



Keating Channel Pedestrian Bridge Schematic Design

Oct. 30, 2024

Summary

The Keating Channel Pedestrian Bridge project consists of the design and construction of a bridge crossing the Keating Channel between Quayside and Villiers Island.

- The span of the bridge is approximately 100m
- Minimum vertical and horizontal clearances are required to ensure safe navigation for marine vessels and protect for regulatory flood flows
- As an active transportation bridge, the design must be fully accessible and accommodate various modes of non-vehicular use.
- The scope will include structural infrastructure, surface treatments, potential integrated softscaping, lighting, furnishings, signage, and wayfinding.
- The north and south landings of the bridge fall in Quayside and Villiers Island and as both communities are under development, interim uses and connections for both sites will be studied.
- This project is committed to working in collaboration with the MCFN, and with other Indigenous Communities, throughout the design and delivery the bridge.

RFP Objectives: Project Goals

Keating Channel Pedestrian Bridge

Proponent: Waterfront Toronto

Design Team: WilkinsonEyre, Zeidler Architecture
Two Row Architect, Arup, PLANT Architect

Review Stage: Schematic Design



1 Create a Beautiful and Distinctive Gateway to the Waterfront



2 Connect the City and Villiers Island



3 Incorporate a Living Landscape



4 Create with Indigenous Voice and Agency



5 Embody Sustainable Strategies and Innovation



6 Create a Place for All People

Site Context Existing

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Review Stage: Schematic Design



Site Context Future

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Site Context Landing Sites



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North: Quayside & WEP



South: Villiers Island and PPN

Project Progress

- The 30% Design (100% SD) milestone was submitted in summer 2024
- Since then, the team have:
 - Presented to the Community Advisory Committee
 - Coordinating with the design teams of each landing site
 - Geotechnical Investigations at each landing site
 - Examining multiple cost estimates
 - Undertaken a procurement process to hire a contractor who will provide early input on the project and assist in optimizing the bridge from a cost and constructability perspective
- Next Steps Include:
 - Value engineering studies
 - Advancing the project through Detailed Design (DD) to the 60% Design milestone
 - Project schedule refinement and confirmation

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Review Stage: Schematic Design



DRP Process

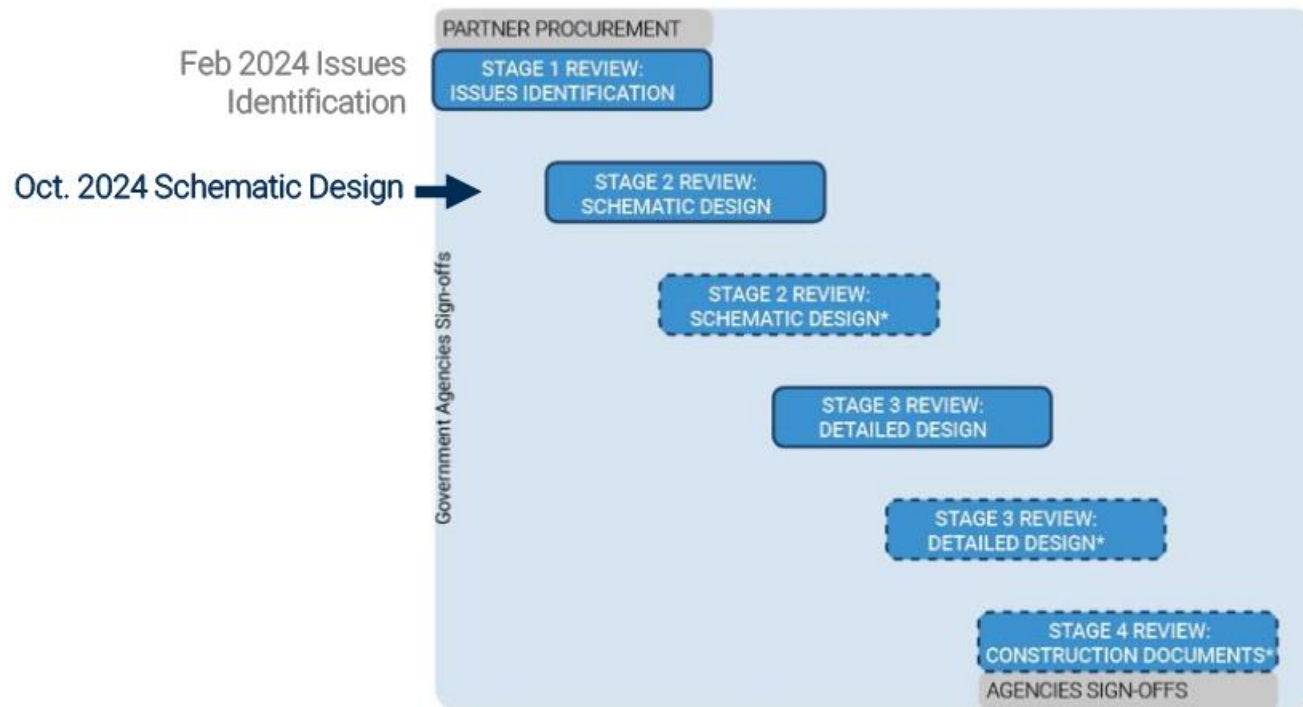
Stream 2: Public Land

Keating Channel Pedestrian Bridge

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Review Stage: Schematic Design



Areas for Panel Consideration

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Review Stage: Schematic Design

Relationship with Context/Integration

- Is the design well integrated with the immediate context and the greater existing and future public realm network?
 - North landing and Water's Edge Promenade
 - South landing and Promontory Park

Design Excellence

- How are accessibility and active transportation challenges being addressed?
- How can the design continue to evolve to meet the objectives of the Project Goals?
- What are the most crucial aspects of the design, that must not be lost through VE?

Sustainability and Resilience Design

- Are there other strategies to consider for reducing the embodied carbon emissions of the project?

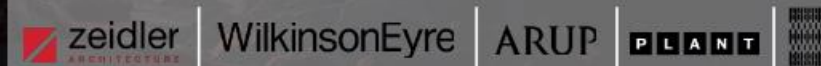


The Equinox Bridge

Keating Channel Pedestrian
Bridge

DRP#2 – Schematic Design

October 30, 2024



Team



Prime Proponent

WilkinsonEyre

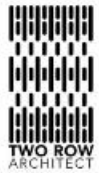
Design Lead

ARUP

Engineering

PLANT

Landscape



Indigenous Consultant/Architect



Accessibility



Costing

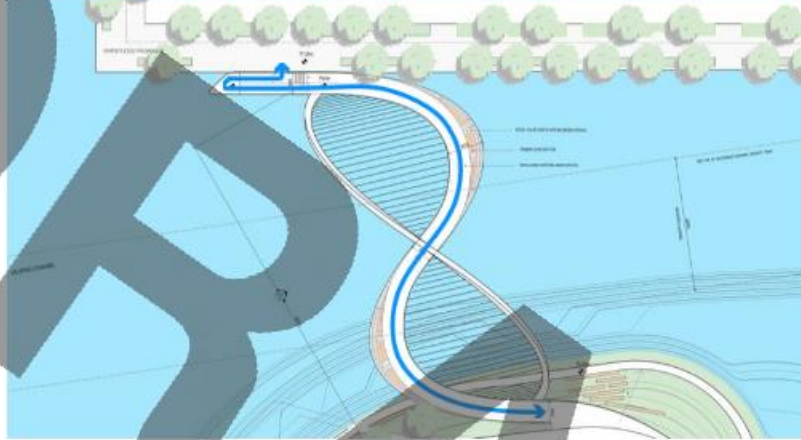
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Six Project Goals

Beautiful and Distinctive Gateway to the Waterfront



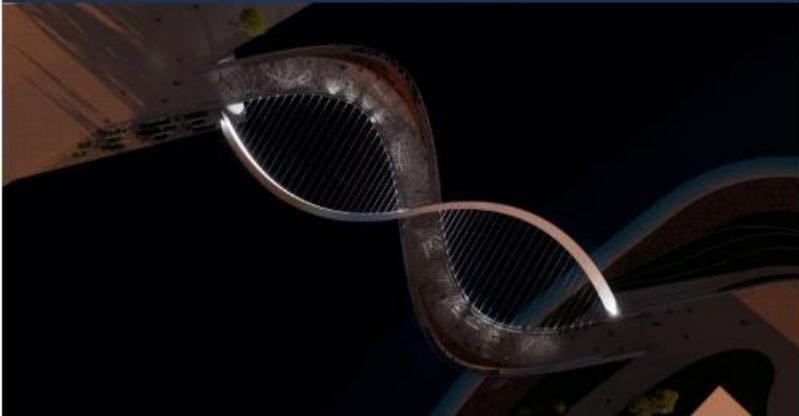
Connecting the City and Villiers Island



Incorporate a Living Landscape



Create with Indigenous Voice and Agency



Embody Sustainable Strategies and Innovation



Create a Place for All People



Site Analysis

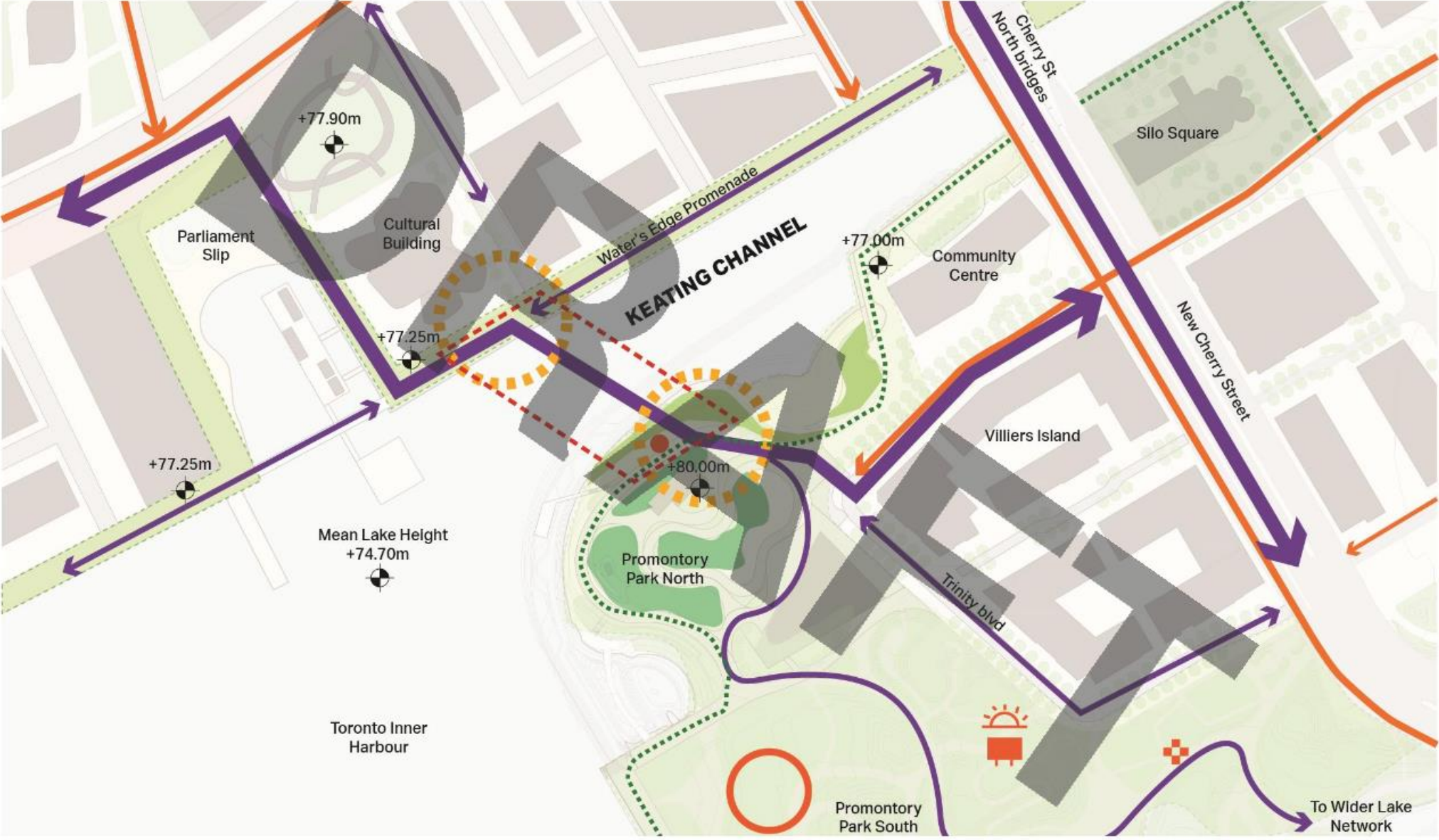


Existing naturalized site condition along the south bank.

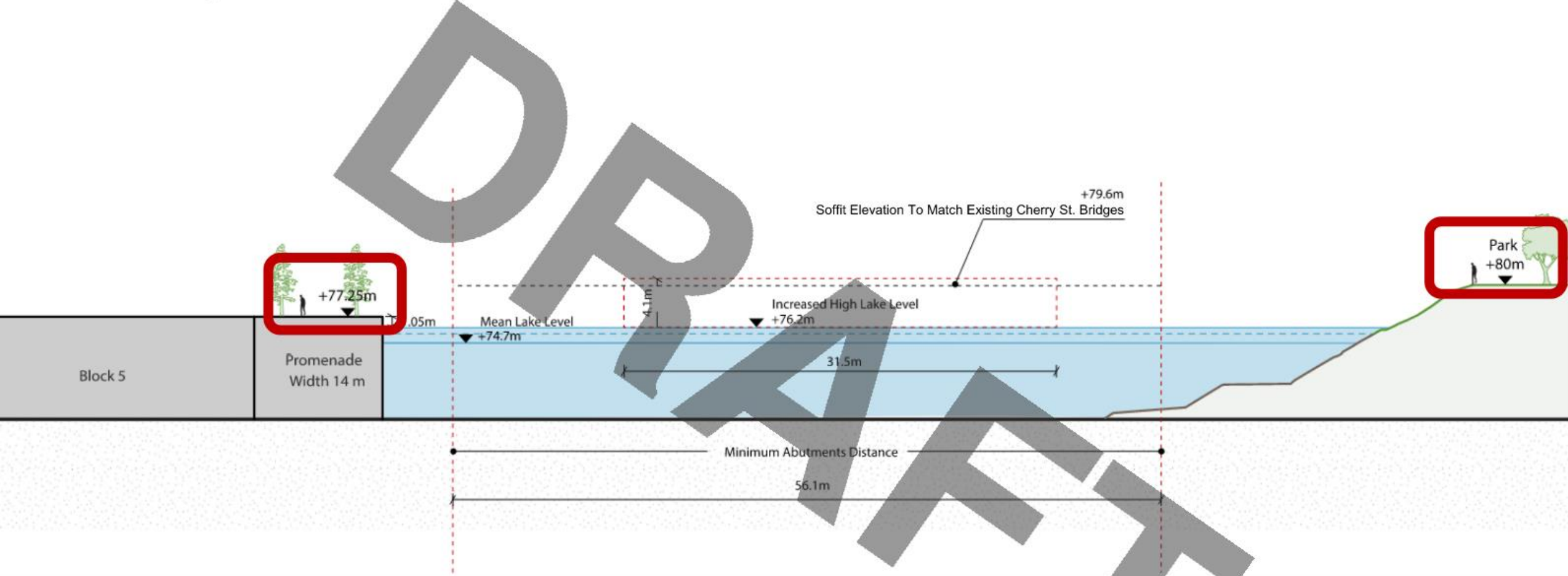


Existing site condition along the north bank with concrete slab.

