



NDA-NWENDAAGANAG

“ALL MY RELATIONS”

We acknowledge that the Land where the Keating Channel Bridge will be created is part of Treaty 13 (The Toronto Purchase) with the Mississaugas of the Credit First Nation, is part of the Traditional Territory of many nations including the Chippewa, Haudenosaunee and Wendat, and now home to diverse First Nations, Inuit and Métis peoples.

**PROJECT GOAL /
CREATE WITH INDIGENOUS VOICE AND AGENCY**



"The prophecies of our people tell us that the time will come to share our knowledge... that our ways will resurface and we will once again be strong. Our teachings are to be shared with all of the races of the world, so that they too can thrive."

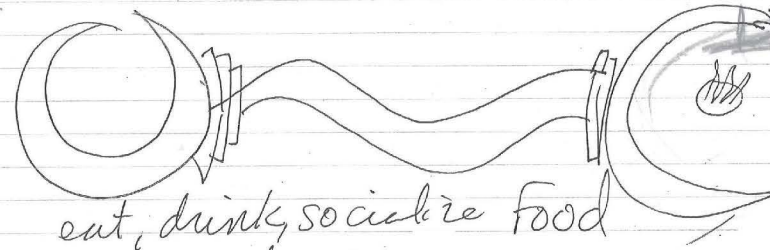
Aimee Bailey (2019), Circle of Turtle Lodge, p. 3



- continuation of downriver
- side height limits? / safety
- meadow - self-care
- logo - carved
- Paris area
- Bring Water to Bridge
- colors
- Stone, Wood
- Curved legs

SUN
MOON

Egde
Salmon

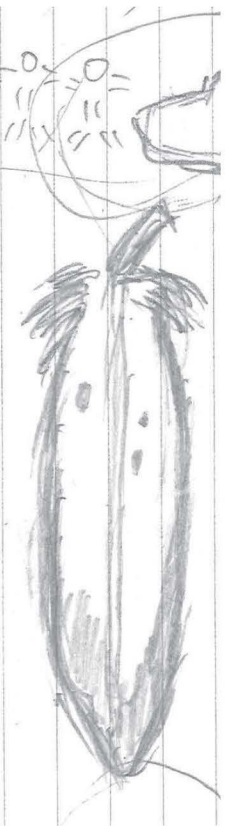
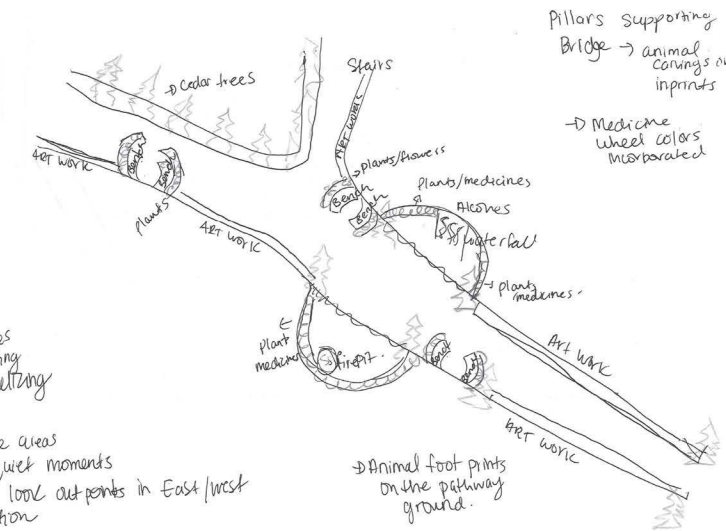


eat, drink, socialize food
landscape

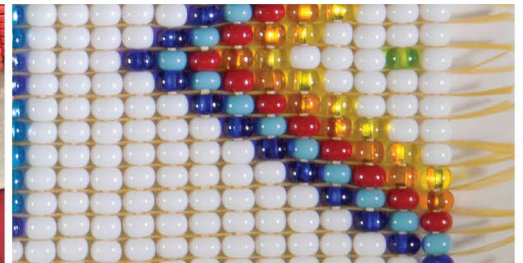
benches
for sitting
+ socializing

niche areas
for quiet moments
and look out points in East/West
direction

Art Work
→ opportunities for education
→ different media uses
→ want people on us.



* Indigenous Co-designers: Tiffany Adair, Megan Clark, Darlene King, Reno Koostachin-King, Gwen Lane, Michelle Letourneau, Roger Misquadis, Judy Rheume



A LIVING BRIDGE FOR NDA-NWENDAAGANAG [ALL OUR RELATIONS]

“So often we hear the Elders say: Listen to your heart. What is my way may not be your way. Listen to the Teachings. Take from them what you need and leave the rest.”

Aimee Bailey (2019), Circle of Turtle Lodge, p.4

MAK-KEE-AN-NUK (TURTLE):

The bridge honours Turtle Teachings as an experience that is holistic and multifaceted.

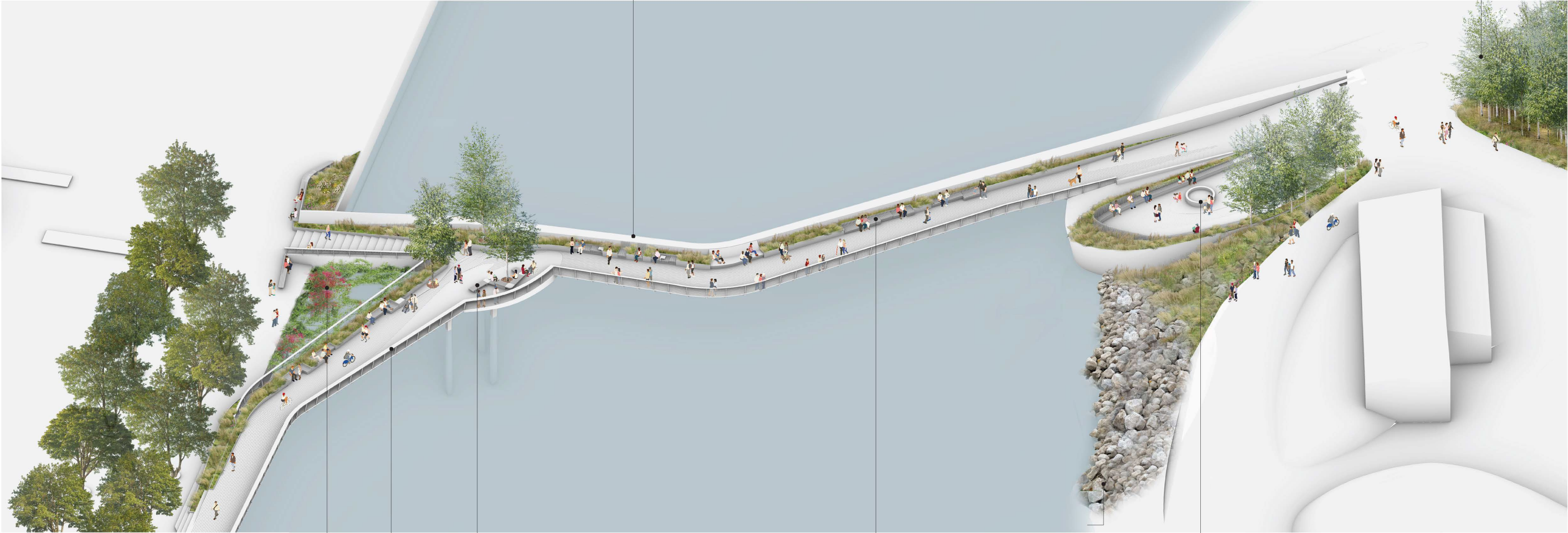
- Stainless steel engraved ‘13 moons’ inlaid into seating areas across the site
- Lifesize metal cast turtles sunning themselves

MISHOOMIS (GRANDFATHER) BIRCH GROVE,

A large grove of wiigwaas (white, paper birch), a native and fast-growing tree species, interspersed with plantings of the seven sacred trees used in sacred fires: willow, cedar, poplar, white pine, maple, and oak. An ecologically biodiverse area planted with a lush understory of ferns, grasses, shrubs and perennials.

7TH FIRE WALL: OSH-KI-BI-MA-DI-ZEEG (THE NEW PEOPLE):

Weathered steel curtain wrapped across and under the eastern wall of the bridge, extending from end to end. It is comprised of patterns abstracted from Traditional arts leading from pre-contact (at the entrances, the lower levels of the bridge) to central issues of importance to Indigenous Peoples today.



NOOKOMIS'S (GRANDMOTHER) DREAMCATCHER:

A metal cable system designed as a dreamcatcher with a large circle opening to view Nibi (water) below, and another layer of nature. Created as a verdant green wall with five native vines species, it will offer a large nesting habitat area for birds and provide local and migratory birds with food (insects, wild grapes) and shelter. Deep edge planters will also include a rainwater harvesting system for irrigation.

SASSAFRAS REST:

A Sassafras ‘mitten leaf’ shaped resting and gathering place where the staircase meets the ramp, and off the main path of travel (an important medicine tree that is now rarely found). Seating is under the shade of trembling aspen trees, and this space can support Water and Full Moon ceremonies.

NIBI (WATER):

Nibi (water) is raised to flow down a metal railing, and a school of lifesize salmon swim upstream, formed of jingle dress cones that sway with the wind. Nibi also splashes slightly on the limestone paved fluid shaped area, honouring the ancient sedimentary rock below Lake Ontario, the Grandparent Stones.

MEADOW PLANTINGS:

Extensive meadow restoration plantings offer food and habitat for birds and pollinators, and a more natural ecopassage for urban wildlife.

ISHKODE (FIRE):

A medicine wheel fire pit in a large gathering area, framed by a curved low wood screen of the seven sacred trees, and restoration plantings.



NIBI (WATER)

Nookomis (Grandmother), Grandmother Moon

“When our Grandmother Nookomis is full, she reflects the light of the sun and sees all.”

Elder Lillian Pitawanakwat (June, 1997), in Aimee Bailey (2019), Circle of Turtle Lodge, p.18

Nibi is presented first in this story of balance to honour the Mississaugas, “the People of the Waters” (thought to be from Minzazaheeg: “people living where there are mouths of many rivers”). Nibi is the life blood of Mother Earth, the rivers her veins. The moon, **Nee-ba-gee'-sis, Grandmother Moon**, watches over us and moves Nibi with her power.

Nookomis’s Dreamcatcher:

The lush green wall that will form from the diverse vine plantings in Nookomis’s Dreamcatcher have seasonal interest with flowers, grapes, and fall coloured leaves, and replicates the aesthetic of gracefully draped vines growing on nearby bridges.

