East Bayfront Boardwalk & In-water Pipe

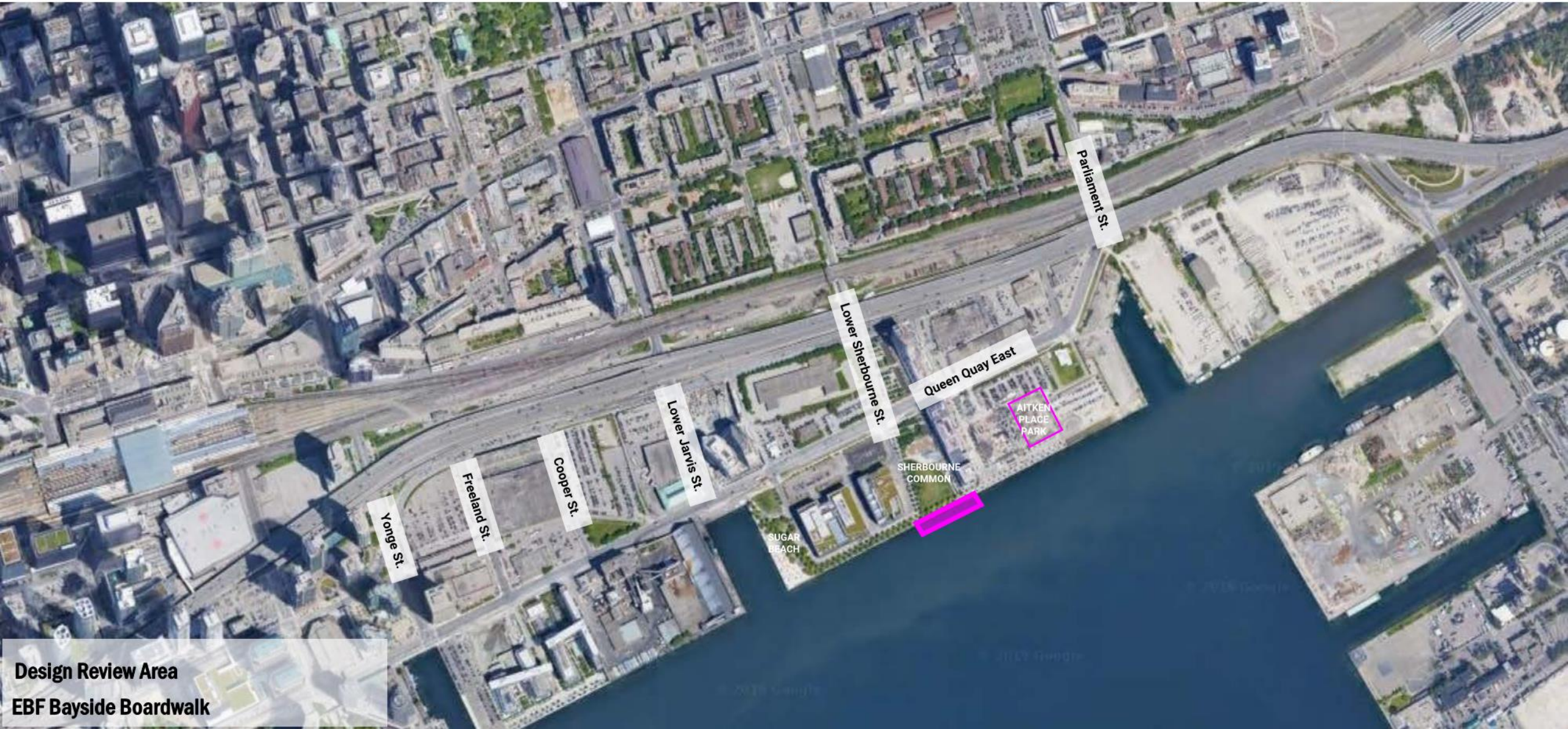
Schematic Design

October 23rd, 2019

Site Context

East Bayfront Boardwalk & In-water Pipe

Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design



Project Description & Background

East Bayfront Boardwalk & In-water Pipe
Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Project Description

- +/- 130M of Boardwalk located adjacent to Shelbourne Common
- The In-Water Pipe will connect the Dockside subdivision's storm drainage to the Bayside subdivision.

Project Timeline

- October 2019 – Schematic Design DRP
- December 2019 – Anticipated Detailed Design DRP
- 2020 Q1 – Tender
- 2020 Q2 – Construction start, duration 1 year

Boardwalk @ Bayside Public Realm DRP Recap

- September 2011: East Bay Front Water's Edge Update
- November 2012: Queens Quay East Bay to Parliament Street

Project Description & Background

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In-water Pipes & Boardwalk

- The In-Water Pipe will connect the Dockside subdivision's storm drainage to the Bayside subdivision. A new sewer pipe has been designed adjacent to the dock-wall to replace the SCO conveyance; Dockside storm water will flow to Bayside storm water management system.

Central Waterfront Secondary Plan Policy Context

East Bayfront Boardwalk & In-water Pipe
Proponent: Waterfront Toronto
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Review Stage: Schematic Design

D24 - THE EAST BAYFRONT, A PROMINENT NEW NEIGHBOURHOOD

The East Bayfront will become a prominent waterfront address for working and living amid the energy and abundance of waterfront activities, including a **new water's edge promenade** and other public activities in the series of new East Bayfront public spaces.

Creating Dynamic and Diverse New Communities

(P31) Excellence in the design of...buildings, infrastructure...and **public spaces**...to achieve worldwide recognition

(P10) The design of the **public realm** will be of a standard of excellence...of the great city waterfronts...

(P11) The public realm will be defined by a **coherent framework** of streets, parks...buildings...walkways...**boardwalks**...

East Bayfront Precinct Plan
Site Context

East Bayfront Boardwalk & In-water Pipe

Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Central Waterfront Master Plan
Site Context

East Bayfront Boardwalk & In-water Pipe

Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Boardwalks (Existing and Proposed)

East Bayfront Boardwalk & In-water Pipe

Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Existing Photos
Area of Proposed Boardwalk

East Bayfront Boardwalk &
In-water Pipe
Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Existing Photos
At Sherbourne Common Looking East

East Bayfront Boardwalk &
In-water Pipe
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Review Stage: Schematic Design

Project Approval Stage

DRP Stream 2: Public land – Site Plan Approval

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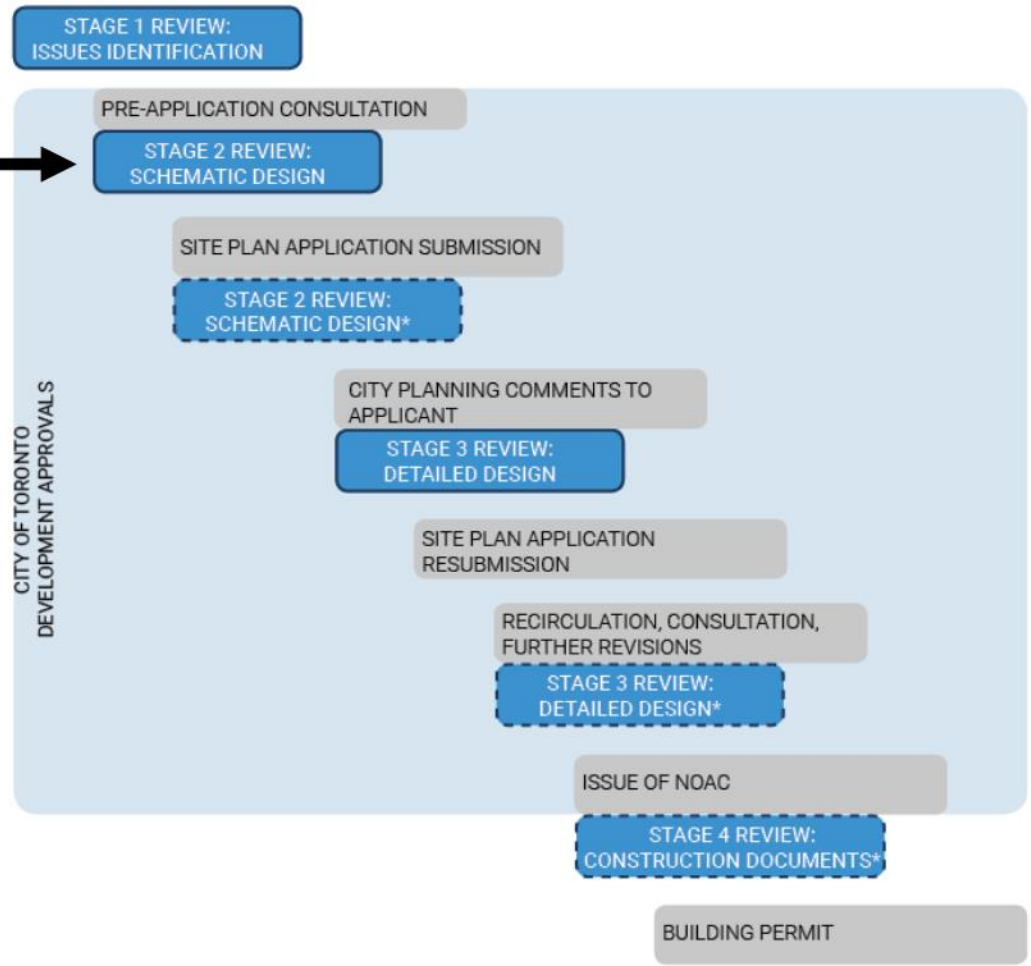
EBF: Bayside Phase I
September 2011

EBF Public Realm: Bayside Water's Edge Promenade
November 2012

EBF Boardwalk
October 2019 DRP



*This review will only be required if the project has changed significantly since the previous review, or the Panel, Waterfront Toronto, or City staff have significant outstanding concerns.

EBF Bayside DRP- September 2011

East Bayfront Boardwalk & In-water Pipe

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WEST 8 + DTAH EBF Bayside
Materials for Discussion DRAFT

Primary Waterfront:
Tree-lined granite promenade (10m)
+
Timber boardwalk (8m)

EBF Bayside DRP- September 2011

East Bayfront Boardwalk & In-water Pipe

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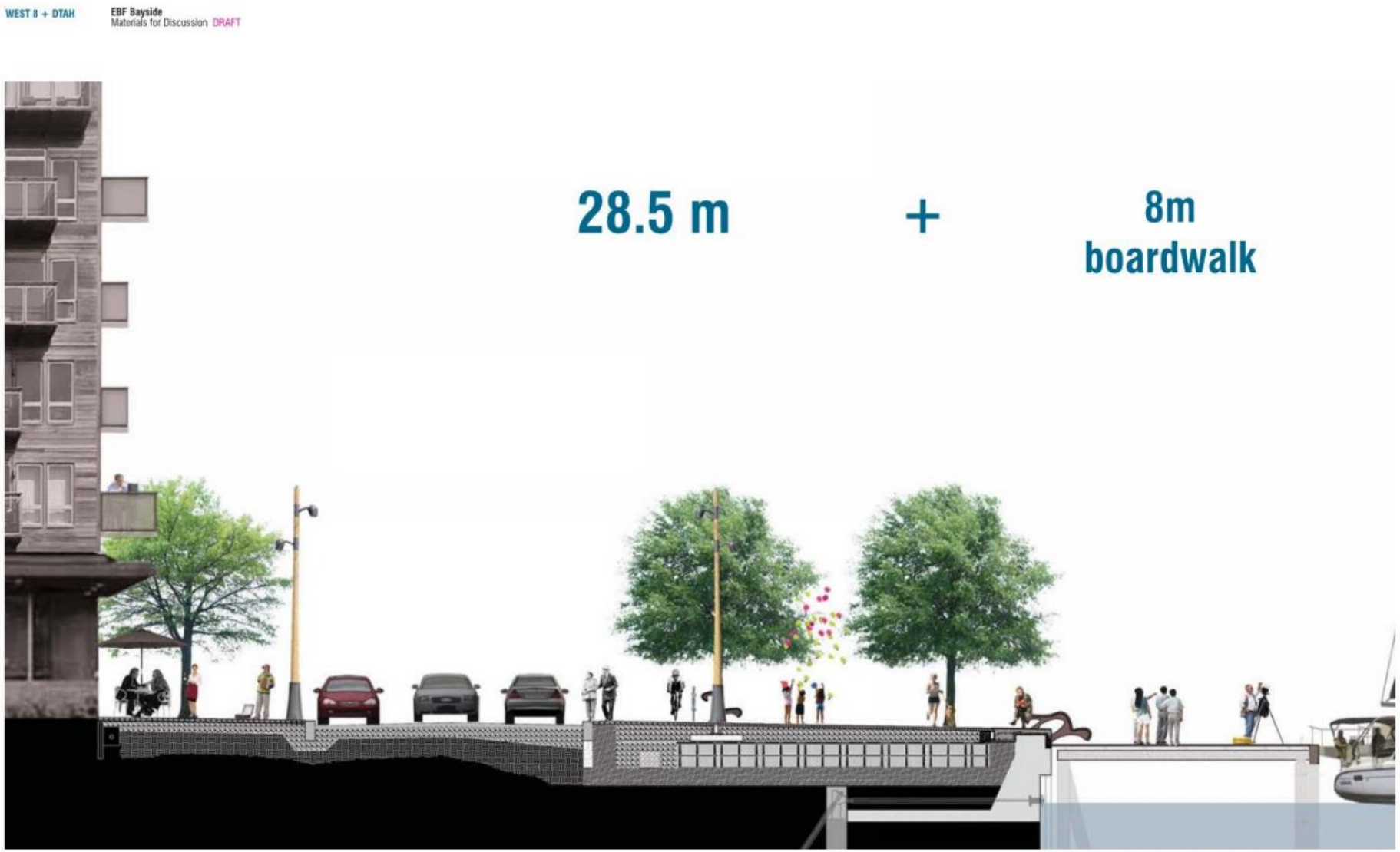


Areas for Panel Consideration - Waterfront Toronto

East Bayfront Boardwalk & In-water Pipe
Proponent: Waterfront Toronto
Design Team: West 8, DTAH, WSP
Review Stage: Schematic Design

Does the latest Boardwalk design meet or exceed Waterfront Toronto's objectives of design excellence?

- Width and scale of boardwalk
- Setting precedent width for future boardwalk network
- Elevation of the boardwalk in relation to water level
- Edge profile at water (pedestrians, boat mooring, etc.)
- Interface and connection with future bridges

- Bench profile and materiality
- Boardwalk board pattern and materiality

- Coordination with future public art piece and marine use strategy


East Bayfront Public Art Master Plan
Artwork Locations Map
^ Thresholds
+ Connections
* Destination

