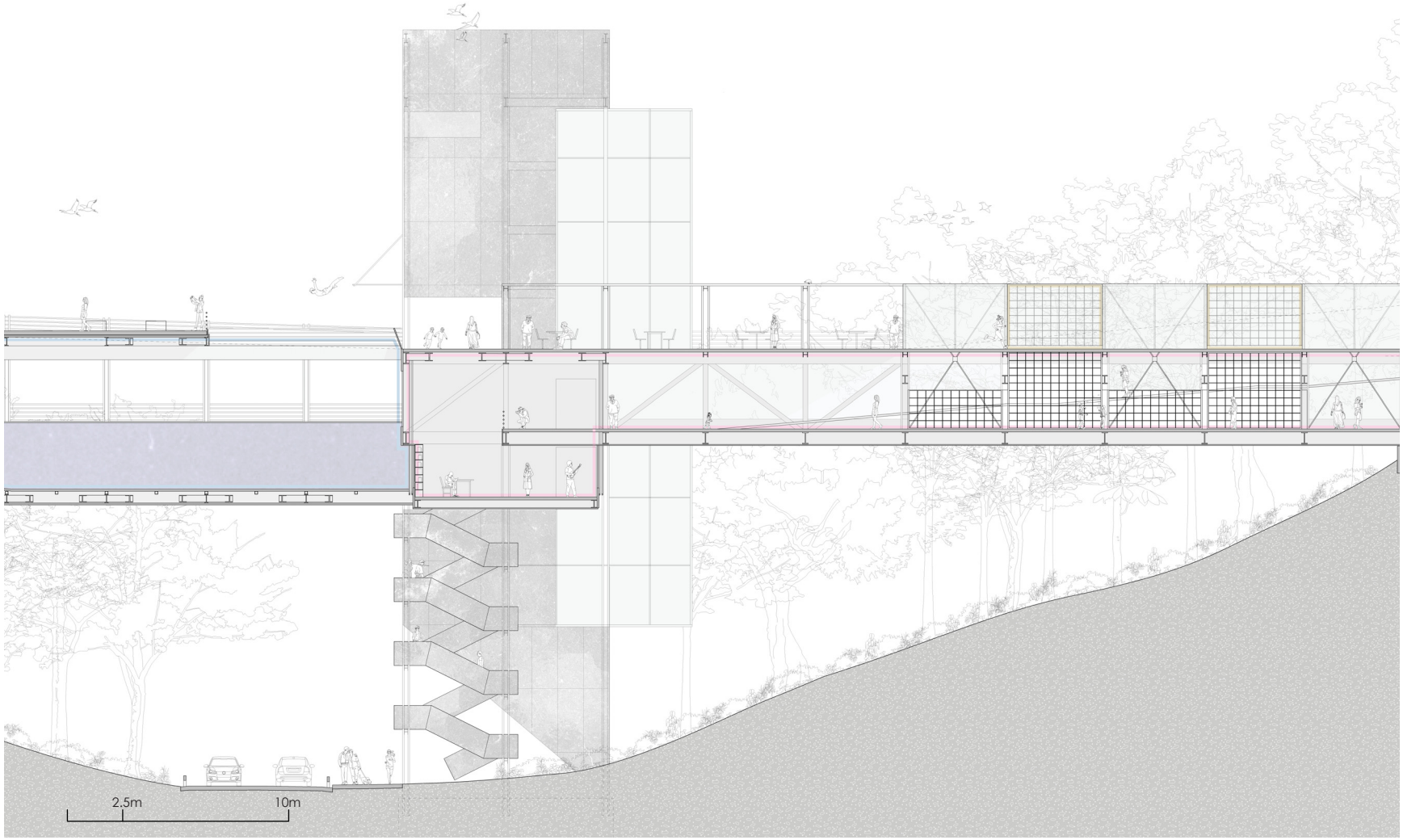
Exploded axonometric illustrating the arrangement of program and activity along the bridge



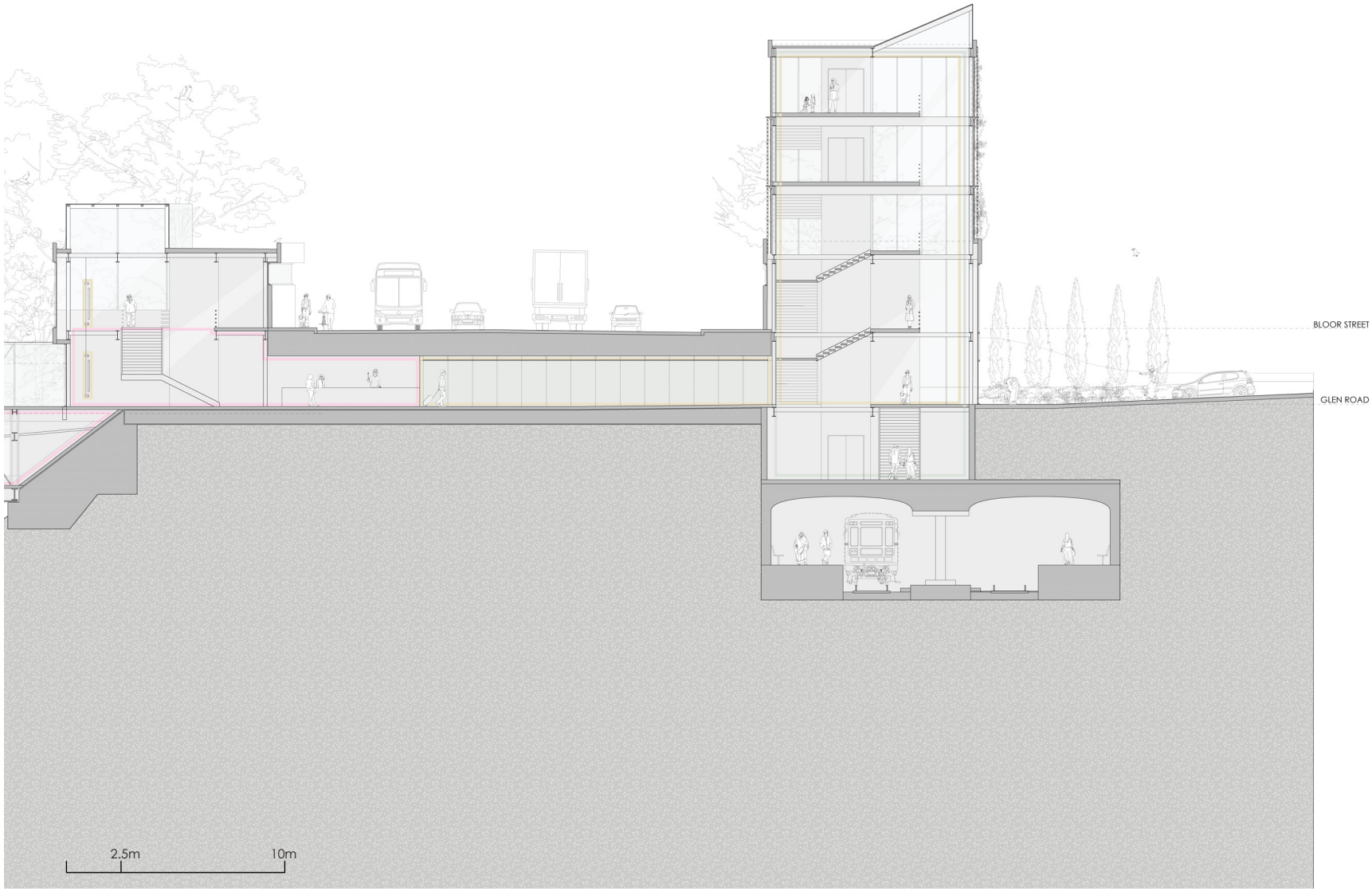
Section facing East: overall view



Section facing East part 1 of 3: Rosedale side with art/community classroom and sculpture garden at Glen Road level, and pool beneath



Section facing East part 2 of 3: center, above Rosedale Valley Ravine through pool and library



Section facing East part 3 of 3: St. James Town side through Bloor Street, and entry buildings on either side

Anchoring into Existing Urban Conditions

The garden tower is inspired by the seasonal changes of the long horizontal ravine. The landscape and character of this part of the city changes dramatically between seasons. This portion of the design offers a piece of green space all year for visitors from the community and those arriving by subway. The tower offers people views of both the city and ravine, and is a social anchoring point rooted in the recreational aspects of the ravine network. It is built above the existing entrance to the Sherbourne subway station, South of Bloor Street and provides a formal entry into the station and new bridge from both Bloor Street and Glen Road. Furthermore, the tower and entry pavilion also brings natural light down towards the subway station, and can function to filter some of the exhaust air produced underground.

A smaller pavilion on the North side of Bloor Street provides another formal entry point into the project. Access into the library arm of the bridge is within this pavilion through the cafe beneath street level. This room opens Northward with views into the Ravine. The videography/ light-art tunnel running beneath Bloor Street at the same level connects this smaller building to the garden tower previously described. Both of these formal entry additions are inspired by and celebrate the city’s cultural relationship to the ravine, while offering a material piece of social infrastructure which contributes to the engagement of the community.