Waabshkaakzaat (Poplar) Trembling Aspen:

Three hardy Trembling Aspen (poplar) trees offer the healing sound of water as they rustle in the wind, shading the generous wood bench seating below. They are planted in deep soil volumes in the structural supports for the bridge, and share soil below the deck to live in community, communicating through their roots systems with mychorrizal fungi.



ISHKODE (FIRE)

Mishoomis (Grandfather), Gee'sis, Grandfather Sun

"Give thanks to Grandfather Sun for his gift of light which allows you to thrive."

Annie Parker (2019), Circle of Turtle Lodge, p.7

Nimishoomis wiigwaas (Grandfather Birch):

Anishinaabe view trees as 'Standing People' that carry the knowledge of the past, present and future (Elder Jules Lavalley, in Aimee Bailey (2019), Circle of Turtle Lodge, p.32.

A large birch grove with biodiverse plantings, will collect adjacent rainwater to naturally irrigate this ecologically restored space.

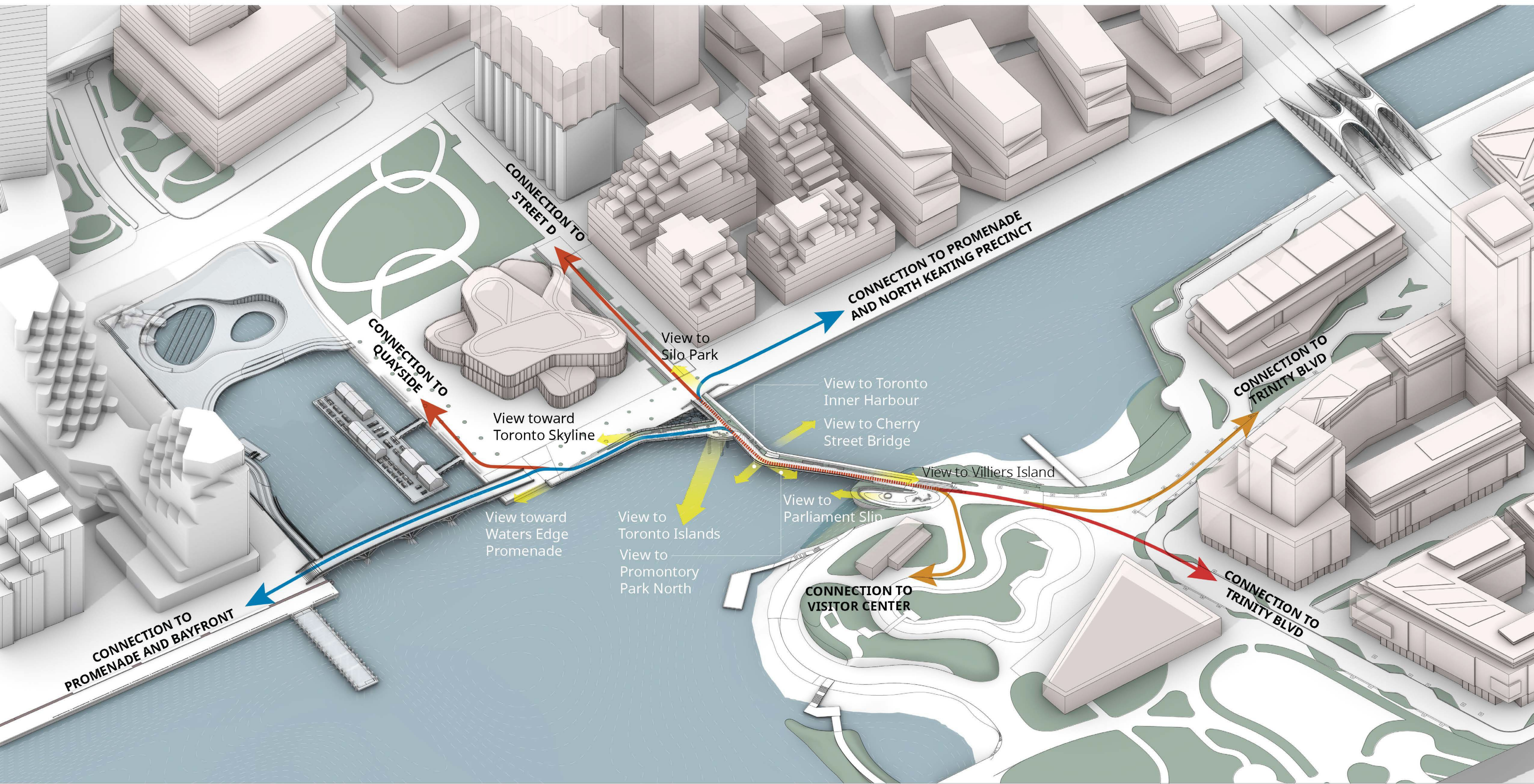
The south shore is where Ishkode (Fire) is found, sacred to Indigenous Peoples around the world, used in ceremony and for prayer, a power that is critical to human survival.

Medicine Wheel Fire Pit:

A large, oval gathering area with a Medicine Wheel designed fire pit at the center (having the colours of the four sacred directions, East/yellow, South/red, West/black, and North/white). A low, curved wall made of vertical timbers of the seven sacred trees frames the space, with their names carved into them going clockwise, beginning with wiigwaas (birch, used to start the fire), followed by oziisigobimizh (willow), waabshkaakzaat (poplar), giizhik (cedar), zhingwaak (white pine), and bgaakmish (oak).



PROJECT GOAL / CONNECTING THE CITY AND VILLIERS ISLAND



SITE CONTEXT



LEGEND

- | | | |
|-------------------------------------|-----------------------------------|----------------------------------------|
| A Quayside | F Future Pedestrian Bridge | L Promontory Park North |
| B East Bayfront | G Silo Park | M West Cove |
| C Aqualuna | H Future Cultural Center | N Future Catalytic Use Building |
| D Parliament Slip Activation | J North Keating Precinct | O Villiers Island Development |
| E Parliament Slip | K Visitor Center | P North Cove |



CONCEPTUAL PLAN



KEATING CHANNEL

LEGEND

1:750

- | | |
|------------------------------------------------|-----------------------------------------|
| A Nda-nwendaaganag Threshold | G Toronto Island Viewing Deck |
| B Promenade Terrace | H Sun Deck Seating |
| C Nibi: Water | J Ishkode: Fire |
| D Nookomis's Dreamcatcher [Habitat Net] | K Promontory Park Visitor Center |
| E D Street Stair | L Mishoomis Birch Grove |
| F Sassafras Rest [Overlook] | |



**PROJECT GOAL /
INCORPORATE A LIVING LANDSCAPE**



MASHKIKI (MEDICINE) / NATIVE SPECIES PLANTING DESIGN

“In some Native languages the term for plants translates to “those who take care of us.”

Robin Wall Kimmerer (2013). P.229

“According to Keewaydinoquay’s teachings, plants are thought of as beings with their own histories, stories, beliefs, and ways of life. Anishinaabe protocols require us to introduce plants just as we would introduce another human being...”

Wendy Makoons Geniusz (2015), p.xiii



LEGEND

- Seasonal interest - Spring
- Seasonal interest - Summer
- Seasonal interest - Fall
- Seasonal interest - Winter
- Bird habitat
- Pollinator species



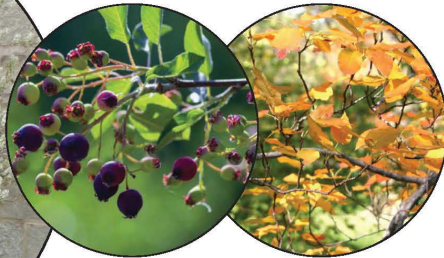
BRIDGE MEADOW

TREES



Waabshkaakzaat
Trembling Aspen
(Populus)

SHRUBS



Gozigwaakomin
Allegheny Serviceberry
(Amelanchier laevis)



Paakzigan
Bearberry
(Arctostaphylos
canadensis)



Odigadimanido
New Jersey Tea
(Ceanothus
americanus)



Northern-Bush
Honeysuckle
(Diervilla lonicera)



St. John's Wort
(Hypericum
kalmianum)



Bush Cinquefoil
(Potentilla fruticosa)



Canadian Yew
(Taxus canadensis)

PERENNIALS



Aadjdamowana
Yarrow
(Achillea millefolium)



Pearly Everlasting
(Anaphalis
margaritacea)



Canadian Windflower
(Anemone canadensis)



Asters
(Aster species)



Purple and Pale Purple Coneflower
(Echinacea purpurea & E. pallida)



Prairie Smoke
(Geum triflorum)



Kansas Gayfeather
(Liatris spicata)



Common Bee Balm
(Monarda didyma)



Evening Primrose
(Oenothera biennis)



Mamaakade-niingweyag
Black-eyed Susans
(Rudbeckia hirta)



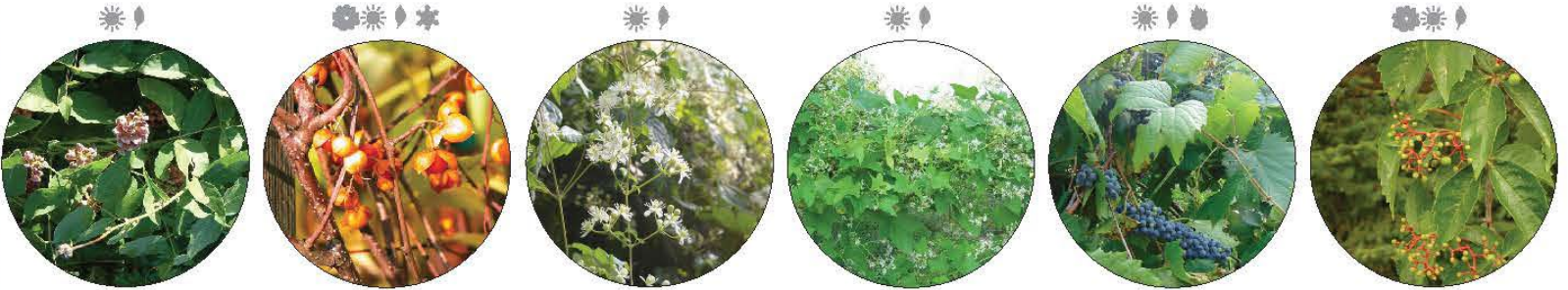
Waasakoneg+wag
Goldenrod
(Solidago species)

GRASSES



Sideoats Grama (*Bouteloua curtipendula*)
 Sedges (*Carex* species)
 Canada Wild Rye (*Elymus canadensis*)
 Switch Grass (*Panicum virgatum*)
 Little Bluestem (*Schizachyrium scoparium*)
 Dropseed (*Sporobolus cryptandrus*)

VINES (DREAMCATCHER)