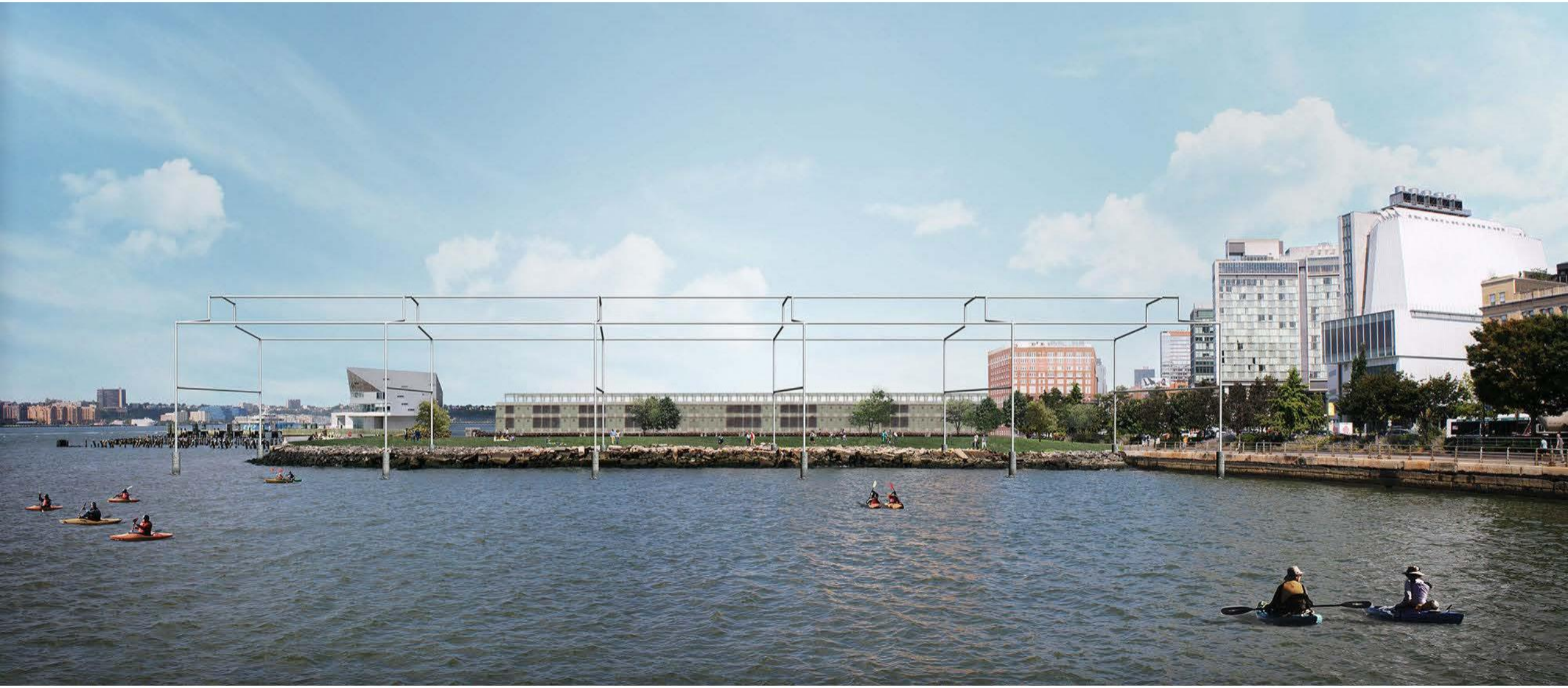

68.11m
15.24m
11.12m
15.24m
75.02m

Badeschiff, Susanne Lorenz, Berlin

Infinite Bridge, Niels Povlsgaard and Johan Gjødes, Aarhus

Floating Island, OBBA, Bruges Triennial

***She Lies*, Monica Bonvicini, Oslo**



***Day's End*, David Hammons, Hudson River**

Areas for Panel Consideration - Waterfront Toronto

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2019.10.23

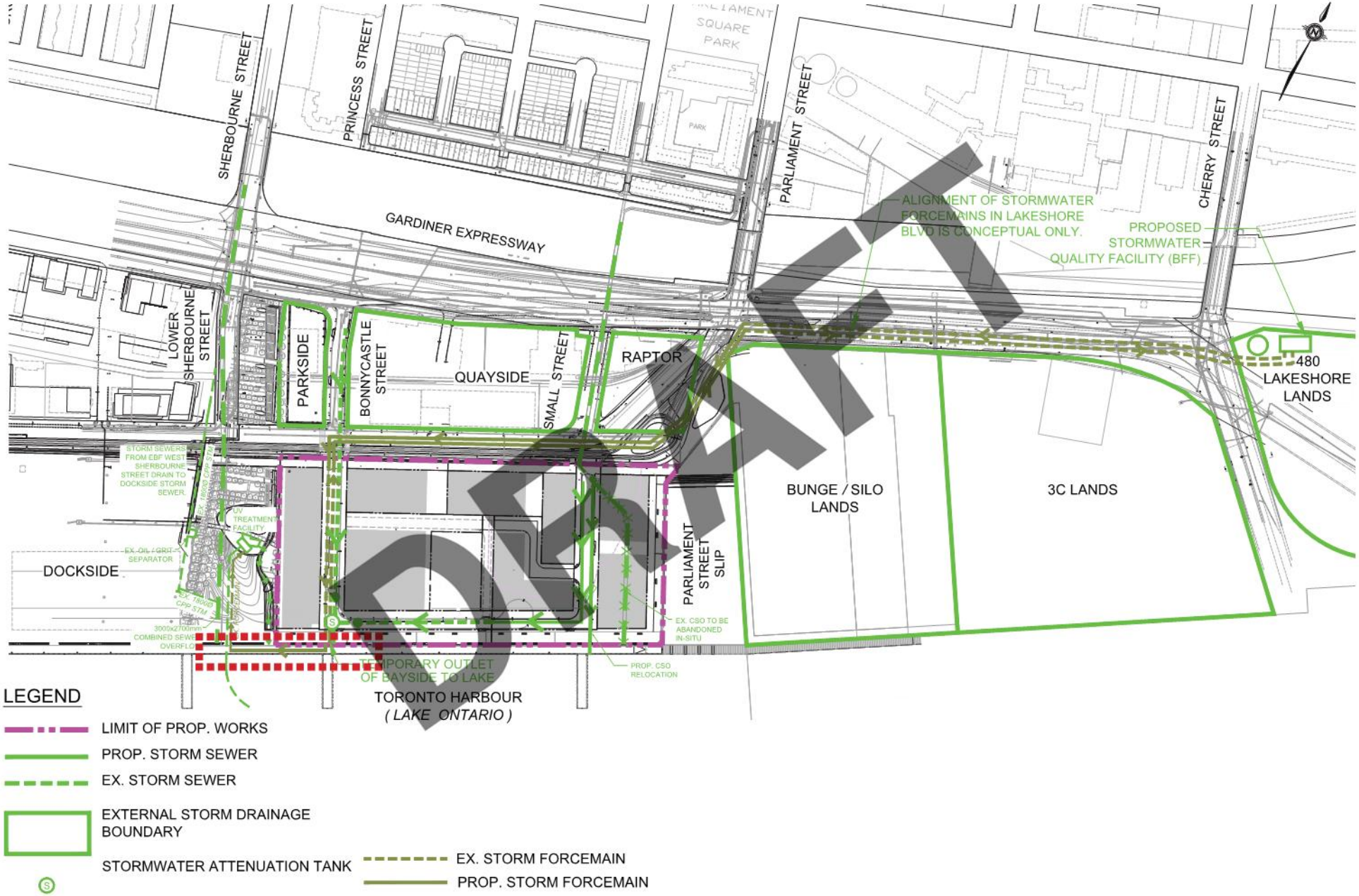
East Bayfront Dockside and Bayside
Dockwall Rehabilitation, In Water Pipe and Boardwalk