Rosedale Valley Road and the ravine during winter: facing West

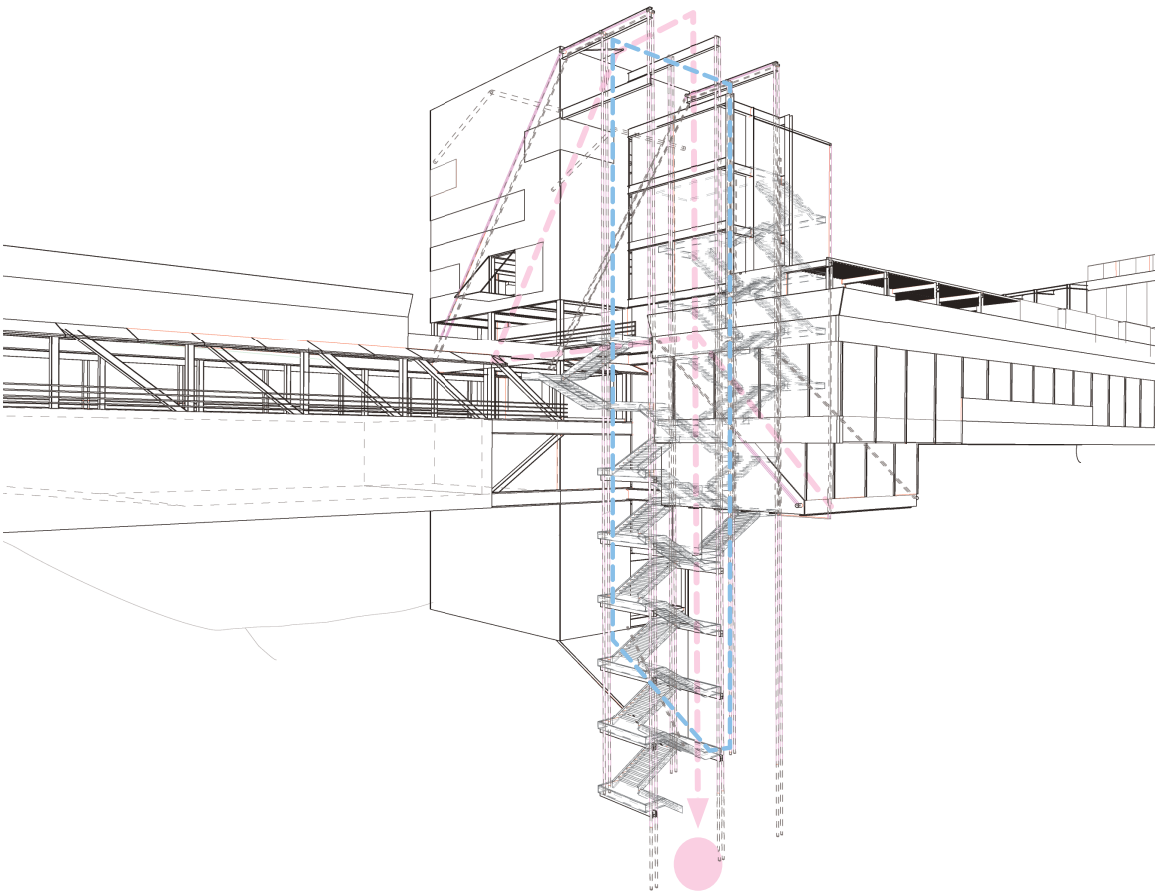
Rosedale Valley Road and the ravine during early autumn: facing East

Bridge entry from the North side of Bloor Street: Facing West

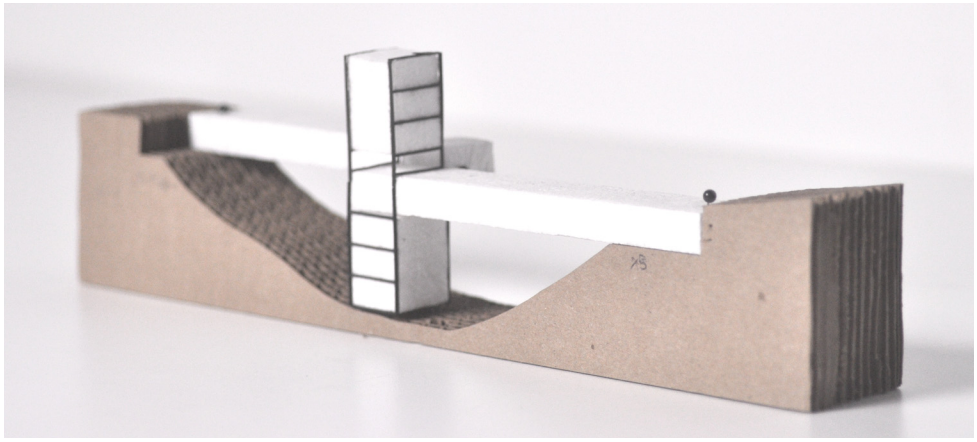
Structure

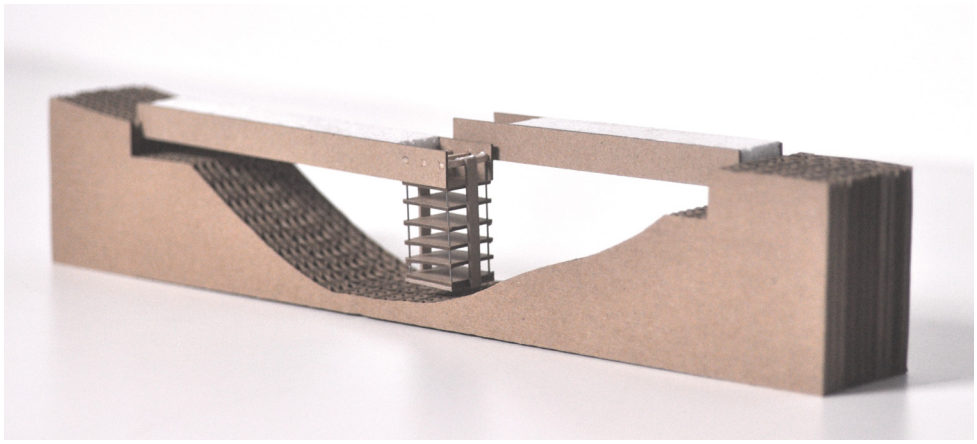
Development of a Structural Strategy

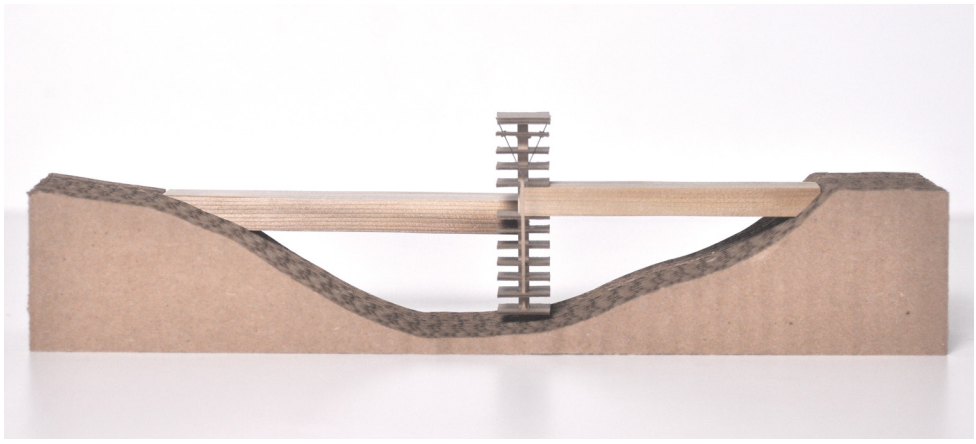
The arrangement of the programs along the new bridge has implications towards the structural strategy of the project, particularly due to the misbalance created from the swimming pool on one arm. An iterative physical model was used to develop and test an approach based on the structural methods outlined in the previous chapter. What was learned through several modeling-testing cycles is that creating a continuous diaphragm along the bridge deck helped to stabilize and support more weight, but with the lopsided loading, a compression member was needed to bring load to the ground at the center point where the two bridge arms cross. The weight of the pool meant that the bridge was twisting about this central axis point.



Interpretive perspective of the two arms meeting at the center of the bridge



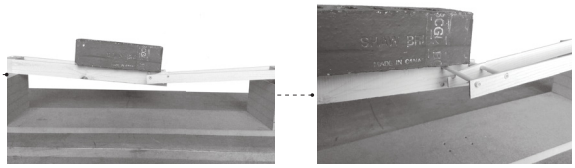




Series of formal study models

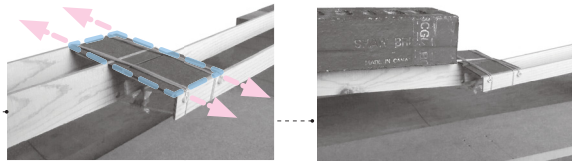
MODEL ITERATIONS

01. Two trusses are connected at the formal shifting point through transfer beams along the shared bridge deck level

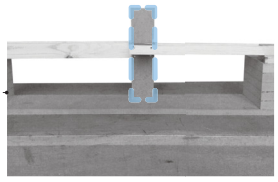


02. Compression and tension connections are used to fasten the two bridge arms more tightly across their short section.

The result is a continuous diaphragm across the bridge deck level. This combats the sheer forces acting between the two arms. Rather than two cantilevers meeting at the center of the ravine, the result is a system which structurally functions more as a continuous beam supported on either end of the ravine, with forces transferring across this middle section. Formally, the bridge still maintains the appearance of two arms sliding past one another.

