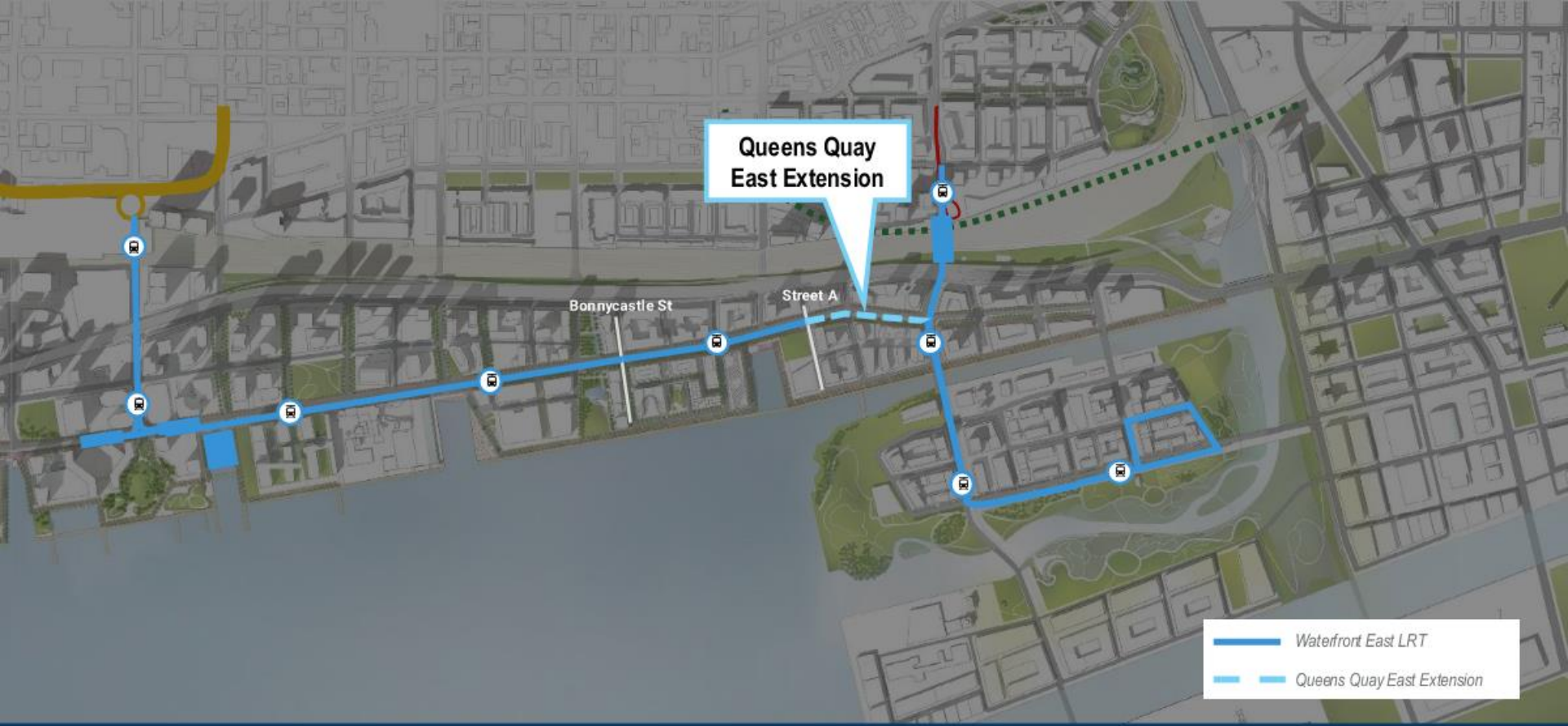


Segment 2 Early Works–Queens Quay East Extension – Waterfront East LRT

Detailed Design | October 2024

Context: Waterfront East LRT

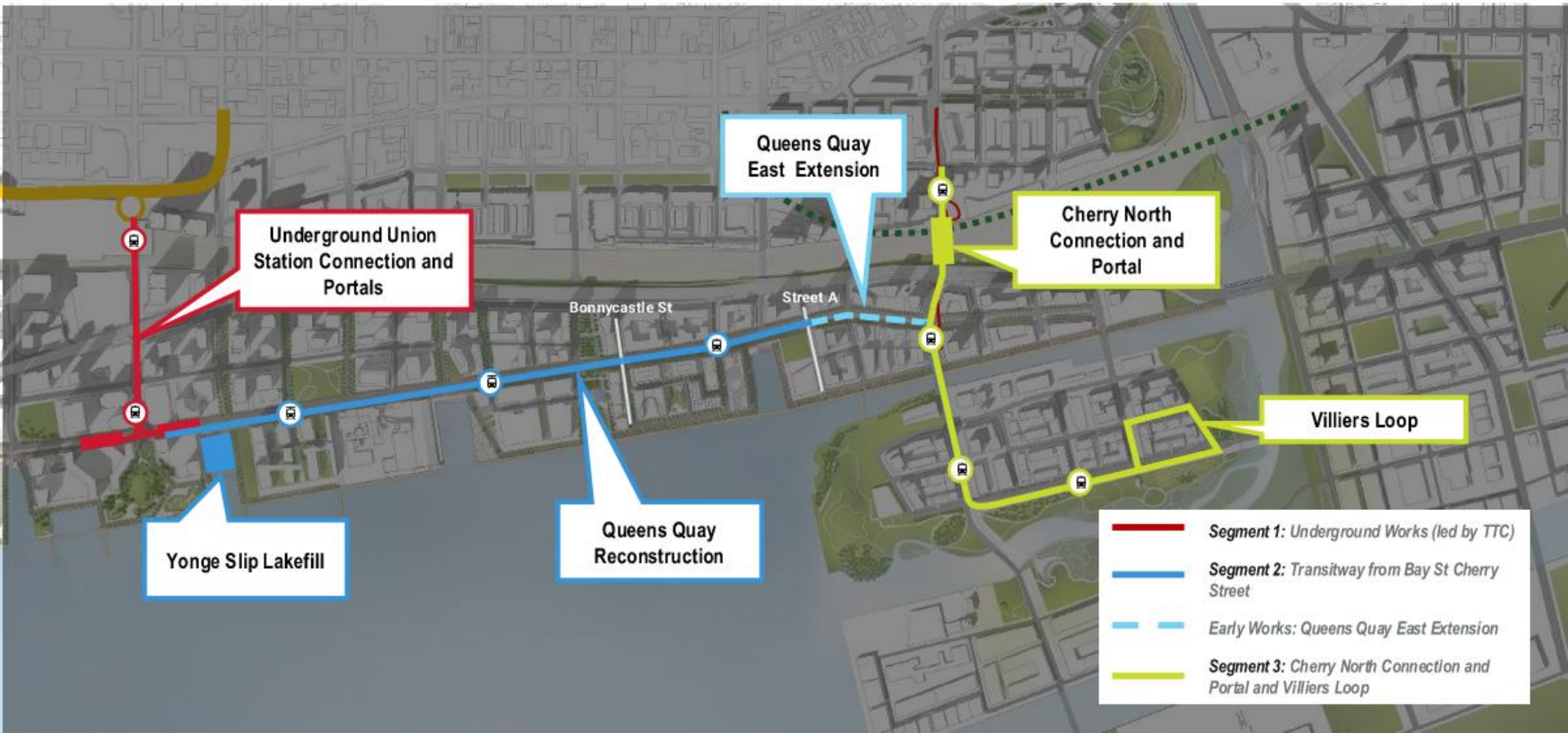
The Waterfront East LRT (WELRT)