Connectivity

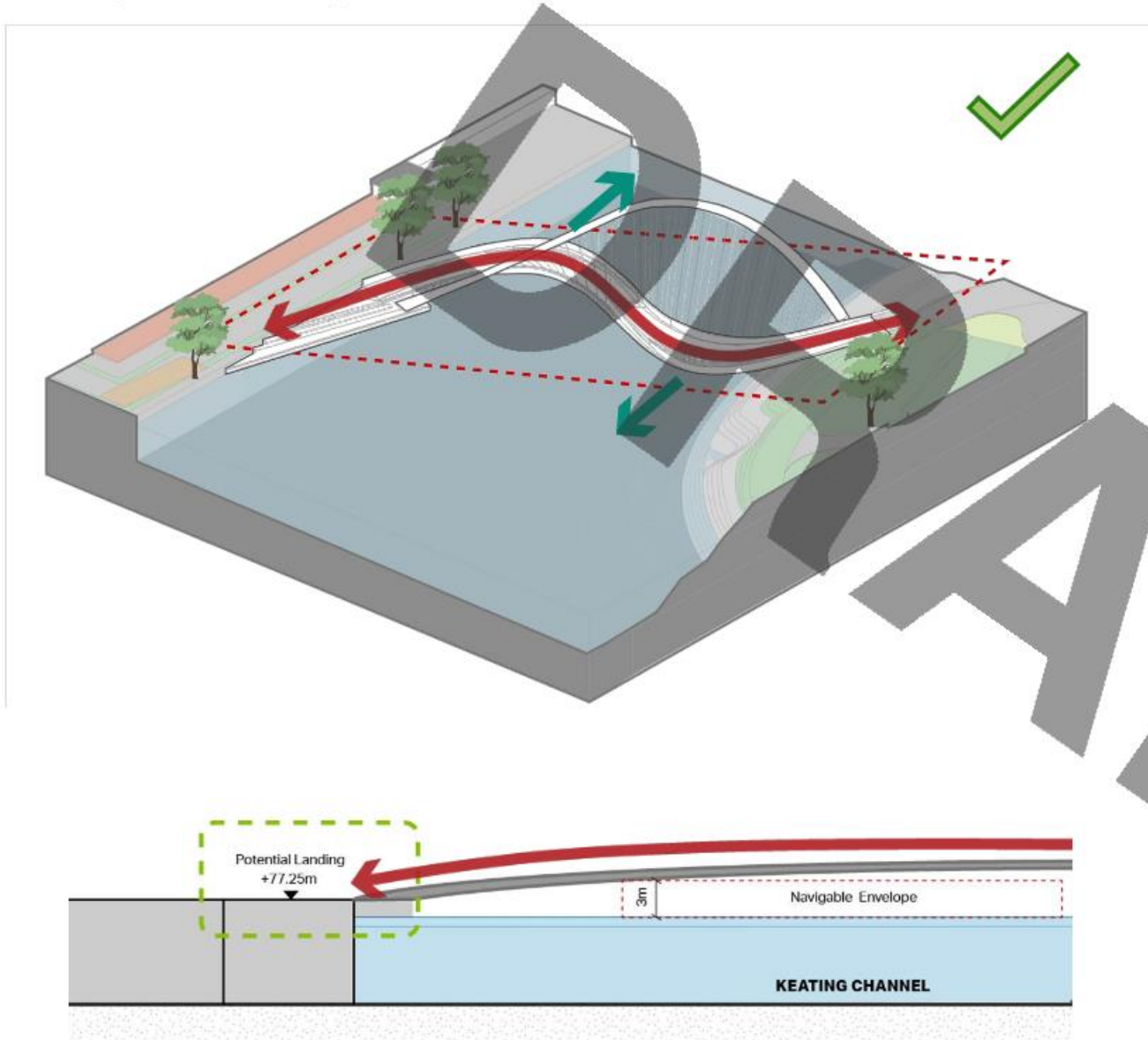


Site Analysis



Section through Keating Channel with revised site constraints

Concept Design Studies



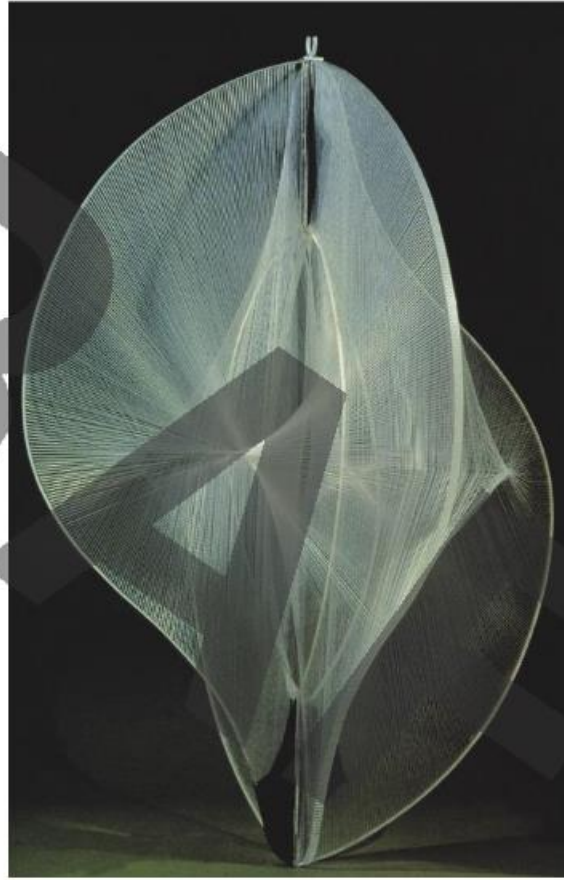
S-Deck and Arch

- + No barriers at Quayside promenade
- + Curving deck length resolves levels at Quayside
- + Natural traffic calming effect to allow pedestrians and cyclists to share bridge safely
- + Equal importance to each side of the bridge, creating a balanced approach and views to both sides
- + Informed by directionality and a connection to place
- + Arch is structurally efficient and requires minimal steel
- + Ties in with the 'family of bridges' approach in elevation, complimenting the Cherry Street North bridges
- + Form aligns with sinuous forms of the deck and natural landscape

Concept Design Studies



Bridge Deck Geometry and Anti-funicular Arch selected for development in final design (Competition Stage Image)



Naum Gabo - Cable Sculpture



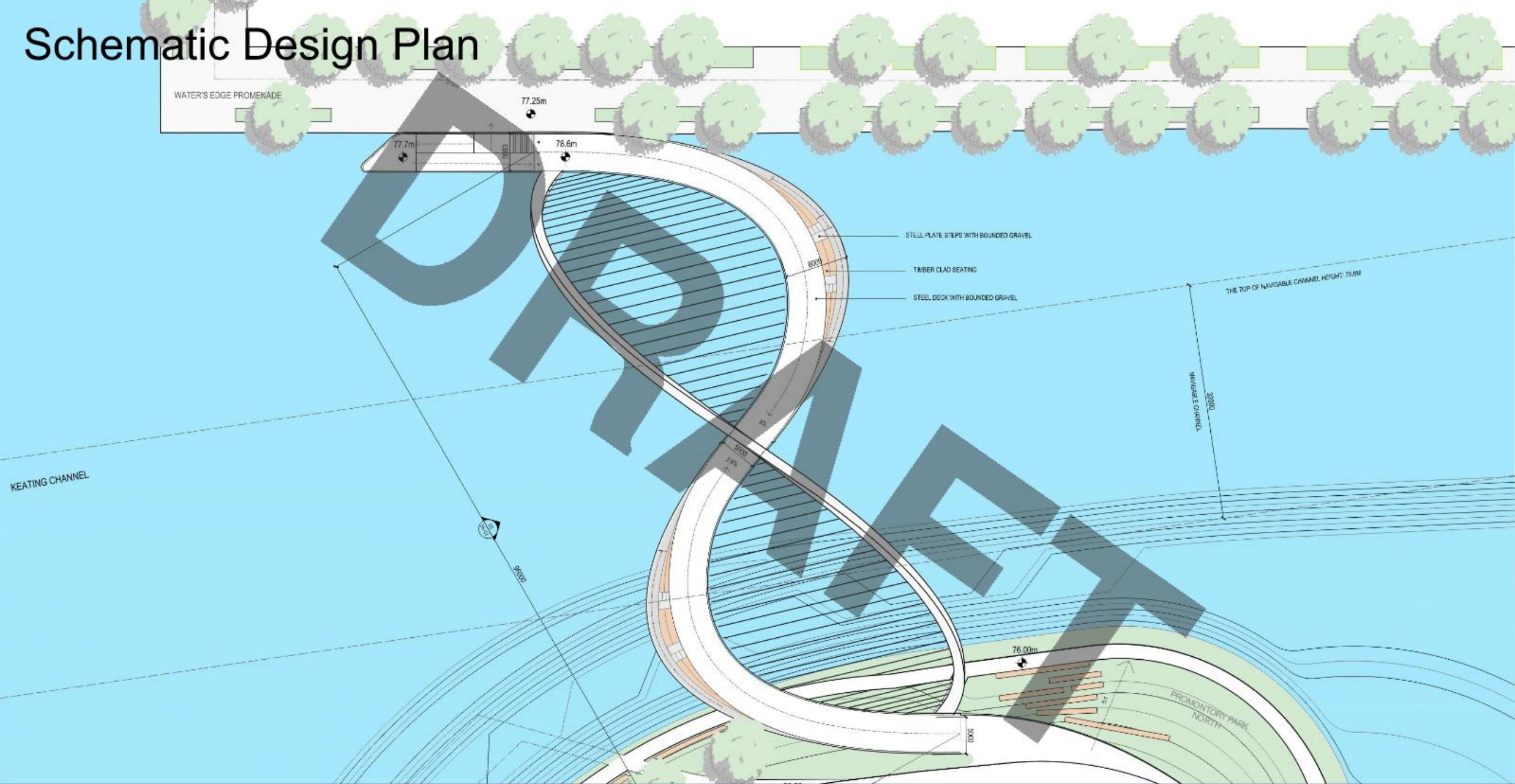
Brian Jungen – Sculpture: *My Decoy*

Schematic Design

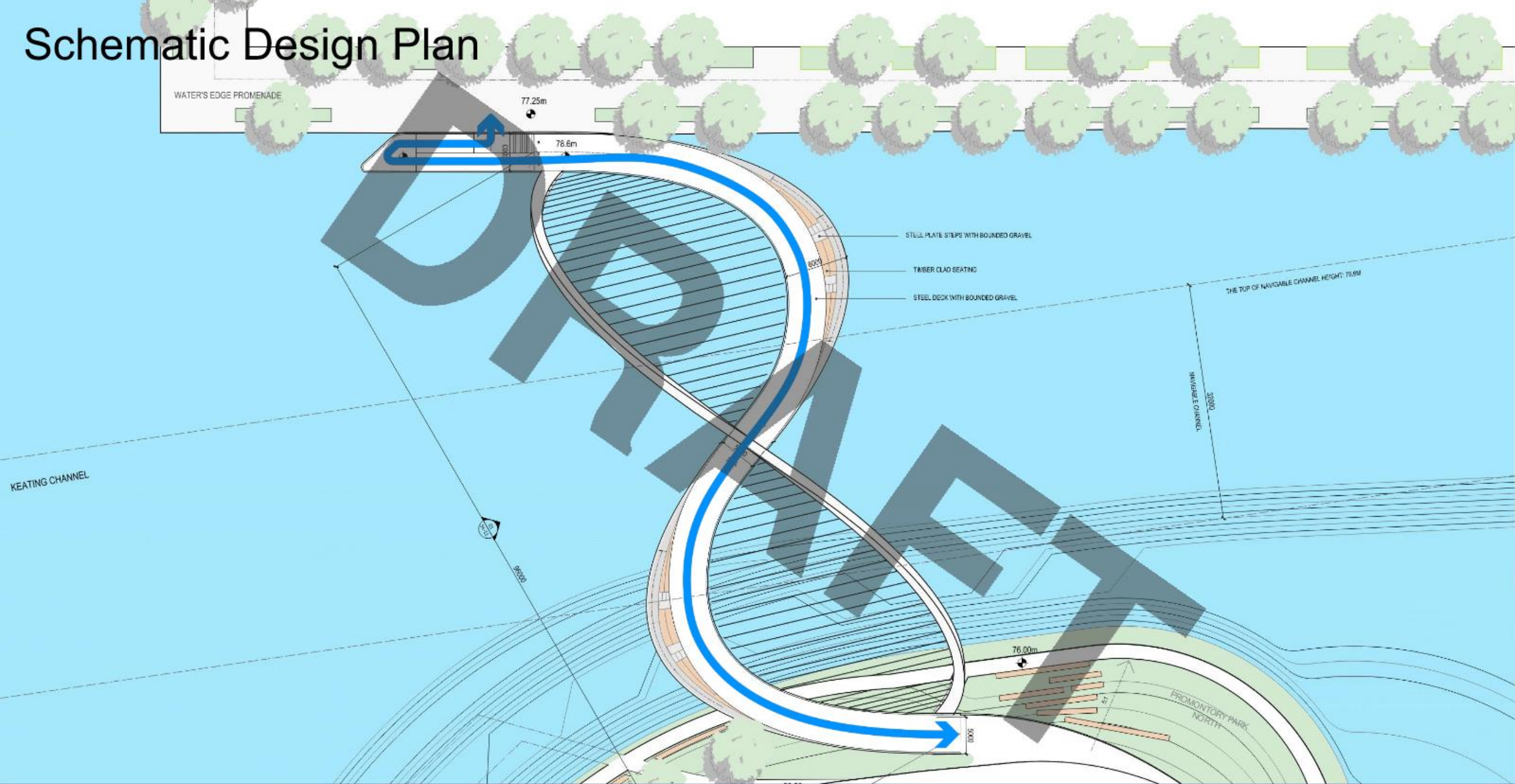


S-shaped bridge aligns with north quay and park finished levels. All ramping is part of bridge geometry