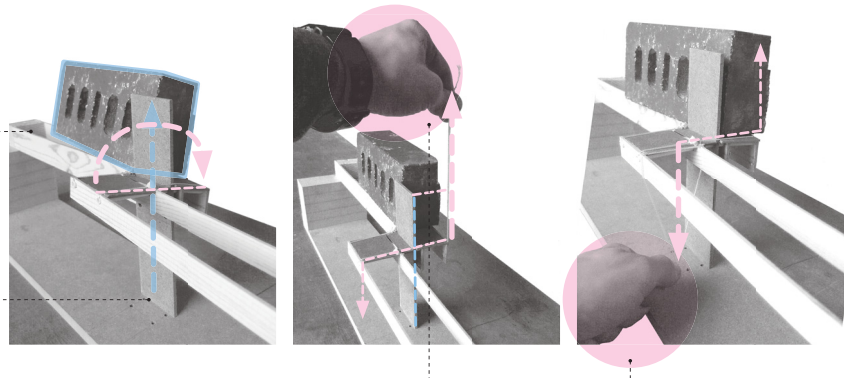


03. With a majority of the load falling on one of the arms and across the connecting diaphragm,additional support is needed. One response, which is tested here, is to add a compression plane that comes to the ground between the two arms.



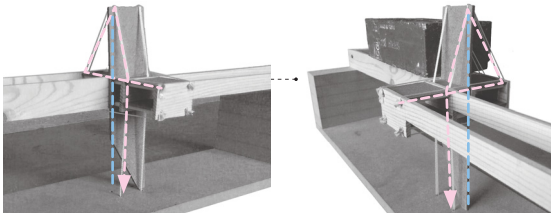
04. A balancing of forces is necessary even with the inclusion of a compression plane in the middle zone. Because a diaphragm connects the two arms of the bridge, a misbalance of forces acting on one side, must be counteracted.

An increased load on one arm causes twisting around the central compressive anchoring point.



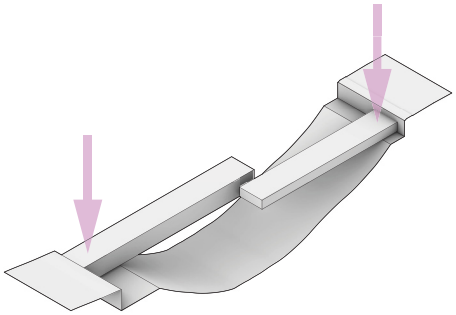
Tension pulling up on the arm with larger loading can be used and anchored into the central compression plane.

Tension pulling down on the opposite arm can also be used as a balancing force. On this portion of the bridge, a suspended staircase leading to the ravine floor can add to the tensile load needed.

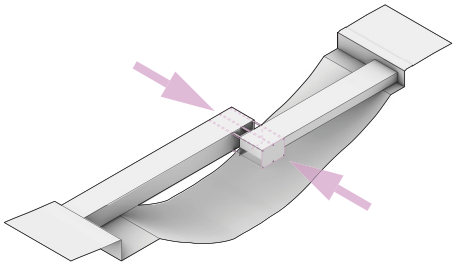


Description and development of the iterative structural model

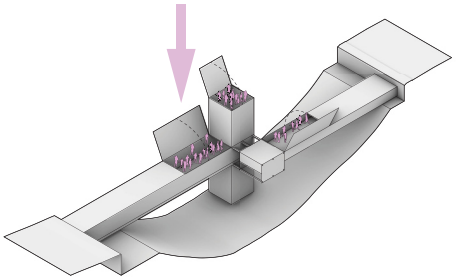
ADJACENT BOX TRUSSES PINNED ON EITHER END



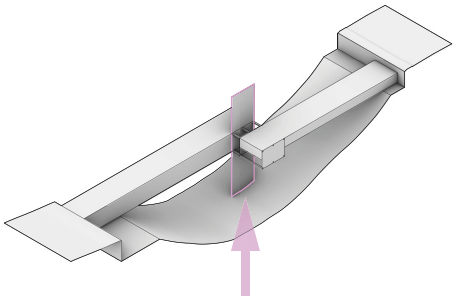
LATERAL TRANSFER DIAPHRAGM BETWEEN TRUSSES



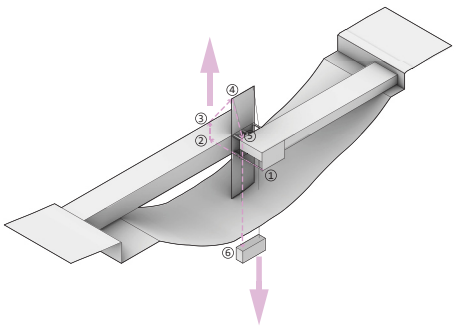
ADDED PROGRAM MISBALANCES LOAD



PLANE MEETS GROUND IN COMPRESSION



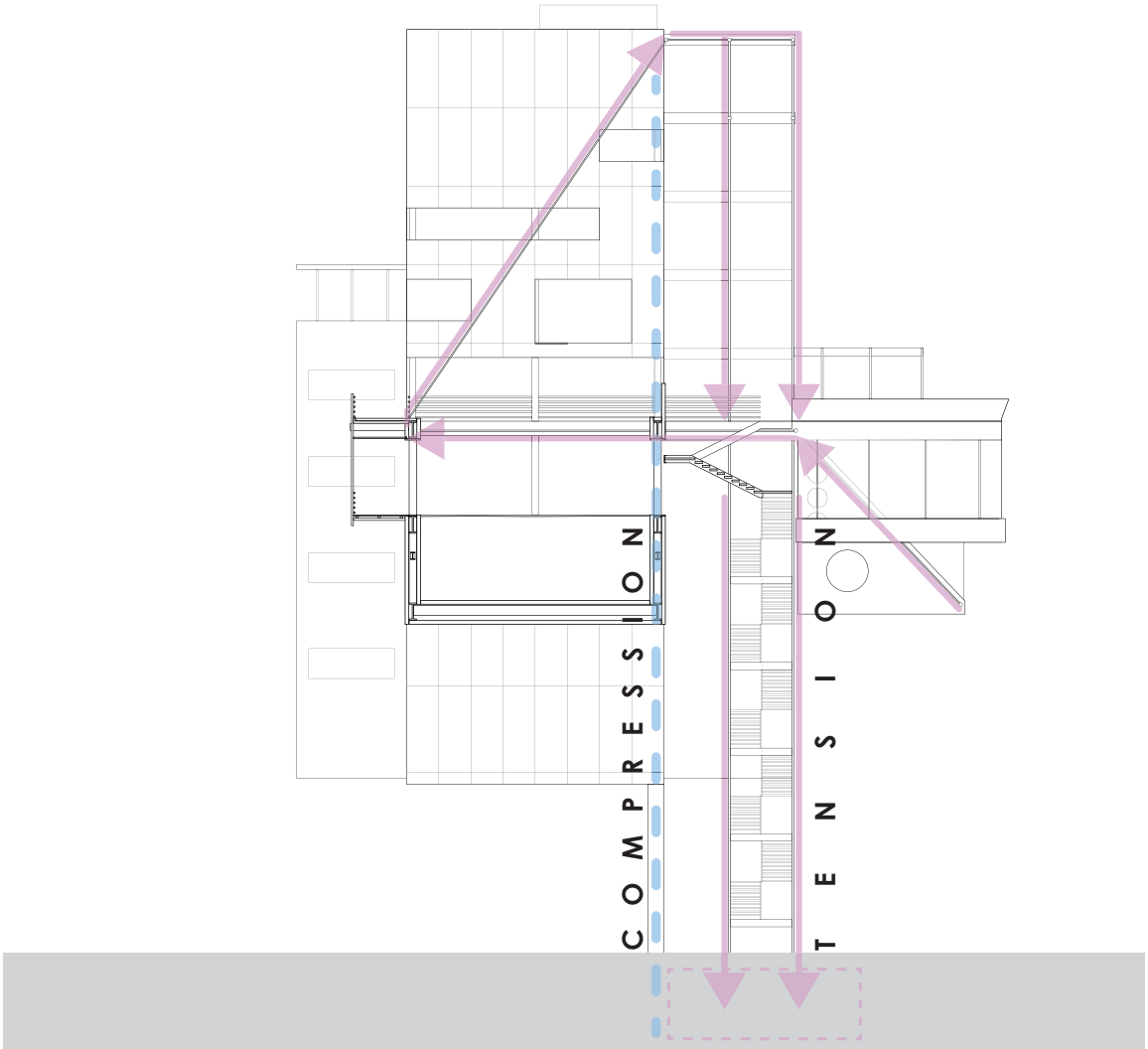
TENSION CABLES GROUNDED AT BASE - RE-BALANCE THE LOAD REVOLVING AROUND COMPRESSIVE PLANE