Groundnut (*Apios americana*)
 Bittersweet (*Celastrus scandens*)
 Virgin's Bower (*Clematis virginiana*)
 Wild Cucumber (*Echinocystis lobata*)
 Riverbank Grape (*Vitis riparia*)
 Virginia Creeper (*Parthenocissus quinquefolia*)



ISHKODE (FIRE) AREA

WIIGWAAS (WHITE BIRCH) GROVE

THE SEVEN SACRED TREES (IN ORDER OF USE IN FIRE)

- LEGEND**
- Seasonal interest - Spring
 - Seasonal interest - Summer
 - Seasonal interest - Fall
 - Seasonal interest - Winter
 - Bird habitat
 - Pollinator species

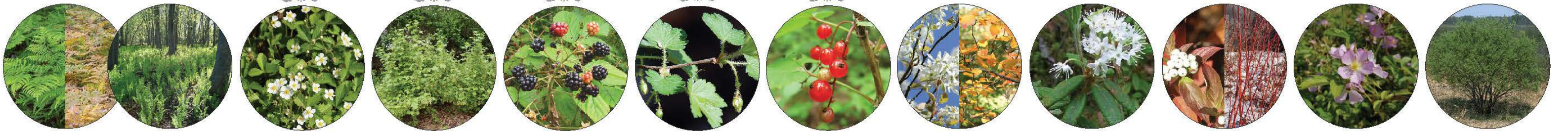


Wiigwaas White (Paper) Birch (*Betula papyrifera*)
 Zasgobmish Black Willow (*Salix nigra*)
 Giizhik Eastern White Cedar (*Thuja occidentalis*)
 Waabshkaakzaat Poplar (*Populus* species)
 Zhingwaak Eastern White Pine (*Pinus strobus*)
 Ninaatik Maple (*Acer* species)
 Bgaakmish Oak (*Quercus* species)

FERNS

BERRIES

SHRUBS



Bracken Fern (*Pteridium aquilinum*)
 Ostrich Fern (*Matteuccia struthiopteris*)
 Ode'imín Wild Strawberry (*Fragaria virginiana*)
 Am'komín Black Currant (*Ribes americanum*)
 Odatag' Gomíc Common Blackberry (*Rubus allegheniensis*)
 Zhaaboomnagaawansh Prickly Gooseberry (*Ribes cyanosbatii*)
 M'itci' M'ínók Wild Red Currant (*Ribes triste*)
 Gozigwaakomin Serviceberry (*Amelanchier* species)
 New Jersey Tea (*Ceanothus americanus*)
 Mskwaabimzhiins Red Osier Dogwood (*Cornus sericea*)
 Ginii Roses (*Rosa* species)
 Oziisigobimzhi Willows (*Salix* species)

PROJECT GOAL / EMBODY SUSTAINABLE STRATEGIES



1 LONGEVITY OF STRUCTURE / A bridge that is admired for its presence on the landscape just as much as its value to daily use.



2 WEIGHT OPTIMIZATION / The bridge's design saved materials by optimizing its structure through rigorous engineering modeling and force-based calculations.



3 RECYCLED MATERIALS / The use of recycled steel and locally sourced limestone helps to reduce the bridge's overall carbon footprint.



4 CARBON SEQUESTERING SUBSTITUTES / Portland cement, concrete admixtures, and Kebony decking hold onto carbon that would be released into the atmosphere.



5 HABITAT IMPROVEMENT / Non-human species will benefit from rock rip rap and habitat netting, allowing more biodiversity to flourish in the area.



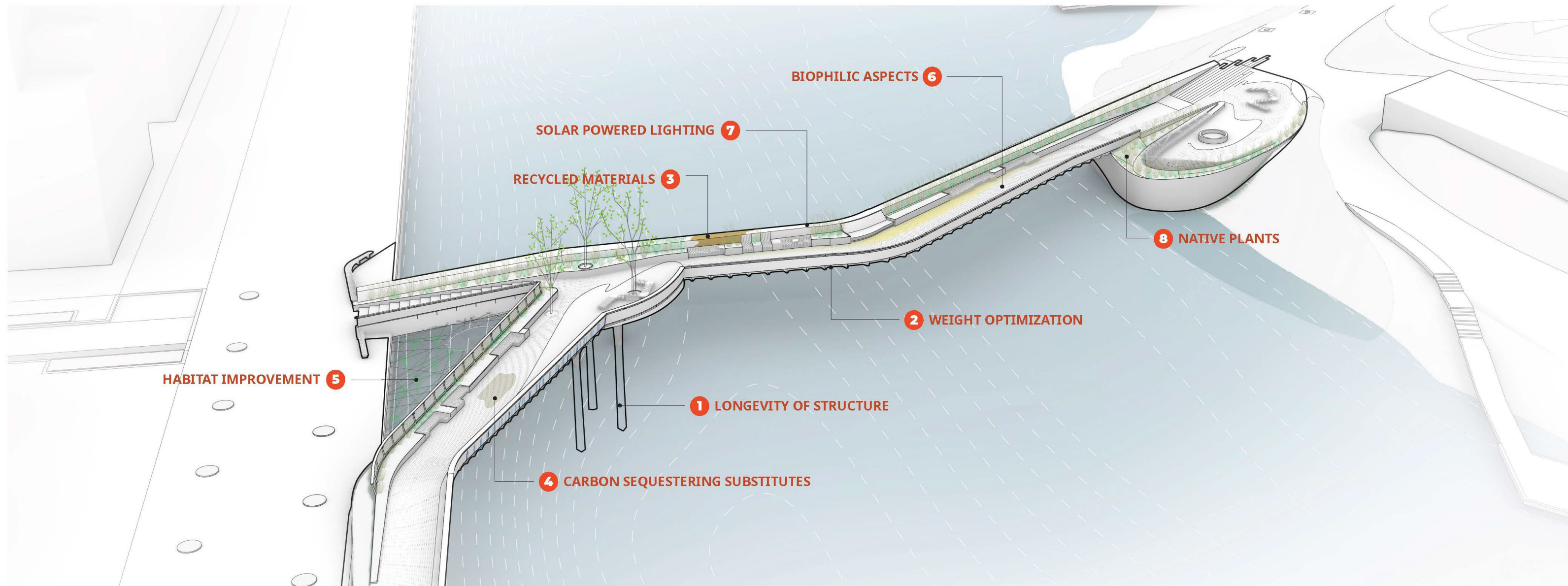
6 BIOPHILIC ASPECTS / The warmth of carbon-sequestering wood is used throughout, along with body-adjacent water and natural vegetation to improve health.



7 SOLAR POWERED LIGHTING / LED fixtures and low carbon lights minimize light pollution and electricity consumption.



8 NATIVE PLANTS / Low-maintenance and low-water vegetation provides decreased use of natural resources and contributes to biophilic and habitat aspects.