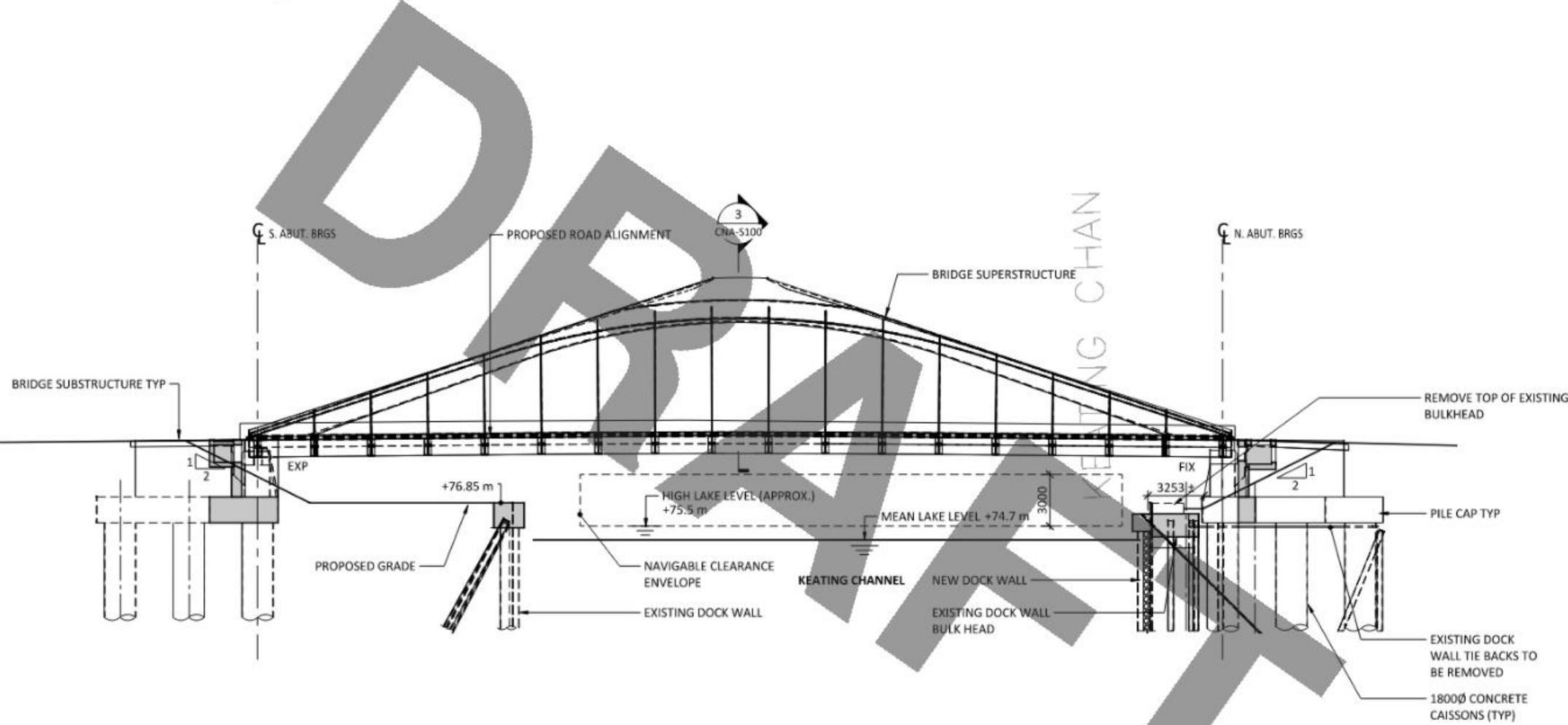
Schematic Design Plan



Schematic Design Plan

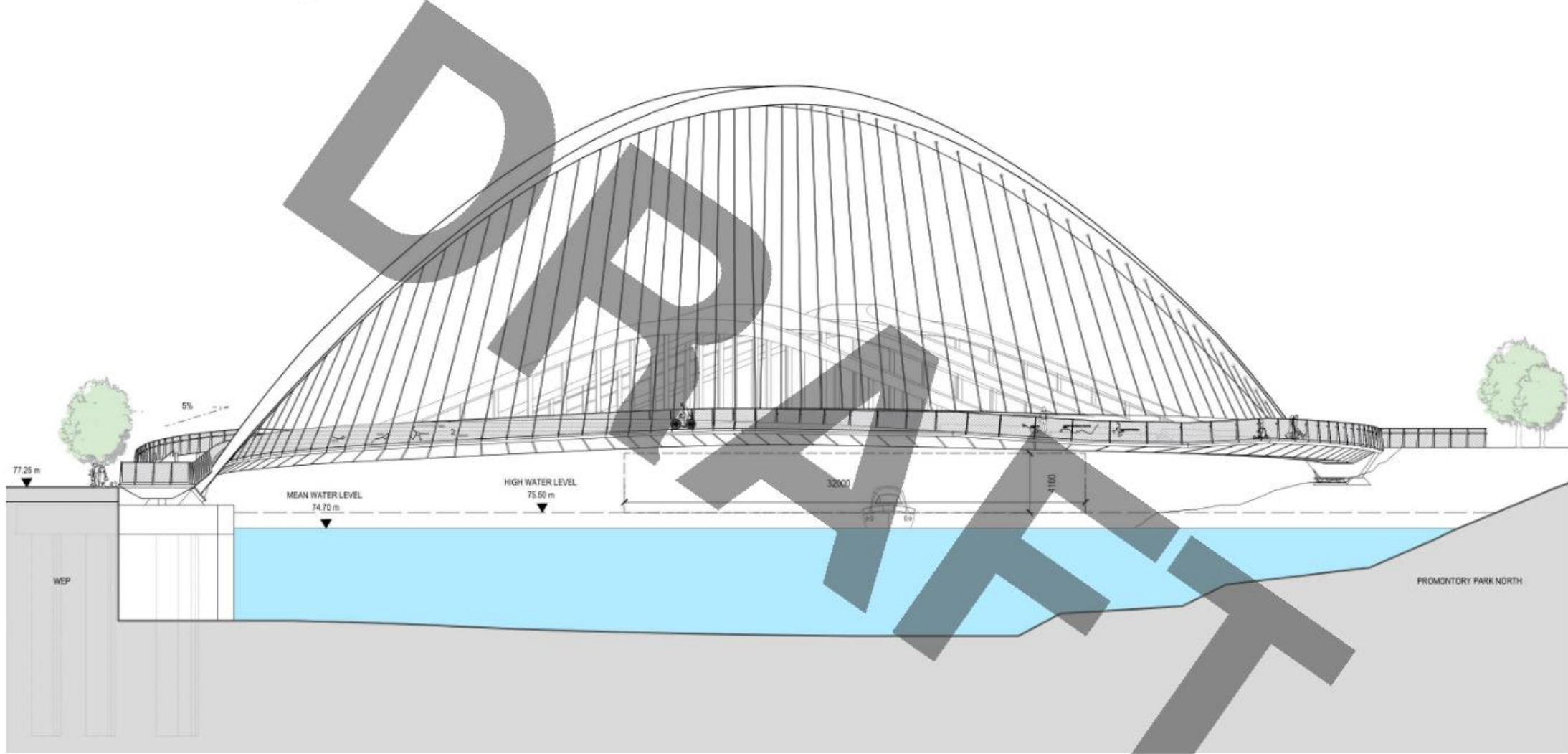


Schematic Design - Elevation



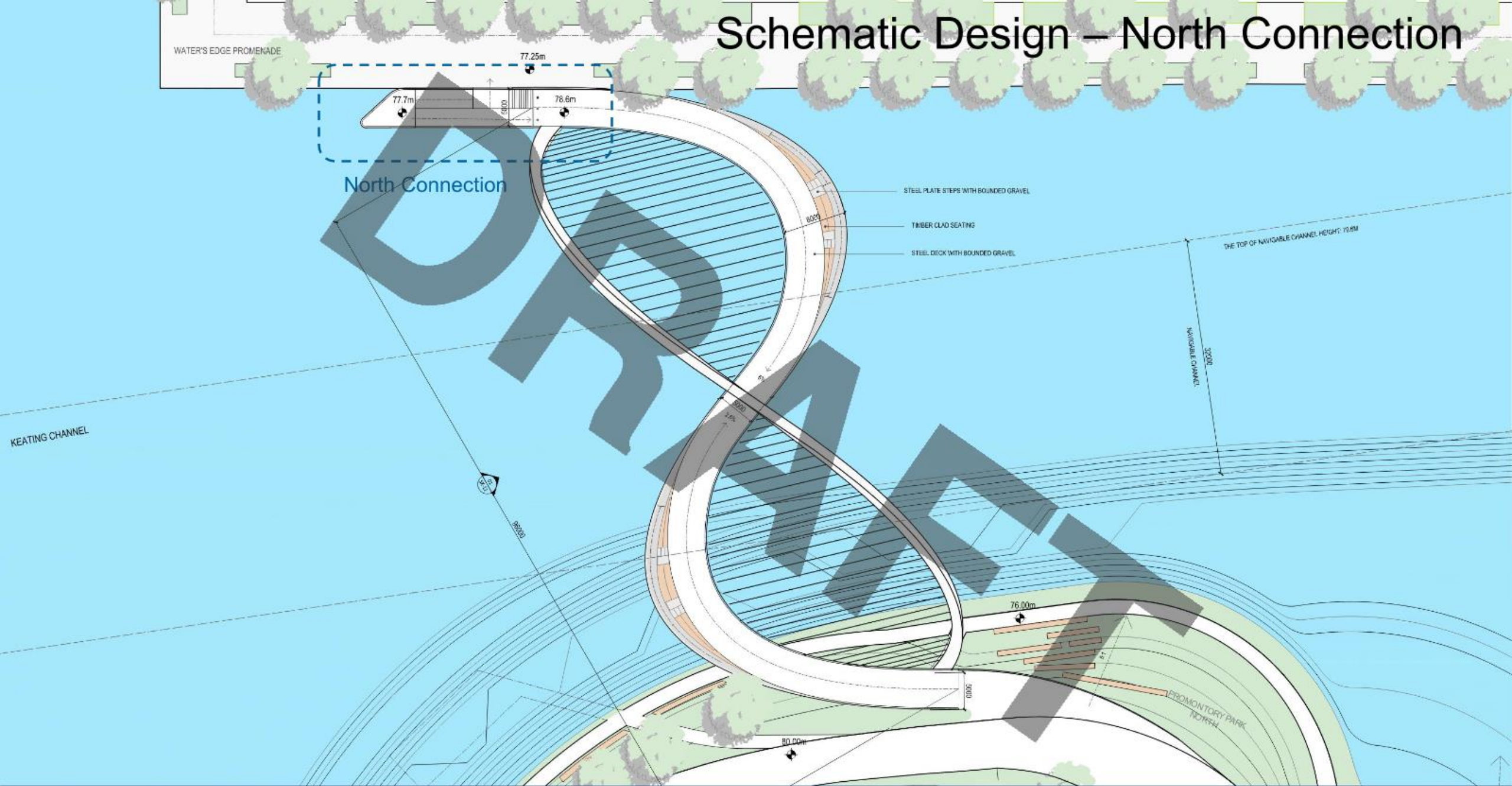
Cherry St. Bridge Elevation

Schematic Design - Elevation

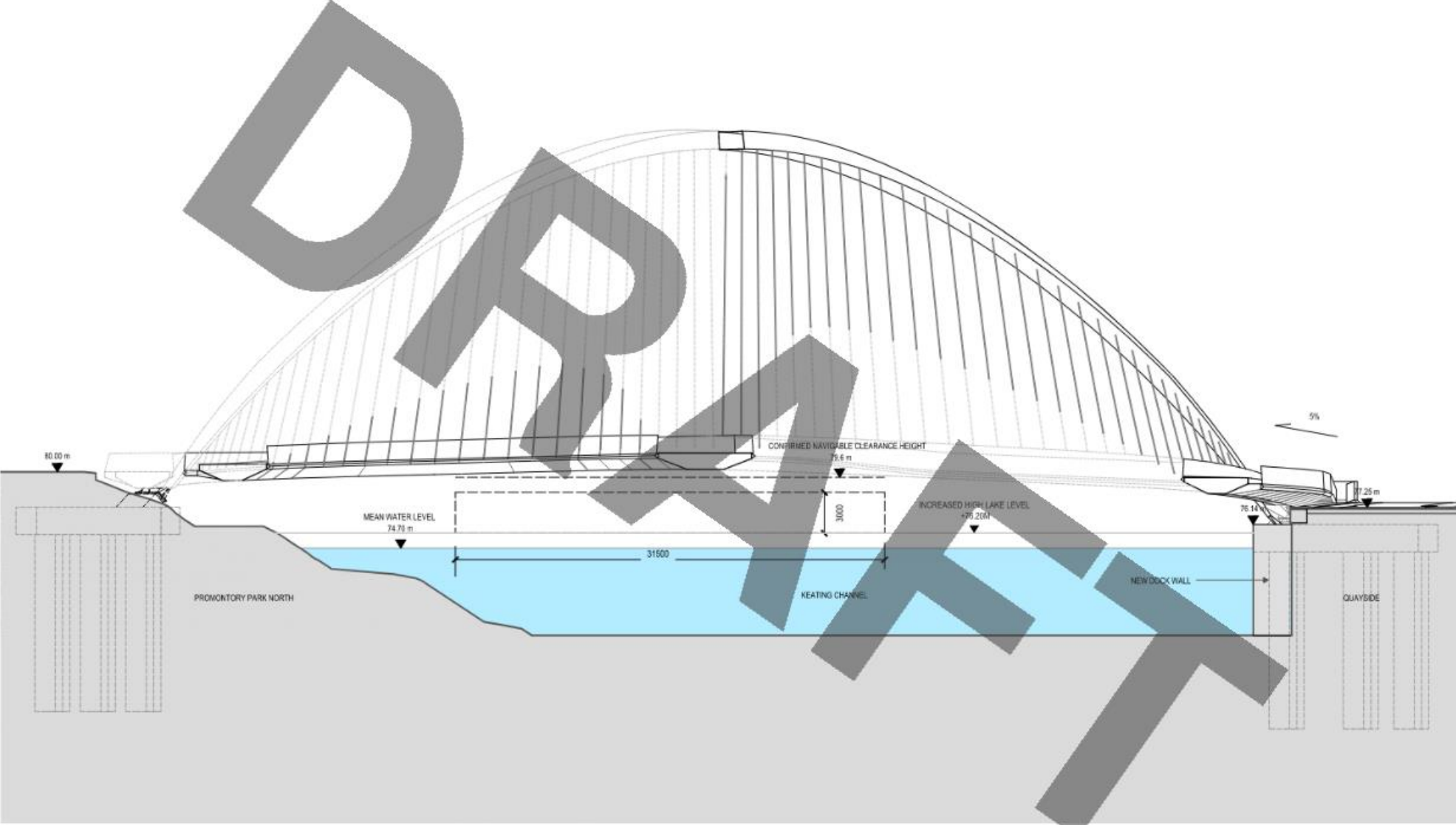


Bridge Elevation Showing Relationship to Cherry St. Bridge Beyond

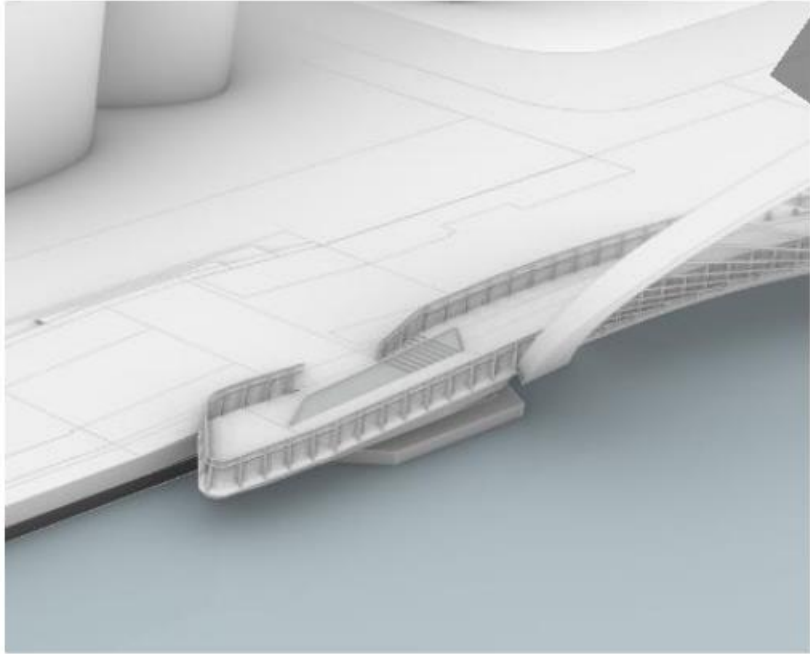
Schematic Design – North Connection



Bridge Section & Constraints



Schematic Design – North Connection

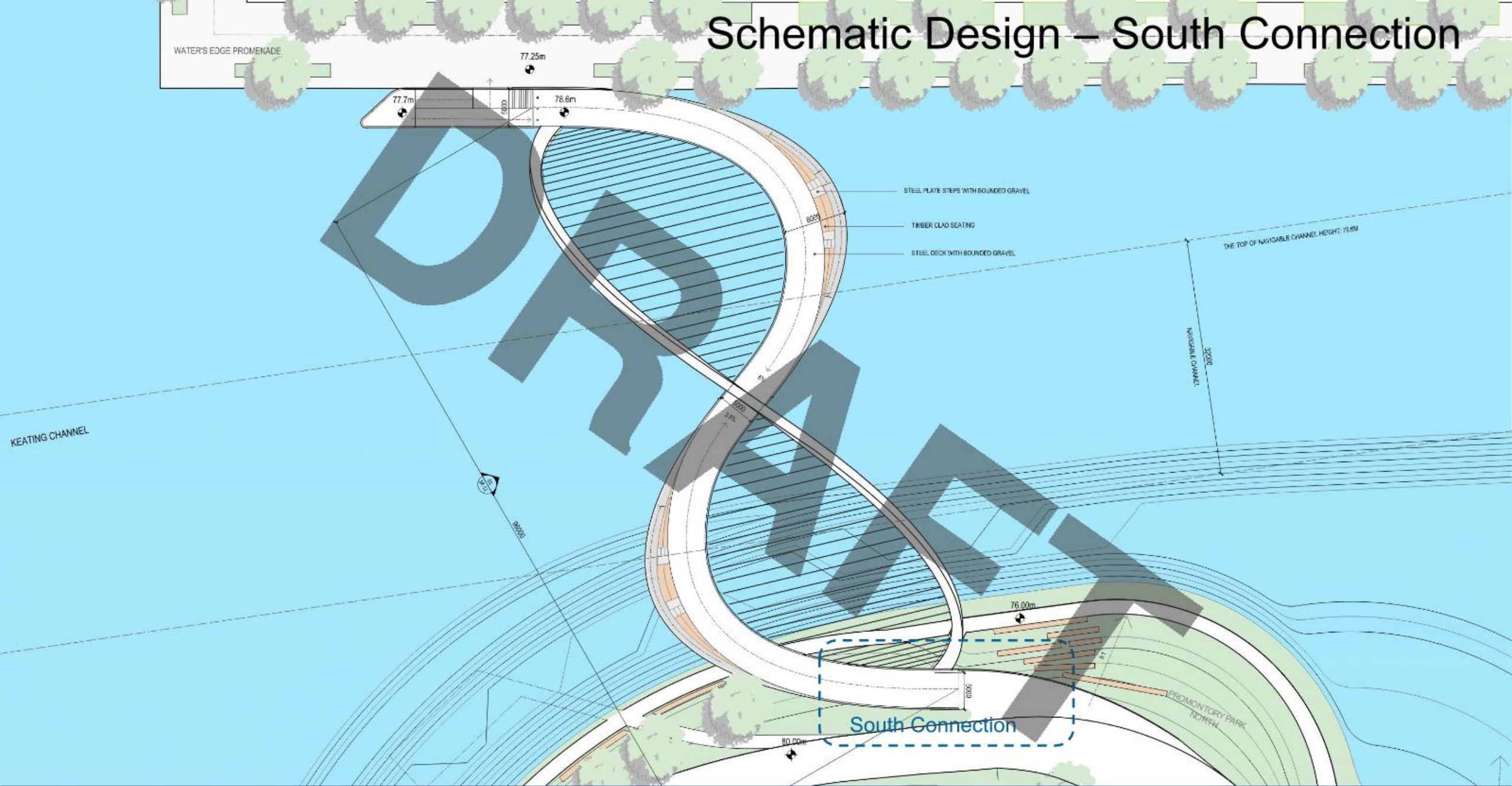


North abutment viewed from the south

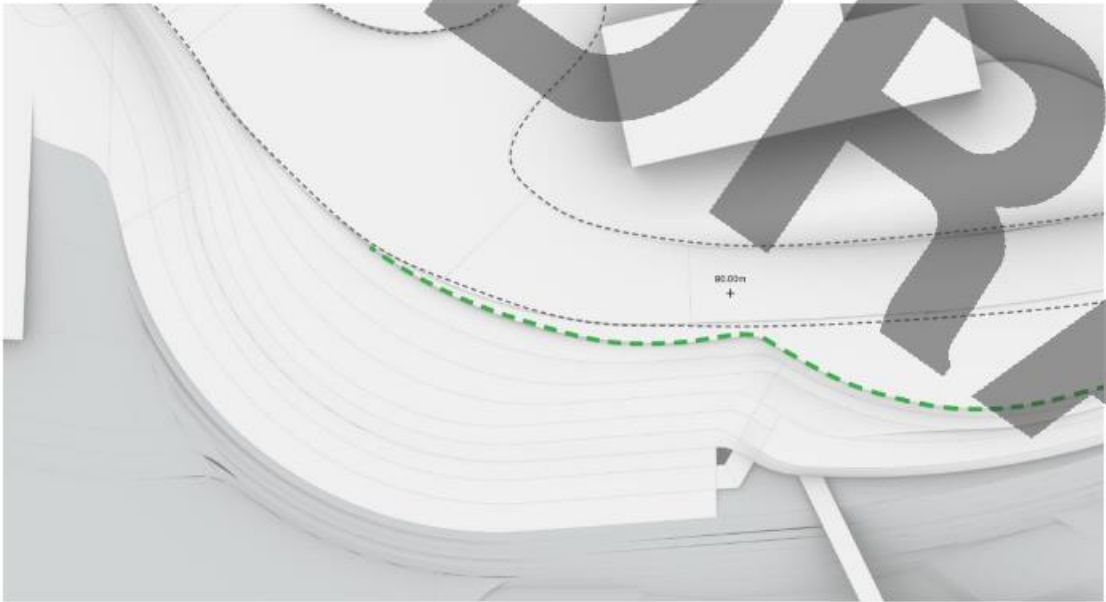