Development of the structural system

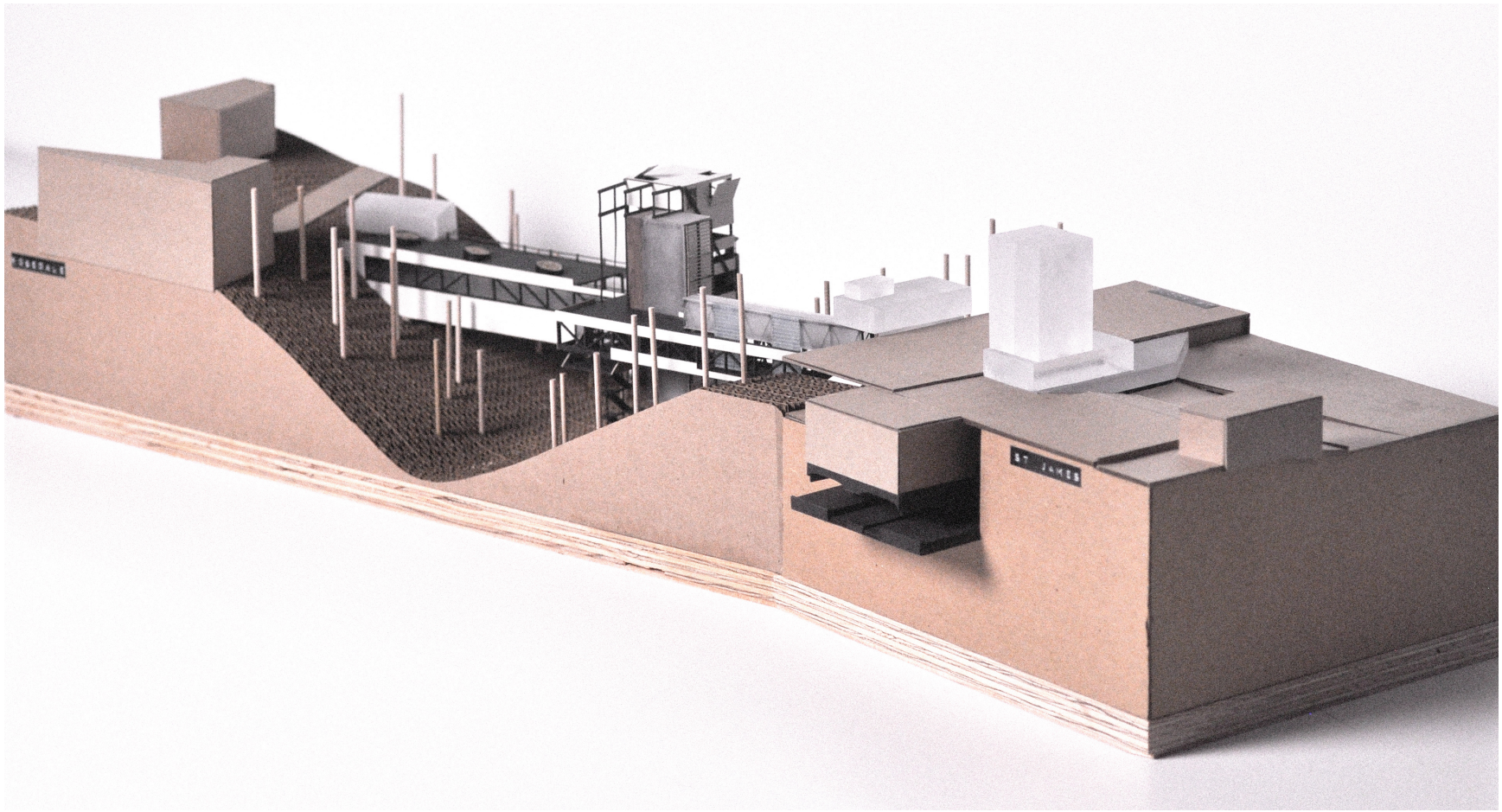
Balance Through Tension

As a response and in conclusion from the working model, tension cables are used to re-balance the loads by lifting up the pool arm and pulling towards the ground in the central zone where the arms shift past one another. These tension cables parallel some of the historic tension that exists between the neighborhoods and between the city and ravine. Like the example of The Maison Bordeaux, the new bridge uses both tension and compression in harmony as a method for grounding to its site. These tension cables also hold a set of stairs which connect the bridge deck to the multi-purpose trail at the base of the ravine. The stairs provide an access point into the ravine network as they pass through the vegetation and past the bridge programming on either side. The tension cables, in addition to balancing the bridge, provide a physical place for visitors to unite.



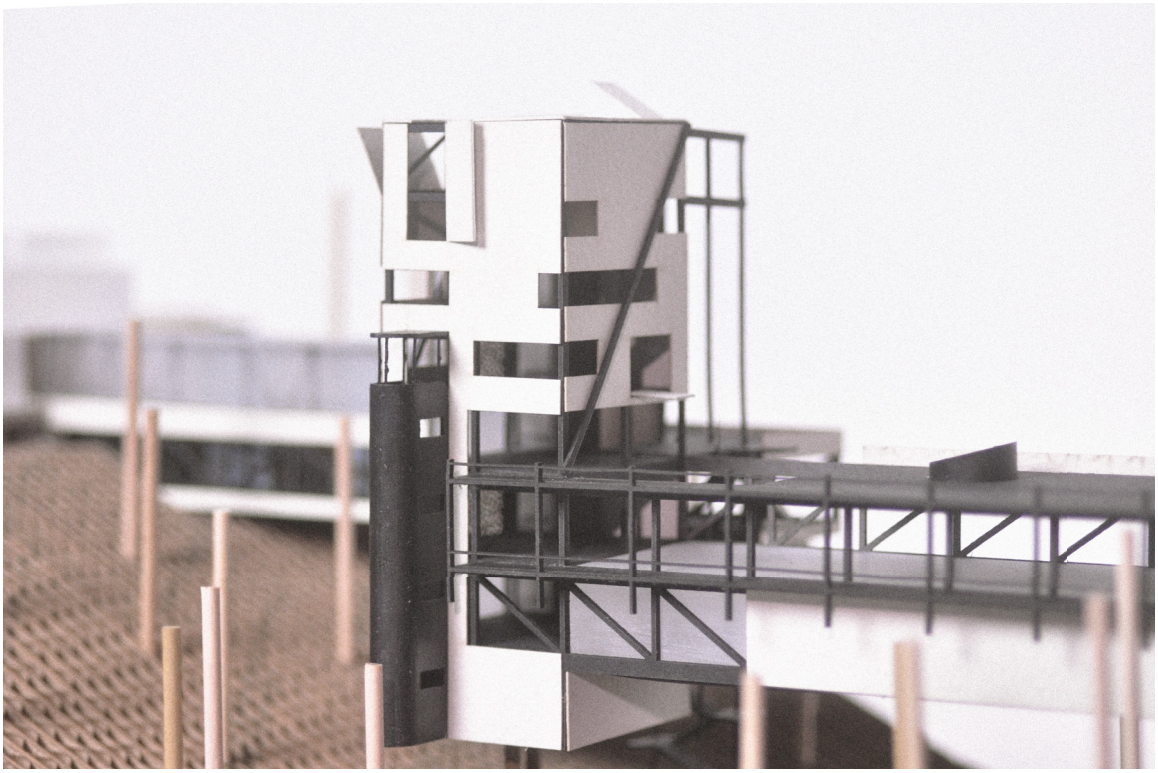
Section facing South, describing compressive and tensile strategy at the shifting point of the bridge arms

View facing South: stairs hung from the structural tension cables, connecting ravine floor to bridge deck

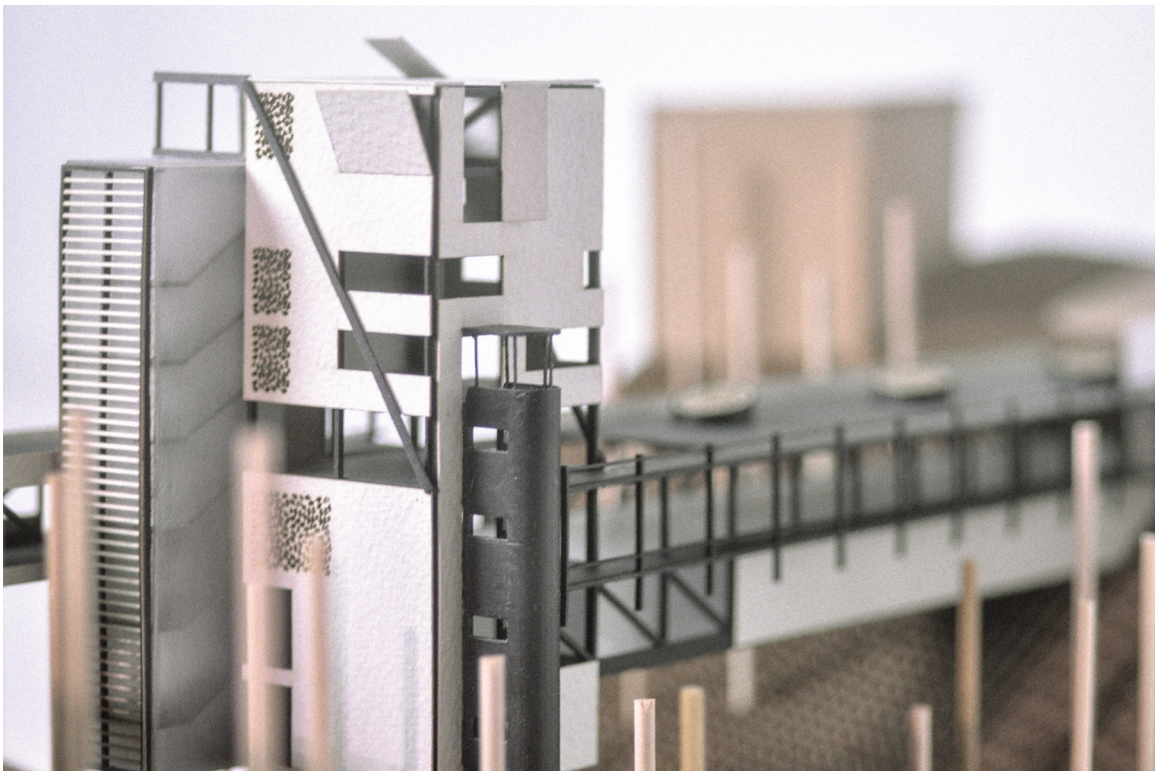


Overall view of working model developed throughout design process: facing North-East