MICRO-CLIMATES



SHADED SEATING



WIND BREAK



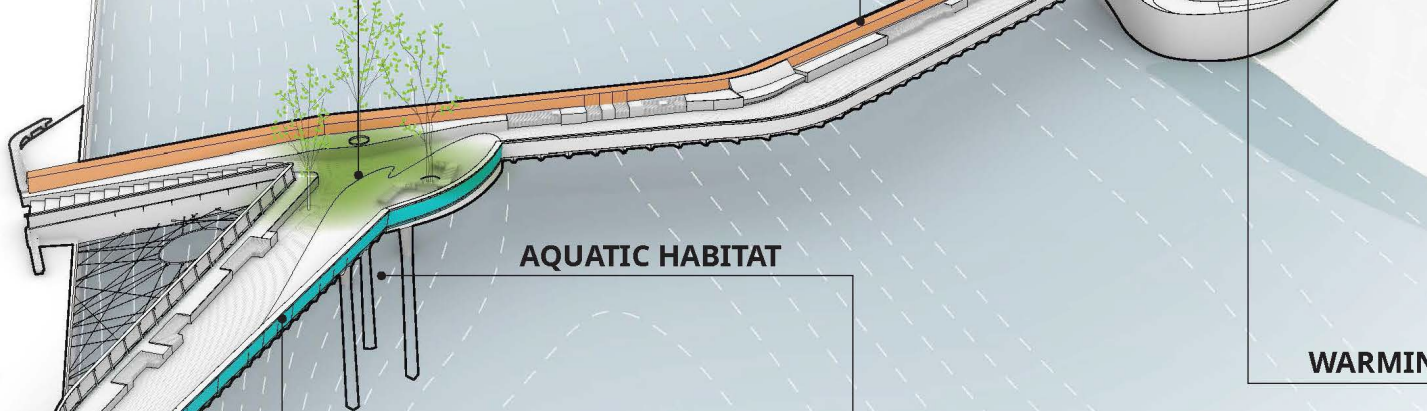
WARMING AREA



EVAPORATIVE COOLING



AQUATIC HABITAT



PROJECT GOAL /
CREATE A PLACE FOR ALL PEOPLE



SURFACE MATERIALS



WEATHERED STEEL



LANDSCAPE EDGING



PERFORATED SKIN



ENGINEERED MODIFIED WOOD



SEATING



DECKING



RAILING CAP



QUEENSTON LIMESTONE



FLAMED PAVER & STEPS



CLEFT ABUTMENT CLADDING



CONCRETE



PIERS



STAINLESS STEEL



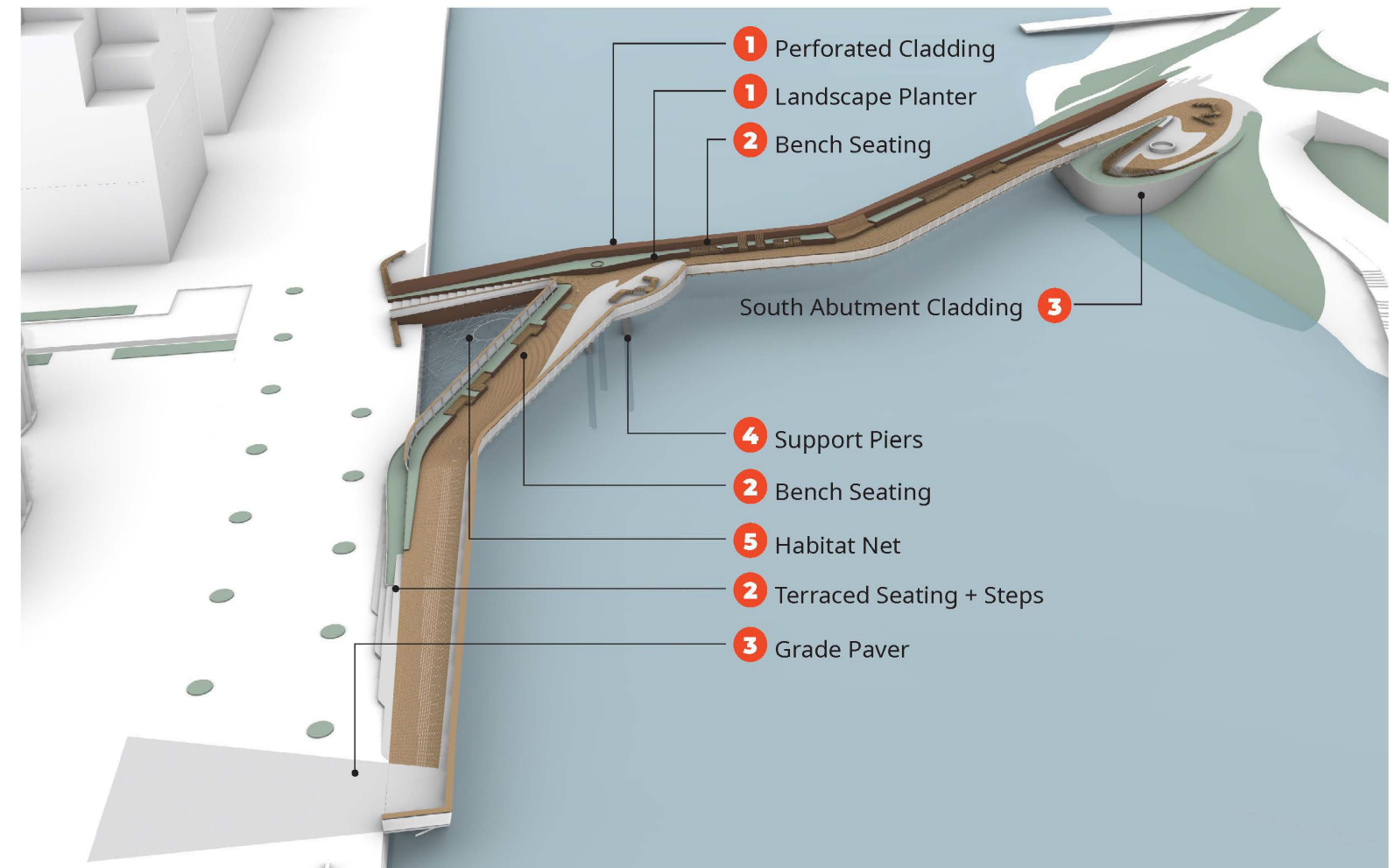
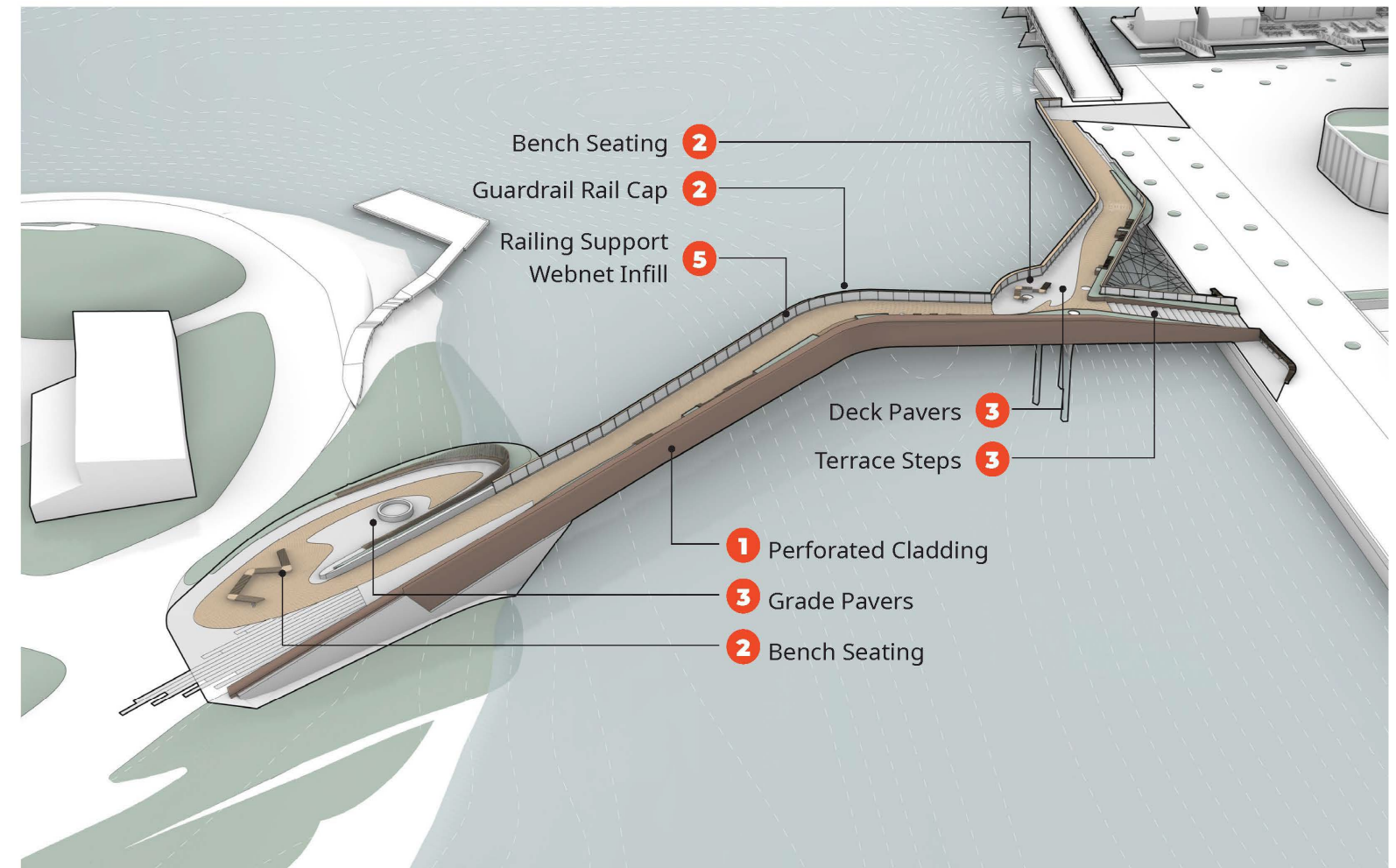
RAILING



HABITAT NET



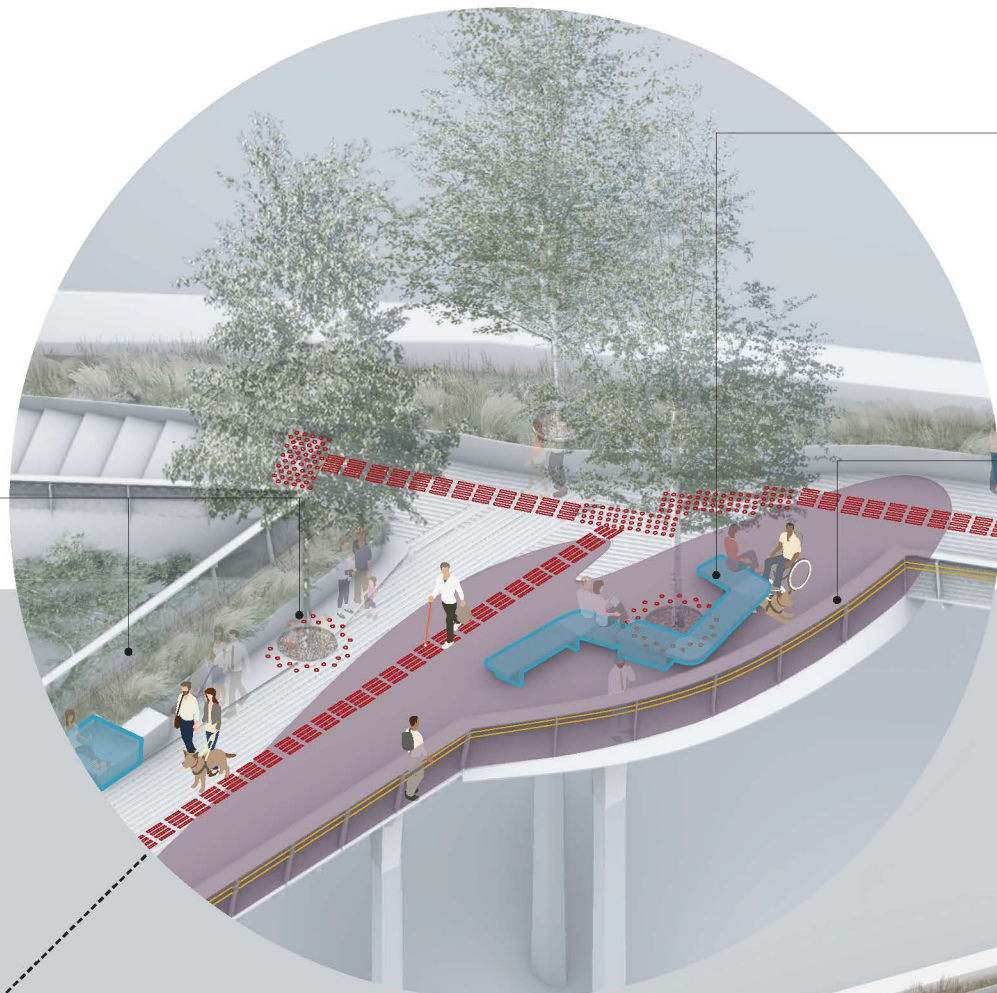
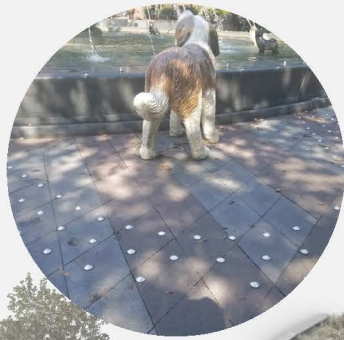
STRUCTURAL RIBS



UNIVERSAL ACCESSIBILITY

TACTILE INDICATORS & PATHWAYS

Tactile indicators are strategically placed near trees, and tactile pathways run the length of the bridge to safely guide visually impaired individuals, enabling them to navigate independently

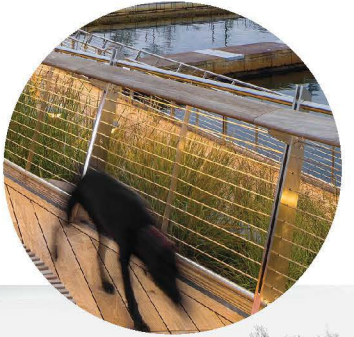


SEATING OPTIONS

Diverse selection of seating options positioned throughout the entire bridge, designed to cater to various body sizes and mobility needs. Beneath the trees, you'll find bench seating areas that not only offer a cool, shaded place to sit but also accommodate service animals comfortably beneath the benches.