Prepared for
Meeting with DRP

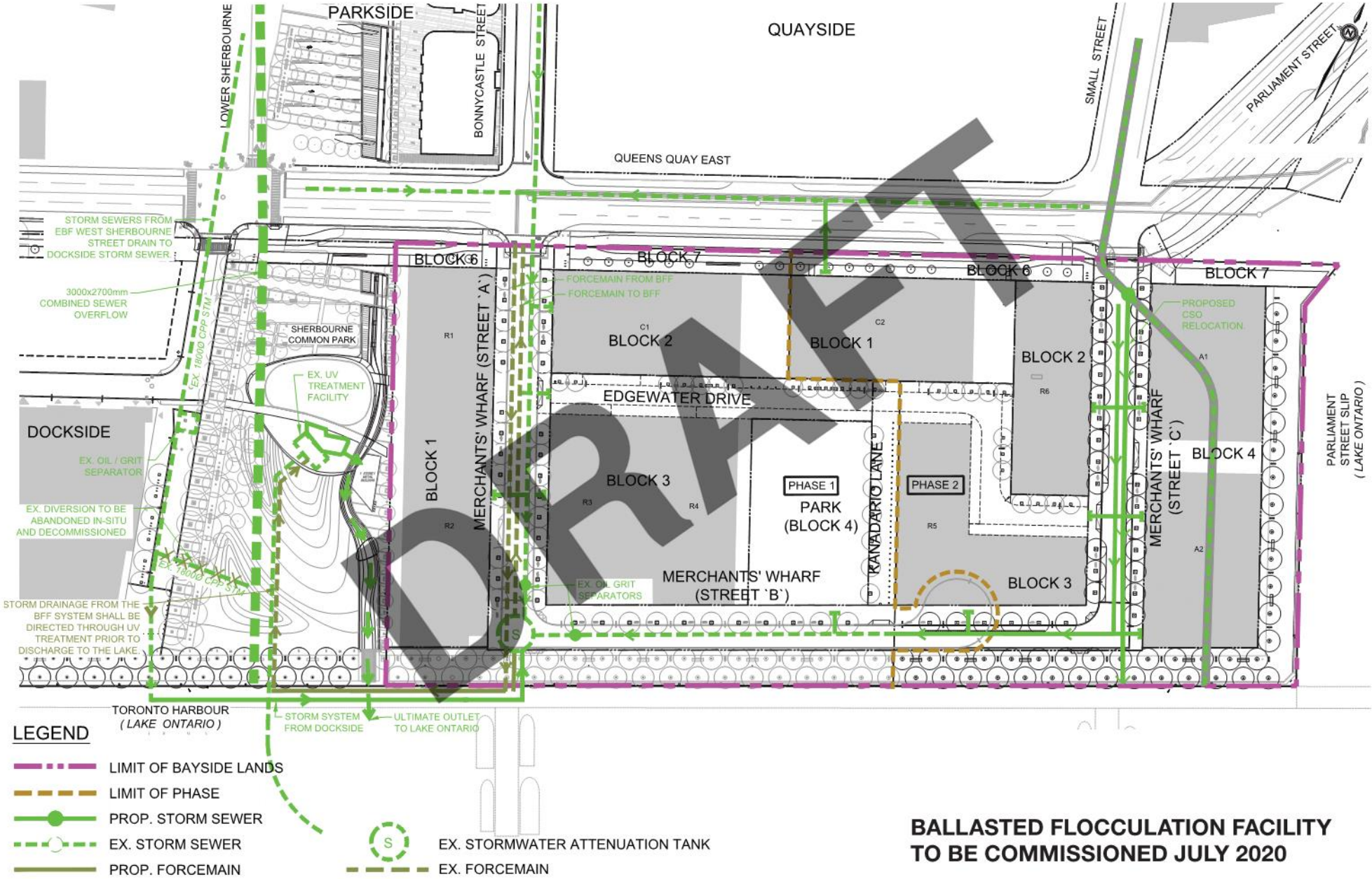
Team
DTAH
WSP Group
West 8

dtah

OVERALL CONTEXT

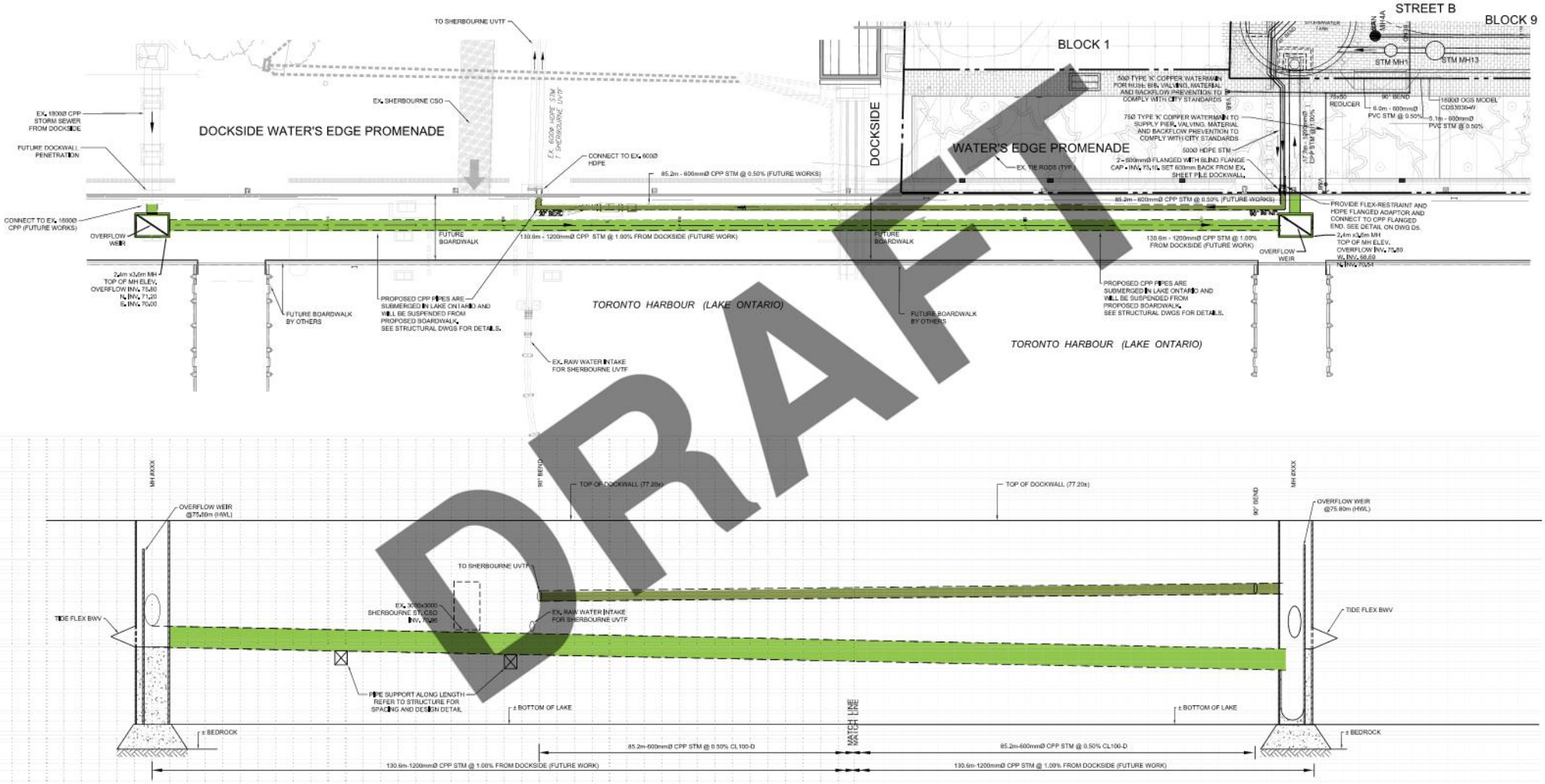


OVERALL CONTEXT

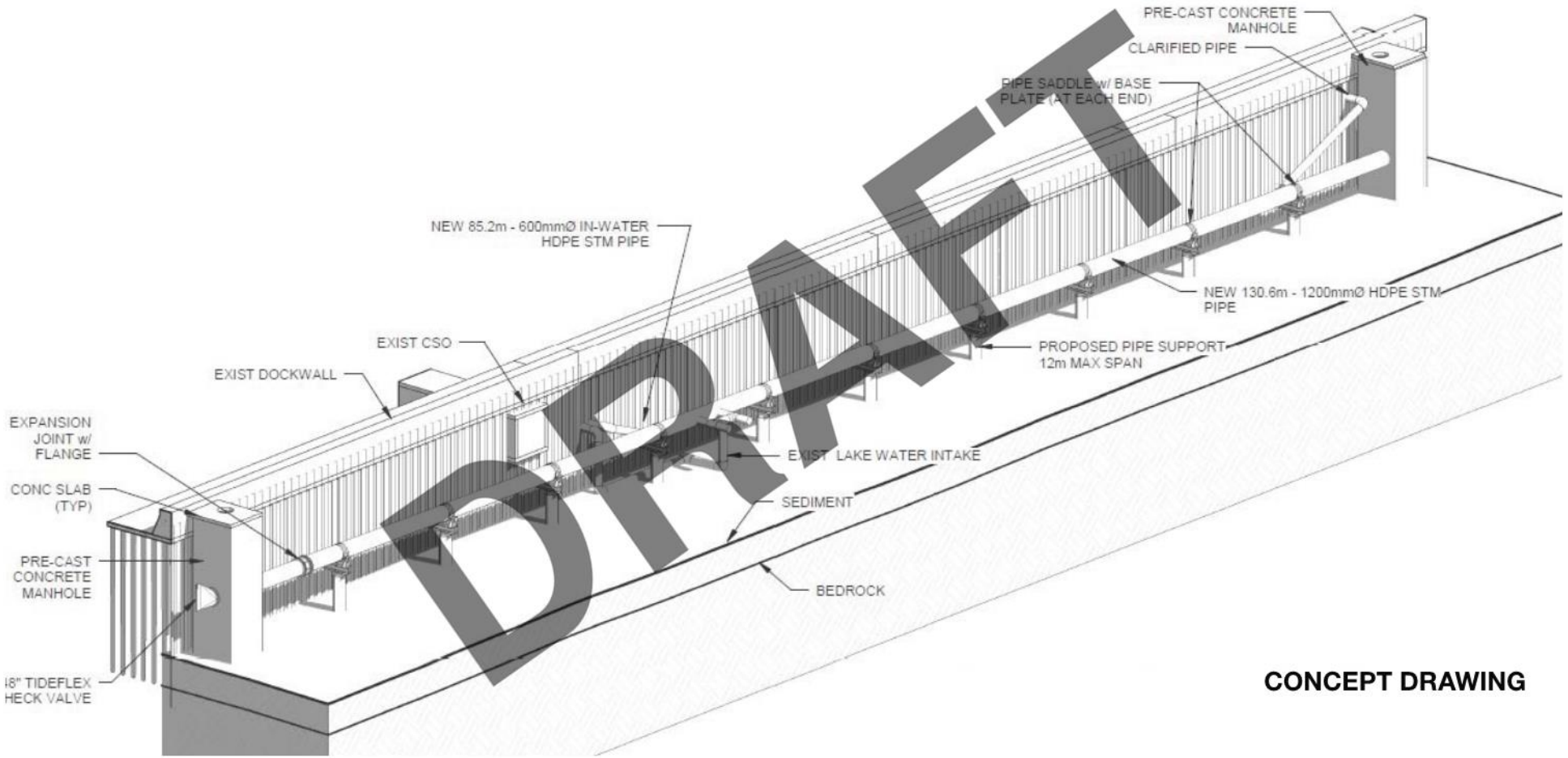


BALLASTED FLOCCULATION FACILITY TO BE COMMISSIONED JULY 2020

OVERALL CONTEXT



OVERVIEW OF CIVIL COMPONENTS



CONCEPT DRAWING

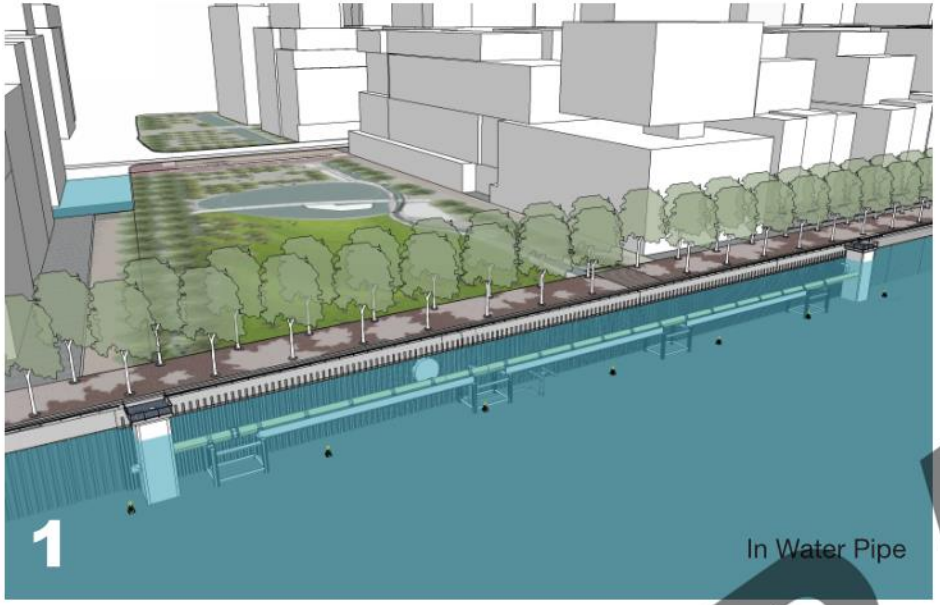
INITIAL CONCEPT OVERVIEW

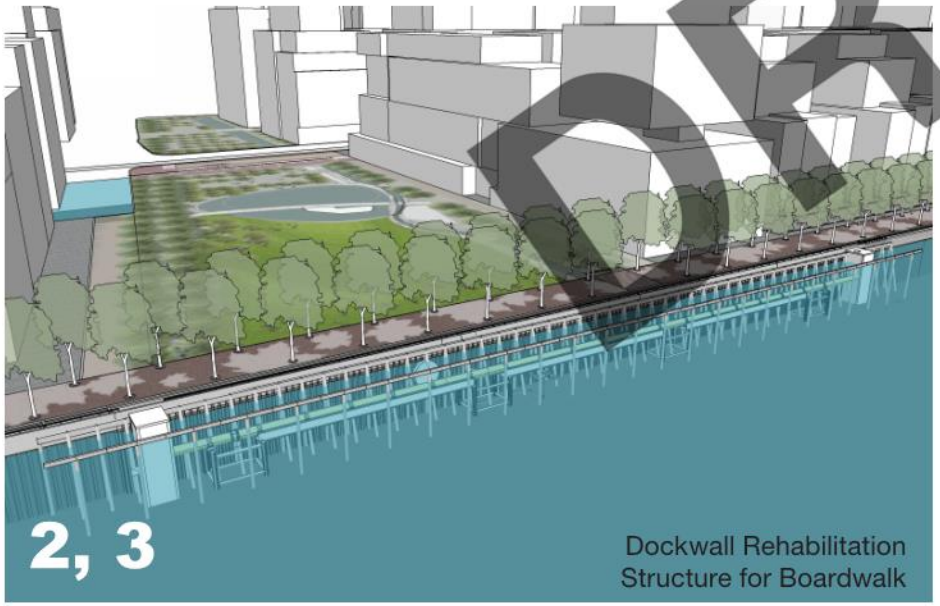
MAINTAIN AND PRESERVE EXISTING ESTABLISHED PUBLIC REALM

Safety Ladders

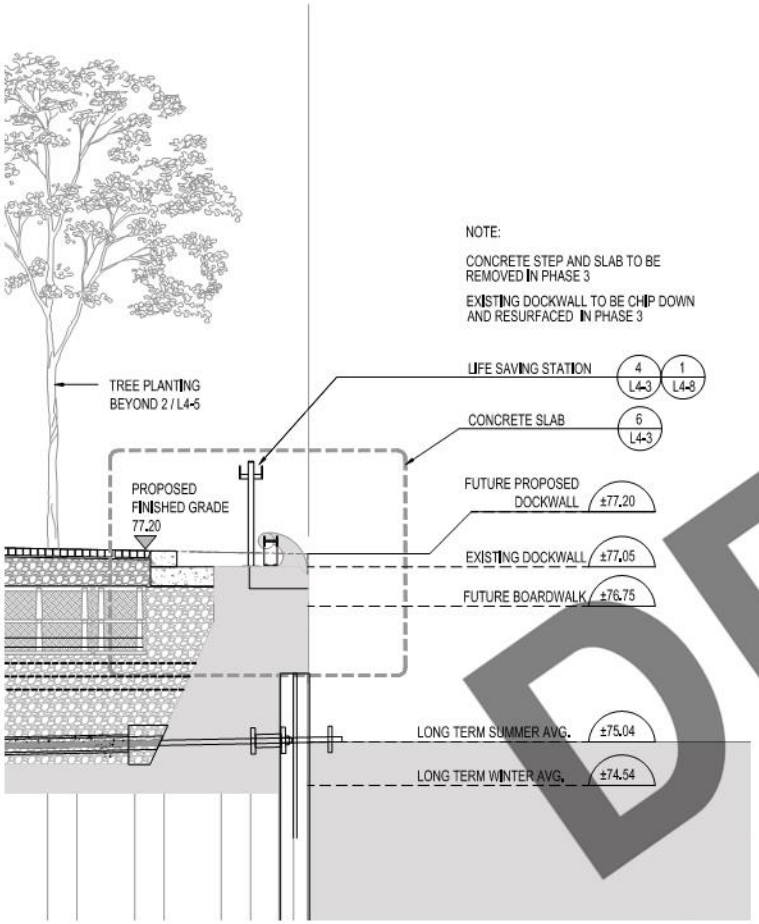
Warning Buoys
(Marine Exclusion Zone)

PUBLIC REALM INTEGRATION AND MARINE CONSIDERATIONS

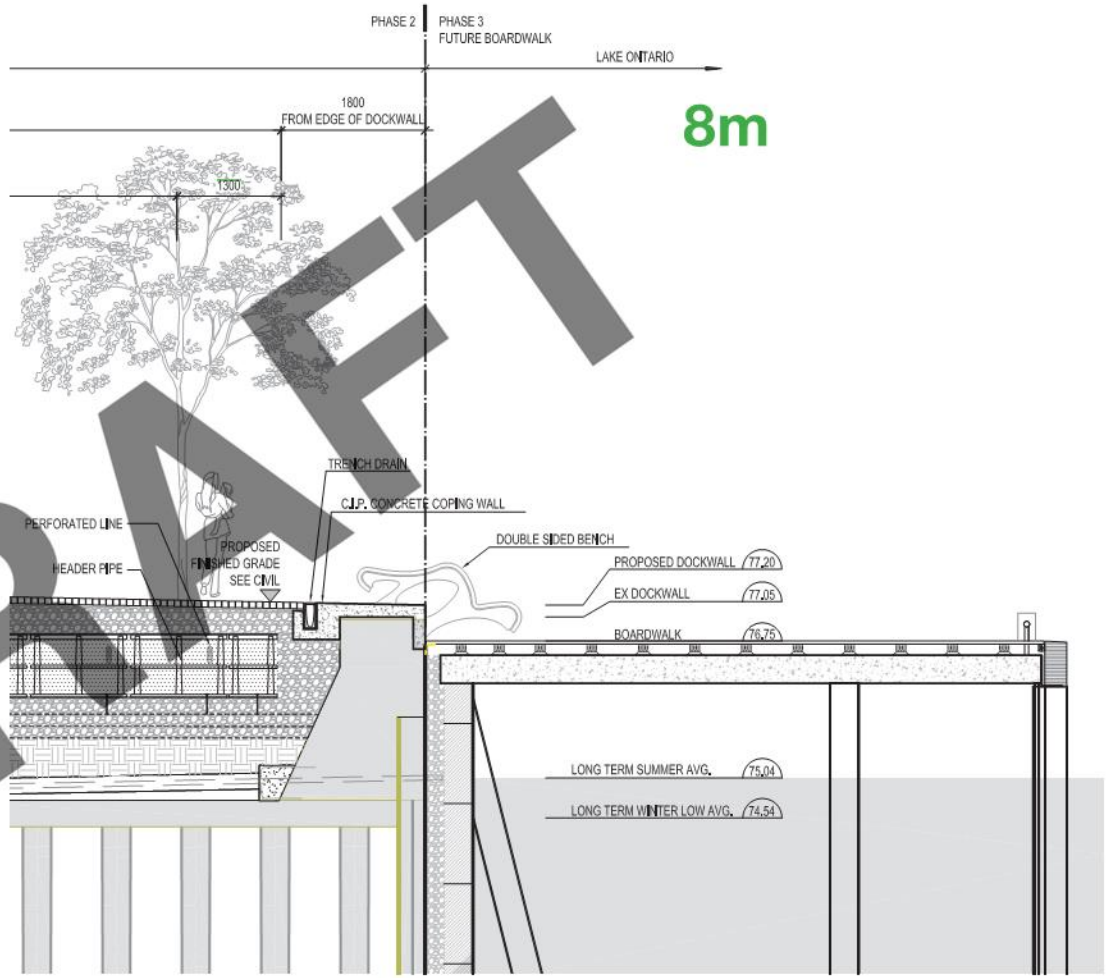




PHASED IN WATER PIPE, DOCKWALL REHABILITATION AND BOARDWALK CONSTRUCTION



Section - existing condition at dockwall.



Section - future condition with lower level boardwalk.

EARLIER CONSIDERATIONS FOR FUTURE BOARDWALK

In Water Pipe Boardwalk

Concept Design Refresh

October 16, 2019

WEST 8

WATERFRONToronto

Design Refresh Requested by Waterfront Toronto

Original Boardwalk Design from 2012 over Stormwater Tank

SPRING, SUMMER, FALL, WINTER | SPRING, SUMMER, FALL

1. WIDTH

8m minimum
*10-11m wide sections over formerly proposed stormwater tank

2. ELEVATION

Three steps below WEP (0.45m)

3. BENCH

Soft Furniture
Double Sided Organic Form

Ipe Wood Slats
Cast Aluminium Base

4. WATERS EDGE CONDITION

Galvanized Steel Toe Rail

5. DECK PATTERN

Diagonal-ish Herringbone Style

6. WOOD TYPE

Ipe

2.1km of Fixed Boardwalks in the Toronto Waterfront Master Plan

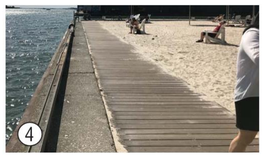
Considering the In Water Pipe Boardwalk in context

Part of an Existing Palette of Waterfront Boardwalks

HTO Park East
Width: 3m
Completion Year: 2007
Wood: Ipe
Edge Condition: Galvanized steel toe rail
*Underwater

York Quay Boardwalk
Width: 5m
Completion Year: 2005
Wood: Ipe
Edge Condition: Mixed Toe Rail, Guard Rail, Raised Wood Edges

Harbour Square Park East + West
Width: 5.3m
Completion Year: 1970's, planks replaced in last 7 years
Wood: Cedar
Edge Condition: Metal Chain Guard Rail



Canada's Sugar Beach Park
Width: 2.5m
Completion Year: 2010
Wood: Ipe
Edge Condition: Wooden Beam

5km of Waters Edge Promenade (WEP) in the Toronto Waterfront Master Plan

Considering the In Water Pipe Boardwalk in context

Existing Built Portions of the Waters Edge Promenade

Portland Slip
Width: 9.7m
Completion Year: 2014
Edge Condition: Wood Seat

Dockside
Width: 9.4m granite and 9m additional pedestrian area between buildings and promenade
Completion Year: 2010
Edge Condition: Steel Toe Rail

Canada's Sugar Beach Park
Width: 11-16m
Completion Year: 2010
Edge Condition: Park

Bayside
Width: 9.4m + 3m additional pedestrian area between buildings and promenade
Completion Year: Phase 1 2016
Edge Condition: Steel Toe Rail

Design Principles

✓ **Iconic** — Consistent Innovative Recognizable Timeless

✓ **Simple** — Elegant Versatile Maintenance Friendly

✓ **Robust** — Durable Resilient Sustainable Harbour Friendly

1. Boardwalk Width

Support a variety of user groups while maintaining marine functionality and generous sense of scale

Original Design

8m minimum

2010 Toronto Waterfront master plan proposed a generous wooden boardwalk at the waters edge in order to facilitate a variety of activities, adjacent to a 9m wide Waters Edge Promenade with granite paving.

Proposed Design

6m

Accommodates a diverse range of users: striders and strollers.
Reduced dimension from 8m improves affordability of boardwalks and bridges while maintaining a generous dimension.
Close relationship to existing 5m wide boardwalks already built on waterfront.

Research: Iconic Boardwalks (from 2010 Master Plan)

To inform a generously scaled world class boardwalk and waters edge experience

7.3m

Sunnyside Boardwalk, Toronto (Historic c. 1920)
A 7.3m wide wooden boardwalk constructed of White Pine formerly connected the Humber River to Exhibition Park.

16m

Atlantic City Boardwalk, New Jersey
This boardwalk emphasizes the need for generosity of scale - it has become an iconic attraction in itself.

1880s Atlantic White Cedar
1900s Western Red Cedar
1950s Chemically Treated Yellow Pine
1960s Ipe and Cumaru

24m

Coney Island Boardwalk, New York
At 24m wide and 5.63km long, the hardwood boardwalk at Coney Island originally built in 1923 is perhaps the quintessential timber boardwalk, establishing a generous scale in relation to the beachscape and ocean. A herringbone pattern provides special texture and a memorable quality.

1960's onward Ipe + Other Tropical Hardwoods

Research: 6-8m Wide Iconic Boardwalks

7m (including benches)
Oosterdok Jetty, Amsterdam (2017)

Floating boardwalk constructed of Accoya, creates expanded public space on south facing side of Oosterdok to increase scale of public realm with the construction of new large buildings adjacent.

8.5m (excluding bench area)
Ocean City Boardwalk, Maryland

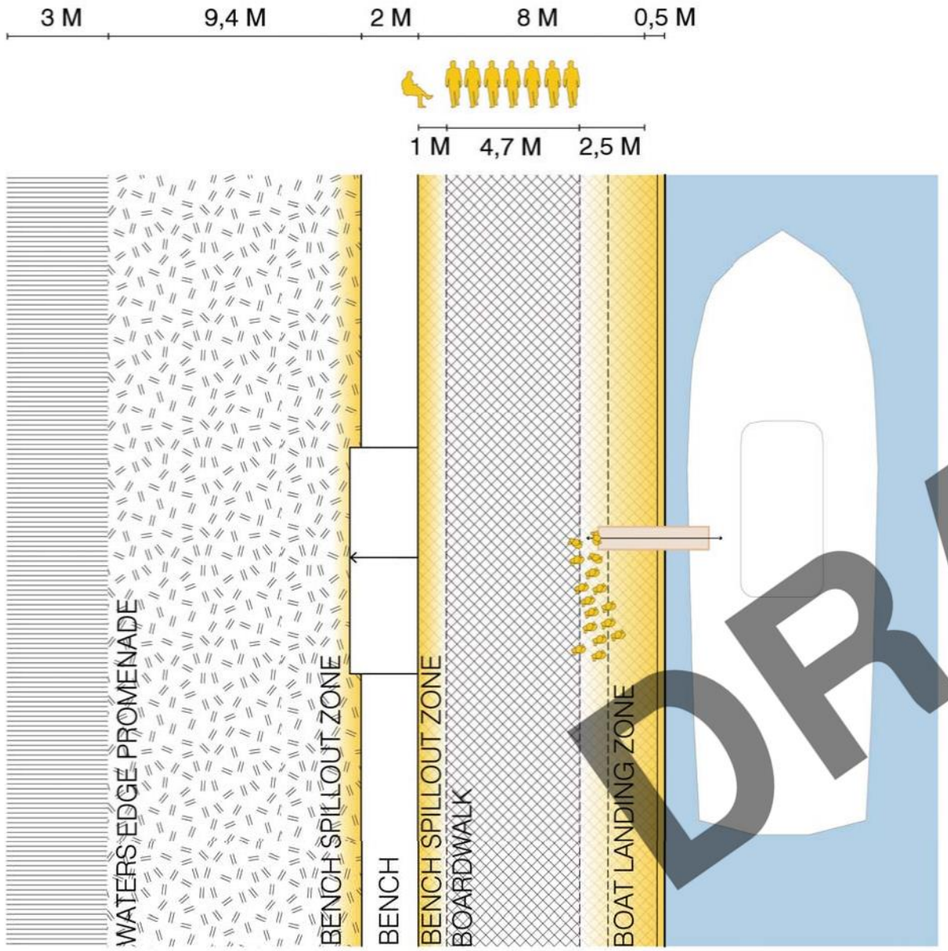
4.8km of boardwalk between the beach and commercial activities open to bicycles and pedestrians.