- Extends high-order transit service from Union Station to Villiers Island, enhancing connectivity to the eastern waterfront.
  - Connects an estimated 100,000 residents and creates 50,000 jobs in the eastern waterfront, serving a projected daily ridership of 53,000 passengers
  - Would be among the most popular routes in the TTC surface network.
- The project consists of three segments:
  - Segment 1: Underground Union Station and Portals
  - Segment 2: Transitway and related street reconstruction on QQE including **extending the current limits of the street eastward to new Cherry**
  - Segment 3: Cherry Street North Connection and Villiers South Connection and Loop
- **Segment 2 includes Early Works that enable the rest of the project to proceed and are advancing to 60% including The Yonge Slip Lakefill and the Queens Quay East Extension.**

Waterfront East LRT (WELRT)

Queens Quay East Extension – Segment 2

Proponent: Waterfront Toronto
Design Team: Stantec/Public Work
Review Stage: Detailed Design



Segment 1 : Underground Union Station and Portal

- As part of this work, **a new portal** will be located along Queens Quay east of Bay St to **bring streetcars from the underground station to Queens Quay**
- The underground components of the WELRT (Segment 1) are **led by the City of Toronto** in collaboration with the **TTC**
- **Designed to 30%**

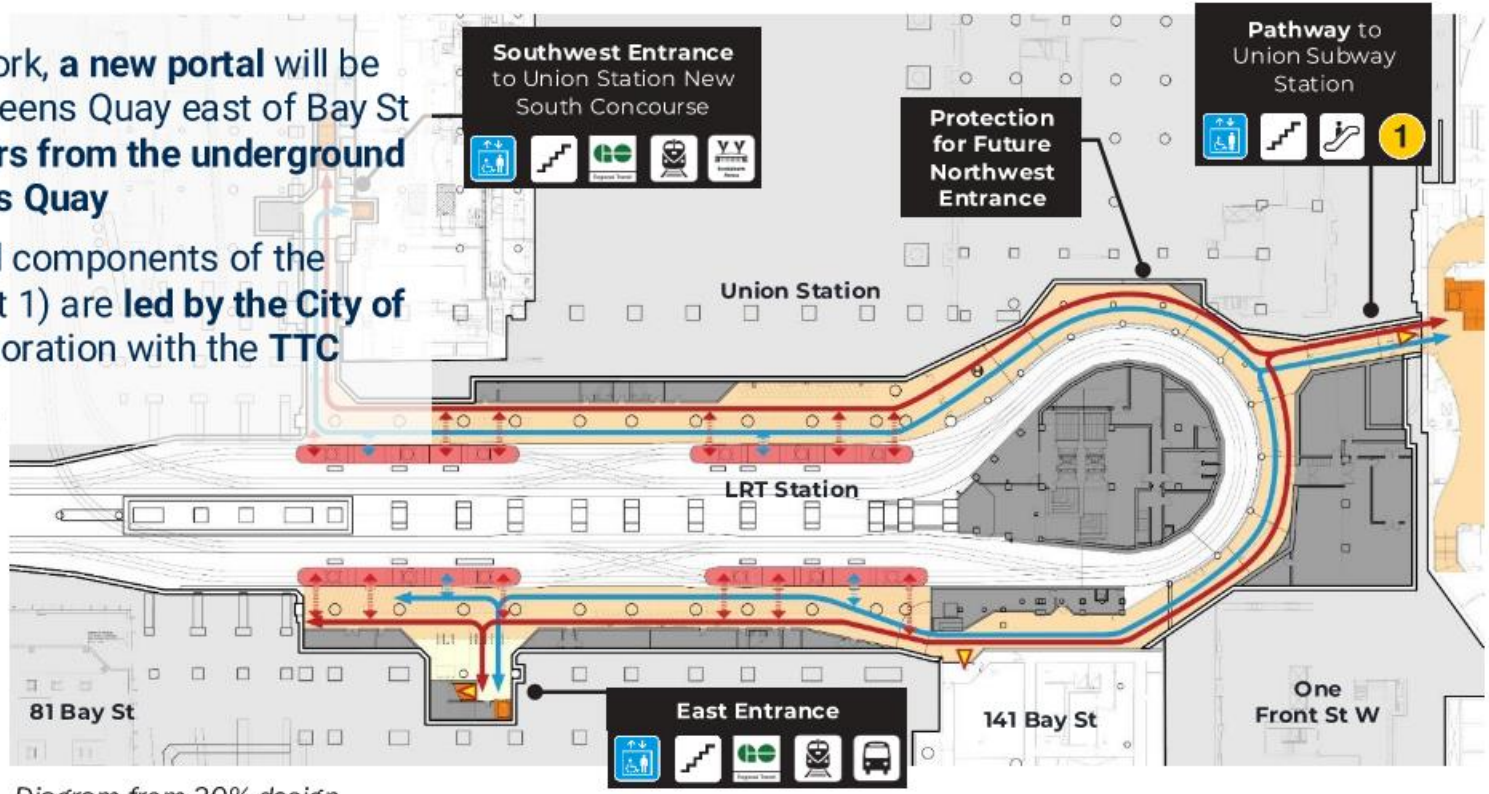


Diagram from 30% design

Segment 2: Queens Quay East Reconstruction and Extension

- Redesign of QQE to **include an LRT guideway**
- **Extends QQE** from Small St to Cherry St
- Enhances **Martin-Goodman Trail**
- Aims to **improve transit, pedestrian, and cyclist experience** and **delineations**
- Integrates **green infrastructure** and prioritizes **pedestrian experience** of streetscape
- Currently undergoing **60% Design**

Rendering from 30% design

Segment 3: Cherry Connection North and Villiers Connection South and Loop

- Connects Queens Quay LRT **north** along Cherry St. to the existing Distillery Loop.
- Connects Queens Quay LRT **south** along Cherry St. to Villiers Island.