RAILINGS

Wooden handrail made from locally sourced wood with integrated light to clearly light the pathway.

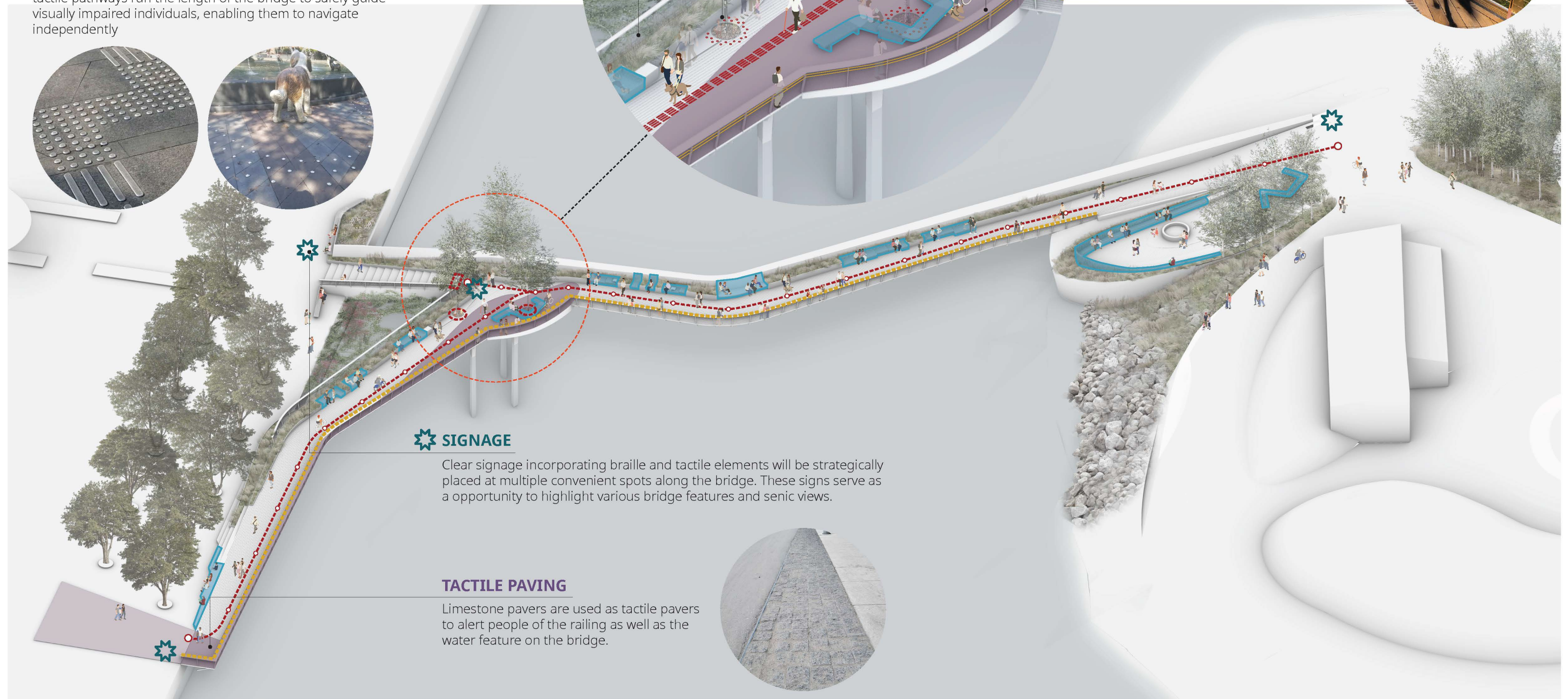


SIGNAGE

Clear signage incorporating braille and tactile elements will be strategically placed at multiple convenient spots along the bridge. These signs serve as an opportunity to highlight various bridge features and scenic views.

TACTILE PAVING

Limestone pavers are used as tactile pavers to alert people of the railing as well as the water feature on the bridge.



SEATING / NORTH BRIDGE + PROMENADE

D STREET STAIR

- (1) Cascading D Street Stair
- (2) East Bench facing new Indigenous Cultural Center
- (3) West Bench Nookomi's Dreamcatcher



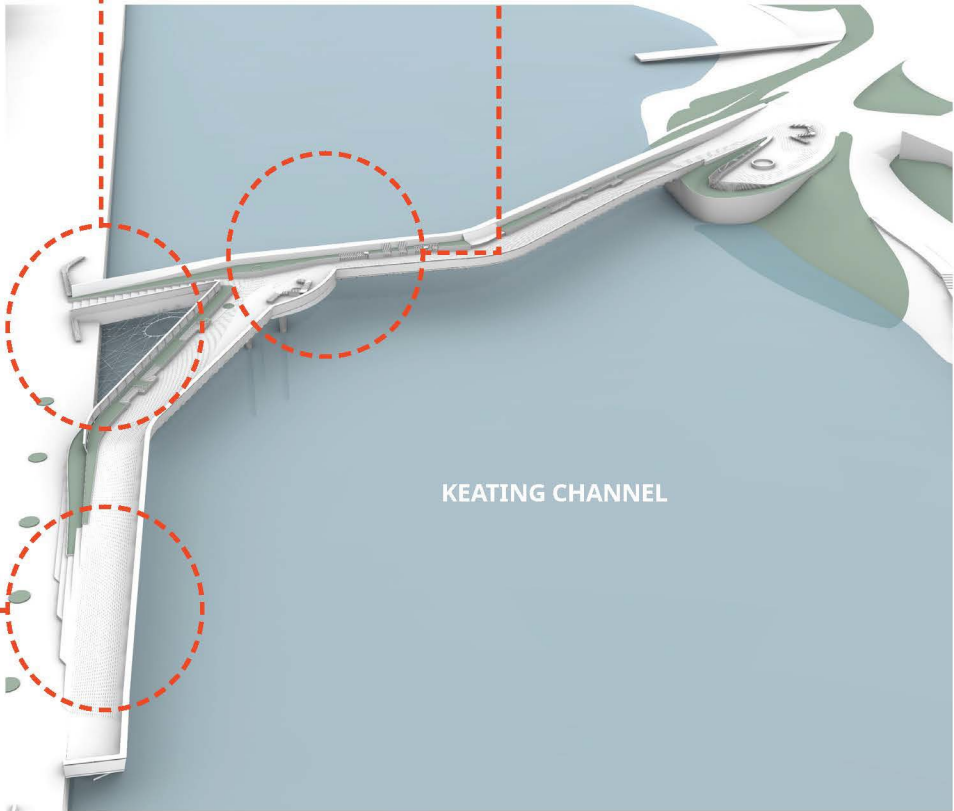
SASSAFRAS REST AREA

- (5) Trembling Aspen trees bench
- (6) Wood Benches along the 7th Fire Wall



NDA-NWENDAAGANAG THRESHOLD STEPS

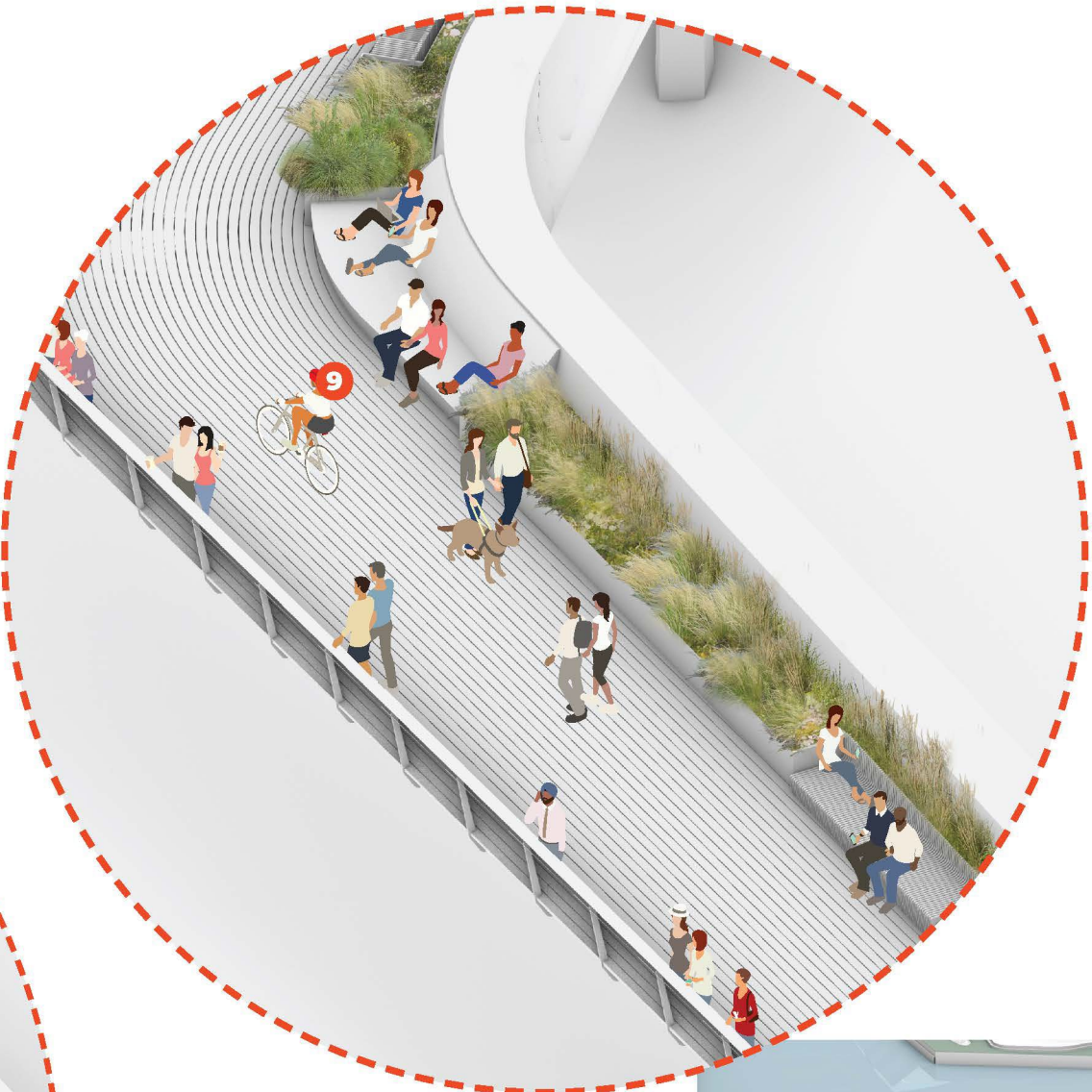
- (4) Seating in the shade of trees along the Waterfront Promenade