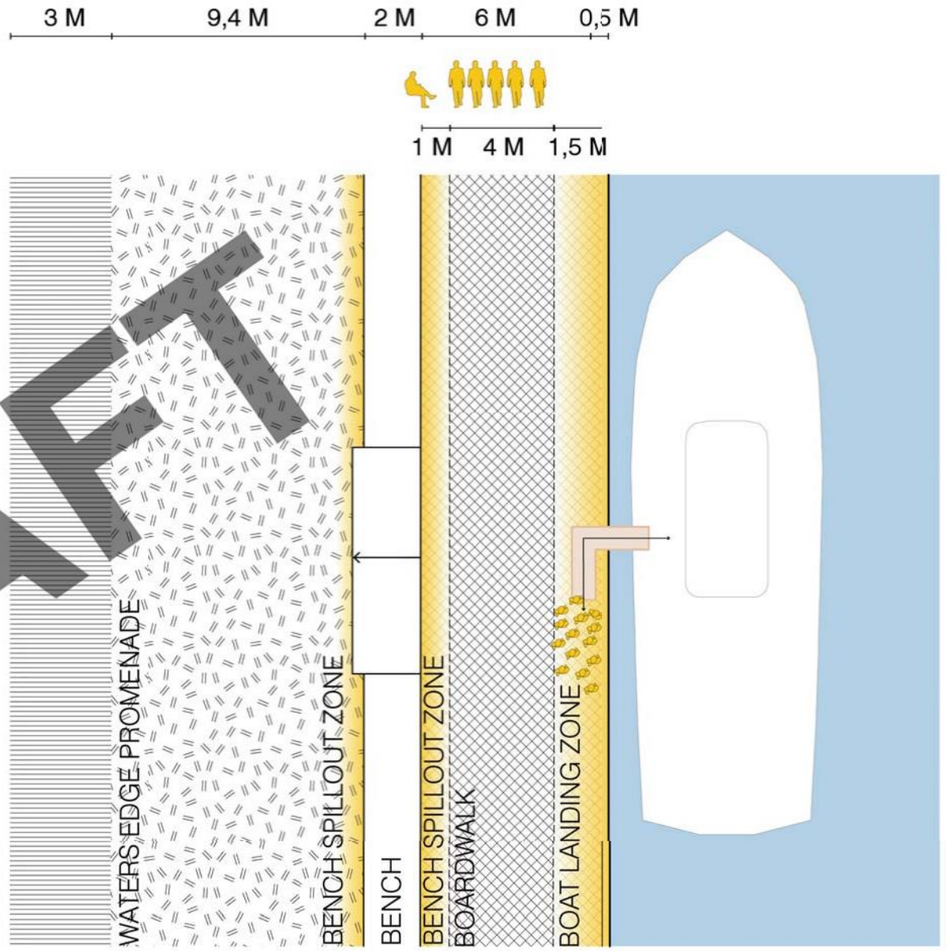
5-10m (6.3m pictured)
Halifax Harbour Walk, Nova Scotia

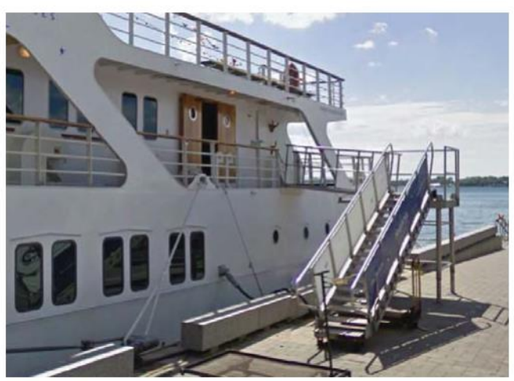
4.4km of continuous wooden boardwalk made of (pressure treated?) softwood.

Boardwalk typology changes throughout the waterfront experience, sometimes out on piers in the water, sometimes cutting behind buildings, and sometimes occupying the edge between building and water.

Research: Boat Mooring Arrangement



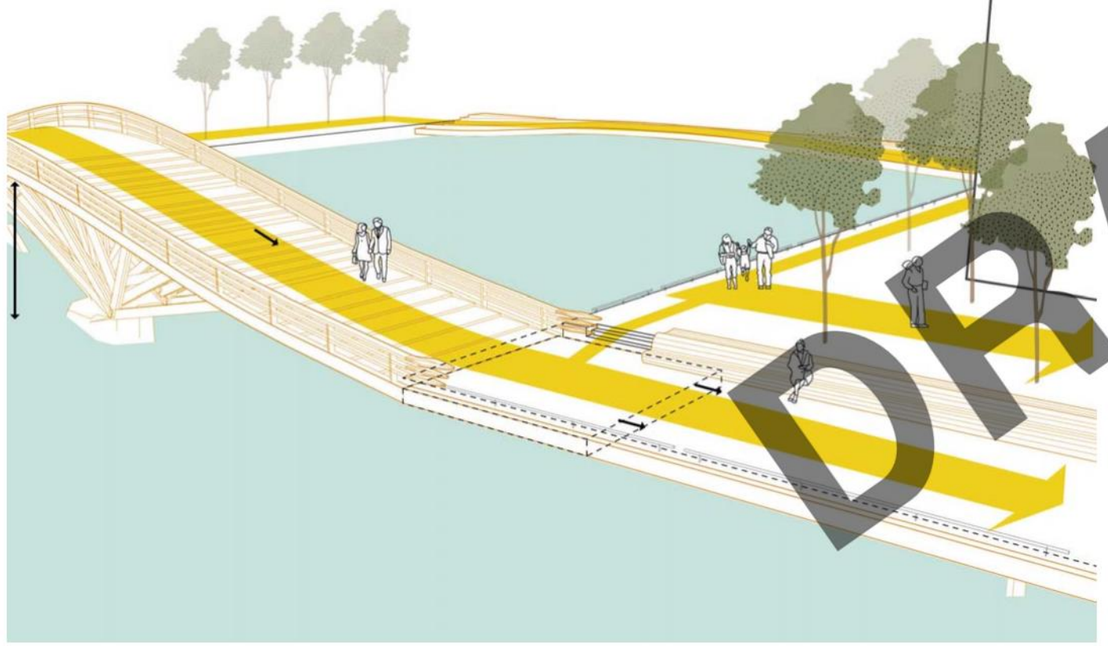




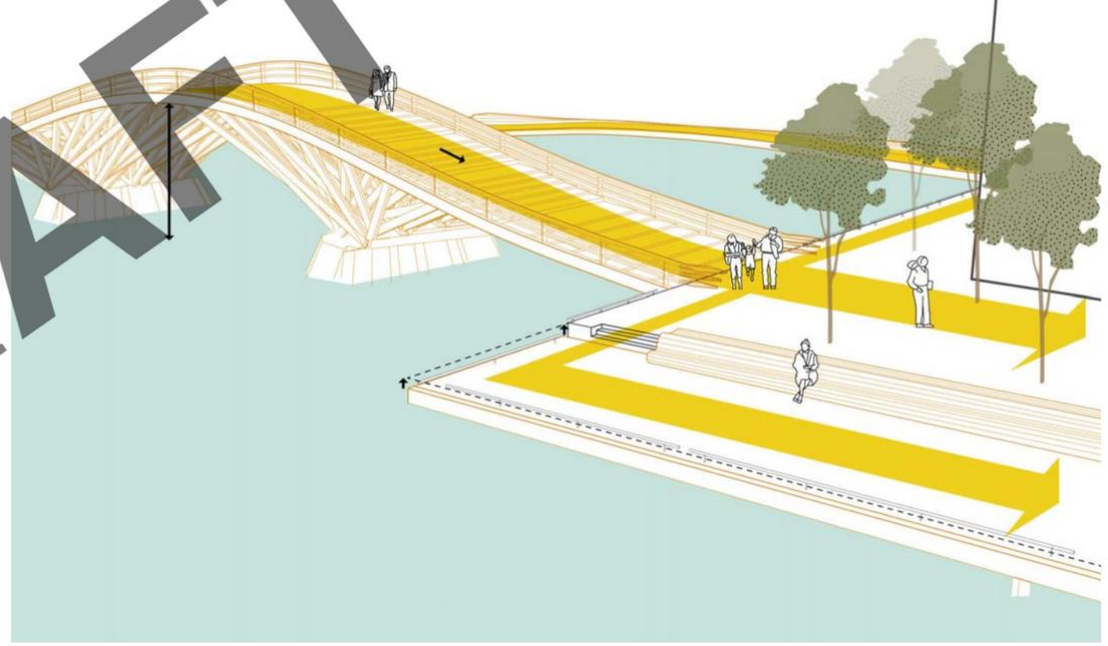
Context: Boardwalk + Bridges = Consistent Waterfront Walk Experience

Direct spatial and material relationship of boardwalk width to width of future bridges under review as part of Waterfront Walk Refresh

Original Design: Bridges can Land on Boardwalks...



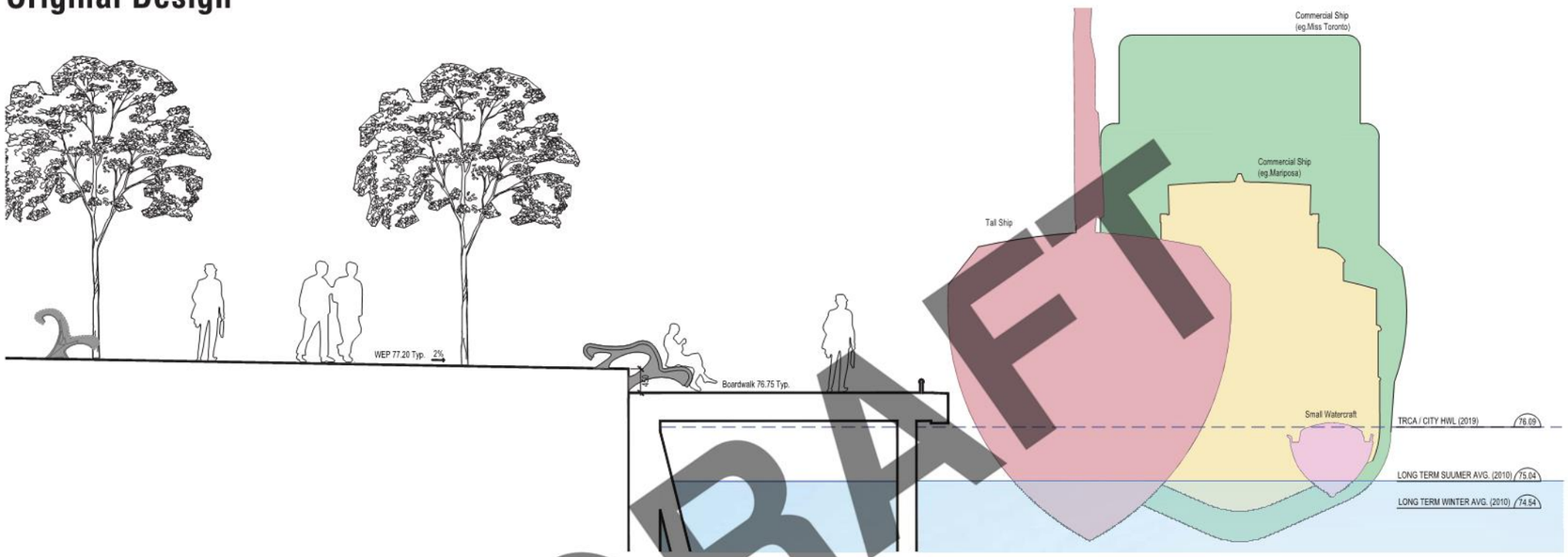
or Bridges can Land on Dock Walls



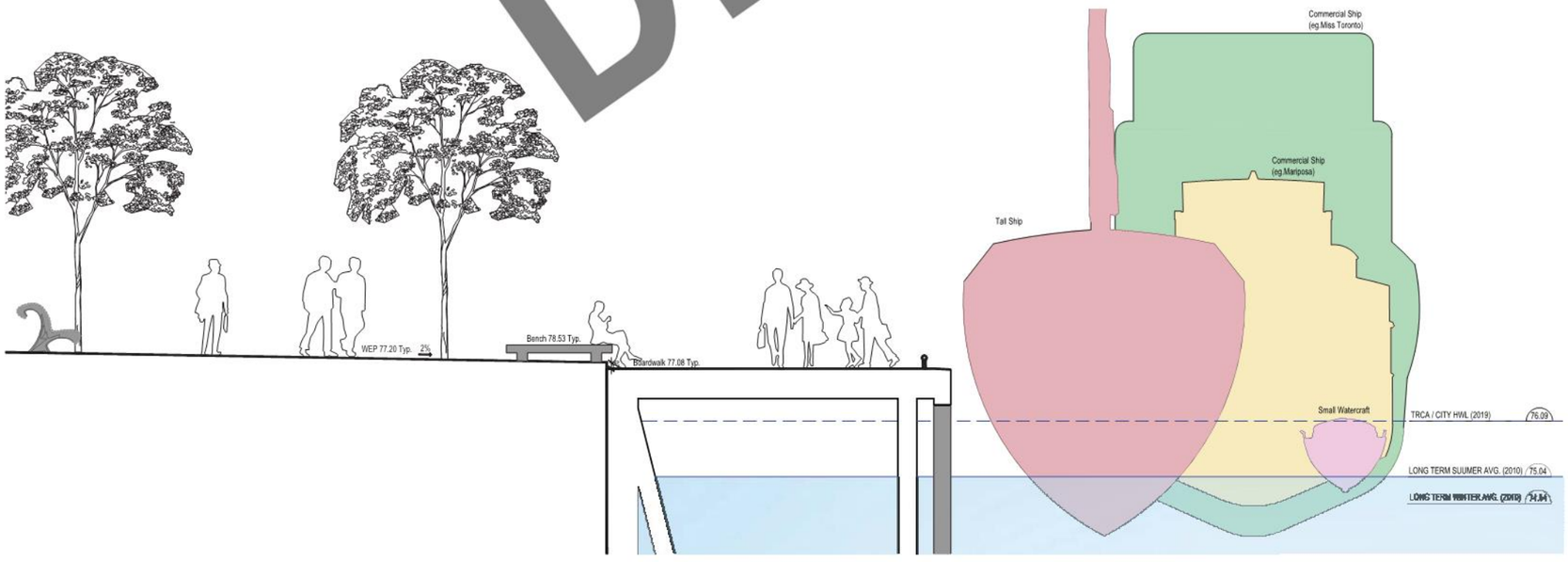
2. Boardwalk Elevation

In Relation to Fluctuating Lake Levels and Mooring Requirements

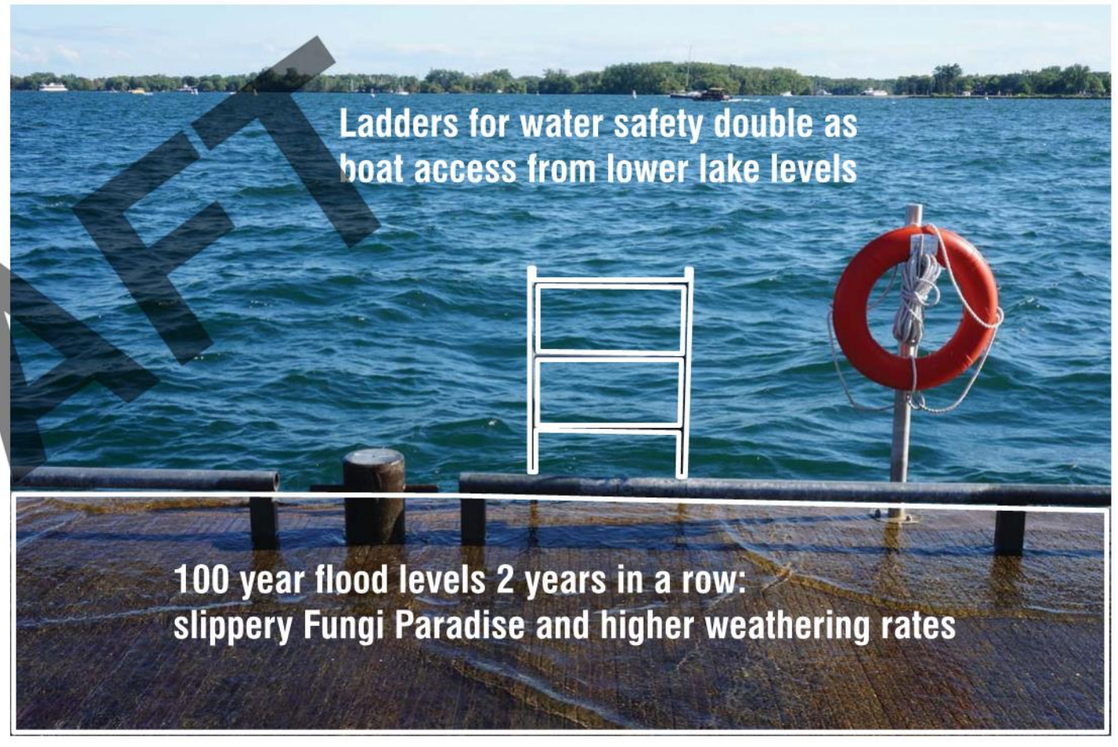
Original Design



Proposed Design



Balance Demands of Safe, Accessible Public Realm w/ Marine Functionality



Research: Future Proof the Public Realm

THE CONVERSATION

Academic rigour, journalistic flair

Waves on Lake Superior crash against the Duluth, Minn. waterfront Sept. 10, 2014. Randen Pederson, CC BY

Climate change is driving rapid shifts between high and low water levels on the Great Lakes

June 4, 2019 1.43pm BST

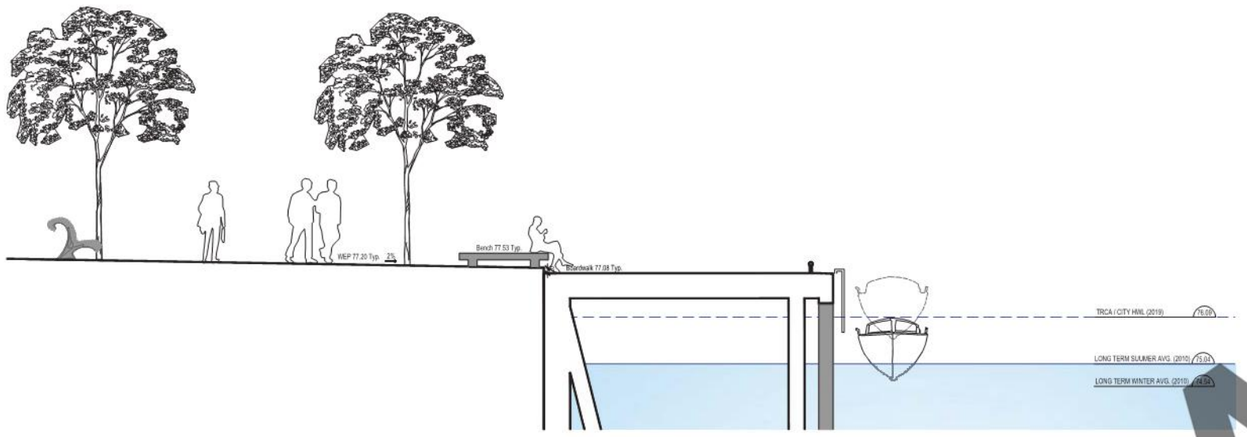
"As researchers epcializing in hydrology and climate science, we believe rapid transitions between extreme high and low water levels in the Great Lakes represent the "new normal. Our view is based on interactions between global climate variability and the components of the regional hydrological cycle."