- Aims to provide **higher order transit** through **existing and future transit infrastructure**.
- Currently undergoing **60% Design**

Rendering from 30% design

Project Team

- Led by the City of Toronto (Transit Expansion), in partnership with Waterfront Toronto and the Toronto Transit Commission (TTC)
- Waterfront Toronto is managing the project design for Yonge Slip enabling work, the transitway from Bay Street to the Villiers Island Loop (including **Queens Quay East extension**), and the Cherry St North connection.
- TTC is managing the project design for the Underground Union Station Connection and Portals
- The TTC is the planned operator of the future WELRT service

Existing LRT and Public Realm along Queens Quay West

Queens Quay East Extension

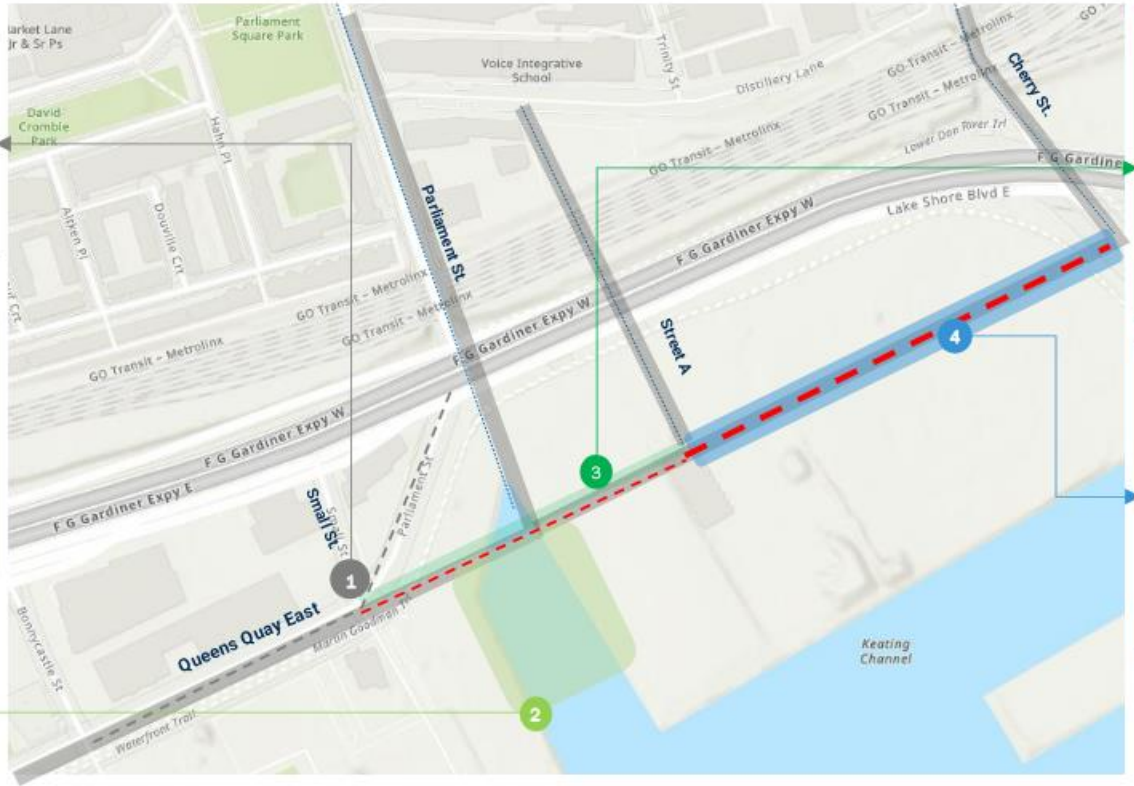
Enabling Adjacent Projects

Location & Context

Queens Quay East is planned to be extended from Small Street to New Cherry Street.

1 Currently, Queens Quay East ends at Small St, and merges into Parliament and Lakeshore Boulevard.

2 The **Parliament Slip Lakefill** project is in **construction** as part of QIPR. This work enables the extension of Queens Quay eastward.



3 As part of QIPR, Queens Quay roadway and north public realm will be extended from Small St to Street A. This project is at **90% design** phase.

4 WELRT Early Works extends Queens Quay beyond **Street A to Cherry Street.** This project is advancing to **60% design.**

Location & Context

- The Queens Quay East extension works are surrounded by various communities, and multiple transit and development projects.
- The Queens Quay East extension enables private development at the 3C and Silos site, by providing infrastructure and connecting new communities to the Toronto transit grid.
- This new LRT will enable a new neighborhood to be constructed, servicing approximately 5000 residents and 2500 jobs.*

*Numbers verified at the end of Q2, incorporating all development applicable to date (subject to change as development applications are submitted) for units south of Queens Quay from Street A to Cherry St.