North abutment view from the north

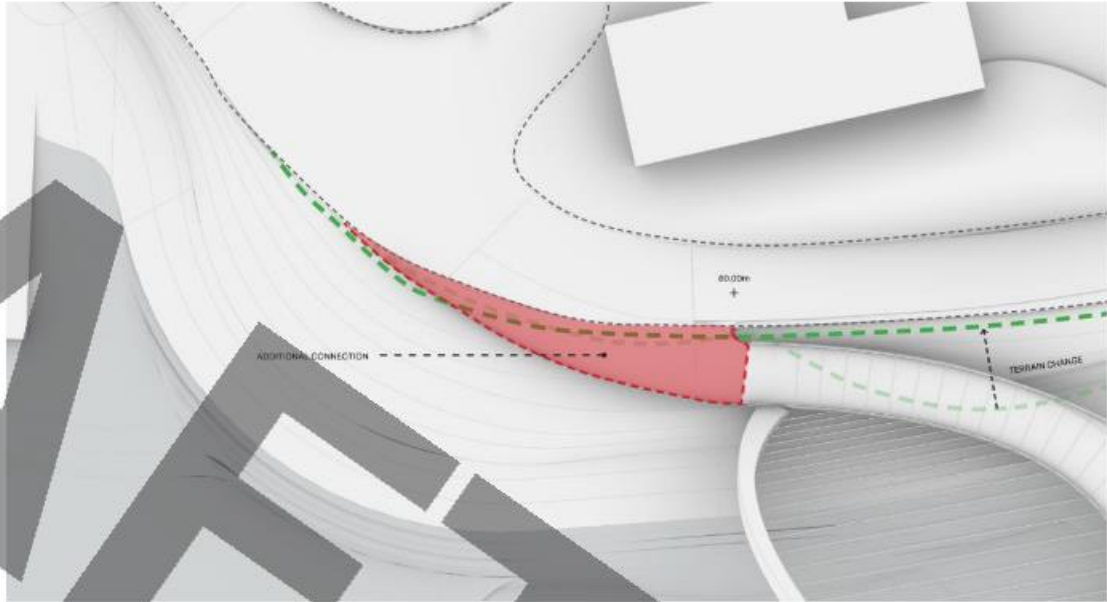
Schematic Design – South Connection



Schematic Design – South Connection

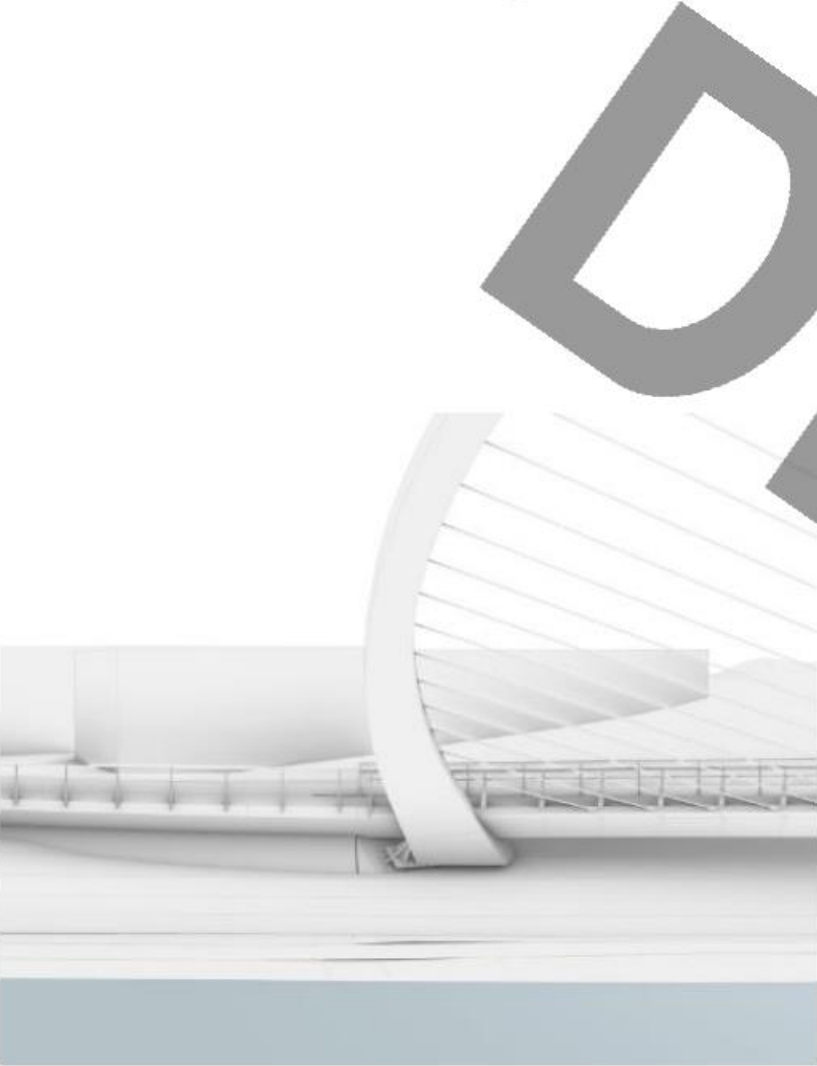


South Landing – Before Bridge



South Landing – Current tie-in

Schematic Design – South Connection



South abutment viewed from the North



South abutment view from the South

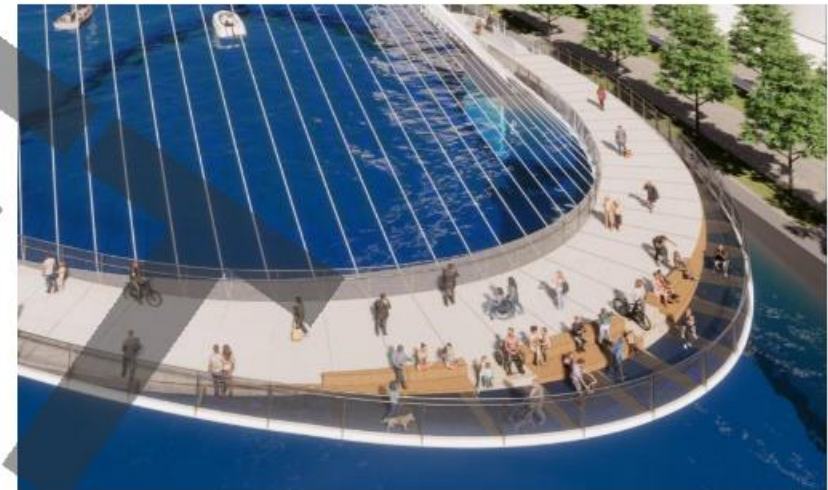
Schematic Design



Sinuous bridge deck with integrated perforated wind screens

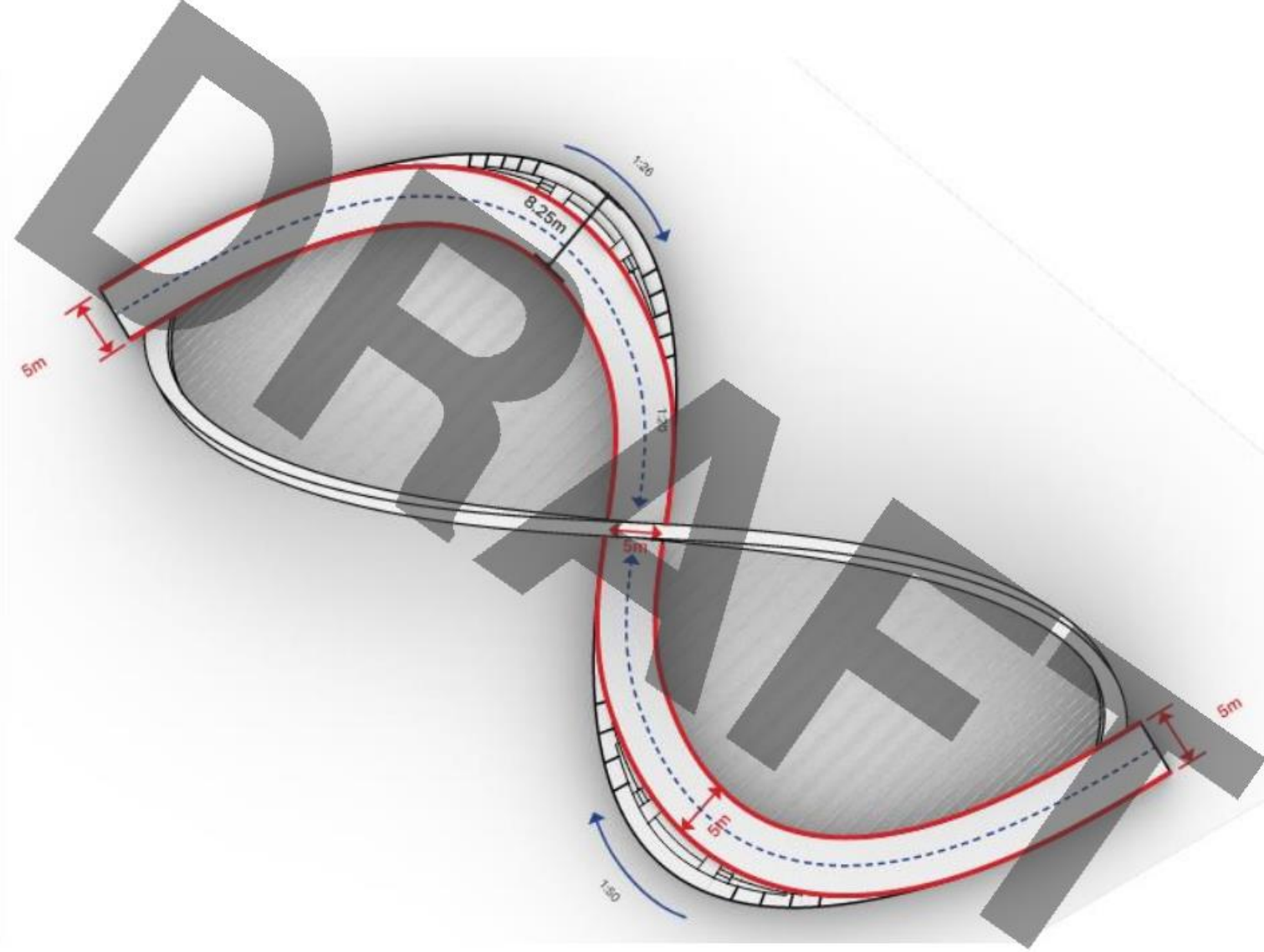


Inclusive spaces for all to enjoy- timber seating accessed via perimeter ramp and steps