"... in the late 1990's, surface water temperatures on Lakes Superior and Michigan-Huron rose...Water levels... dropped to the lowest levels ever recorded. Then in 2014...lakes froze and evaporation rates dropped. As a result, water levels surged."

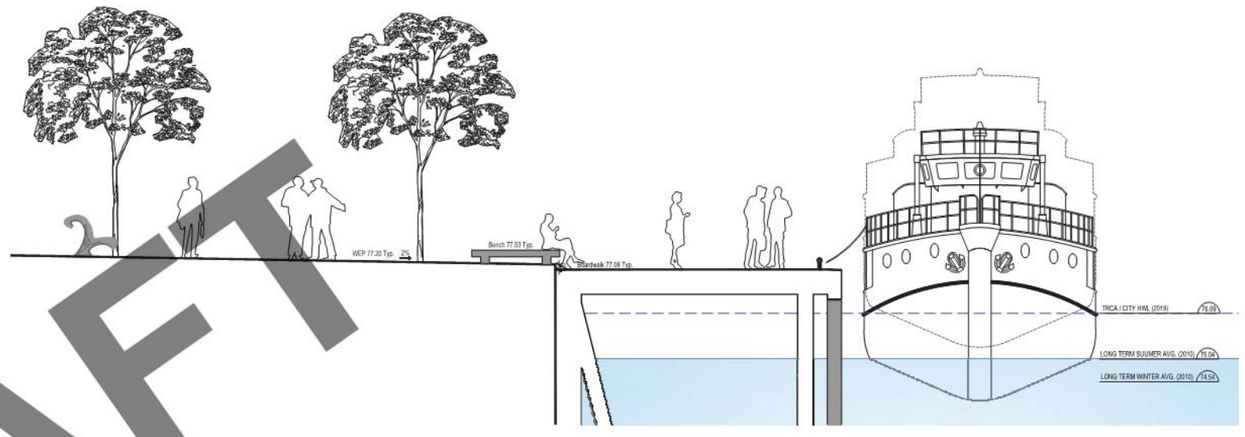
"The bigger point is that past conditions around the Great Lakes are not a reliable basis for decision-making that will carry into the future"

Research: Future Functional Mooring for Boats of All Sizes

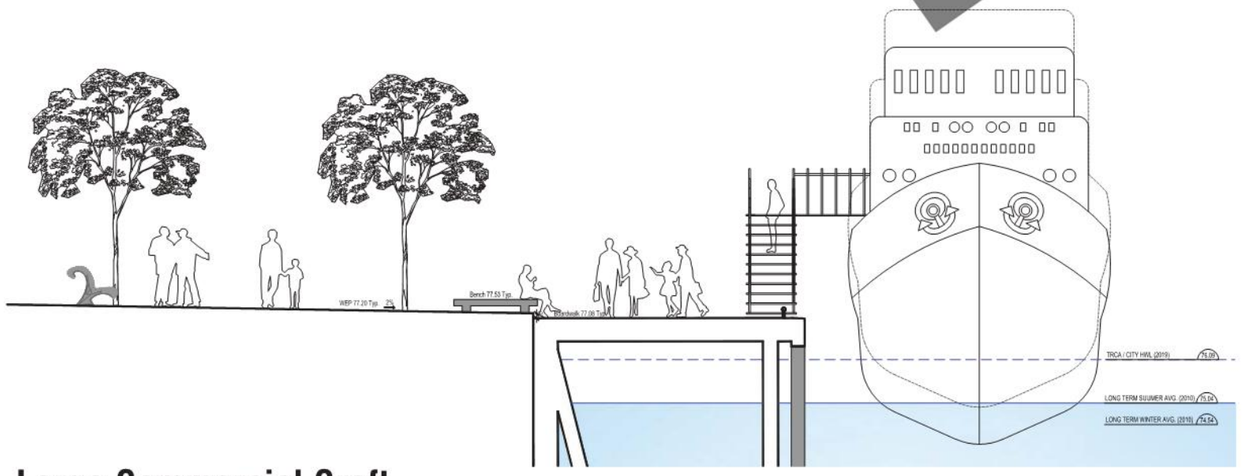
Note: no boats will be mooring along the section of Boardwalk over the In Water Pipe



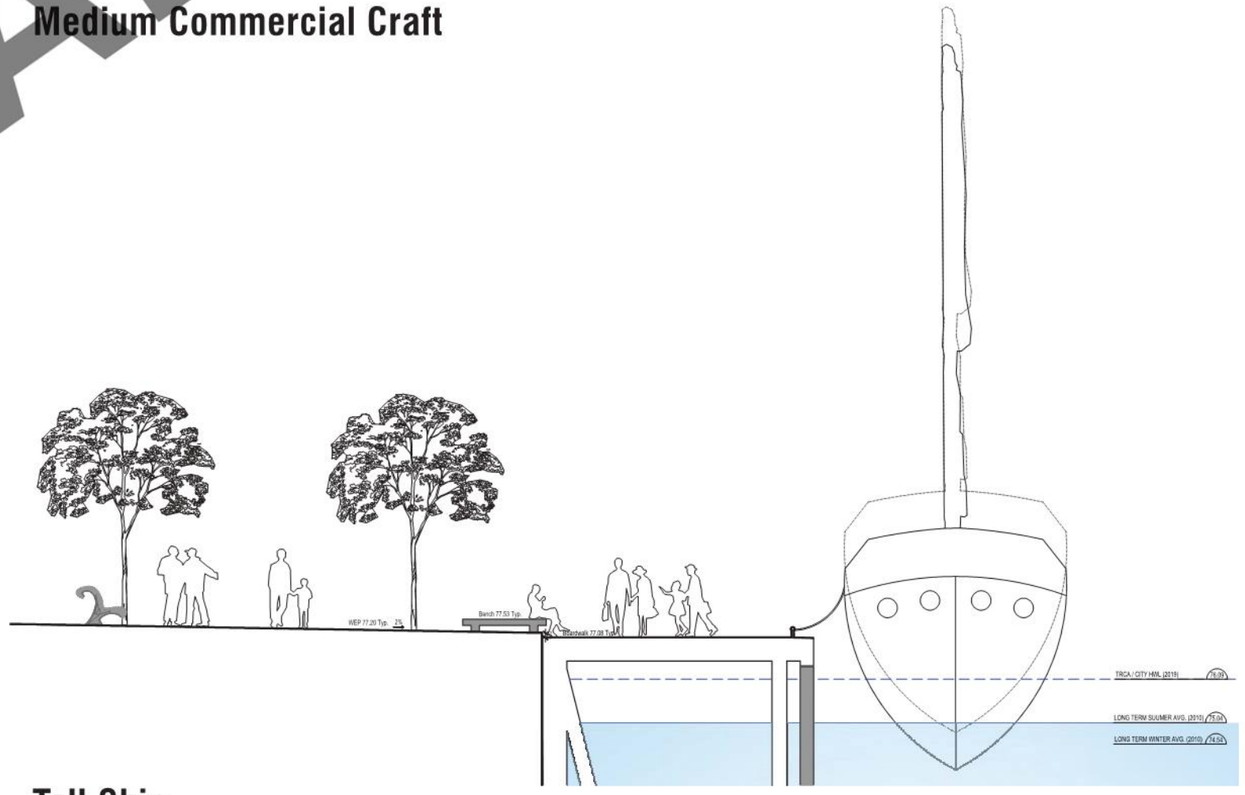
Personal Watercraft



Medium Commercial Craft



Large Commercial Craft

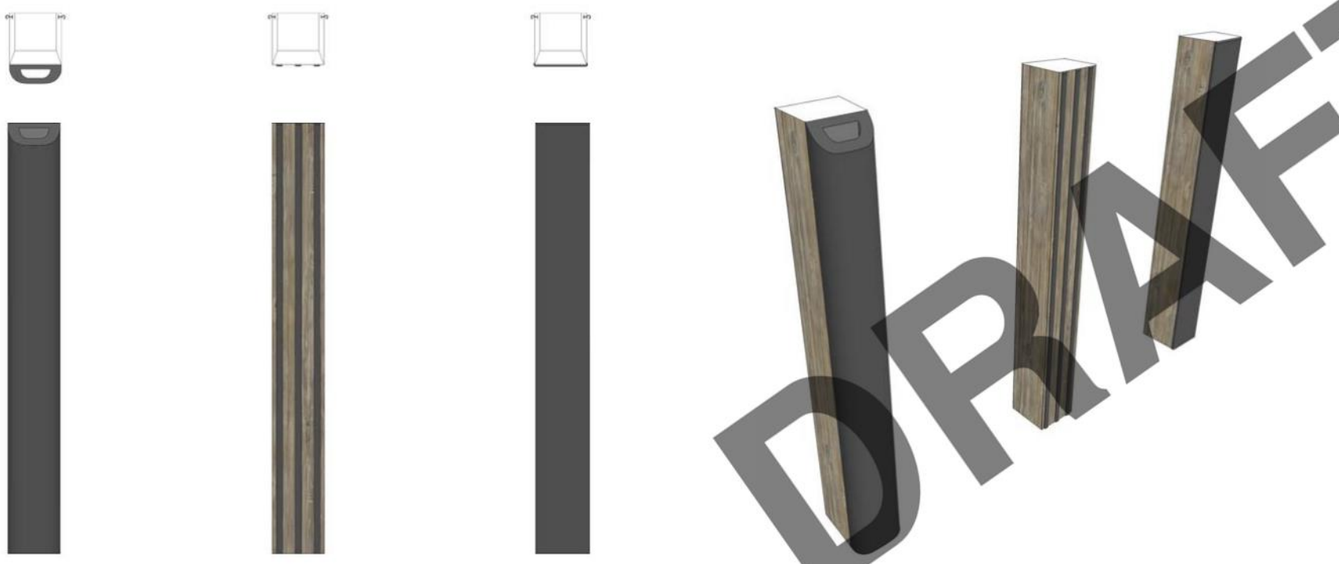


Tall Ship

Accommodate Smaller Boats, Fluctuations through Fendering

Maintain maximum access to the pedestrian public realm and provide access to boats at waters edge

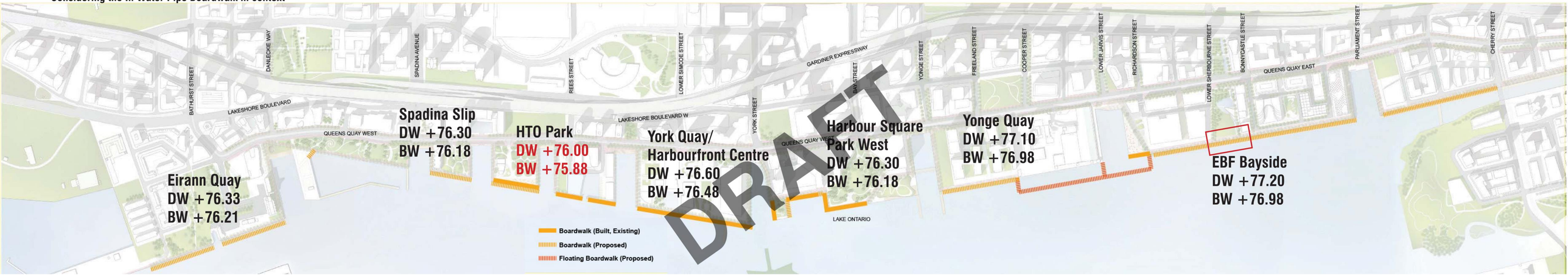
Timber Fendering Options



Reference: Boat mooring infrastructure in the Netherlands

Context: Dock Wall (DW) and Boardwalk (BW) Elevations

Considering the In Water Pipe Boardwalk in context

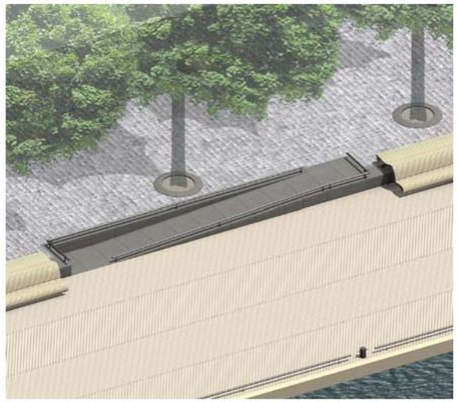


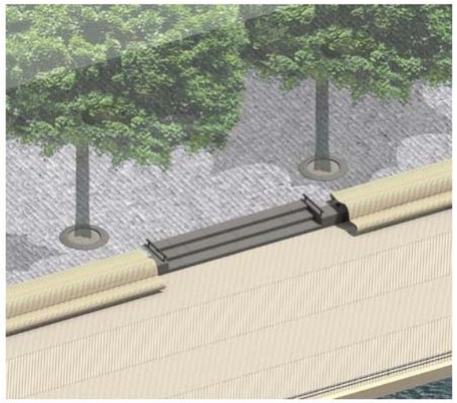
New TRCA High Water Level = 76.09m
Summer Average = 75.04m
Winter Average = 74.04

1 Step, not 3: Elegant Grade Transition between WEP and Boardwalk

Connections between the promenade and boardwalk every 20-40m without need for handrails