Queens Quay East Extension

Design Review Panel Process

Work to Date

- Past DRP in 2021 for 30% Design
- Completed 30% design in 2023
- 30% DRP - Queens Quay East Extension and Cherry Street
- 60% DRP - Only Early Works : Queens Quay East Extension
    - Cherry Street updates to come with Segment 3 in future DRP
- Reviewed 30% Design (Queens Quay) with Accessibility Advisory Committee in May 2024

30% QQEE Design rendering shown at DRP - October 2021

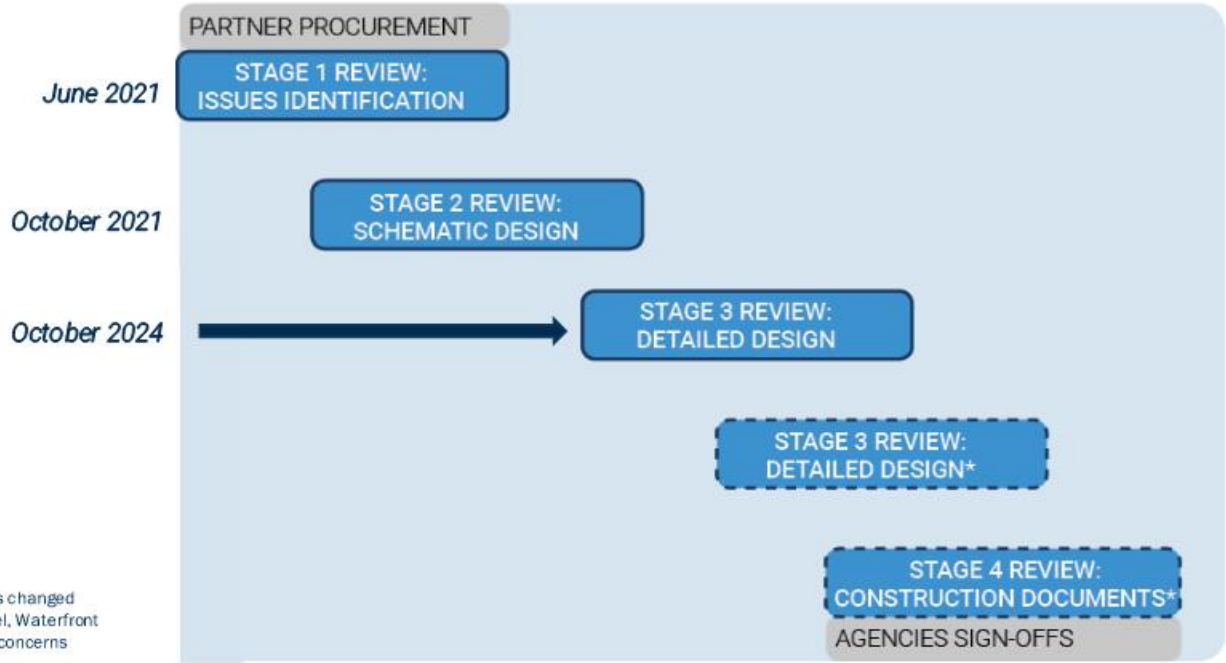
Previous DRP Consensus Feedback – October 2021

- The project is an excellent example of **leading with landscape**.
- It is an important "hinge" that **connects the city to the waterfront**; WT should ensure the design signifies to visitors that you are **entering the waterfront area**.
- The project is demonstrative of the **importance of transit from the city to the waterfront** - from **urban to nature** - and this should be **emphasized as a priority** for the future.
- Supported the **stormwater capture** and monitoring strategies.
- Encouraged WT to ensure the **streetscape design is well coordinated with street furniture** and development frontages in the next phase of design. To consider: laybys without bollards, breaking up the length of benches and boldly refining the design of the planters and landscape while maintaining an unimpeded pedestrian right-of-way.
- Encouraged WT to consider **sustainable material alternatives** to **reduce overall project emissions**.

Goals for 60% Design

- **Lead with landscape** in QQE corridor design
- Create a **cohesive streetscape** across the **whole corridor,** integrated with 2A segment, QIPR segment and the newly completed Cherry Street and Commissioners Street.
- Prioritize the connection between **urban and nature;** highlight the **presence of the waterfront**
- **Integrate streetscape with street furniture** while providing unobstructed **pedestrian rights-of-way.**
- **De-lineate circulation** of various users such as pedestrians, cyclists and vehicles, leading to more **clearly defined user paths**.
- Continue to develop proposed **stormwater and monitoring strategy.**
- Consider **sustainable material alternatives** to **reduce overall project emissions.**

Project Schedule



*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

Areas for Panel Consideration

- Is the proposed street design achieving the right balance between our objectives for enhanced **ecological performance**, **transportation**, and **place-making**?
- Does the proposed streetscape approach successfully **stitch together** the various **adjacent neighborhoods** of today and those planned for the future?
- Does the design of the Queens Quay East Extension achieve **continuity** with Queens Quay West and the rest of Queens Quay East? Does it feel like a **cohesive boulevard**?
- Do the proposed modifications and **material/planting palette integrate well with the street works completed** as part of PLFP (Cherry St, Commissioners St) and the greater waterfront context?