Noses to the deck provide seating and connection to the water

Bridge Width



Bridge Seating/Noses

DR



Seating Aerial View

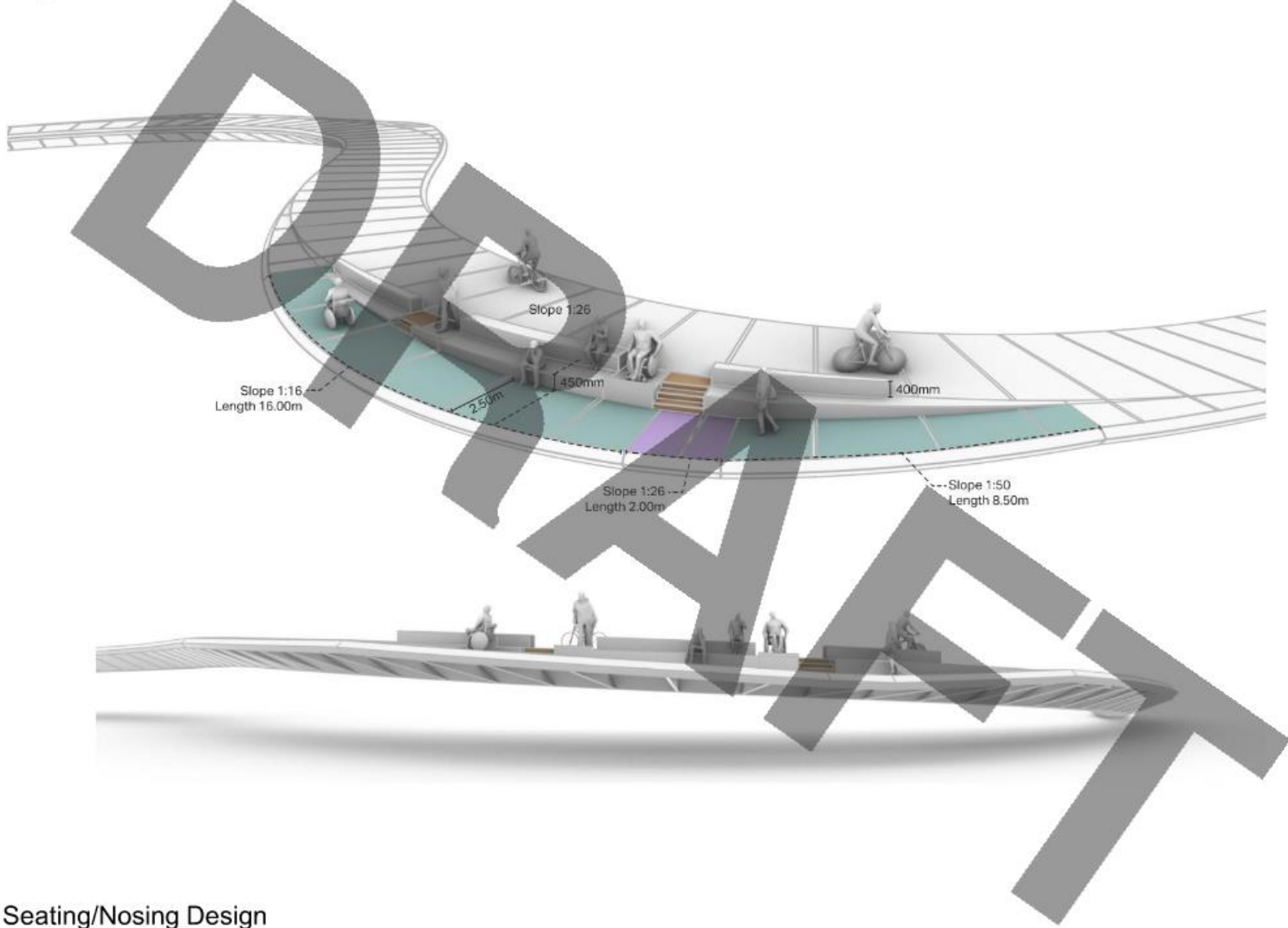


Seating Section Design



View to Keating Channel

Bridge Seating/Noses



Schematic Design – Seating/Nosing Design

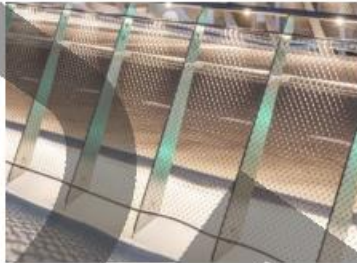
Materiality and Sustainability



A – Painted Steel



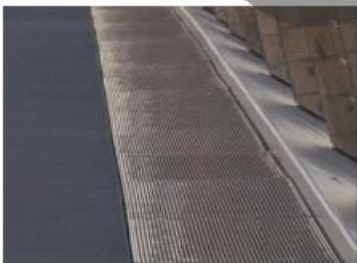
B – Bonded Gravel



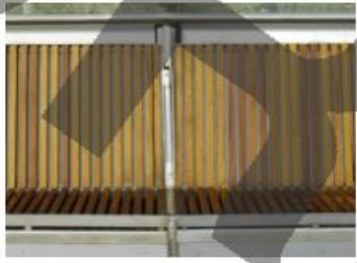
C – Wire Mesh & Brushed Steel



D – Perforated Metal



E – Wedge Wire



F – Timber Slats



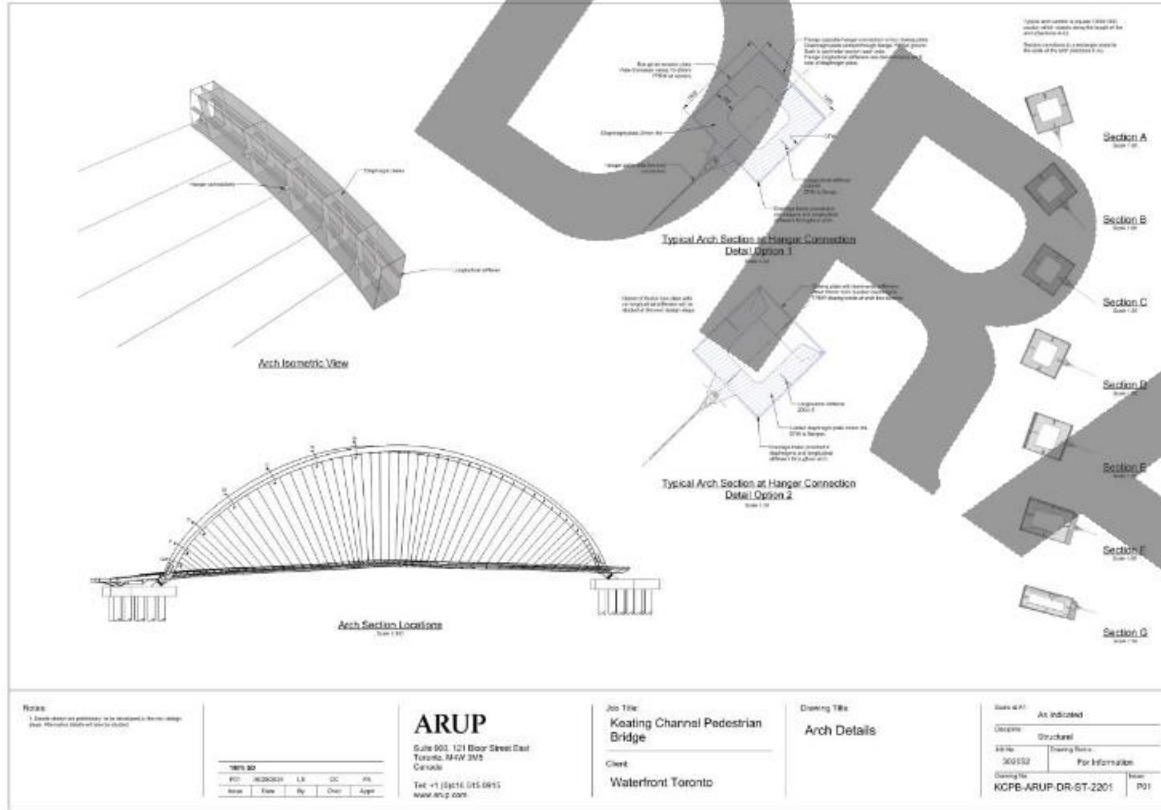
Accessible stepped seating areas for views out to the water



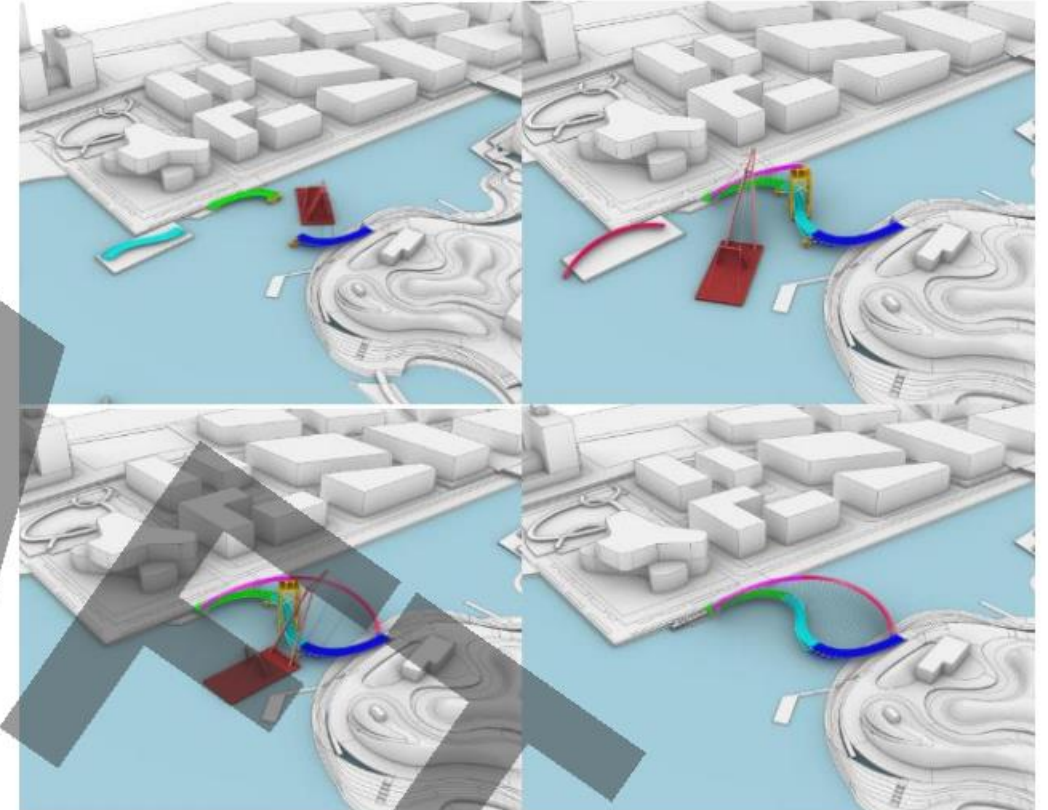
Sectional cut through bridge to indicate conceptual construction and materiality

- Highly efficient arch design reducing steel tonnage and carbon intensity
- Landscaping strategy to align with indigenous planting and include rainwater filtration
- Locally sourced materials
- Low maintenance and high durability of chosen materials