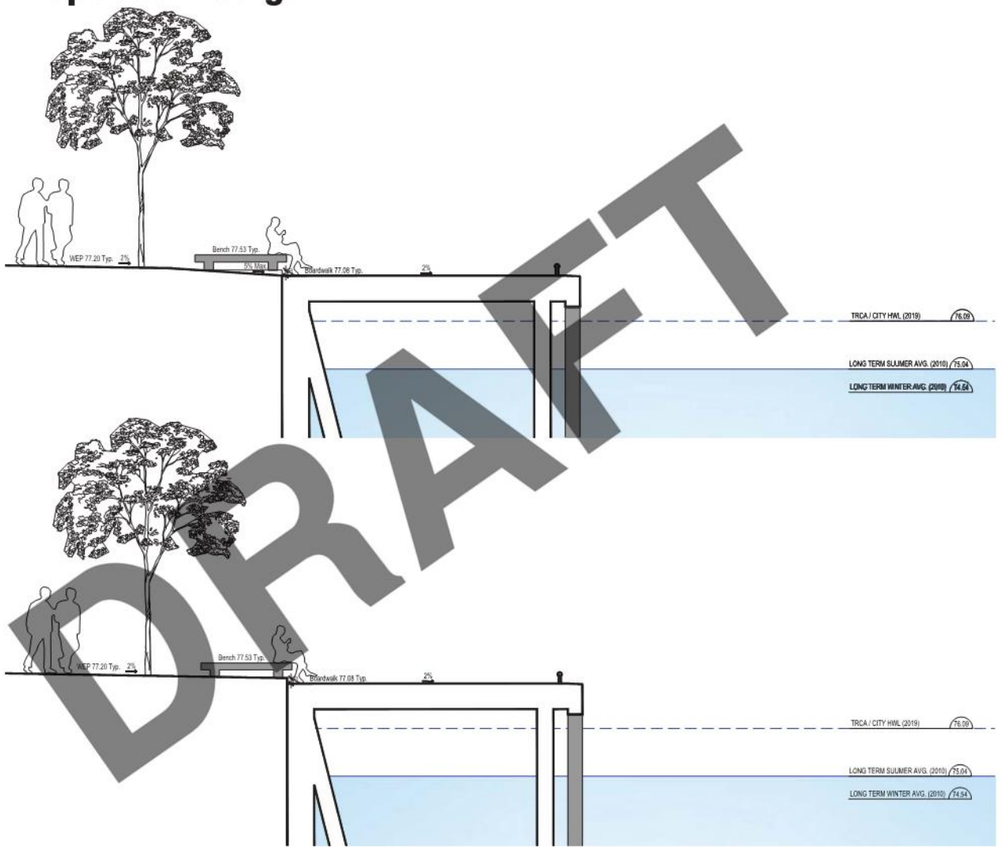
Original Design

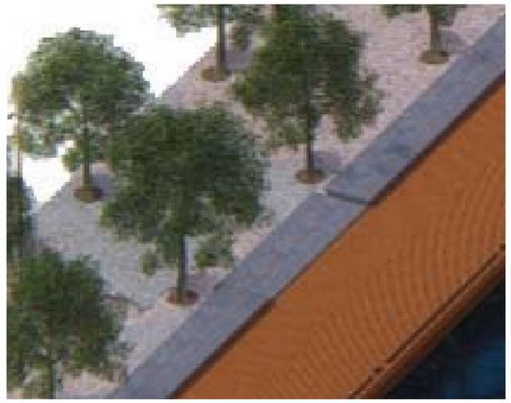




Reference: broken handrail at York Quay

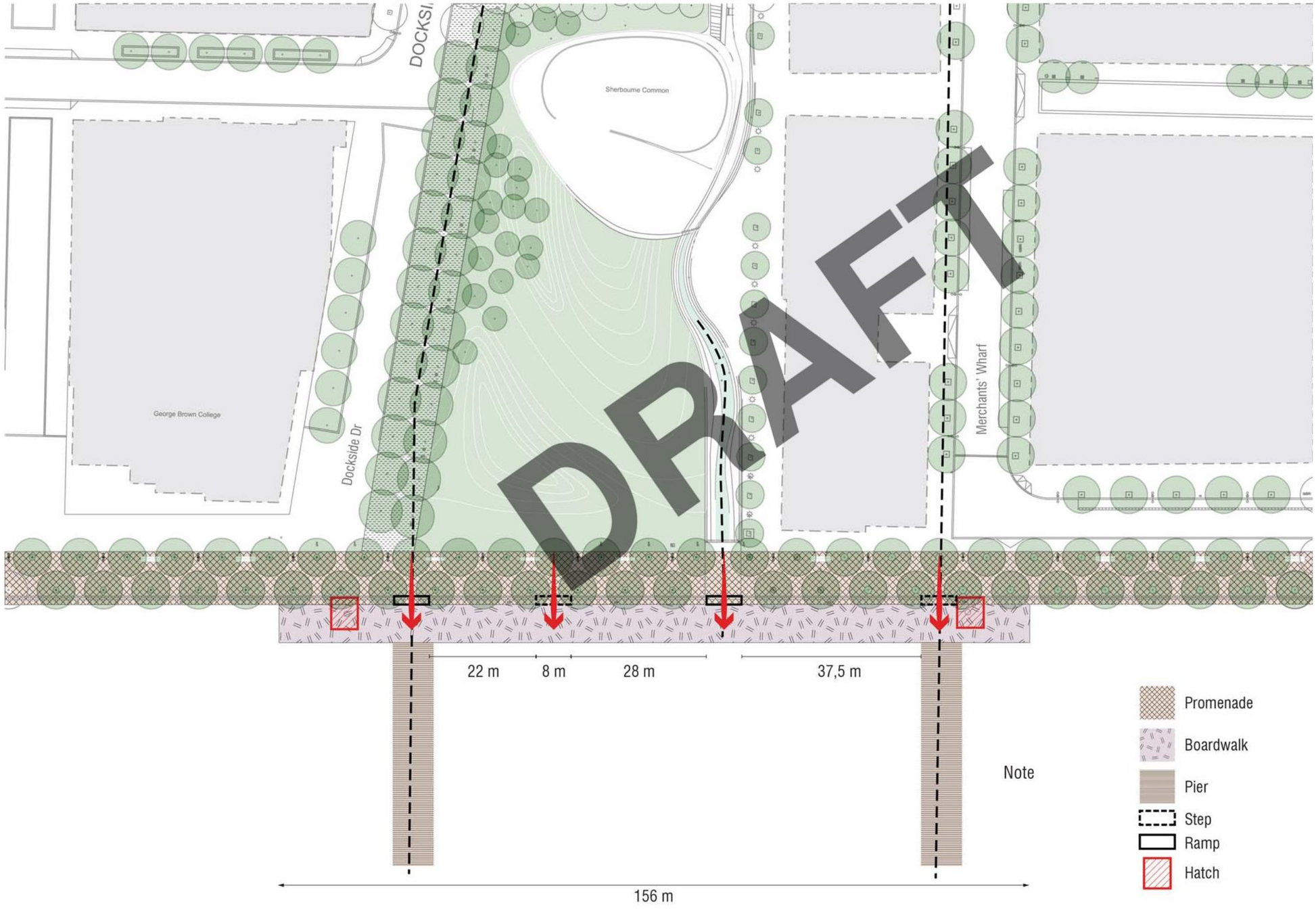
Proposed Design





Reference: Granite sloped walkway transition, York Quay

Spacing of Access Points and Alignment to Surrounding Context



3. Bench

Evoke Sublime Quality of Sitting on Canadian Shield with Lake Overlook

Canadian Granite is durable, elegant, sober, spectacular, and consistent

Original Design

Reference: Broken bench, Queens Quay Boulevard, mock up of boardwalk bench

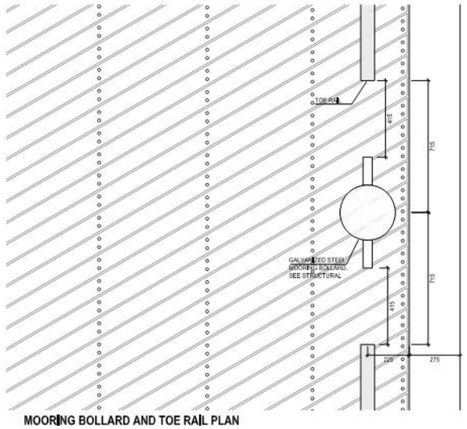
Proposed Design

Reference: York Quay Boardwalk. Granite Bench perfect for sitting, stargazing, and can create multiple height variations

4. Waters Edge Condition

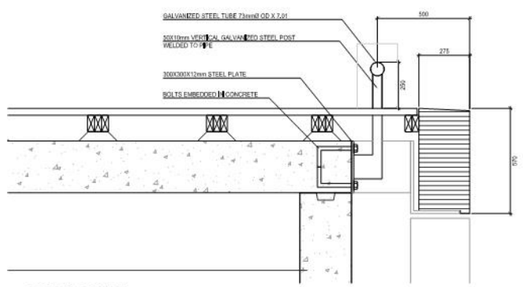
Nautically constructed beam and edge condition consistent with family of existing toe rails and wave decks

Original Design



MOORING BOLLARD AND TOE RAIL PLAN

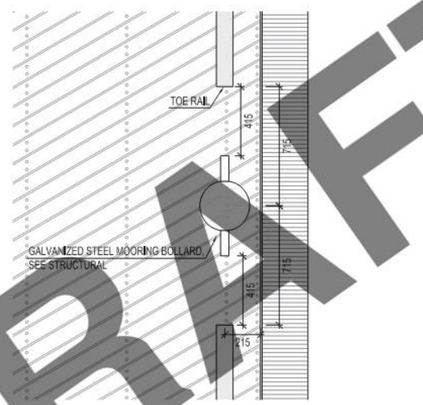
5 MOORING BOLLARD
1:10



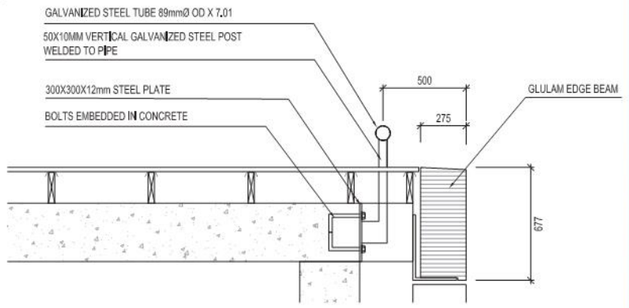
TOE RAIL SECTION
1:10

6 TOE RAIL
AS NOTED

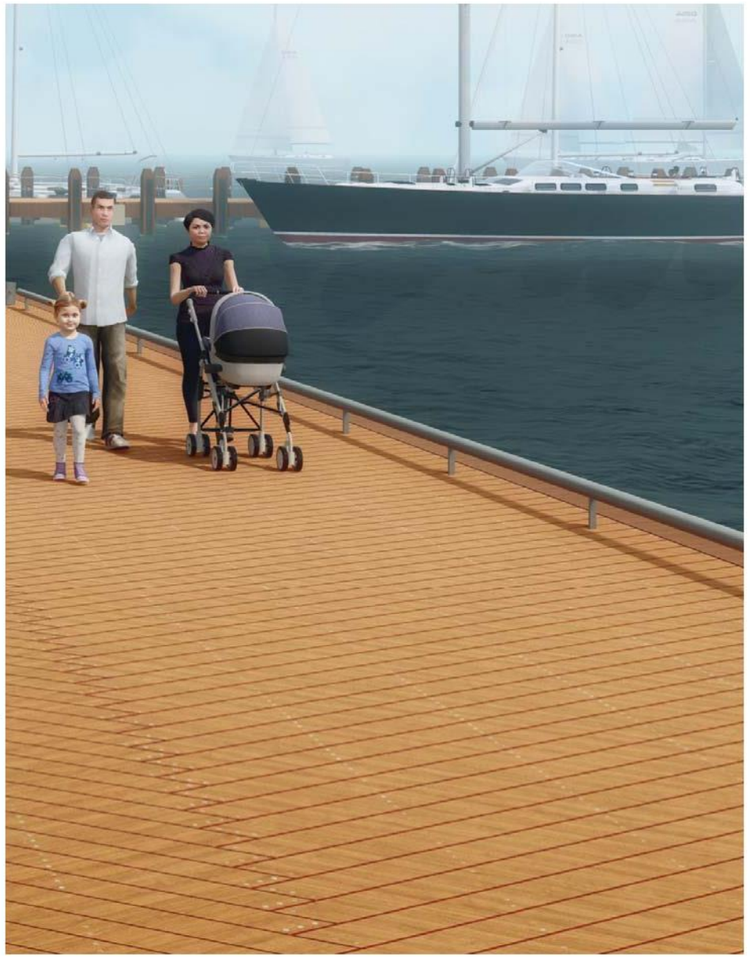
Proposed Design



3 MOORING BOLLARD AND TOE RAIL PLAN
1:20



4 TOE RAIL
1:20



Research: Existing Waters Edge Transitions

Mooring Bollards and Toe Rails
Galvanized steel or large timber, continuity with Waterfront details

Inspiration: Existing Bayside and York Quay Boardwalk Edge Details

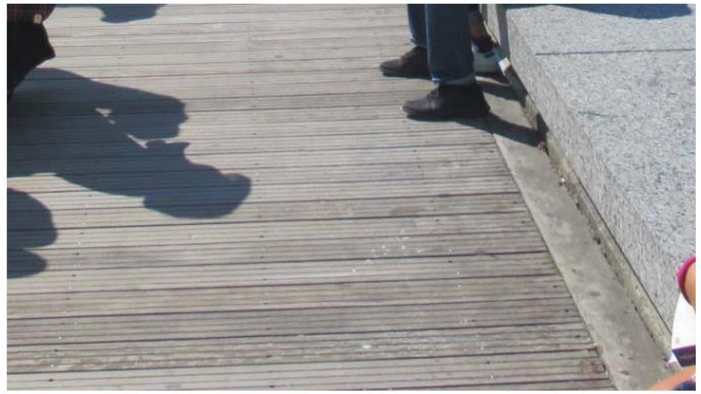
Timber seat edge, Portland Slip (WEP - note: not boardwalk relationship)
Edge guard doubles as a seating edge and encourages lookout

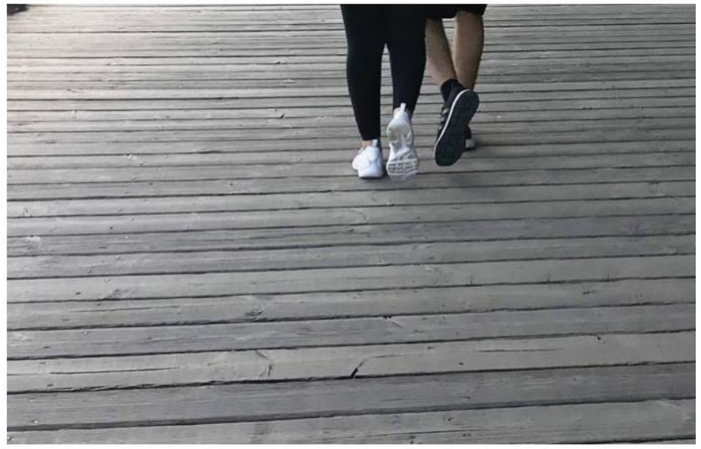
Wave Deck (and future bridge) Profiles - Glulam Beam visible from the Water