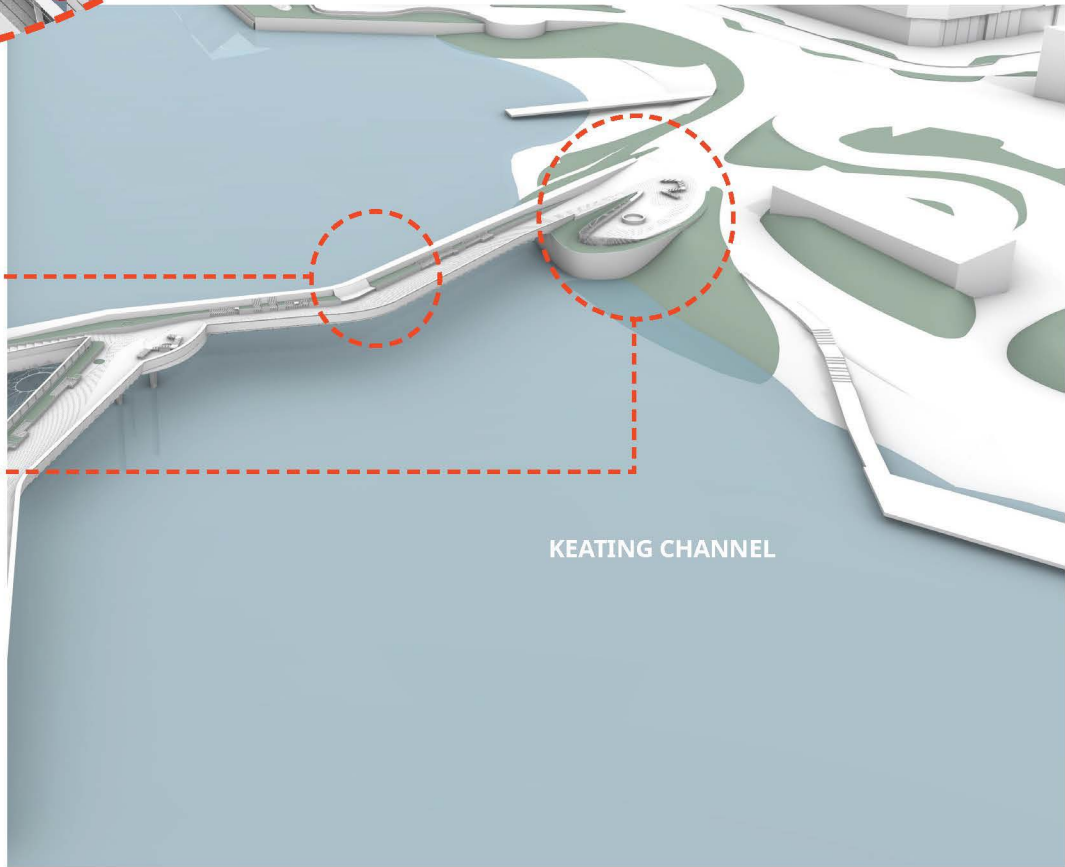
KEY PLAN

SEATING / SOUTH BRIDGE + SHORE

ISHKODE: FIRE SEATING AT THE MEDICINE WHEEL FIRE PIT:
(7) that encircles the Medicine Wheel-inspired fire pit seating
(8) Open seating oriented towards the bridge and Villiers Island



SUN DECK SEATING
(9) The Loungers arranged to maximize sun exposure and sunset views.



KEY PLAN

LIGHTING DESIGN

INTEGRAL STAIR LIGHTING

Integrated stair lighting can create more of a formal lighting gesture to this large staircase



SPOT LIGHTING

Adjustable spotlights can illuminate the landscape vine installation from the side of the bridge to minimize glare and ecological impacts



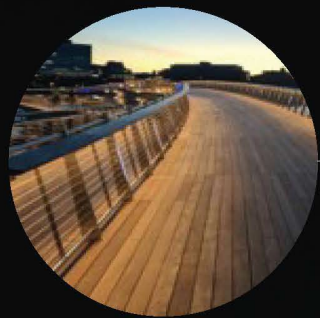
PATHWAY / LANDSCAPE LIGHTING

Low level, full cutoff bollards along the landscape margins will provide localized ambient lighting within plant and flower beds.



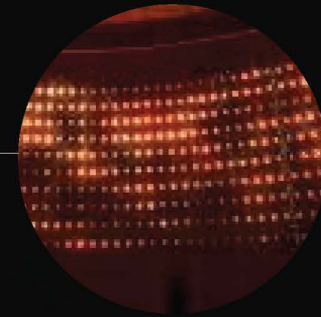
INTEGRAL HANDRAIL LIGHTING

Integrated linear handrail lighting on the western edge of the bridge provides an even, indirect wash on the wood deck, balancing the warm glow of the perforated weathered steel scrim.



BACKLIT PERFORATED WEATHER STEEL SCRIM

A future city landmark and cultural destination, the dynamic light of this artistic intervention mimics the movement and color of fire behind the weathered steel scrim, creating an everchanging vignette along the horizon.



UNDER BENCH LIGHTING

Soft lighting concealed underneath benches pools light at gathering and seating areas

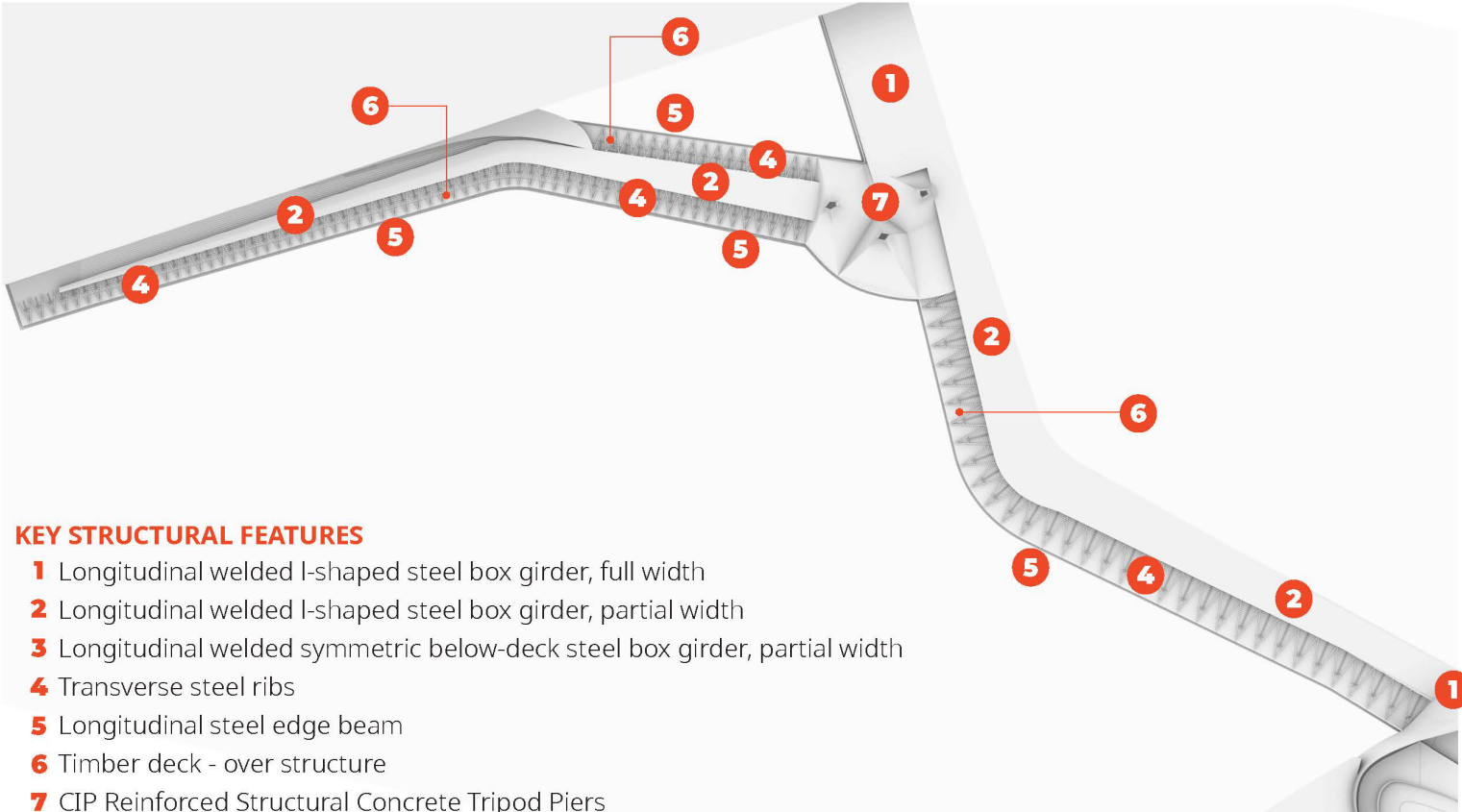


UNDER BENCH LIGHTING

Soft lighting concealed underneath benches pools light at gathering and seating areas



STRUCTURAL / IMPLEMENTATION

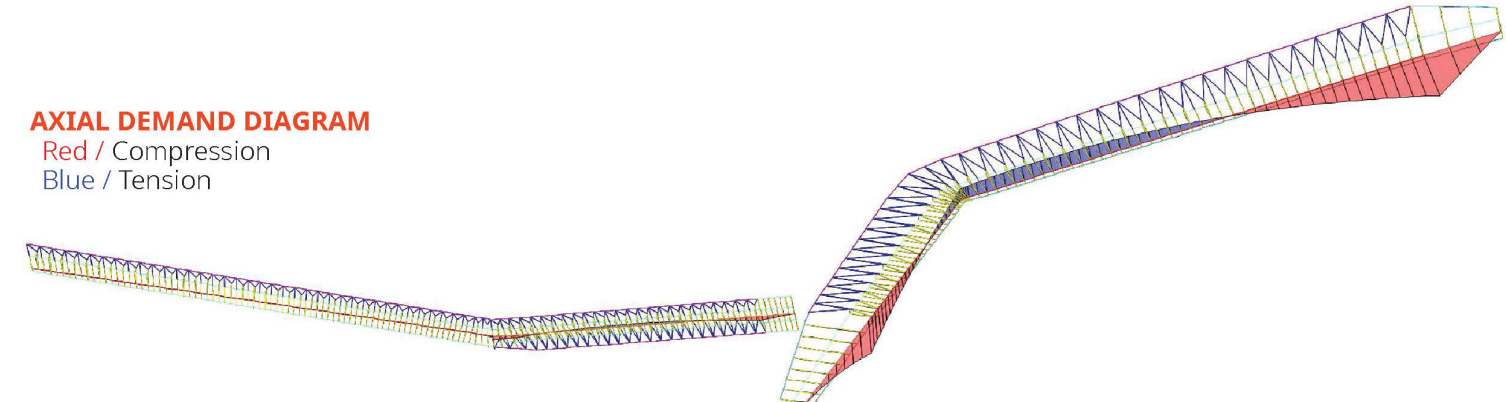


KEY STRUCTURAL FEATURES

- 1** Longitudinal welded I-shaped steel box girder, full width
- 2** Longitudinal welded I-shaped steel box girder, partial width
- 3** Longitudinal welded symmetric below-deck steel box girder, partial width
- 4** Transverse steel ribs
- 5** Longitudinal steel edge beam
- 6** Timber deck - over structure
- 7** CIP Reinforced Structural Concrete Tripod Piers