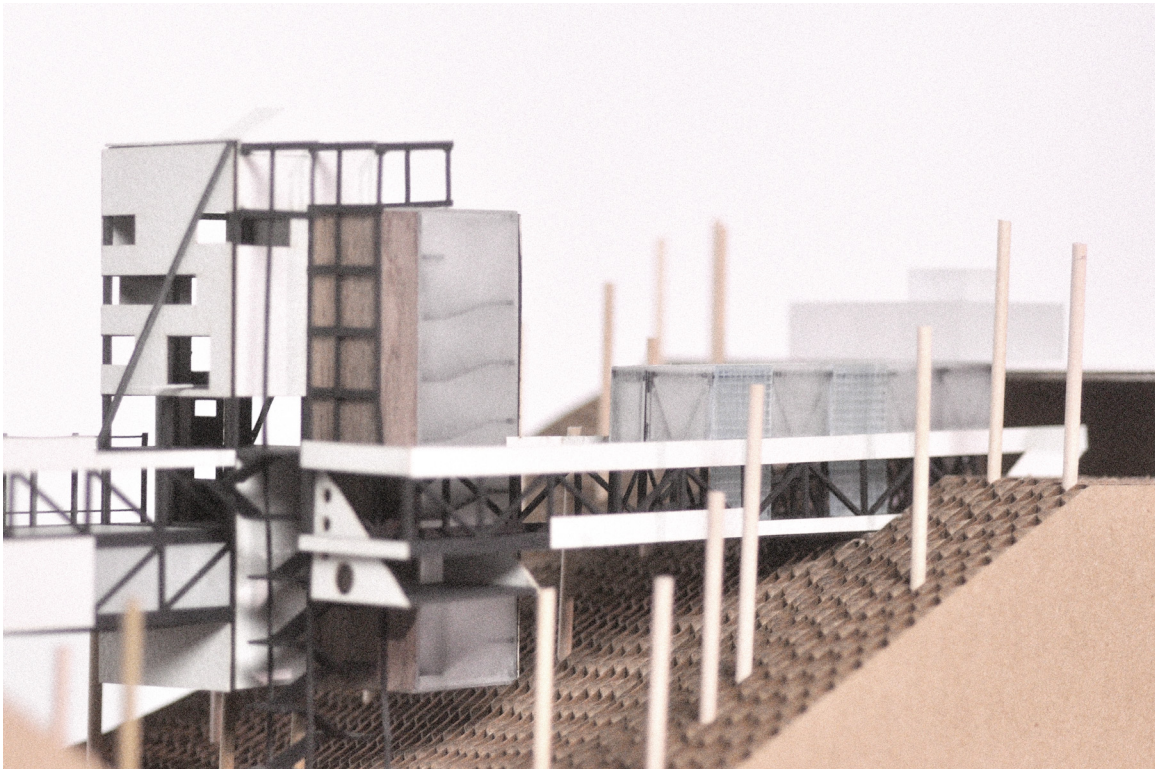
Facing South across sculpture garden towards central tower



Central tower: facing South-West



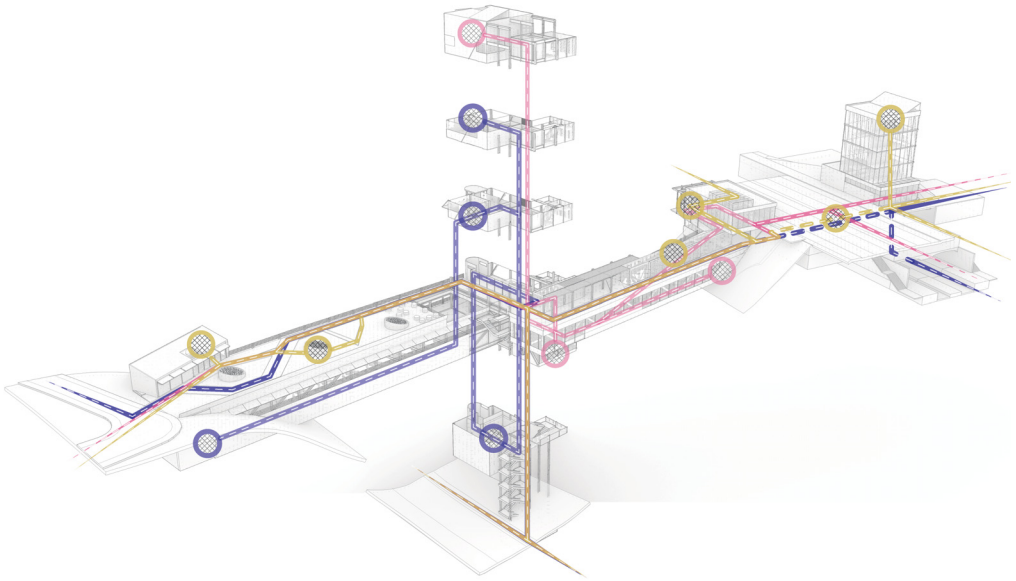
Southern face of central tower: Facing North-West



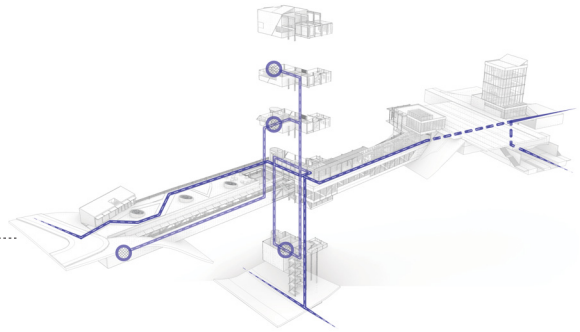
Central tower: facing South-East

Strands of Experience

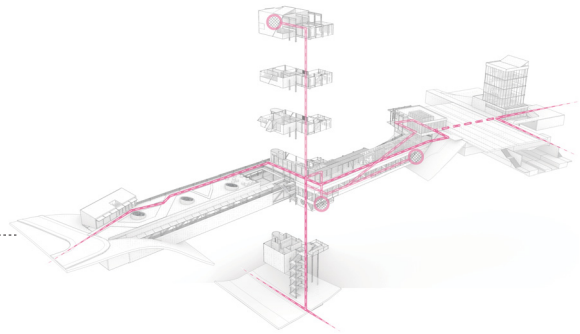
The programming of the new bridge is intended to provide new social infrastructure for the engagement of the communities, while celebrating and physically connecting the city to the ravine. The relationships between these different aspects of the design can be described through program-based strands that run through the project. The experience of the new bridge is described by tracing the visits of several characters through the project; following their routes as strands which weave individual spaces together. Although a multitude of journeys through the project can be defined, one through the swimming pool and one through the library are used as a cohesive description of the spatial and social qualities of the bridge.



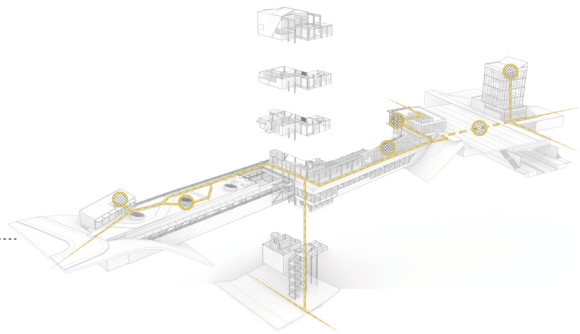
SWIMMING POOL SOCIAL
ANCHOR POINTS AND ROUTES



LIBRARY SOCIAL ANCHOR
POINTS AND ROUTES



ART GALLERY SOCIAL
ANCHOR POINTS AND ROUTES



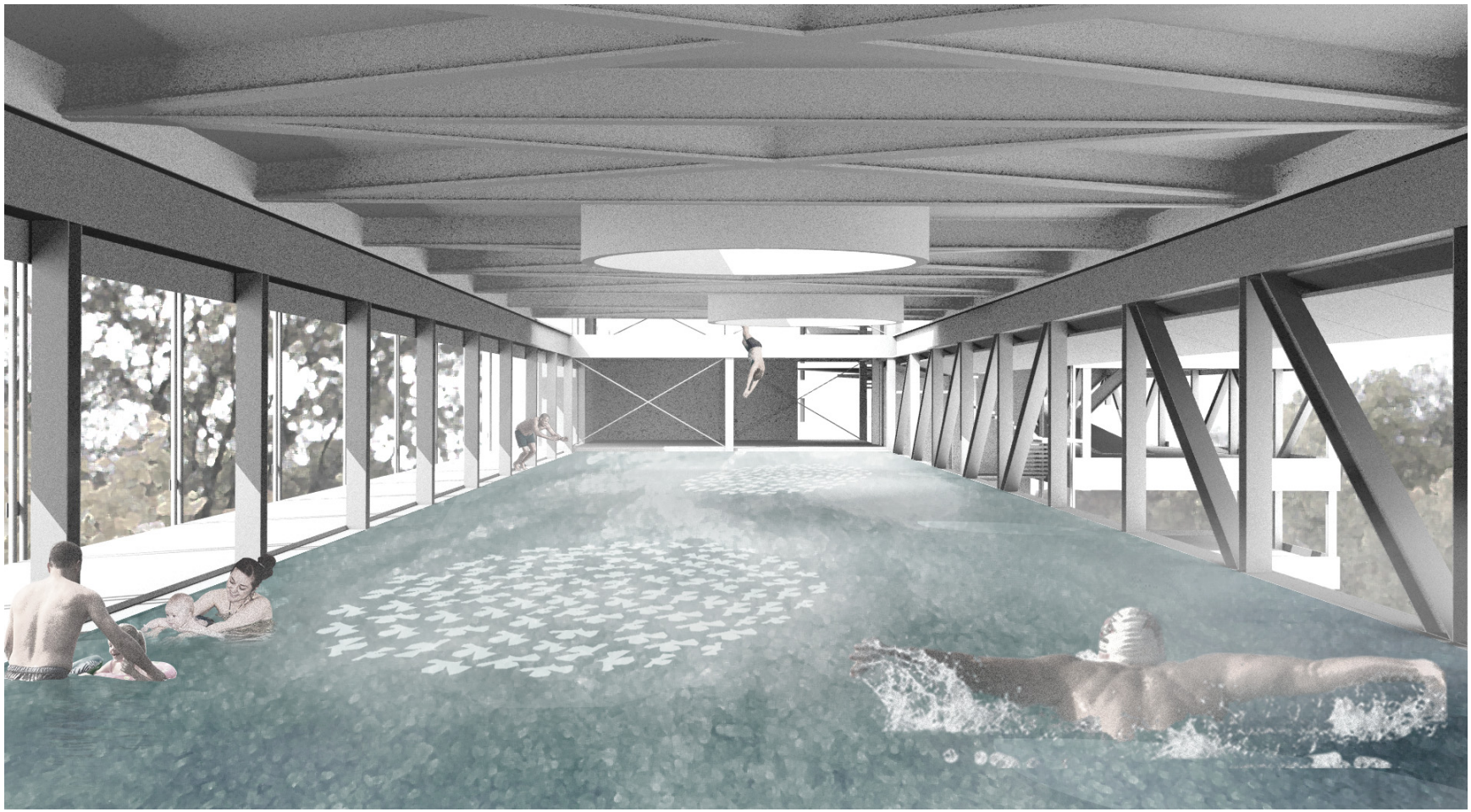
Social infrastructure anchor points and routes diagram