Materiality and Sustainability

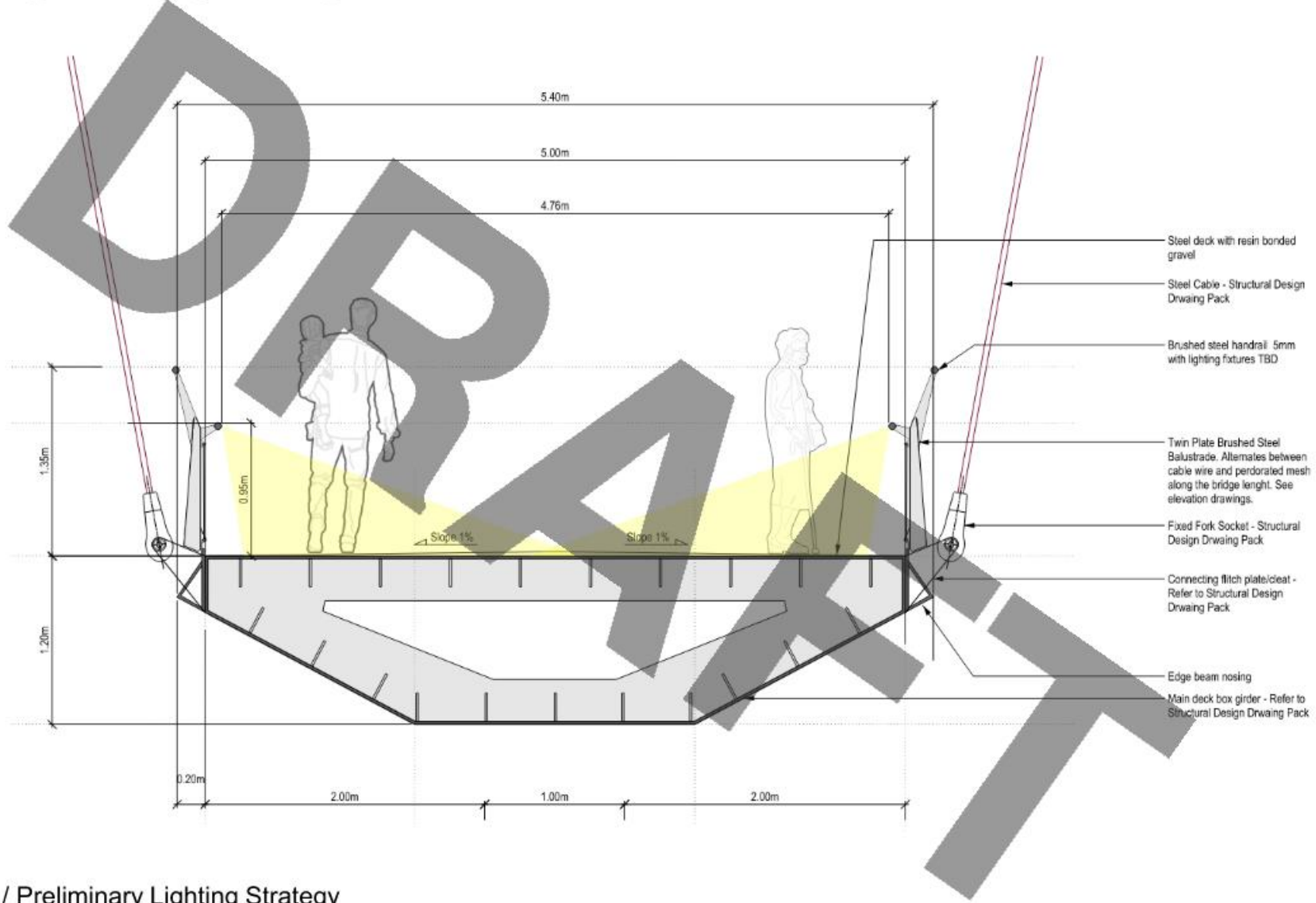


Structural Details



Installation Options

Schematic Design - Lighting

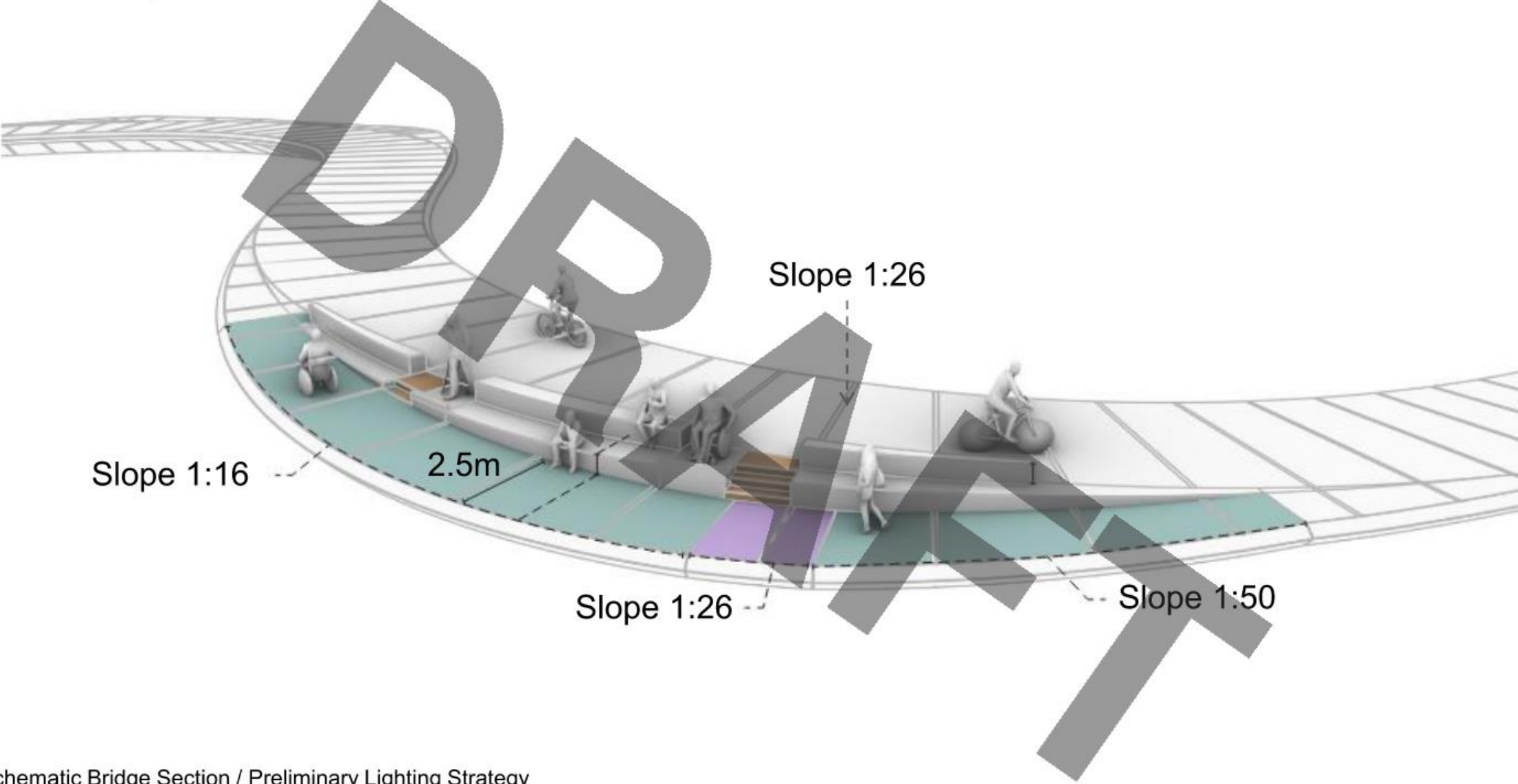


Schematic Bridge Section / Preliminary Lighting Strategy



Competition Stage Rendering - Night View of Keating Bridge from South with Feature Lighting Concept

Accessibility



Schematic Bridge Section / Preliminary Lighting Strategy



Competition Stage Rendering - Dusk View of Keating Bridge from South

Indigenous Design Approach

- Design informed by directionality, through connection to the cardinal directions, and to the sky, water, and land
- A form that connects to the summer solstice and winter solstice days.
- Inclusion of native plantings that contribute to soil remediation, water filtration, and the health of the ecosystem
- Connection and acknowledgement to the sacredness of water
- Seating areas that encourage gathering and connection, to each other as well as to All Our Relations
- Work that is done is a good way, driven by consultation with local knowledge keepers and Elders, to listen and learn appropriate way to reflect the unique perspectives, stories, and wisdom of the MCFN in a respectful and contemporary way.



Concept Design



a Summer Solstice sunrise from the north-east viewing point



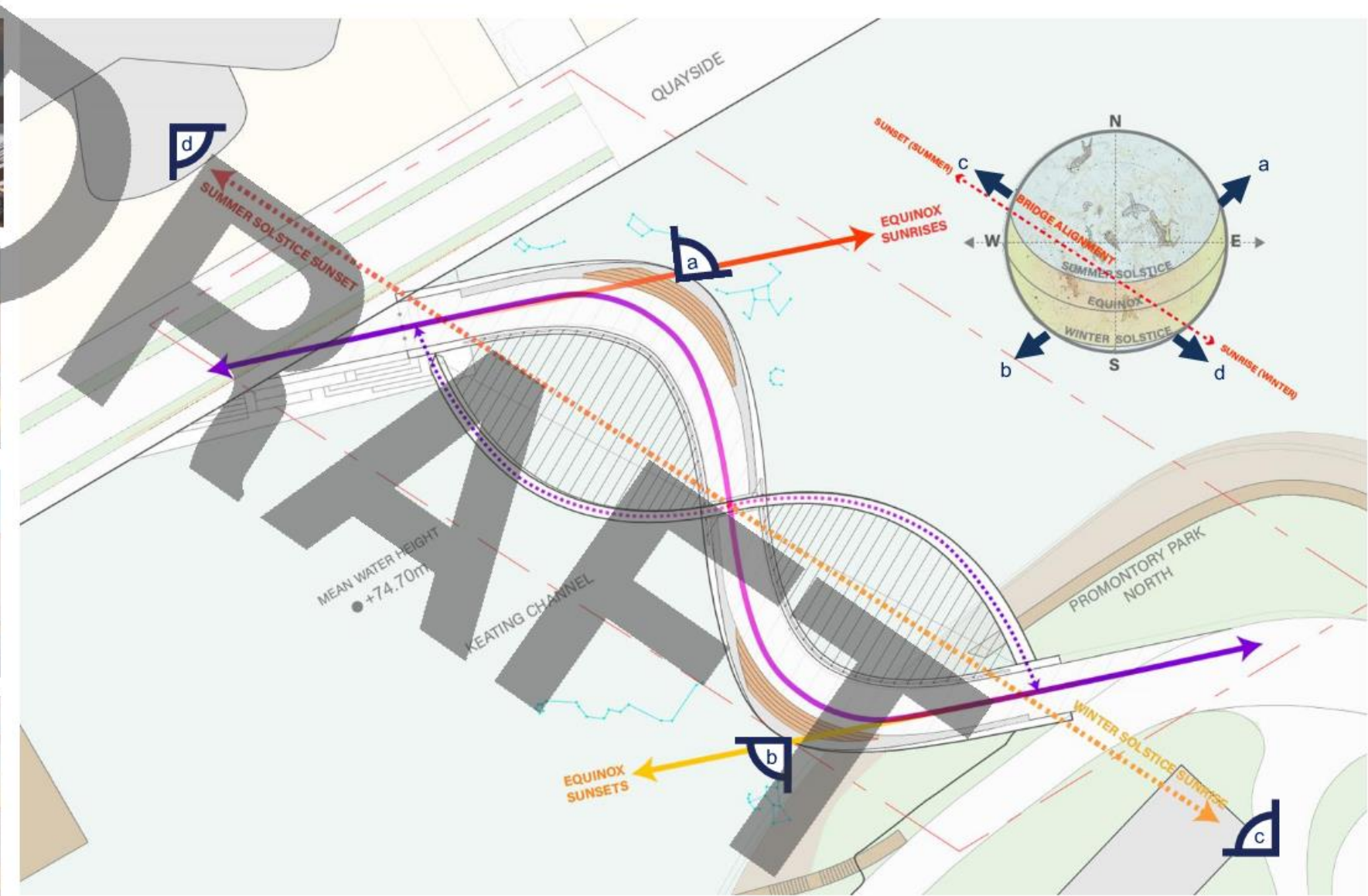
b Winter Solstice sunset from the south-west viewing point



c Summer Solstice sunset through the arch



d Winter Solstice sunrise through the arch

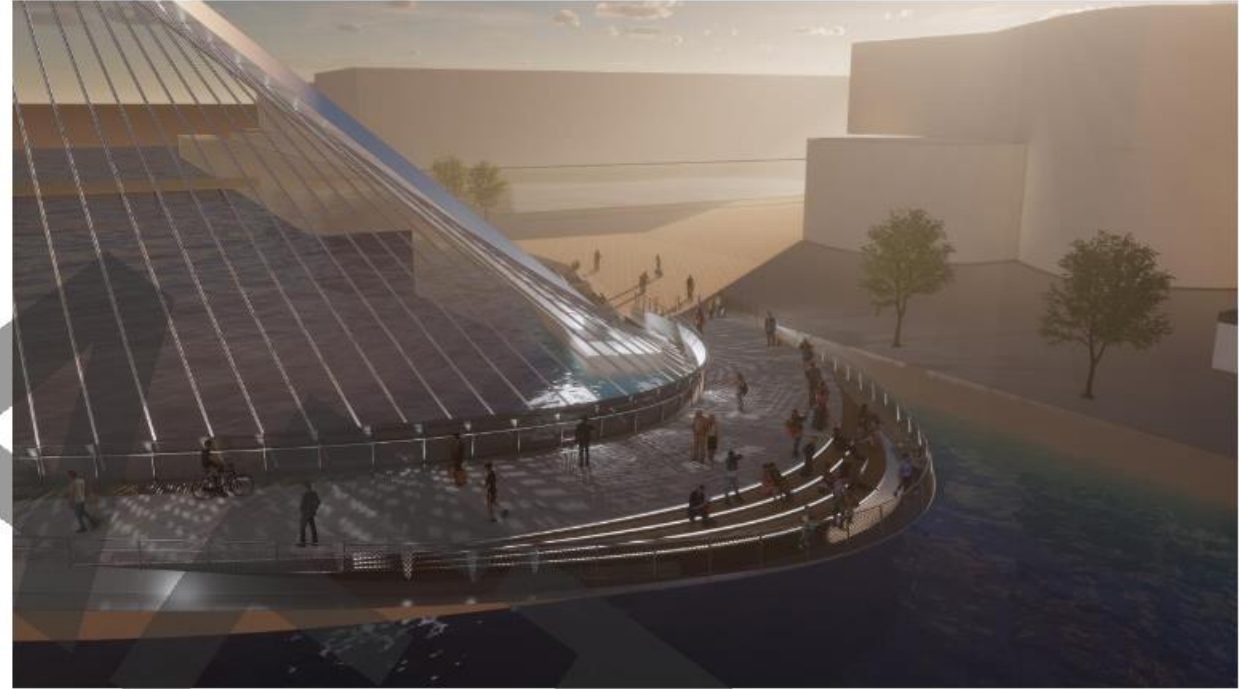


Solstice and Equinox Alignments (Competition Stage Diagram)

Lighting Design



Constellations are projected across the deck, glistening in the sunset
(Competition stage rendering)



Light dances in the water reflected from the bridge
(Competition stage rendering)



Competition Stage Rendering - Aerial view of bridge with conceptual lighting to show indigenous lighting overlay including star constellations projected onto deck surface

Design Workshop: Indigenous Talking Circle

What We Asked:

The following questions were asked to help guide the conversations:

- How can public infrastructure make a place, community or landscape feel like it acknowledges Indigenous cultures?
- How can we best celebrate/acknowledge the celestial bodies to help strengthen our knowledge of this place (or water, land)?
- How can teachings of “All Our Relations” and “Planning for the Seventh Generation” influence the design?
- What materials and/or colours can help add an Indigenous voice to the bridge?

Design Workshop: Indigenous Talking Circle

What We Heard

USE OF INDIGENOUS LANGUAGES

Incorporation of Indigenous languages and cultural practices is crucial, including use of Anishnaabemowin, Mohawk and others

EXPRESSING INDIGENOUS VISUAL FEATURES

Elements of Indigenous art, colour and ornamentation should be prominently displayed on the bridge

CREATING AN EDUCATIONAL JOURNEY

Acknowledging the Indigenous, colonial and modern histories and uses of this waterway and the surrounding land, and taking the opportunity to educate Canadians and newcomers through the pathway

INCORPORATION OF CELESTIAL KNOWLEDGE

Orienting the bridge towards solstice points and incorporating knowledge of important constellations, celestial movement and stories into the bridge's form and decoration

SYMBOLIC POWER AND CEREMONY

Using the inherent symbolic power of a bridge for key moments in its use and creation, as well as designing to support the use of the bridge for ceremony

SENSORY EXPERIENCES

Using the outdoor and pedestrian nature of the bridge to create powerful sensory experiences including touch, smell, and sound