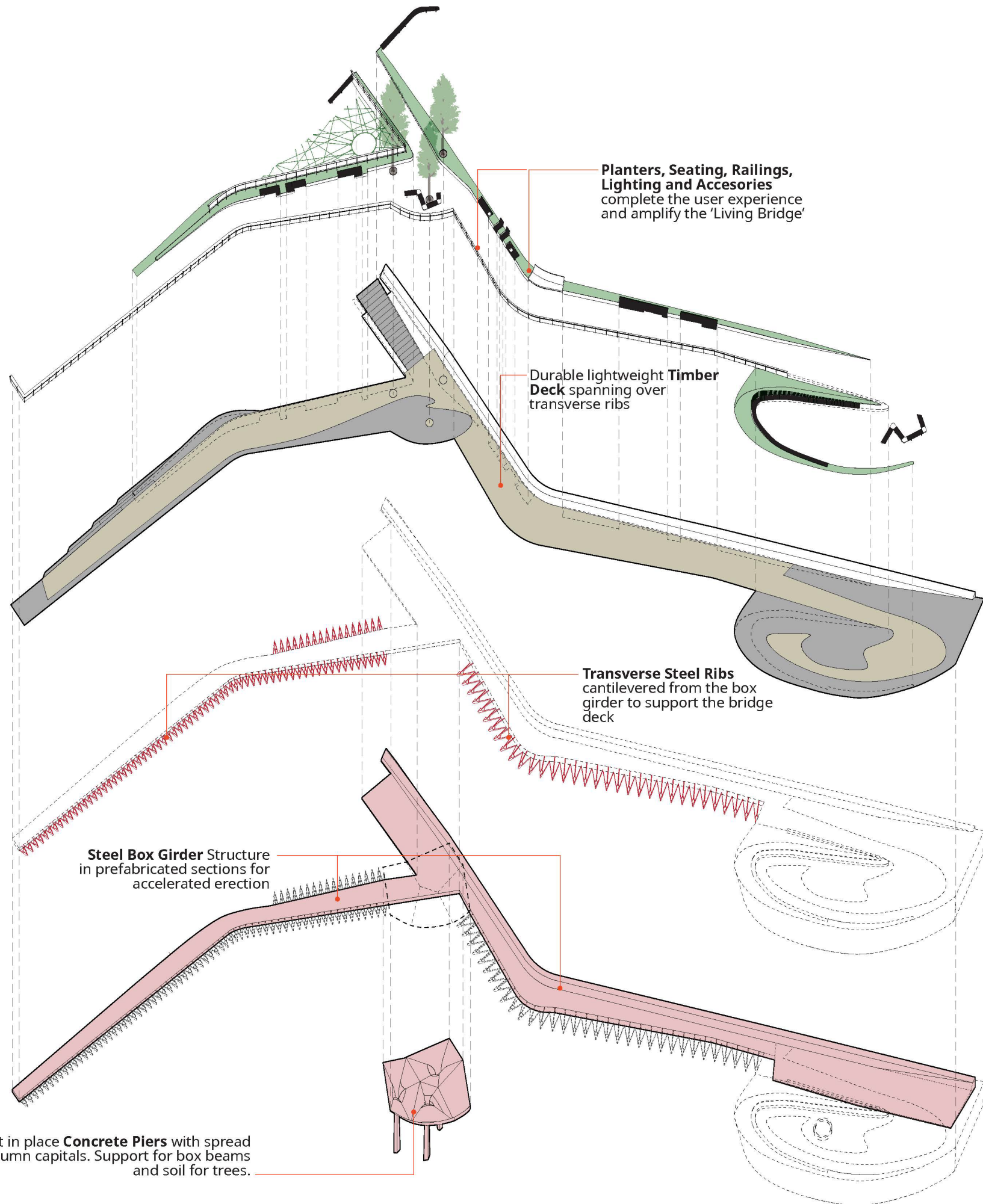
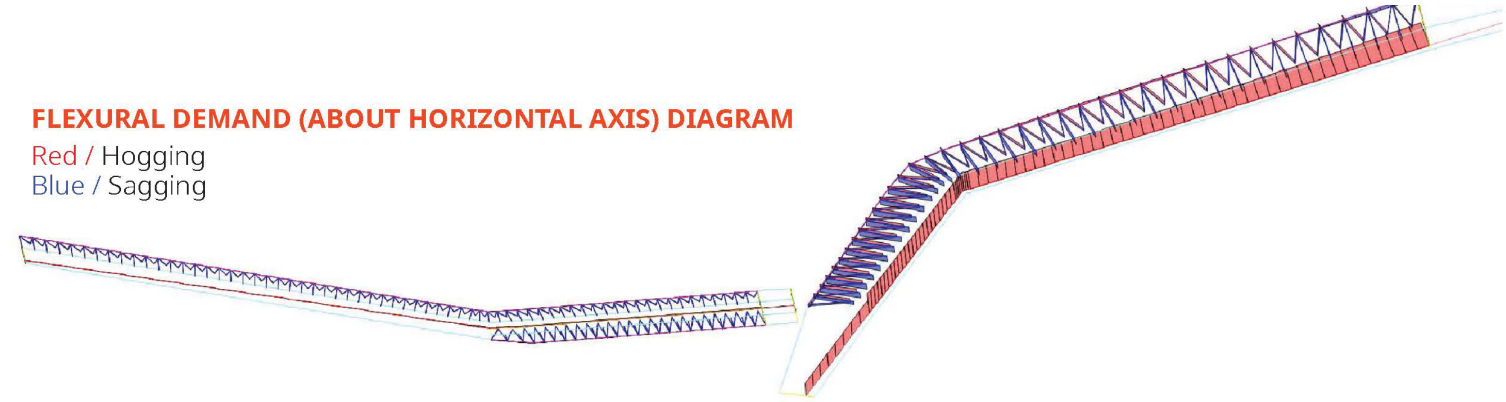
AXIAL DEMAND DIAGRAM

Red / Compression
Blue / Tension

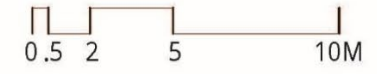
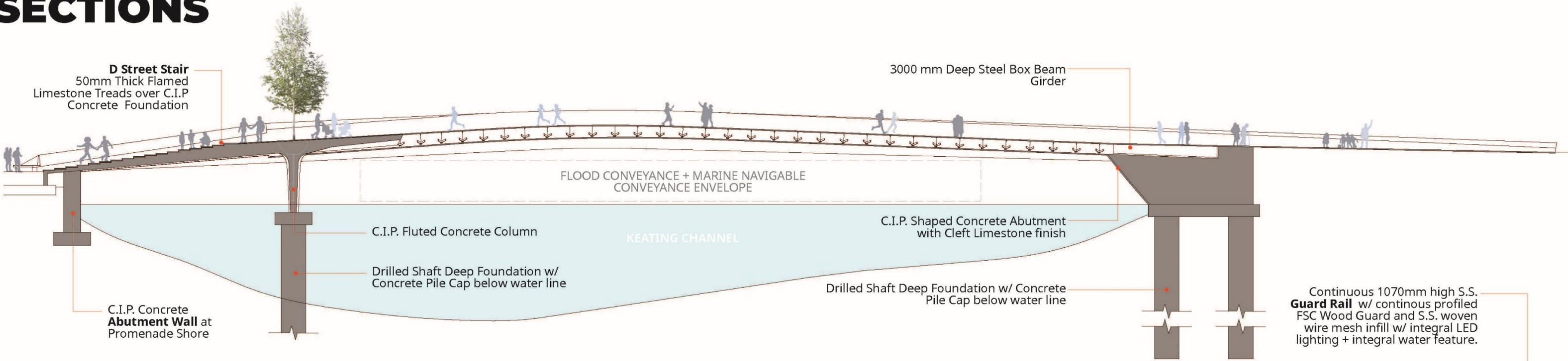


FLEXURAL DEMAND (ABOUT HORIZONTAL AXIS) DIAGRAM

Red / Hogging
Blue / Sagging



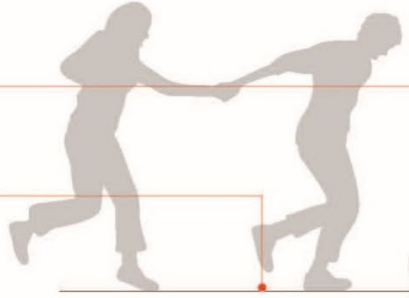
SECTIONS



A-A / LONGITUDINAL SECTION

Promenade Terrace
50mm Thick Flamed Limestone Treads over C.I.P Concrete Foundation

Water's Edge Promenade



Bridge Decking
25mm FSC Wood Decking w/ Sleepers over Girder, w/ 64mm FSC Structural Wood Decking at Ribs



LED Light

Transverse S.S. Rib Plate

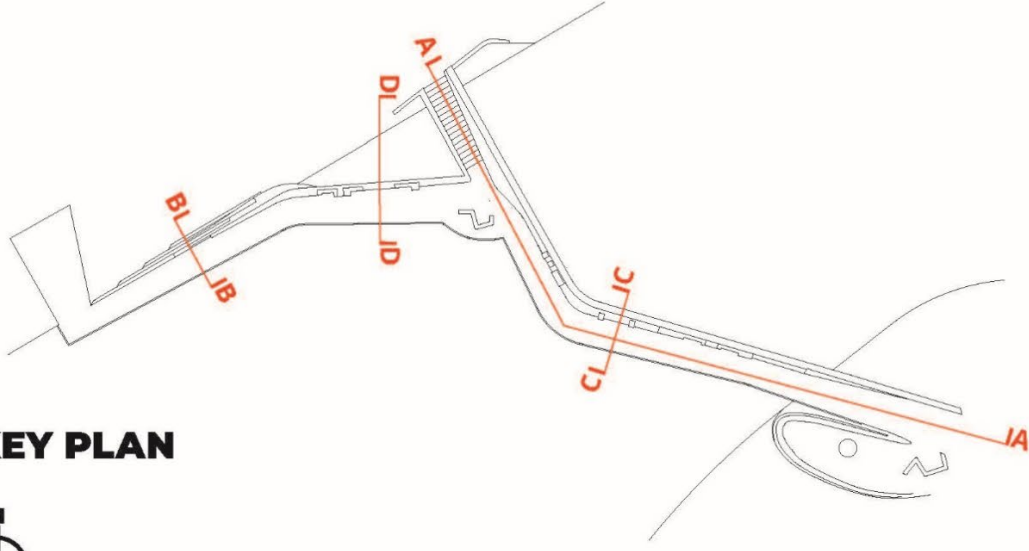
Perforated Weathered Steel Scrim w/ internal LED back-lighting