Waterfront East LRT:
Queens Quay East Extension
DRP Stage 3 Review

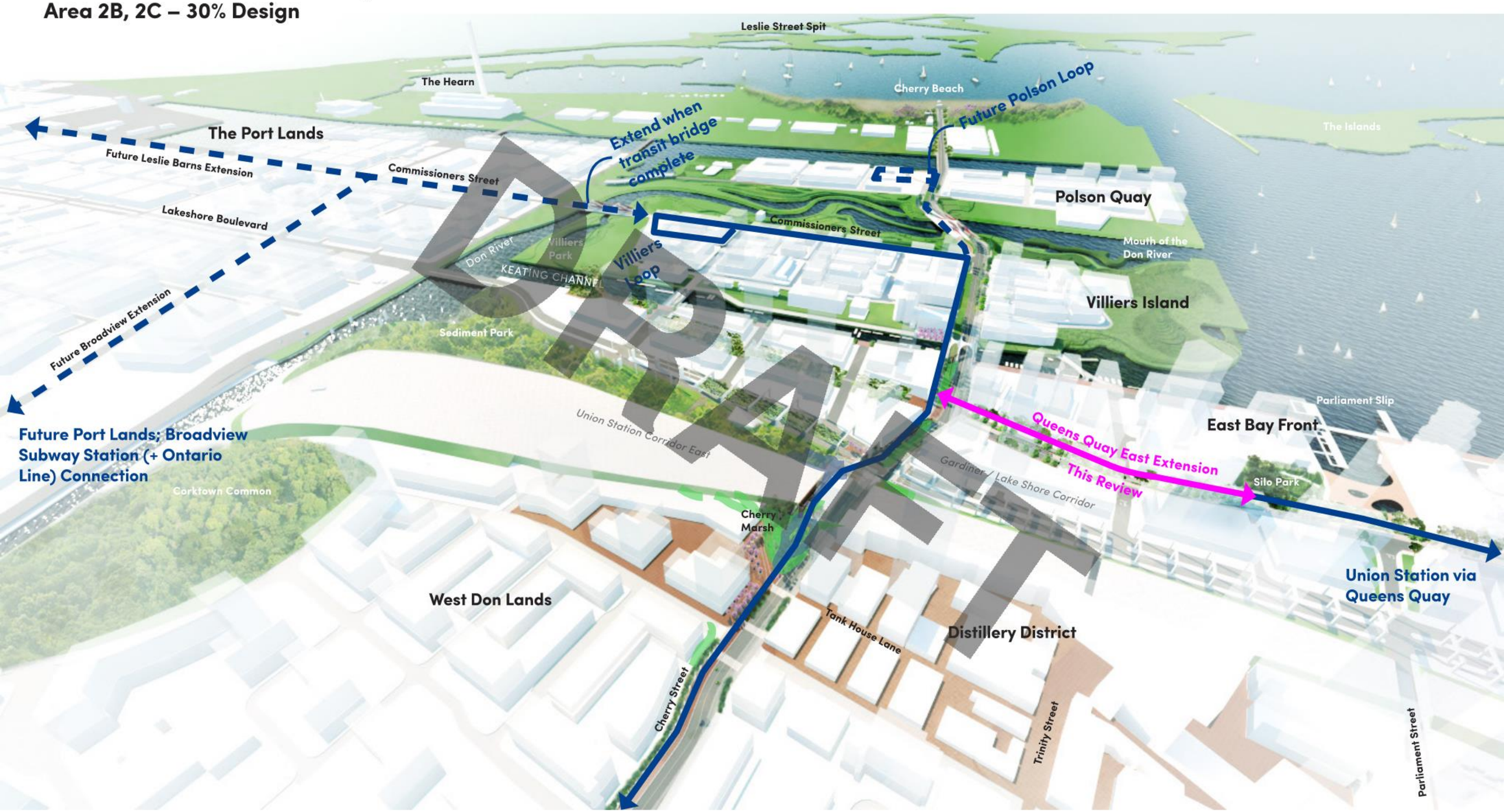
WELRT 2B DRP Stage 3 Review
2024.10.30

PUBLIC WORK

Stantec

Waterfront East LRT Project Overview

Area 2B, 2C – 30% Design



Framing: How the Opportunity Shapes the Approach

DRP Stage 1: Issues Identification, 2021-06-23

Previous

The hinge between the Central Waterfront and the Don River Valley; the gateway between the City and the Port Lands.