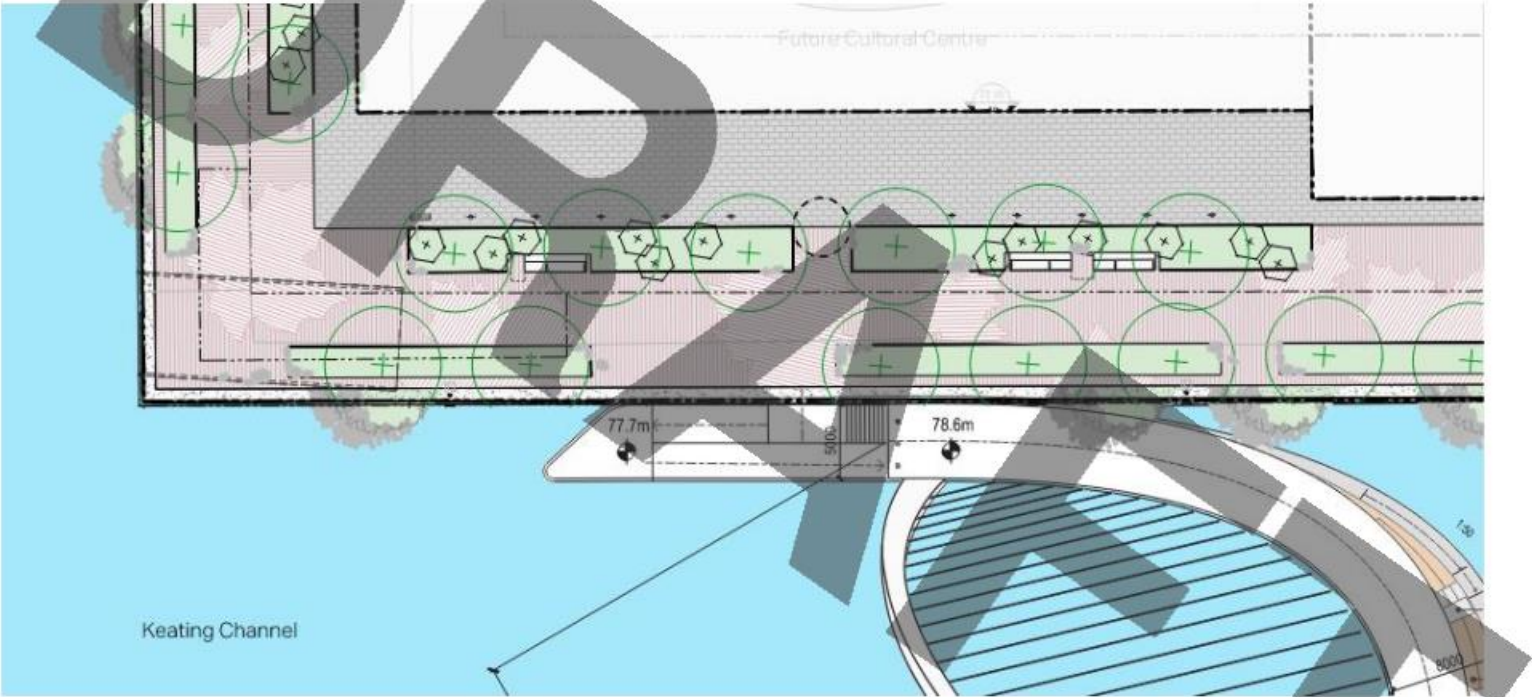
NATURALIZATION THROUGH PLANTINGS

Indigenous values emphasize the importance of land in its natural state, and the benefits to earth, plants, fish, birds and humans that comes from denaturalization of disturbed areas

CONSIDERING ALL OUR RELATIONS

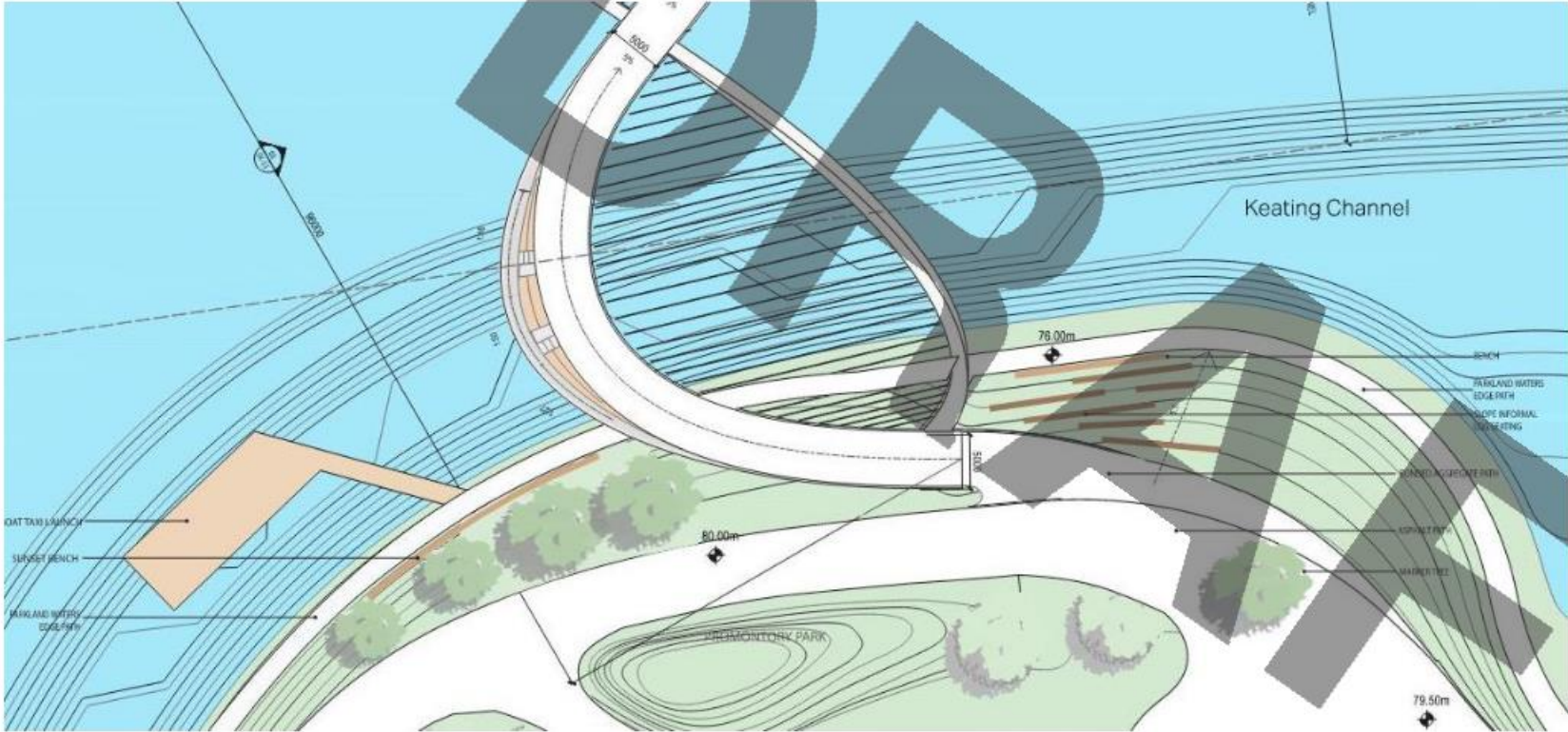
Creating spaces that support positive intergenerational integration, ensuring accessibility for elders and Indigenous communities, and providing access to ceremonial sites are crucial aspects of acknowledging Indigenous cultures.

Schematic Design - Landscape

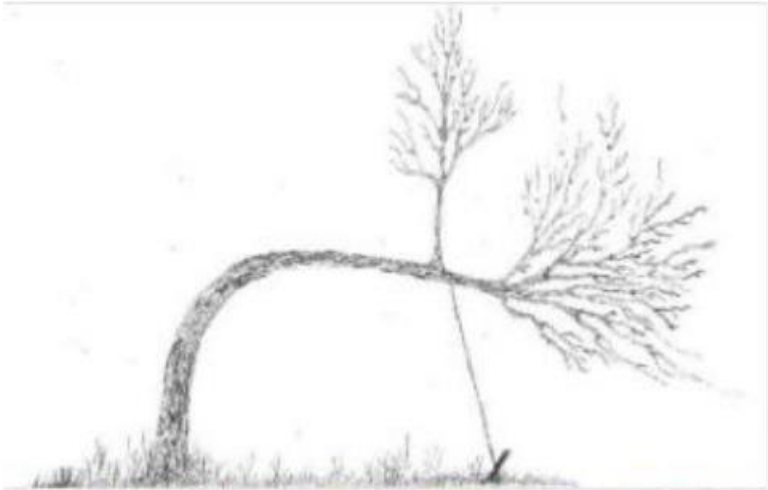


North Abutment Landscape Design

Schematic Design - Landscape



South Abutment Landscape Design

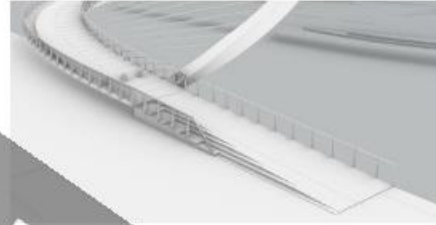


Native Planting and Marker Tree

Design Optimizations

1. North Landing Options:

- Raised Landing on the WEP resulting in a reduced abutment in the channel.
- Landing the Bridge Directly on the WEP



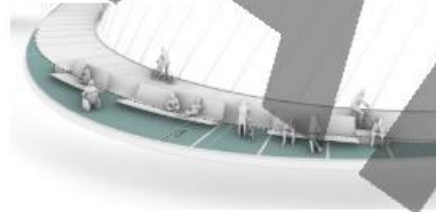
2. Deck Width:

- Reducing the width of the deck to 4.5m
- Reducing the width of the deck to 4.0m



3. Seating/Nosing Design:

- Reducing the width of the seating/nosing areas 25%
- Reducing the width of the seating/nosing areas 50%
- Making height of the seating/nosing areas consistent with the rest of the bridge



4. Hanger Spacing:

- Reduce hanger spacing from 2m to 3m





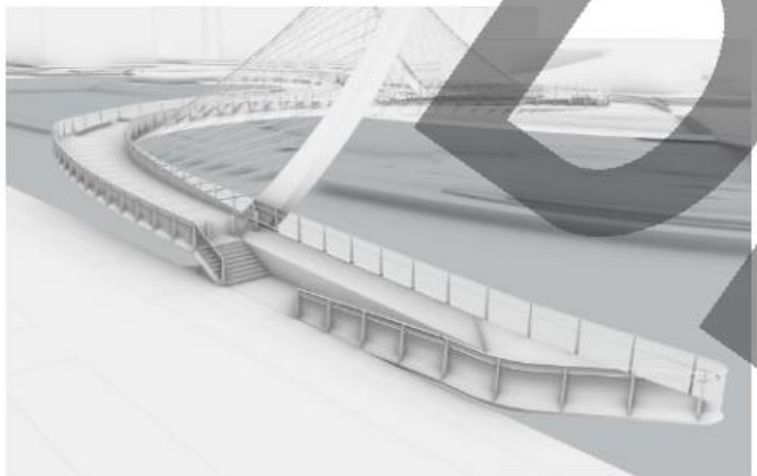
Competition Stage Rendering - Dusk View of Keating Bridge from South

Design Optimizations

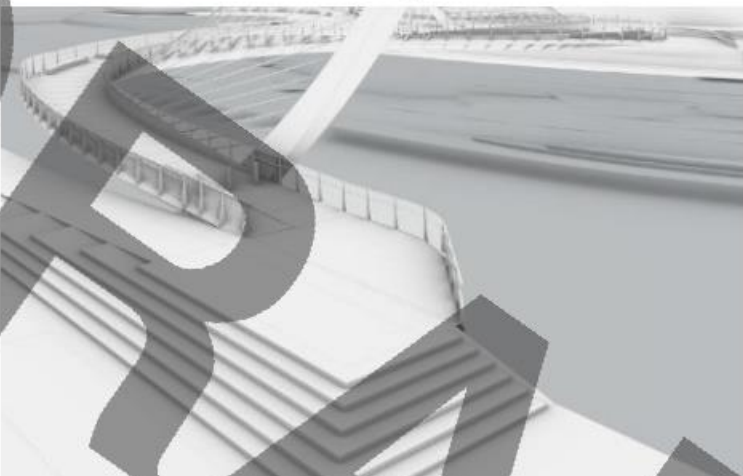


Design Optimizations – North Landing Options

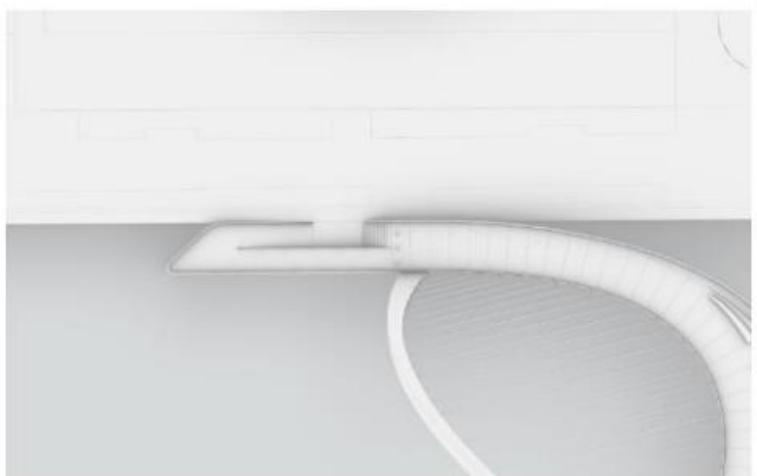
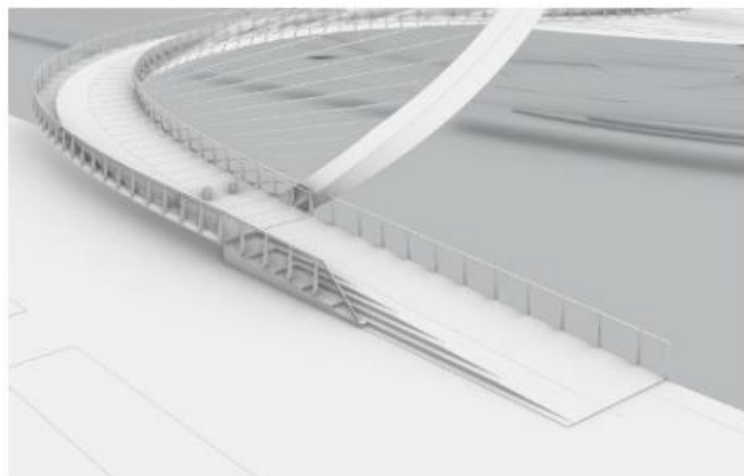
Schematic Design