Stephanie, a resident of Rosedale, might wish to visit the swimming pool after going for a run on the multipurpose trails in the ravine network. Her first move would be across the sculpture garden and down the suspended stairs connecting to the ravine floor. Following her run through the Don Valley, she would re-ascend the stair case and land on the main bridge deck at the lobby for the pool. Once inside, she moves down again towards the change rooms through a staircase on the east side of the central tower. When she emerges she will be back in a staircase in the central zone ascending towards the pool deck, diving, and sauna floors of the pool. As she travels up this central staircase she is first adjacent to people moving between the city and ravine through the same staircase that originally connected her to the trail network. Further up the staircase she is next to library users who are making their way up to the lookout and reading room on the top floor. A perforated metal screen separates the pool and library users, allowing glimpses between the two primary pieces of program. In the pool, screened skylights reminiscent of the tree canopy on either side of the bridge filter light that passes through the sculpture garden above. Further up the central tower, divers jump through an opening in the bridge deck into the pool, and saunas provide views towards the pool and into the ravine.

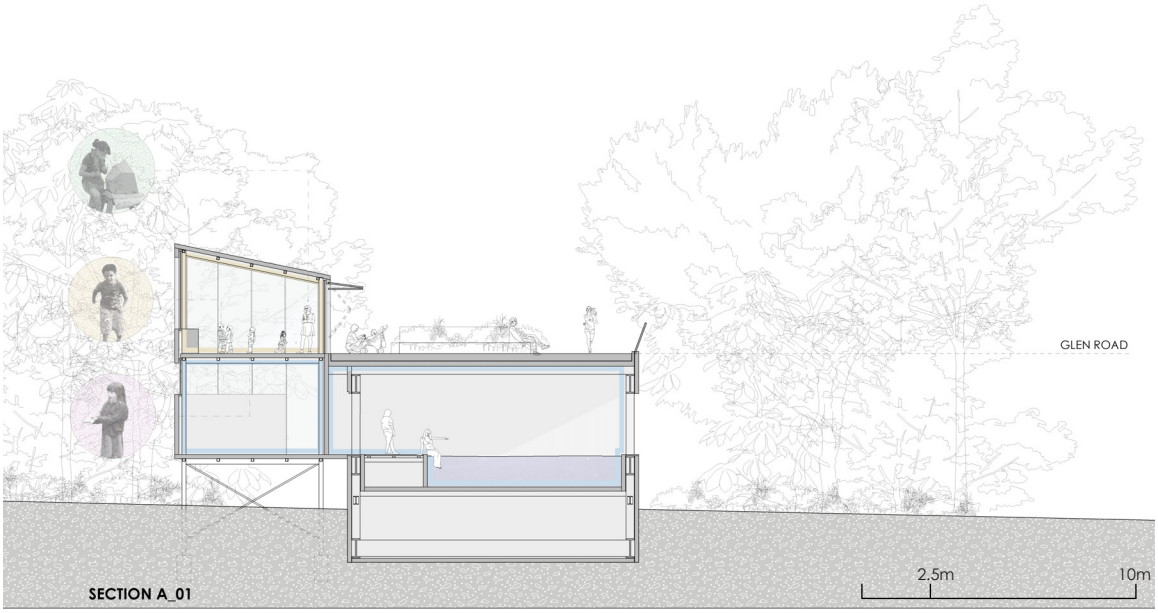
View of bridge from Glen Road in Rosedale: facing South

Sculpture garden above pool: facing South

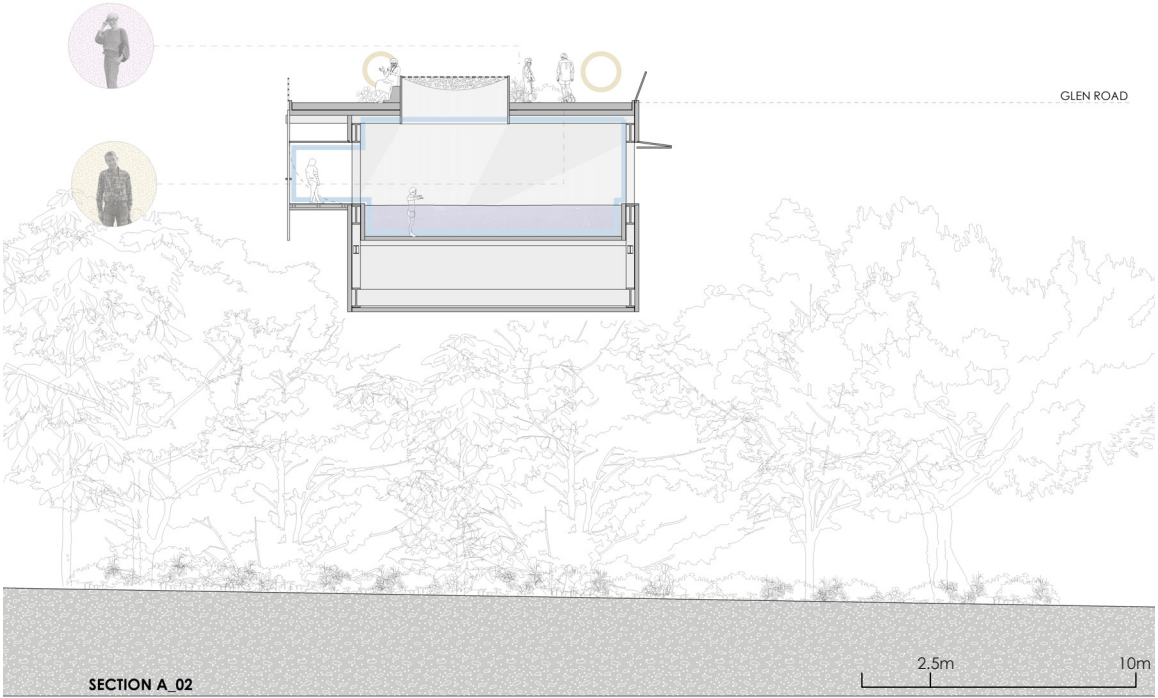
View of the meeting point of the two bridge arms: facing South-West