Former Lake Iroquois Shoreline

Cherry St

Don River Valley

Queens Quay

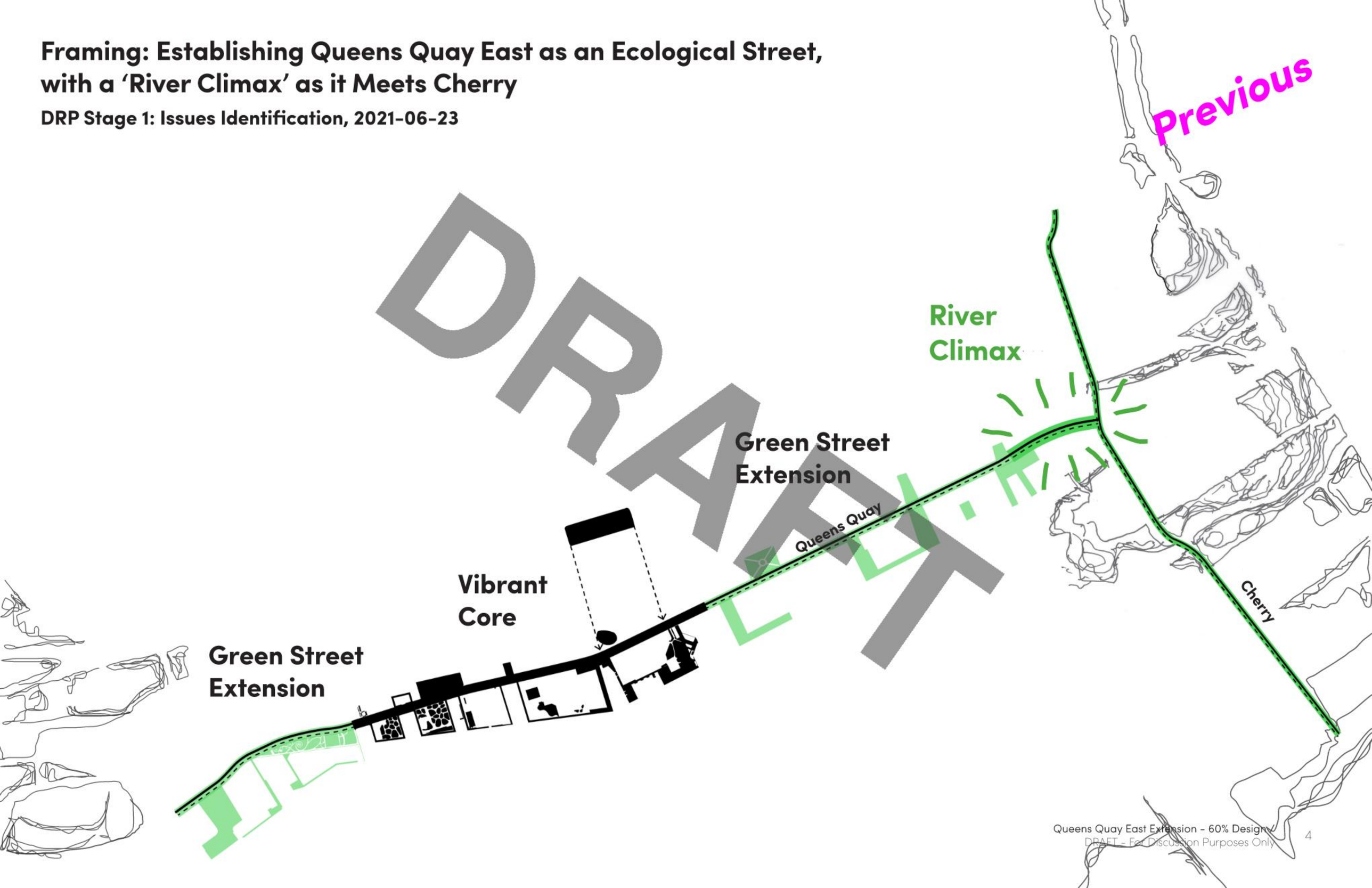
Garrisons Creek

Toronto Islands

Image from TOcore Parks and Public Realm Plan

Framing: Establishing Queens Quay East as an Ecological Street, with a 'River Climax' as it Meets Cherry

DRP Stage 1: Issues Identification, 2021-06-23



Framing: Responsive to Context. Queens Quay East as Complimentary, Cohesive yet Distinct to Queens Quay West in the Core

DRP Stage 1: Issues Identification, 2021-06-23

Central: Core

East: River Mouth

Previous

Design: Familiar Materials and Details, More Dynamic and Immersive Expression

DRP Stage 2: Schematic Design, 2021-10-20

Previous

Queens Quay 'Spectrum':
Cadence, Character and Influences

Spadina | Bay | Jarvis | Sherbourne | Parliament | Cherry

Open ⟷ **Immersive**

Formal ⟷ **Dynamic**

Queens Quay Central Waterfront

1.3km

5min bike
19min walk

Redpath and the Transit Portal

0.7km

2min bike
10min walk

Sugar Beach, Granite Outcrop

0.32km

1min bike
5min walk

Sherbourne Common Water Quality

0.45km

1min bike
6min walk

East: River Mouth

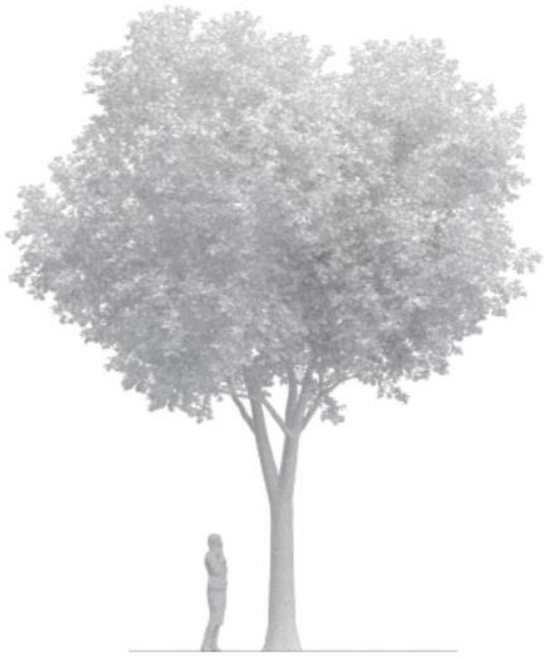
0.38km

1min bike
5min walk

Bike ⟷ *Walk*

13min ⟷ *46min*

Elements: Queens Quay Central Waterfront

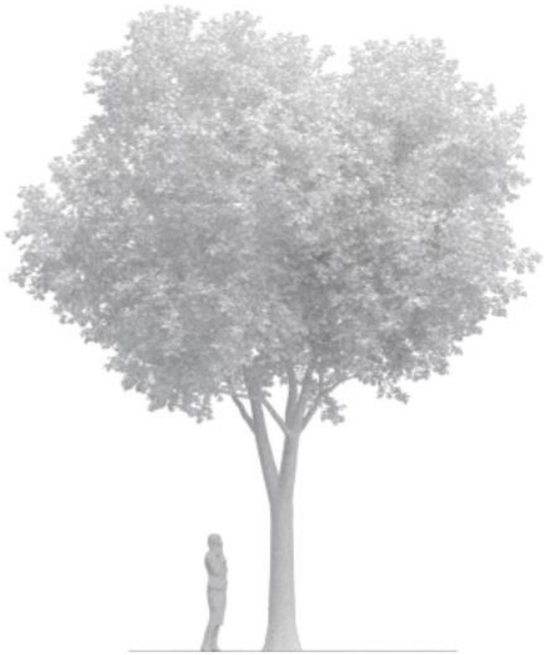


trees in hardscape

granite paving

loose granite

Elements: Queens Quay East



trees in hardscape

trees in landscape

layered ecologies

immersive landscapes

granite paving

loose granite

granite rocks

granite Slabs

granite boulders

granite outcrop

Elements: Queens Quay East

West: Fabricated Materials

East: Source Materials

East: Source Materials

East: Source Materials

Typical Section – 30% Design

(100% Surface Runoff Capture Goal)

Previous

Typical Section – 60% Design

What's Changed Since 30% Design? (DRP Stage 2)

Current

Green Track Gone

Why?