Harbour Square Park and Sugar Beach

5. Deck Pattern

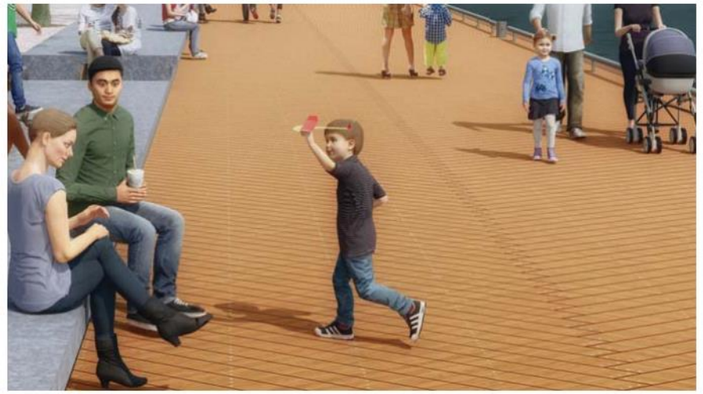
Existing Conditions



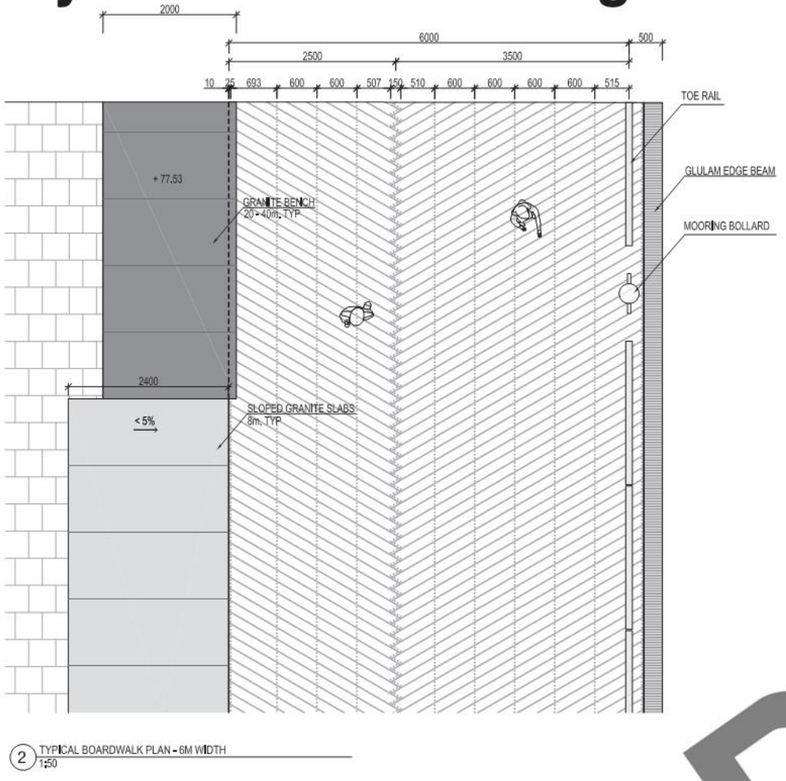


Original Design

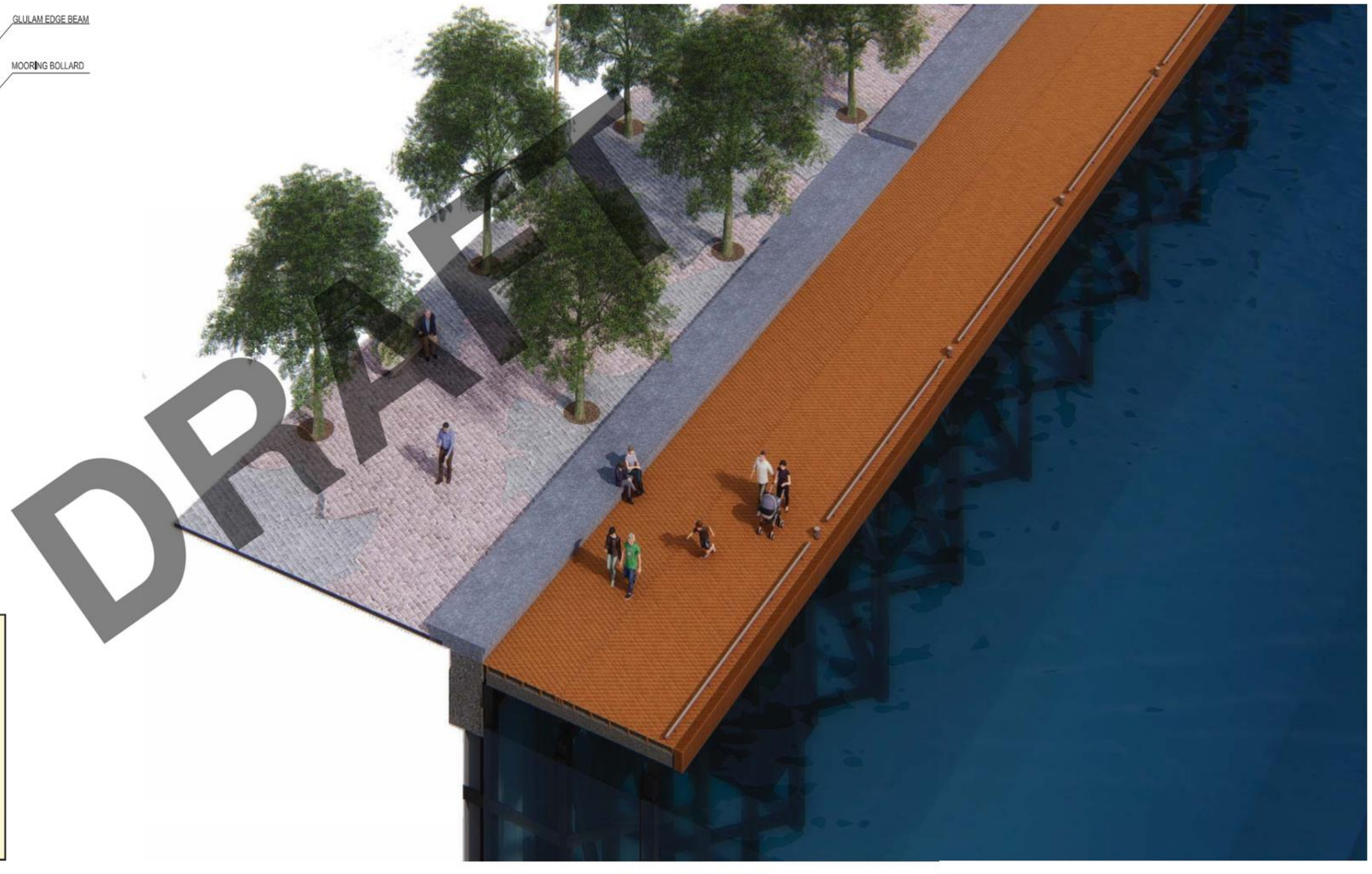
Proposed Design



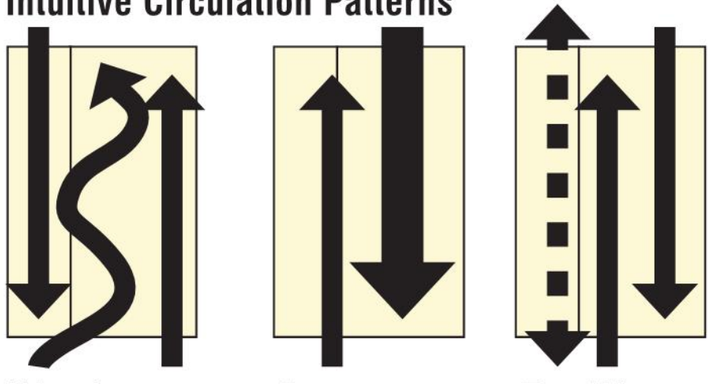
Asymmetrical Herringbone with 2m Bench - Dynamic and Flexible



2 TYPICAL BOARDWALK PLAN - 6M WIDTH
1:50



Intuitive Circulation Patterns

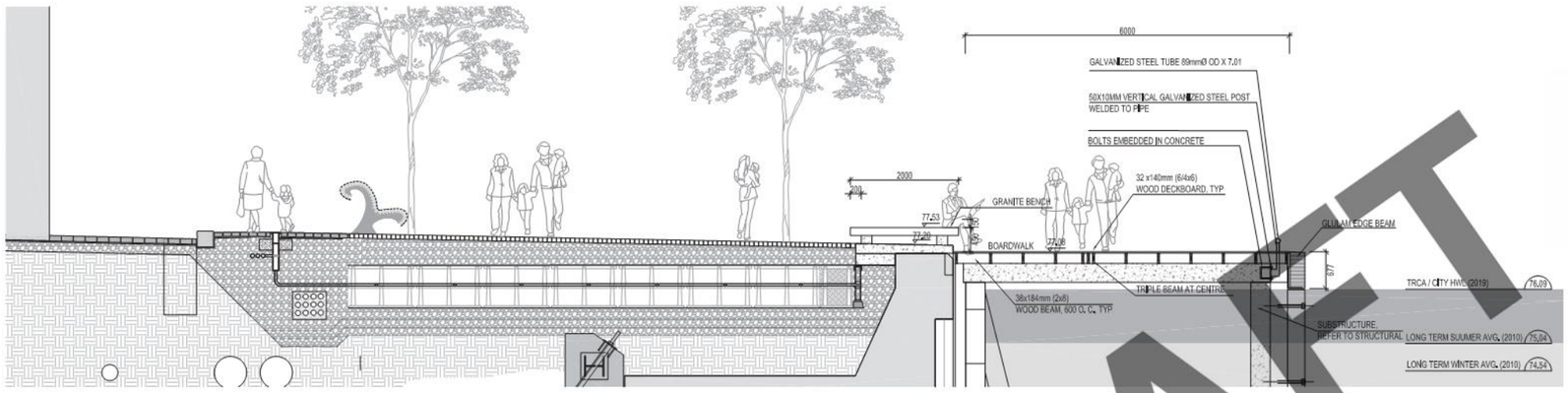


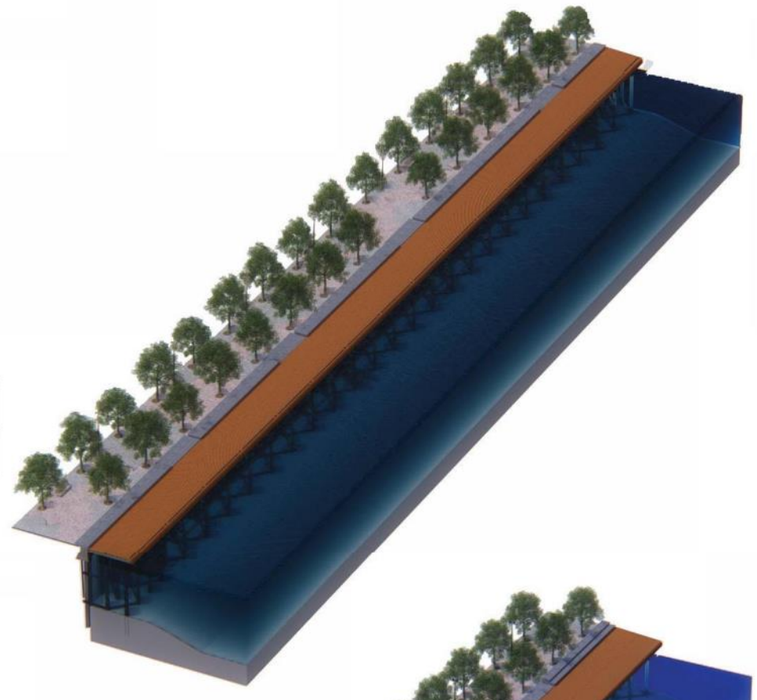
Weaving

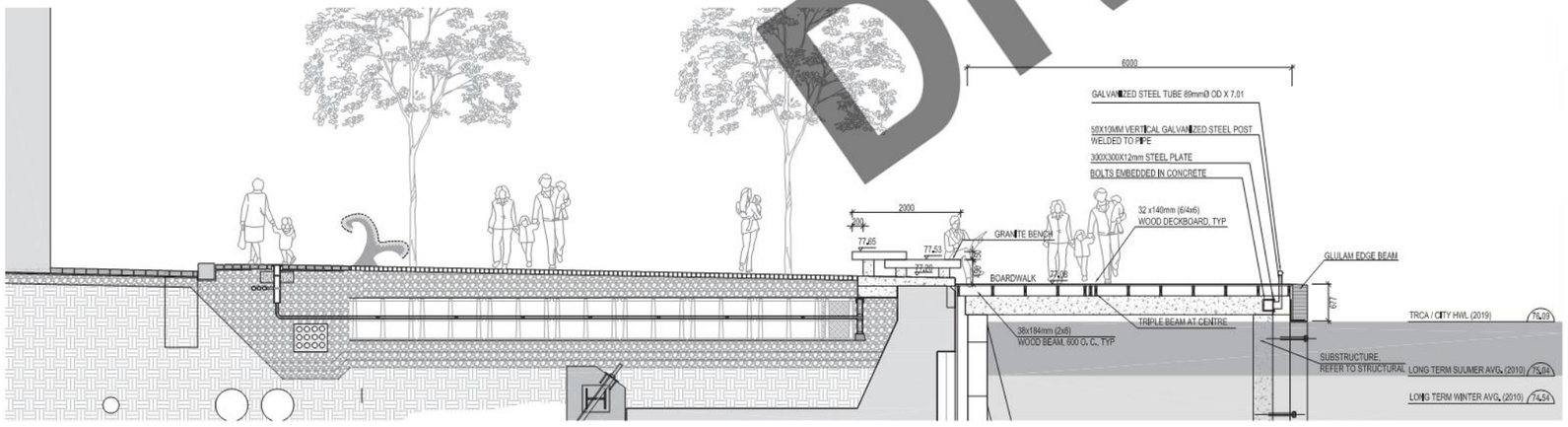
Encourage Directional Flow

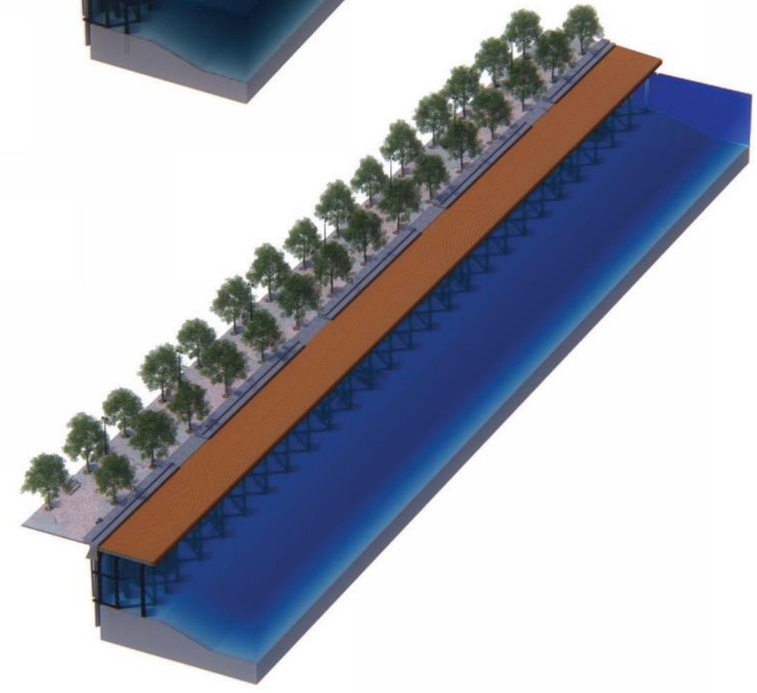
Two Way Traffic with a Slow Lane

Potential for Bench to be Double Sided in Select Areas



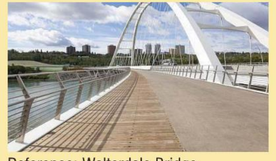






6. Wood Type

Finding an Alternative to Ipe - Two Families of Wood Types

	Product	DESIGN CRITERIA Durability	Longevity	Sustainability	Narrative	Origin	References
Canadian Softwood	• **Western Red Cedar**	Durability Factor II Janka Hardness 350	15-25 years Natural Tannins prevent rot and insects, kiln dried is dimensionally stable	Renewable material	Canadian lumber, matches look, feel, and spatial quality of the quintessential Canadian Boardwalk and lake front	British Columbia, Alaska	 Kinsol Trestle, Vancouver Island, restored in 2011 with Alaskan Yellow Cedar Deck  Reference: Granville Island, Vancouver, 1980's / 1990's
	• **Alaskan Yellow Cedar**	Durability Factor II Janka Hardness 580					
Chemically Reinforced Softwood	• **Accoya**	Durability Factor I Janka Hardness 900	Dimensionally stable, minimal rot Guaranteed for 30-50 years	Cradle to Cradle Certification	Sustainable wood product on market for 10-20 years	Pine from New Zealand treated in Belgium / The Netherlands	 Reference: Oosterdok, Amsterdam, 2017  Reference: Walterdale Bridge, Edmonton, 2018
	• **Kebony**	Durability Factor I Janka Hardness 1730		Reuse industrial by-products			
Tropical Hardwood	• **Ipe (for comparison purposes)**	Janka Hardness 3200	30-50 years	Imported tropical hardwood	Reputation/ perception no longer favourable from sustainability perspective. Material consistent with existing wave decks	Tropical Rainforest, Brazil	 Reference: Rees Wave Deck, Toronto  Reference: HTO Park, Toronto

Proposed Design Approach

Combination of Preferred design options as the outcome of research

1. WIDTH

6m walking width with 0.5m mooring edge and toe rail

2. ELEVATION

One step below WEP, 0.12m, no handrails

3. BENCH

Strip of Canadian Shield 2m wide Granite

4. WATERS EDGE CONDITION

Galvanized steel toe rail with strengthened profile

5. DECK PATTERN

Asymmetrical Herringbone

6. WOOD TYPE

Alaskan Yellow Cedar

Design Refresh Requested by Waterfront Toronto

Original Boardwalk Design from 2012 over Stormwater Tank

1. WIDTH

8m minimum
*10-11m wide sections over formerly proposed stormwater tank

2. ELEVATION

Three steps below WEP (0.45m)

3. BENCH

Soft Furniture
Double Sided Organic Form

Ipe Wood Slats
Cast Aluminium Base

4. WATERS EDGE CONDITION

Galvanized Steel Toe Rail

5. DECK PATTERN

Diagonal-ish
Herringbone Style

6. WOOD TYPE

Ipe


DRAFT

In Water Pipe Boardwalk

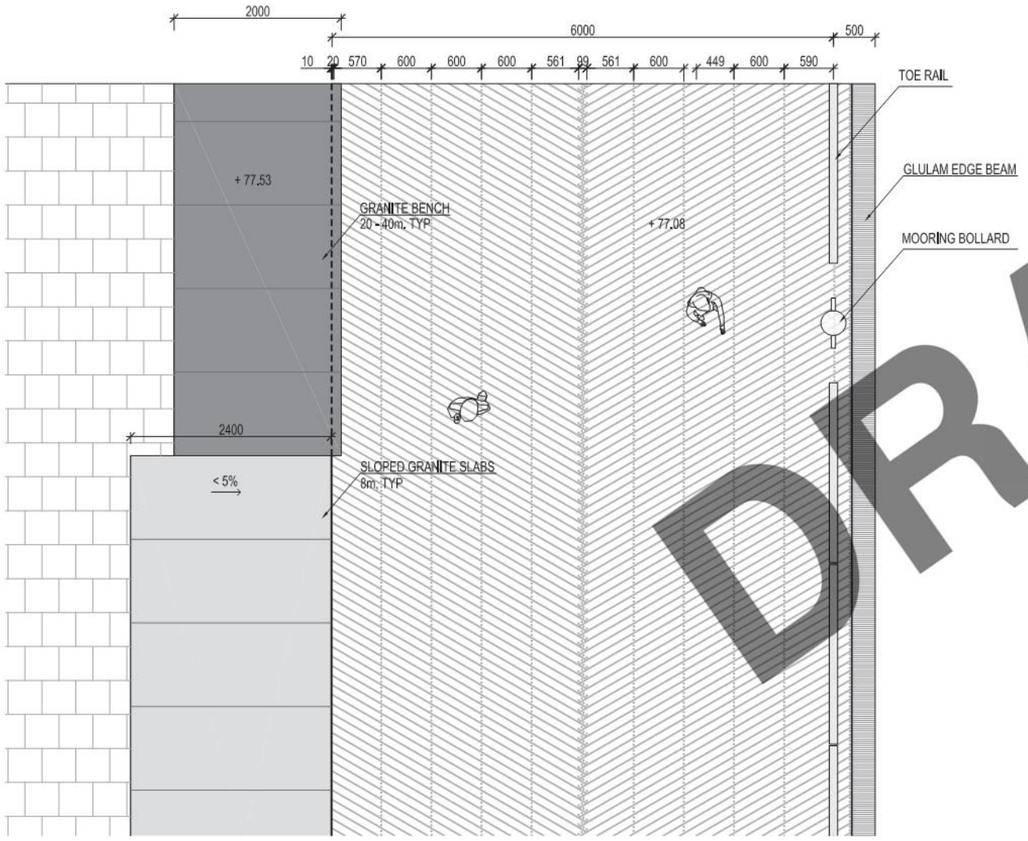
Concept Design Refresh - Addendum

October 16, 2019

WEST 8

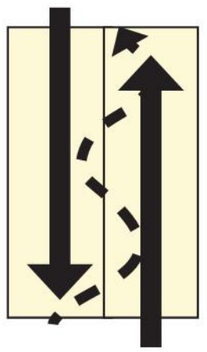
WATERFRONToronto

Research Options: Symmetrical Herringbone with 2.4m Bench - Conventional, Similar to Other Boardwalks