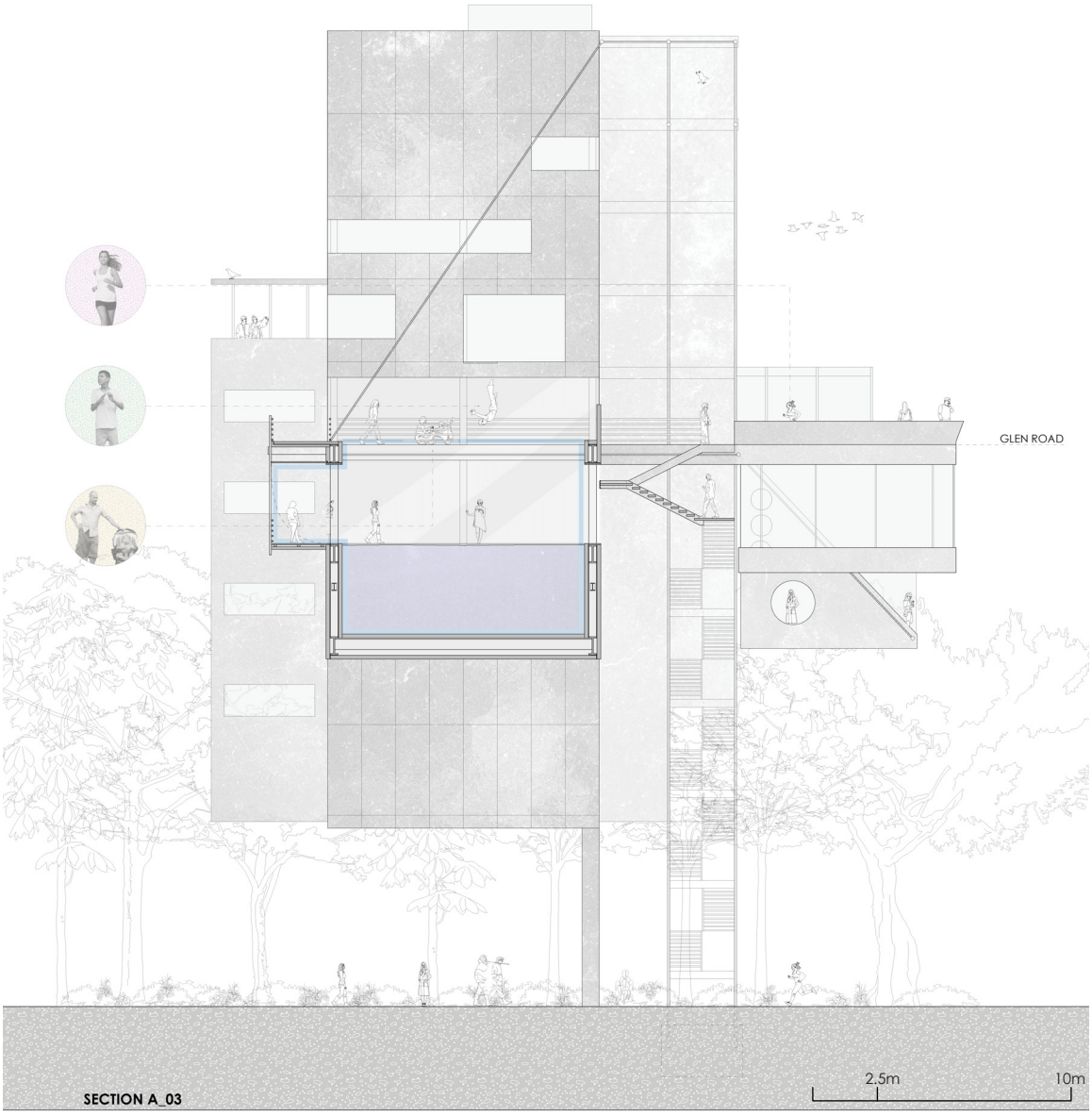
Swimming pool deck level: facing South



Section facing South: through art classroom, sculpture garden, and swimming pool



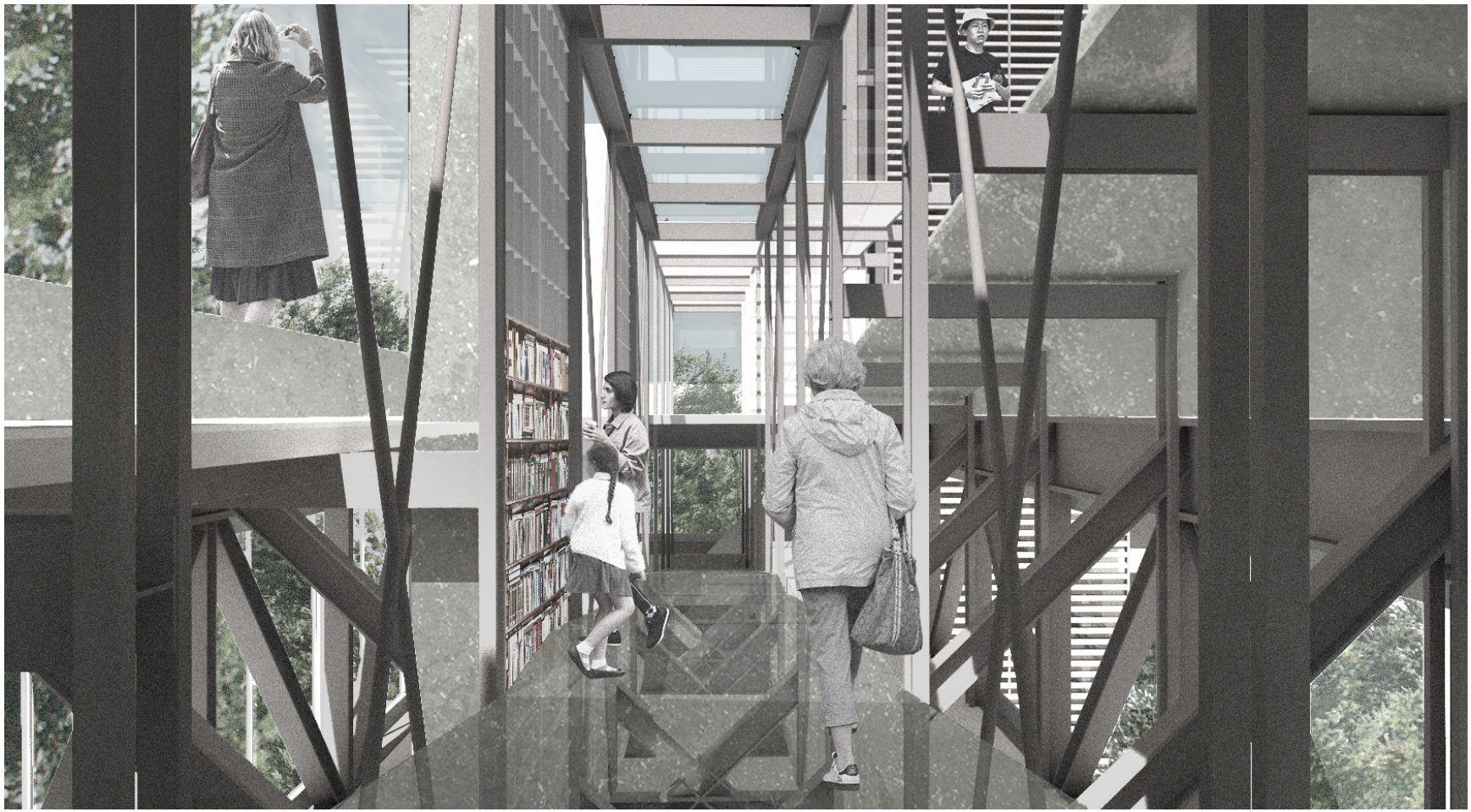
Section facing South: through perforated steel skylight, sculpture garden, and swimming pool



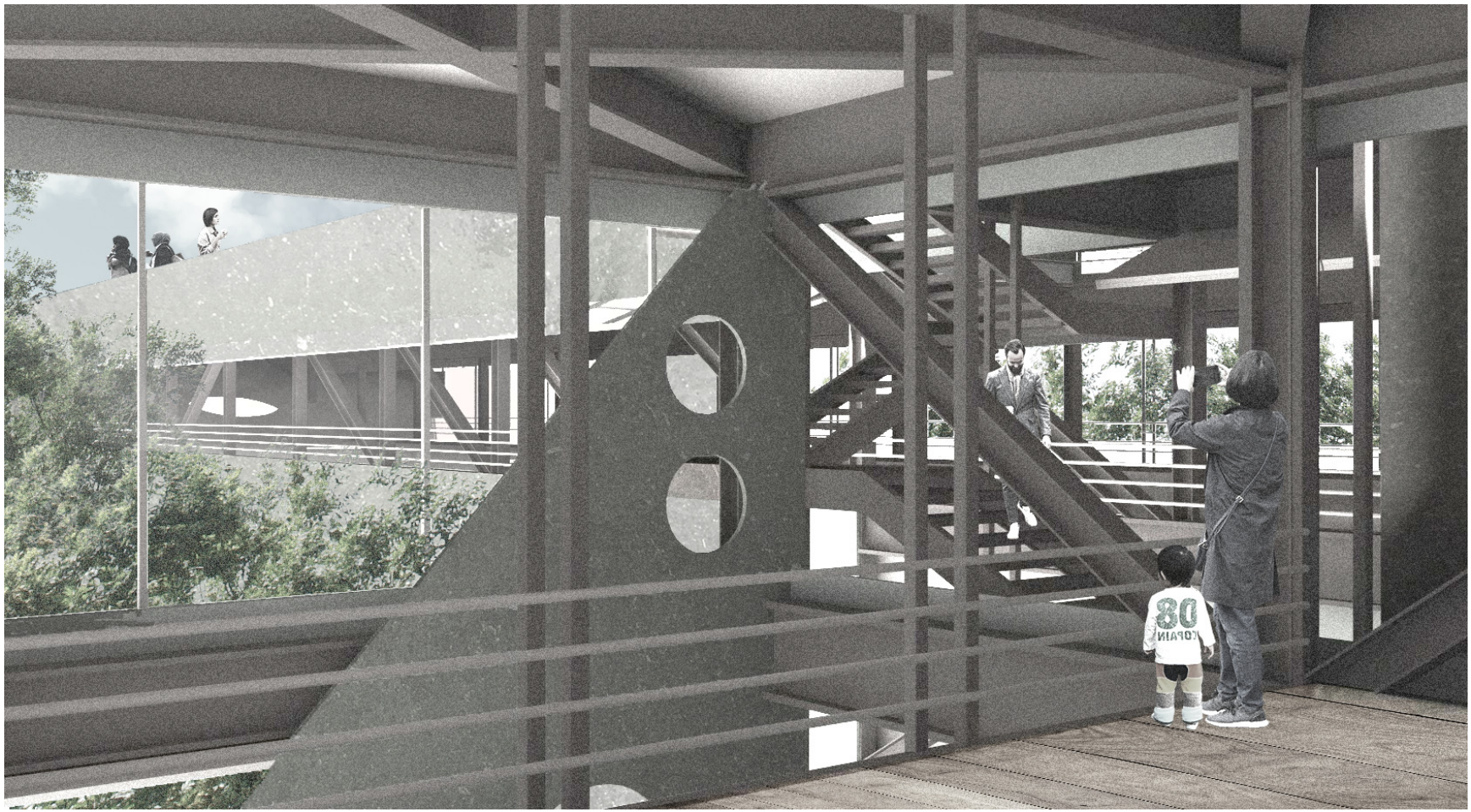
Section facing South: through swimming pool diving area, with central tower and library beyond

Paulo and Tomas, father and son from St. James Town, may be visiting the library during an afternoon. They would enter the garden tower at the end of Glen Road, where they could encounter a group of commuters, depending on the subway schedule, or visitors wandering through the garden. They would pass through the lit tunnel beneath Bloor Street as they arrive at the cafe on the opposite side of the street. The primary entry into the library is through this space which opens up Northward to views of the ravine. Paulo could get a coffee while they enjoy some of the art that was produced in the studio building and is now displayed, suspended from the steel beams in the roof structure, in front of the backdrop of the ravine. As they enter the library through the central interior ramp, they walk past the large glazed vitrines and see people along the main bridge deck above them to the left. More visitors are visible on an exterior ramp connecting Bloor Street to the bridge above them on their right. They browse through and collect their books from the stacks on either side of the ramp that they just descended on. Next, they can choose to read in the suspended room immersed in the vegetation of the ravine, or travel up the central tower towards the topmost reading room and lookout. On their way, they are travelling on the other side of the stairwell that Stephanie takes between the different pool programs. The top reading room offers views up and down the length of the ravine, and to the pool programming directly in line to the North. Screened openings to the South and skylights provide diffuse light for reading.