- Allows Fire, EMS and replacement bus service
- Coordination with 2A team to west

Silver Lining:

- Target Cherry + Commissioners Green Track (collaboration with City/TTC project partners)
- Narrower vehicular lane portion (more green infrastructure)

South Side Promenade Expression

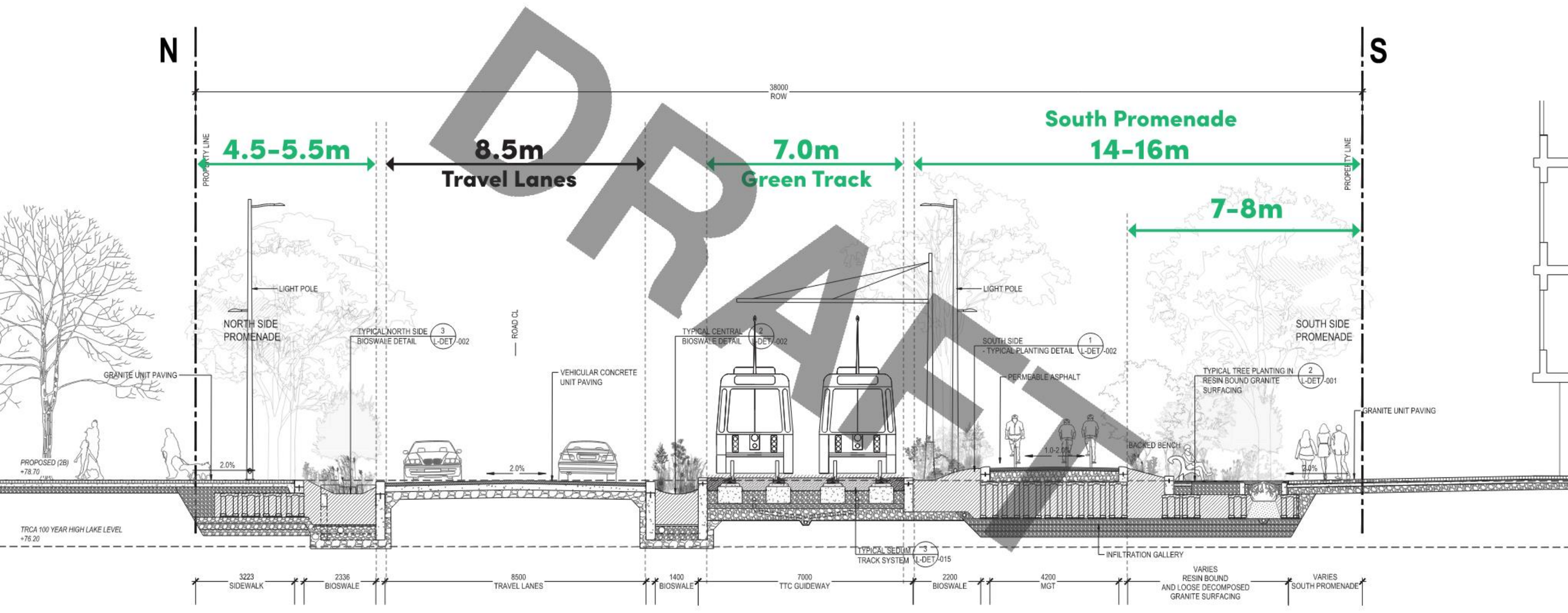
Why?

- Simplification, striving for immersive experience, organic geometry
- More pedestrian clearway