Longitudinal Welded Steel Box Girder

C.I.P. Concrete Abutment Wall at Promenade Shore

KEATING CHANNEL

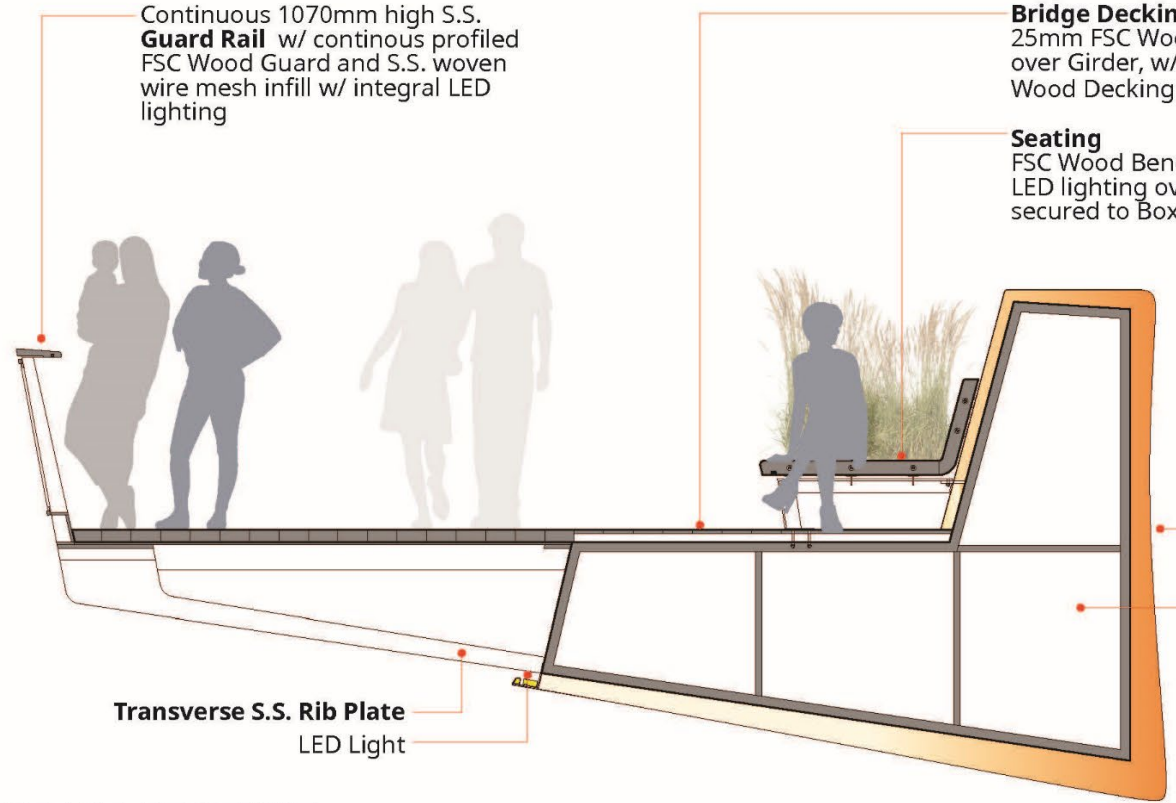
B-B / TRANSVERSE SECTION



KEY PLAN



SECTIONS



Continuous 1070mm high S.S. Guard Rail w/ continous profiled FSC Wood Guard and S.S. woven wire mesh infill w/ integral LED lighting

Bridge Decking
25mm FSC Wood Decking w/ Sleepers over Girder, w/ 64mm FSC Structural Wood Decking at Ribs

Seating
FSC Wood Bench Construction w/ integral LED lighting over aluminum frame secured to Box Girder.

Transverse S.S. Rib Plate
LED Light

Perforated Weathered Steel Scrim w/ internal LED back-lighting

Longitudinal Welded Steel **Box Girder**

C-C / TRANSVERSE SECTION



Continuous 1070mm high S.S. Guard Rail w/ continous profiled FSC Wood Guard and S.S. woven wire mesh infill w/ integral LED lighting

Landscaped Habitat Net - S.S. cable w/ central ring secured to face of Abutment Wall and Bridge structure.

C.I.P. Concrete **Abutment Wall** at Promenade Shore

Weathered Steel Planter Box for **Habitat Net** Planting secured to face of Promenade Abutment Wall.

Bridge Decking
25mm FSC Wood Decking w/ Sleepers over Girder, w/ 64mm FSC Structural Wood Decking at Ribs

On-deck Weathered Steel Planter Box with internal drainage

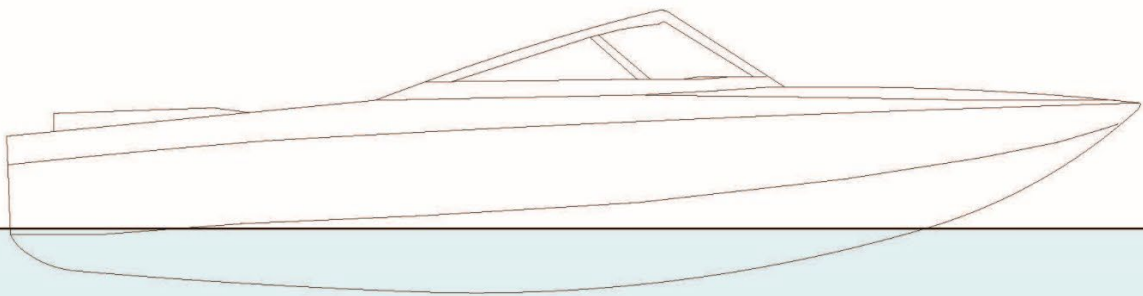
Seating
FSC Wood Bench Construction w/ integral LED lighting over aluminum frame secured to Box Girder.

Perforated Weathered Steel Scrim w/ internal LED back-lighting

Longitudinal Welded Steel **Box Girder**

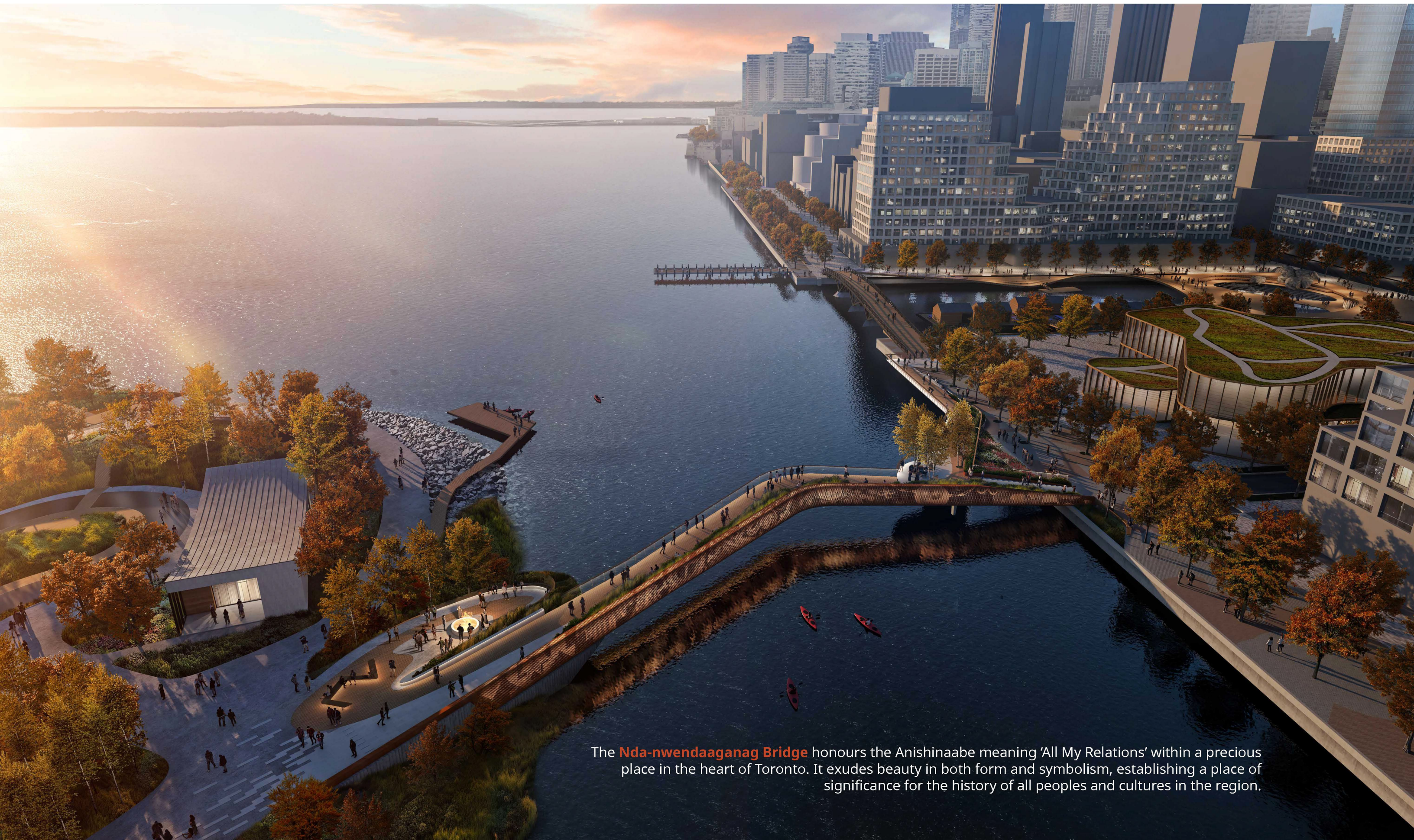
Transverse S.S. Rib Plate
LED Light

D-D / TRANSVERSE SECTION



PROJECT GOAL /

CREATE A BEAUTIFUL AND DISTINCTIVE GATEWAY TO THE WATERFRONT



The **Nda-nwendaaganag Bridge** honours the Anishinaabe meaning 'All My Relations' within a precious place in the heart of Toronto. It exudes beauty in both form and symbolism, establishing a place of significance for the history of all peoples and cultures in the region.