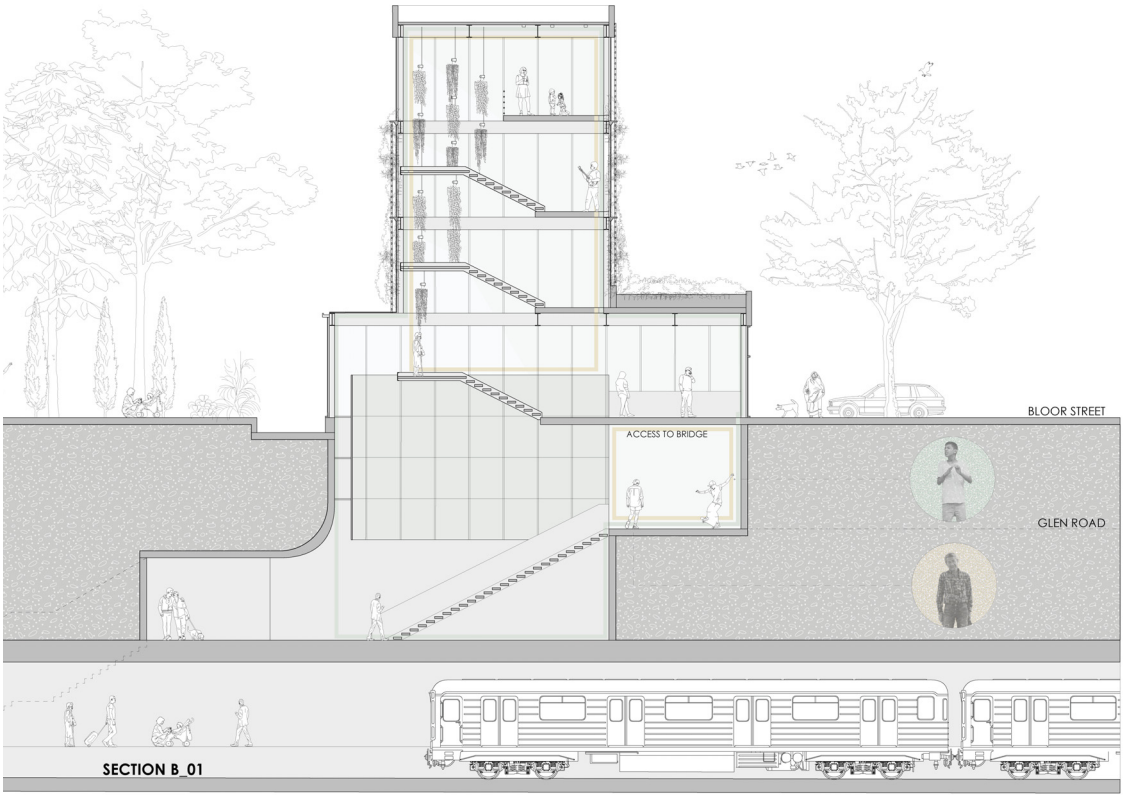
Ramp connecting Bloor Street to bridge deck, with glass library volume to the left and shared staircase beyond: facing South



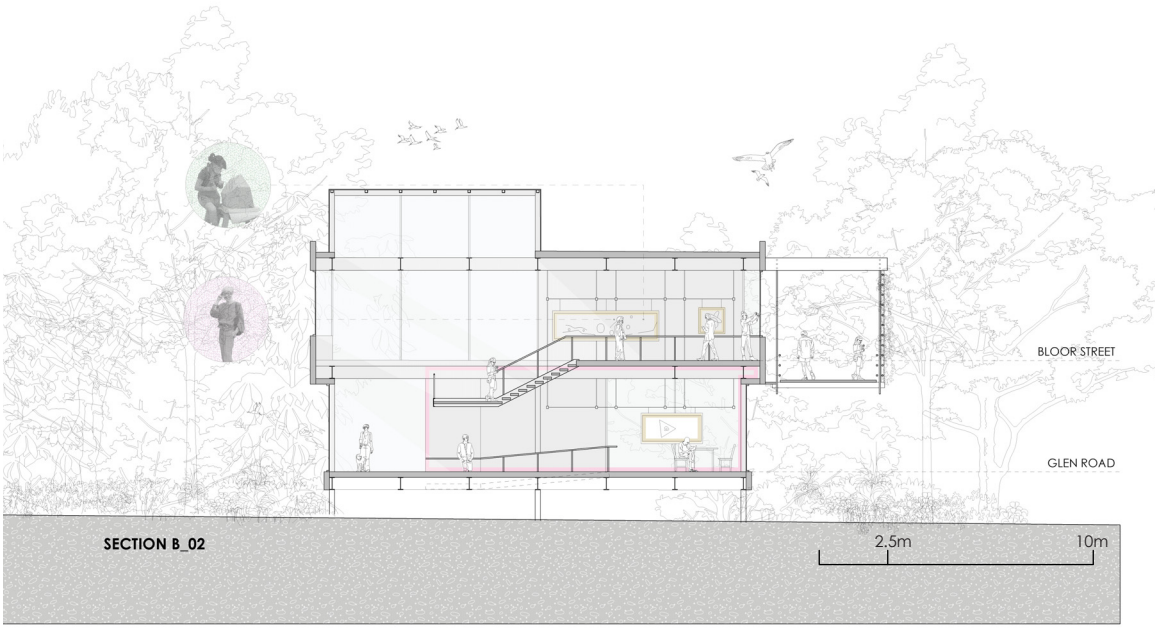
Interior ramp towards the library: facing North



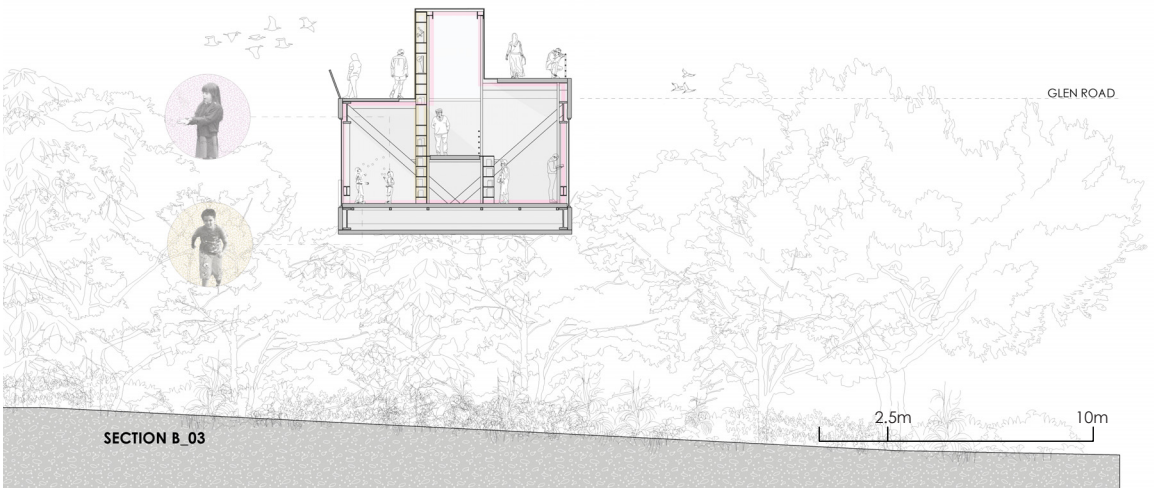
View from library towards the swimming pool: facing North-East



Section facing North: through garden tower and subway station



Section facing North: through North Bloor Street entry and cafe



Section facing North: through library and gallery/stack element

Section facing North: through suspended reading room, shared staircase, and central tower

CHAPTER 5: CONCLUSION

This thesis investigated the opportunity for Toronto's urban infrastructure, specifically the Glen Road Pedestrian Bridge, as a link between the fabric of the city, the ravine network, and the communities directly adjacent. Due to their position, often navigating across or adjacent to Toronto's outdoor space, the city's infrastructure has an opportunity to mediate between and engage unique parts of the city. The investigation focused around the Rosedale Valley Ravine, although the strategy could be applied to other areas of the city. In applying a similar historic and contextually driven approach to augmenting these pieces of infrastructure, a rich network of public spaces could begin to emerge throughout the city. These opportunistic spaces would celebrate the dichotomy between urban and natural while offering a formal transition between the two systems. Furthermore, the unique layers of history that surround and define a site could become revealed through program; arranged and linked through paths that tell stories and which inspire future Torontonians. As a result, the architecture developed at each of these hinges would be a unique assembly which speaks to the specifics of each site, yet the ravine will provide a common denominator. How would a project manifest on a bridge adjacent to a high density commercial zone, along the waterfront, or beside the hectic highways to the North of the city? The vast reach of the ravine network means that it makes contact with a range of urban conditions. Although Toronto's relationship between these urban edge conditions and green space remains ever changing, there is opportunity to strengthen connectivity and create public space which encourages community engagement and stewardship; re-iterating the ravine as a network of social infrastructure.

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