Raised Landing at WEP



Land on Promenade



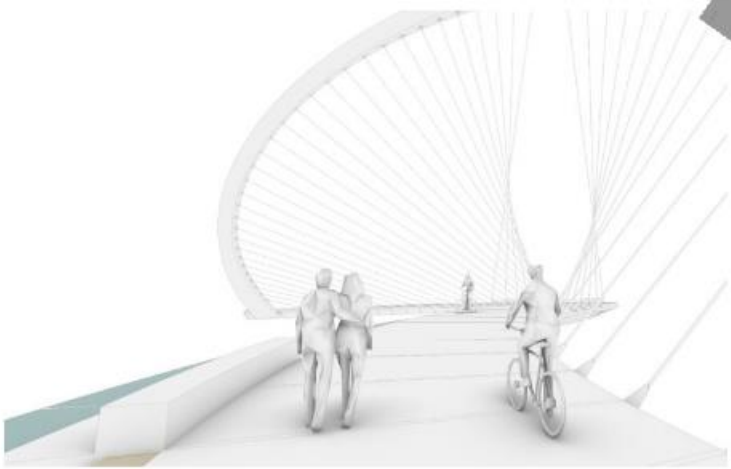
Design Optimizations— Bridge Width

DRAFT

Schematic Design – 5m Deck Width

4.5m Deck Width

4m Deck Width



Design Optimizations— Bridge Width

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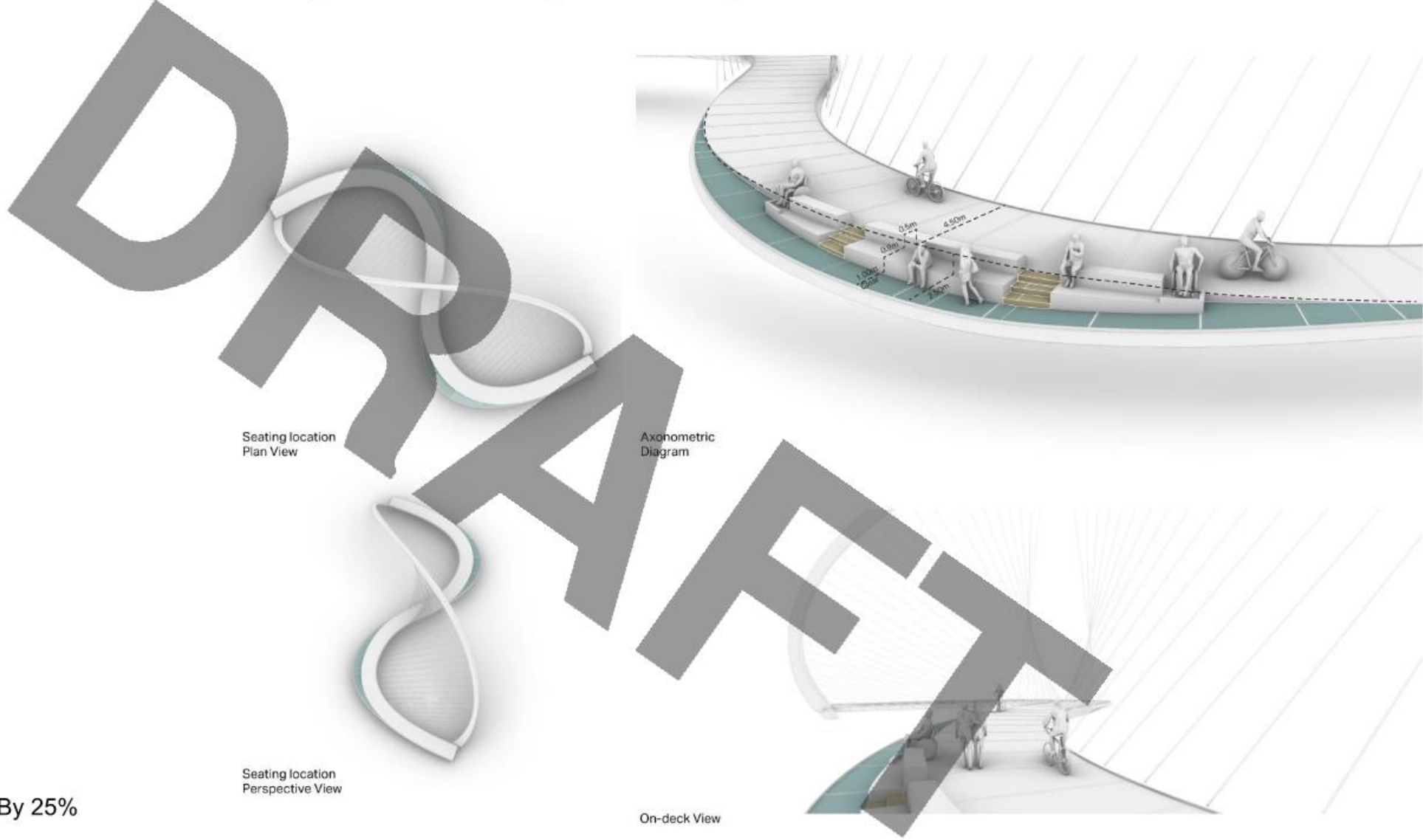
Schematic Design – 5m Deck Width

4.5m Deck Width

4m Deck Width



Design Optimizations— Bridge Seating/Nosing



Seating location
Plan View

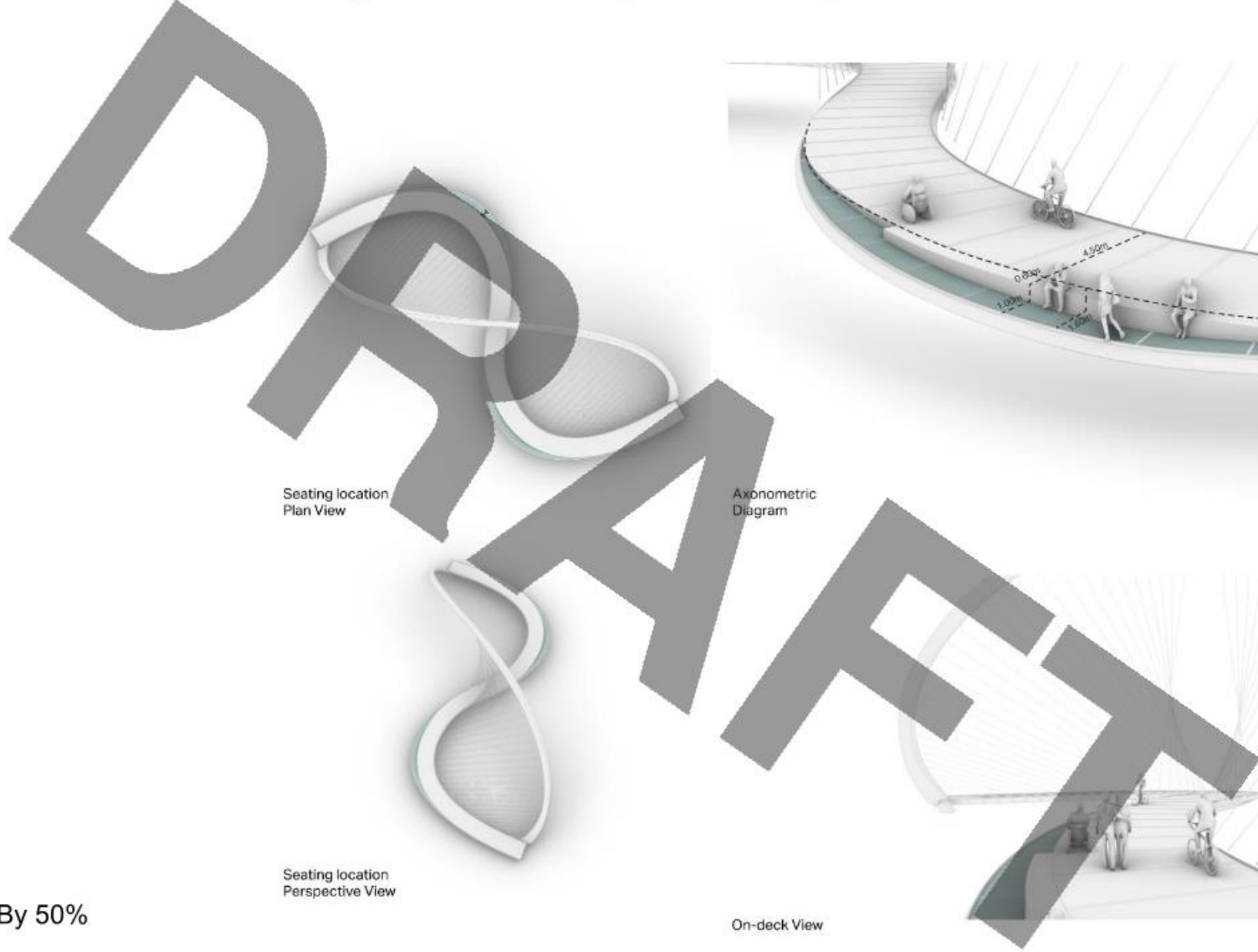
Axonometric
Diagram

Seating location
Perspective View

On-deck View

Reduce Seating/Nosing width By 25%

Design Optimizations– Bridge Seating/Nosing



Seating location
Plan View

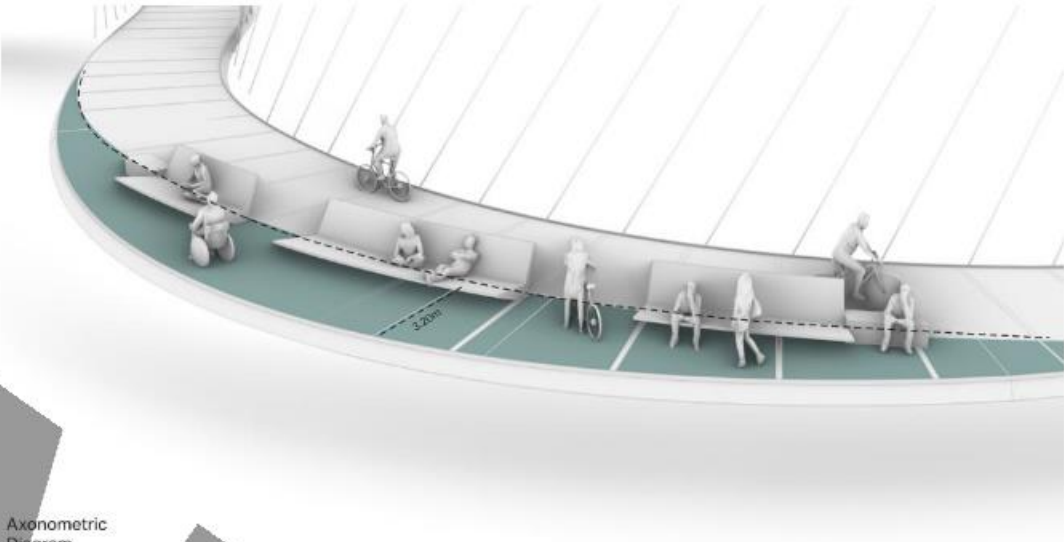
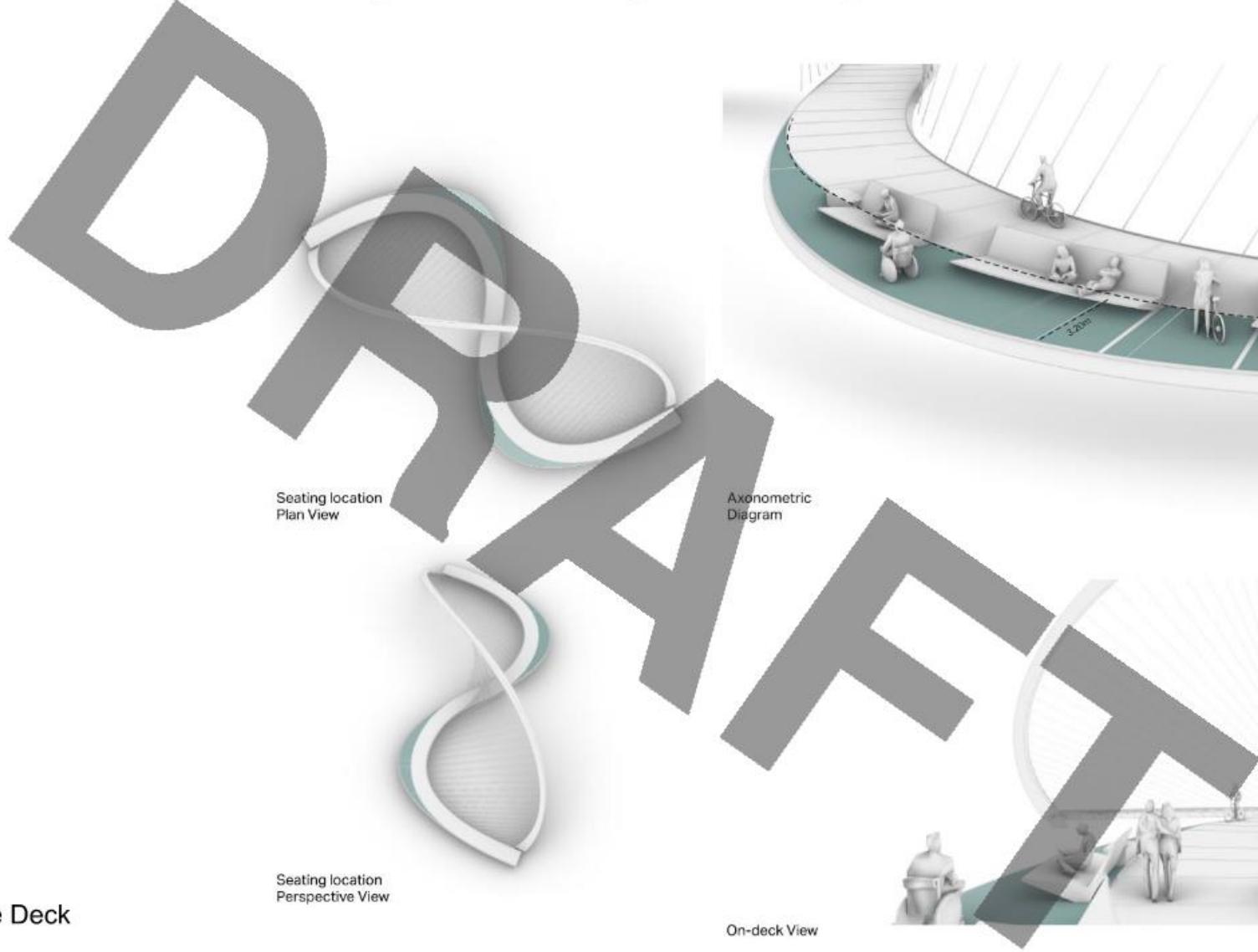
Axonometric
Diagram

Seating location
Perspective View

On-deck View

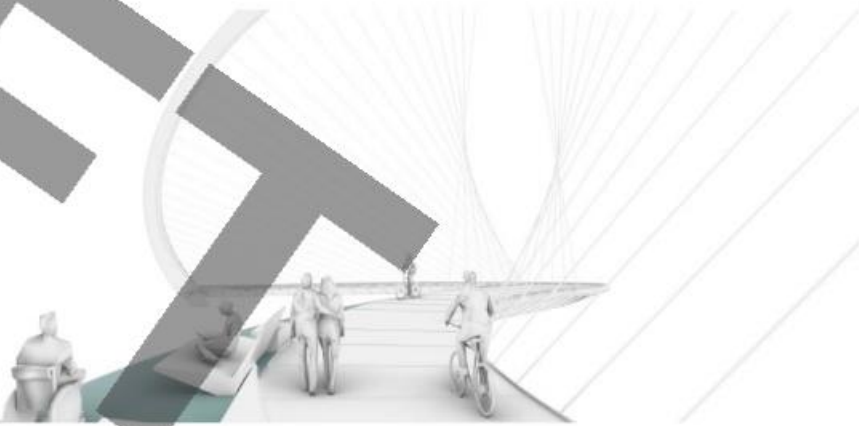
Reduce Seating/Nosing width By 50%

Design Optimizations – Bridge Seating/Nosing



Axonometric Diagram

Seating location Plan View



On-deck View

Seating location Perspective View

Nosing Level to Match bridge Deck

Design Optimizations – Hanger Spacing

Schematic Design Hanger Spacing

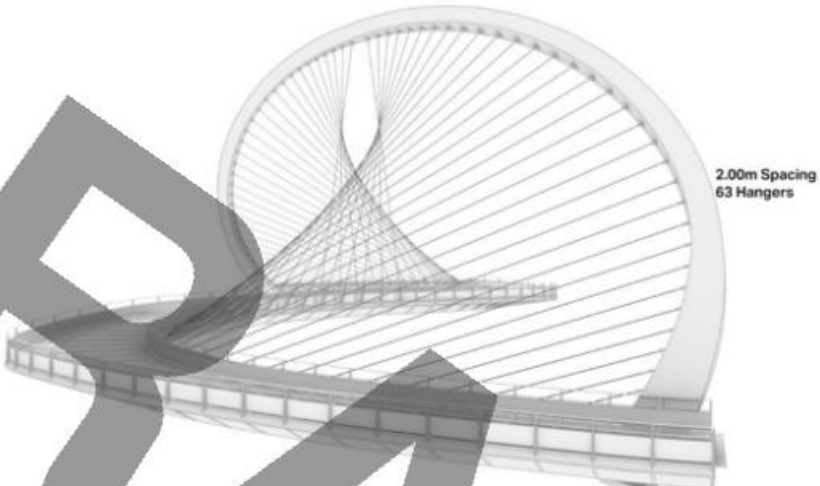
2.00m Spacing
63 Hangers

Reduced Hanger Spacing

3.00m Spacing
41 Hangers

Design Optimizations – Hanger Spacing

Schematic Design Hanger Spacing



Reduced Hanger Spacing