2 TYPICAL BOARDWALK PLAN - 6M WIDTH
1:50

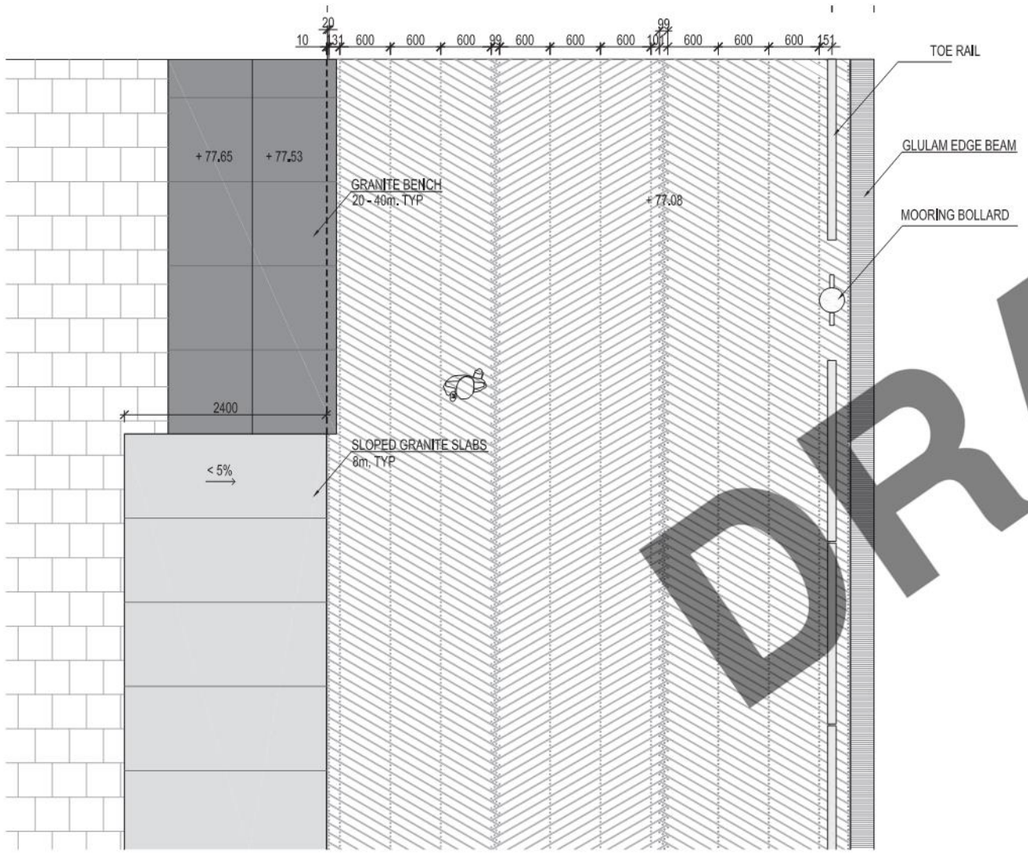
Intuitive Circulation Patterns



Two Way
Traffic with
Weaving

Research Options: Triple Row Herringbone - Three Lanes of Traffic

Boardwalk Option 2 - shorter planks overall not ideal



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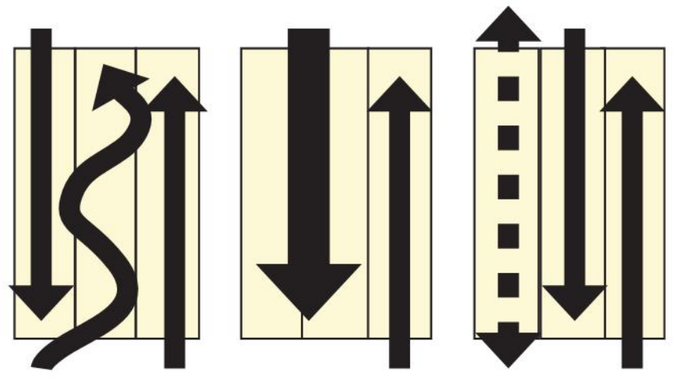


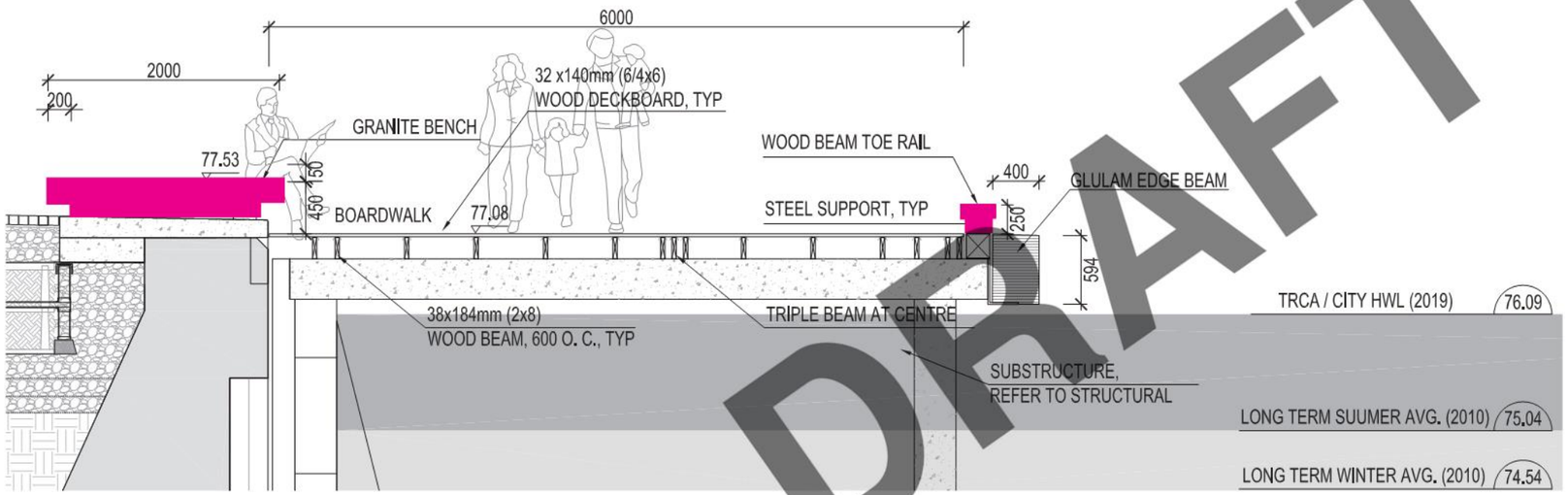
Weaving

2/3 and 1/3 directional flow

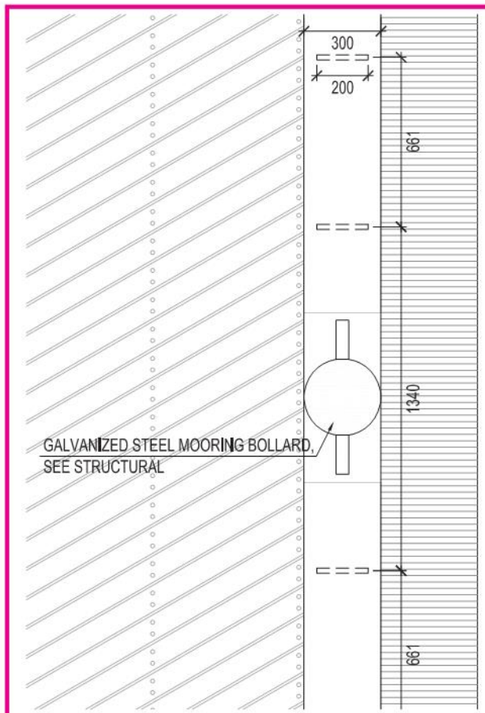
Two Way Traffic with a Slow Lane

Research Options: Wooden Waters Edge Transition

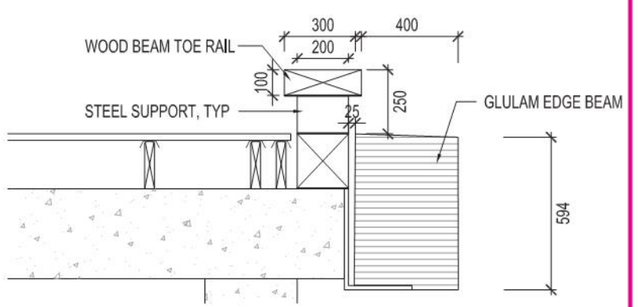
Combine the principles of existing edge conditions for a section with a relationship to the granite benches



1 BOARDWALK SECTION - 6M WIDTH
1:50

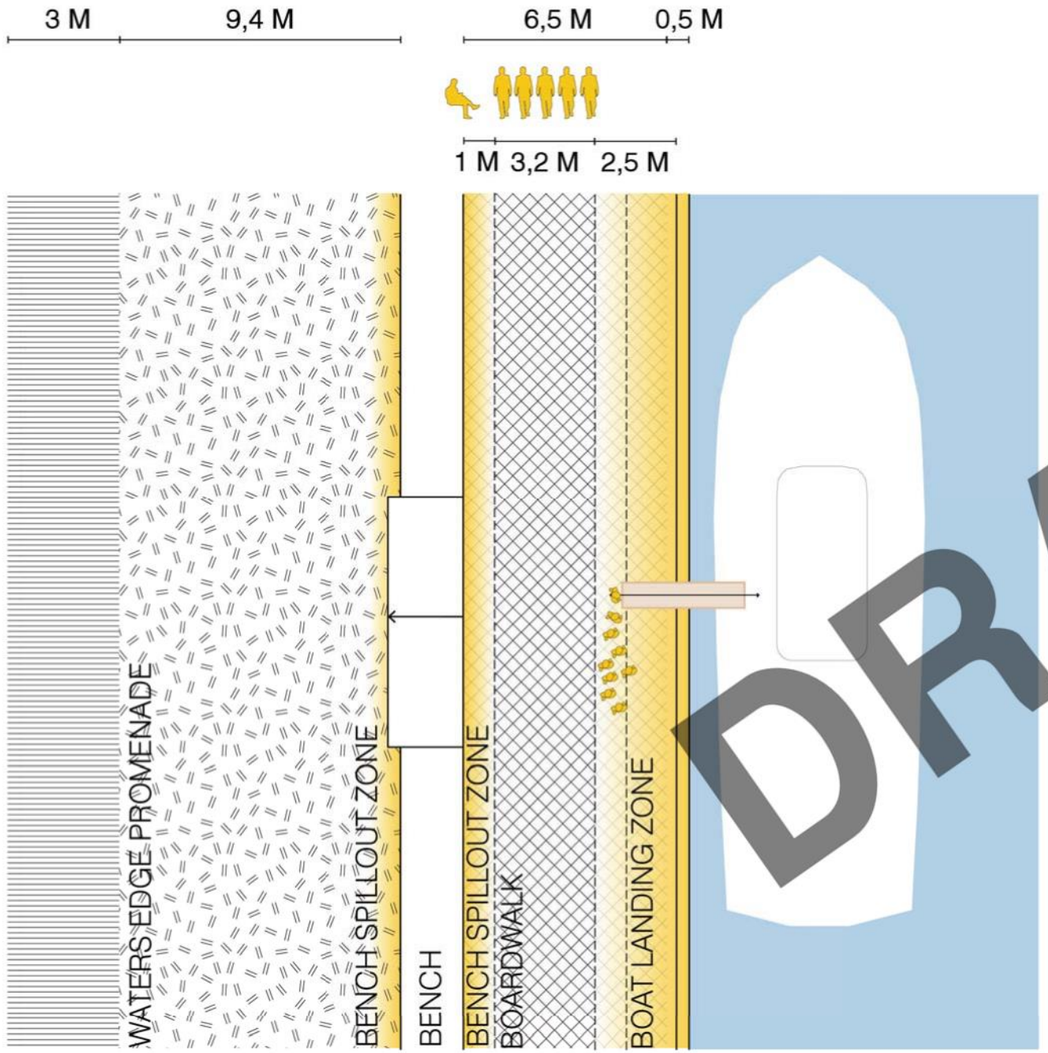


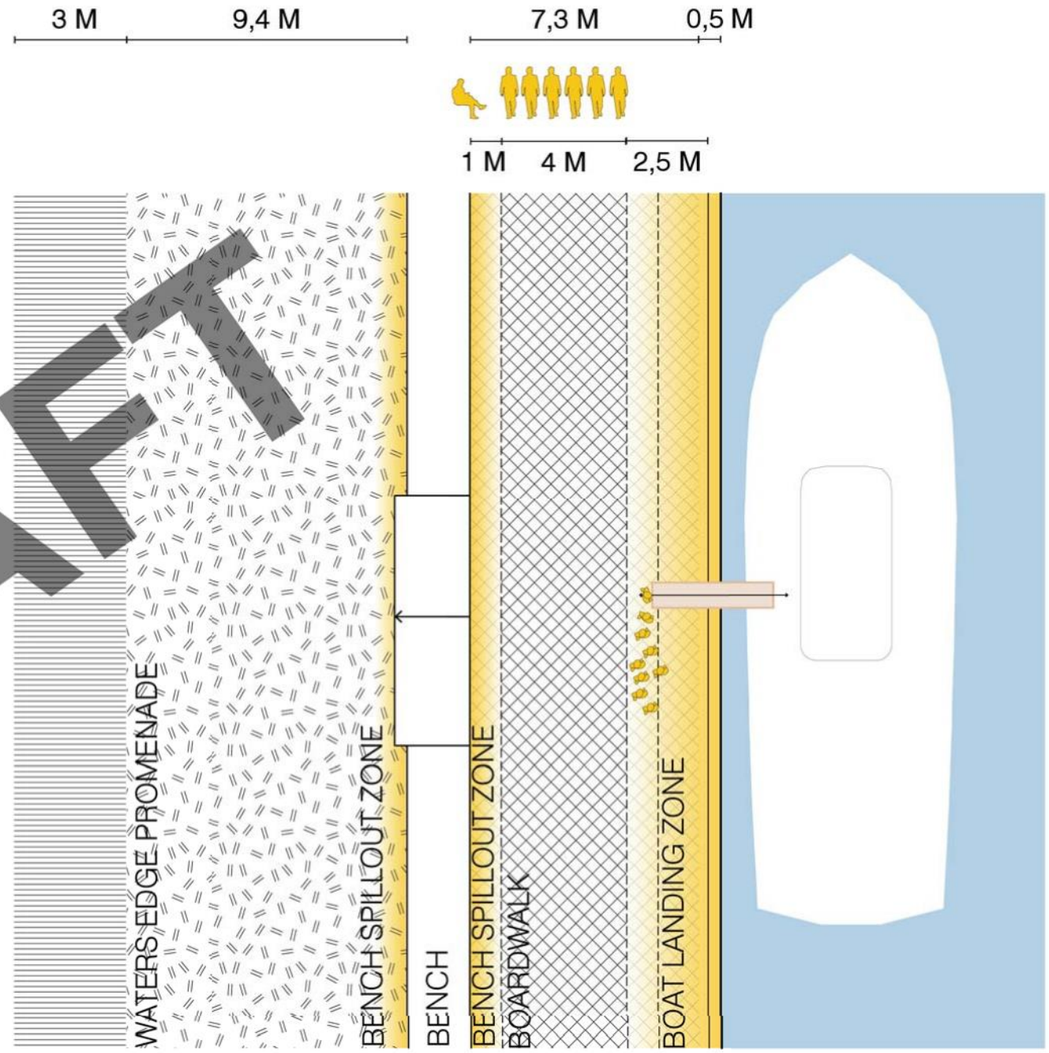
3 MOORING BOLLARD AND TOE RAIL PLAN
1:20



4 TOE RAIL
1:20

Research Options: Boardwalk Width





Kinsol Trestle, Vancouver Island, restored in 2011 with Alaskan Yellow Cedar Deck

Reference: Granville Island,
Vancouver, 1980's / 1990's

Reference: Halifax Harbour Walk,
Softwood with diagonal pattern

Reference: Halifax Harbour Walk
Softwood with diagonal pattern

Reference: Oosterdok, Amsterdam, 2017

Reference: Parklet made from Accoya, Elm Street between Yonge and Bay, Toronto

Reference: Walterdale Bridge, Edmonton, 2018

Reference: Rees Wave Deck, Toronto
Ipe decking slats with yellow cedar glulam beams