Typical Section – 30% Design

8.5m Roadway + 7.0m Green Track

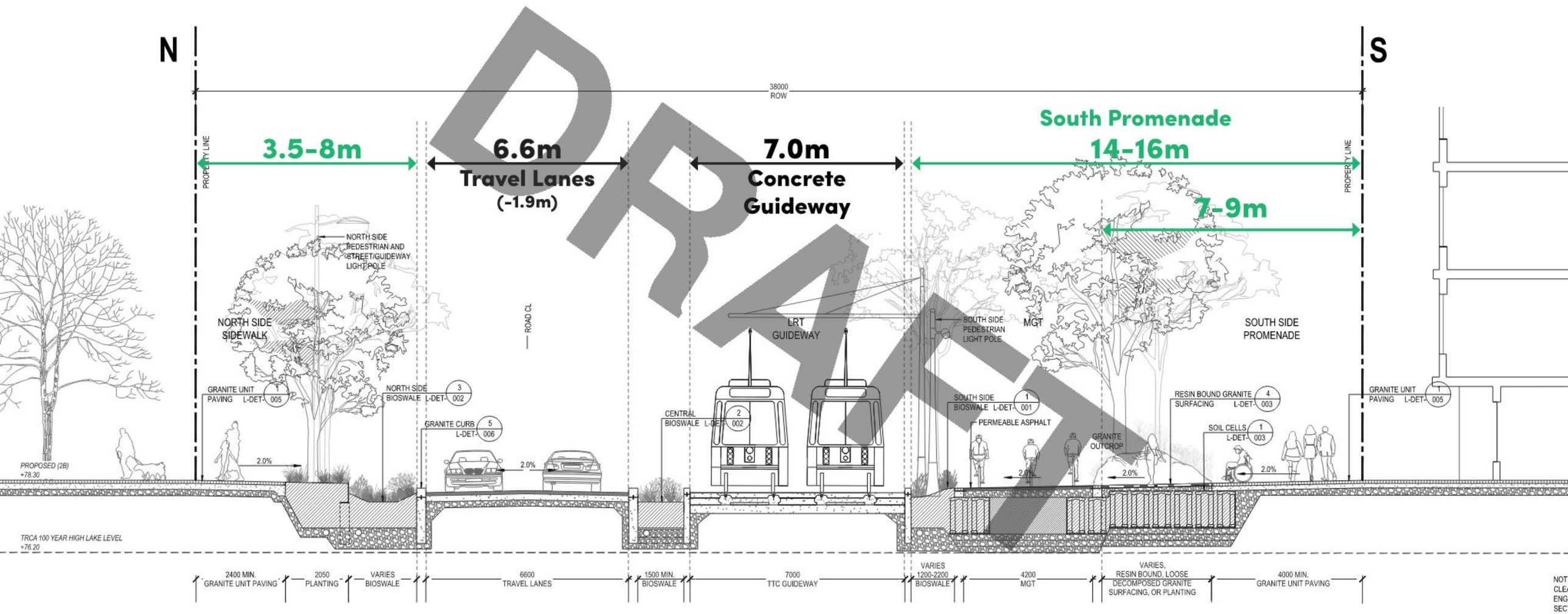
Previous



Typical Section – 60% Design

6.6m Roadway + 7.0m Concrete Track w/ Widened North Promenade

Current



Typical Section – 60% Design

90-95% Surface Runoff Capture Achieved

Achieve Toronto Green Standard, Tier 3

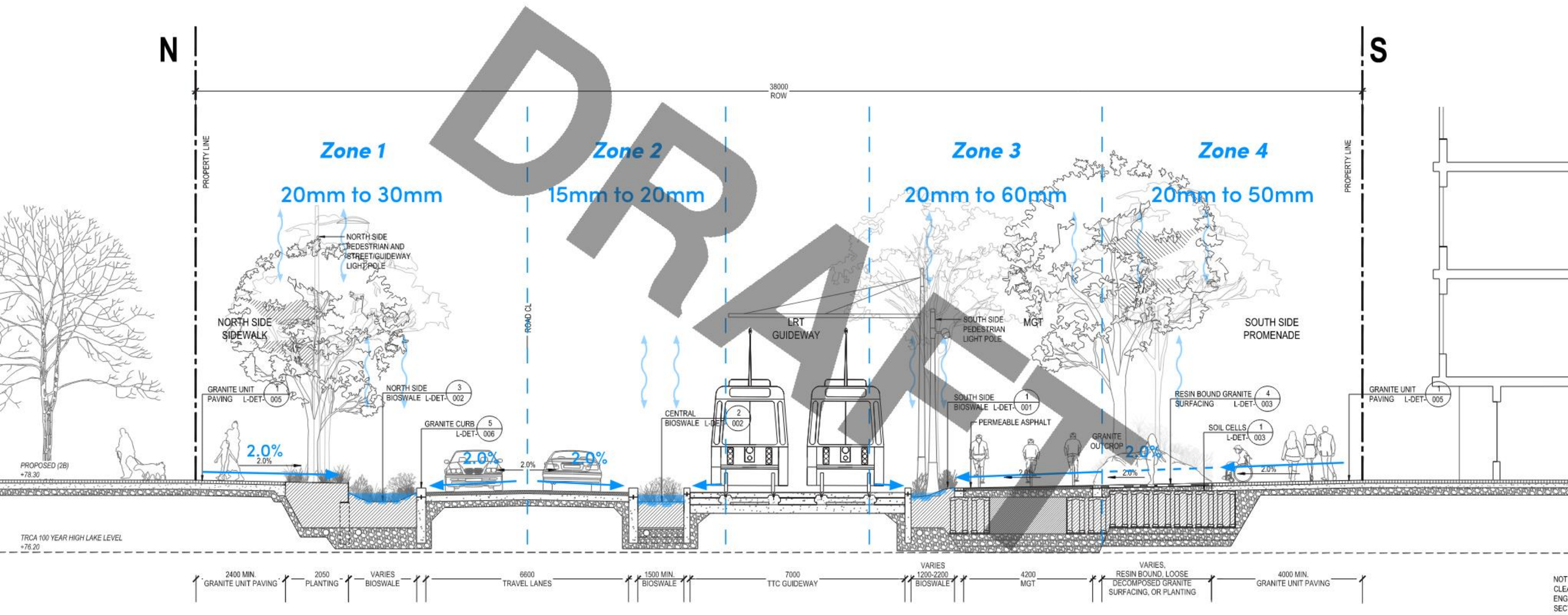
1.1

INTENT

Ensure a comprehensive suite of sustainability and energy efficiency measures are incorporated into all buildings, in alignment with the Toronto Green Standard (TGS).

REQUIREMENTS: TGS TIER 3 COMPLIANCE

1. **Register for and achieve Tier 3 under the Toronto Green Standard (TGS) Version 3.**

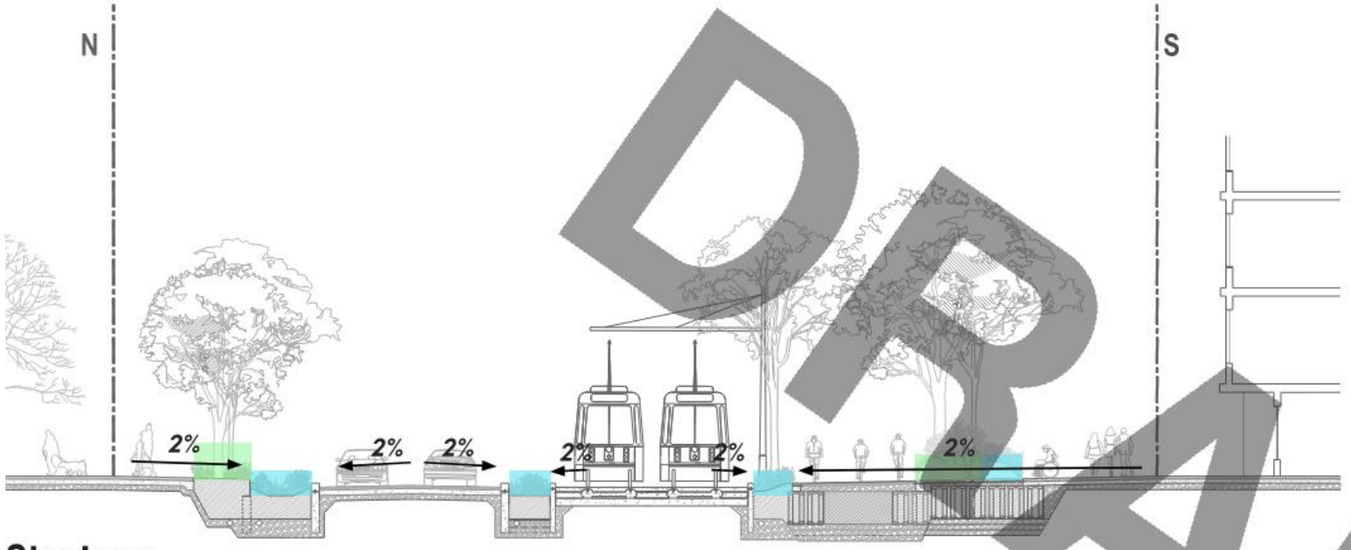


*Lower number is for bioretention storage only; upper number includes an assumed 20% water volume within the tree cells. Numbers do not account for evapotranspiration. Assumes the native soil infiltration rates are 15mm/hr or more and there are no soil contamination concerns to prevent infiltration within the ROW.

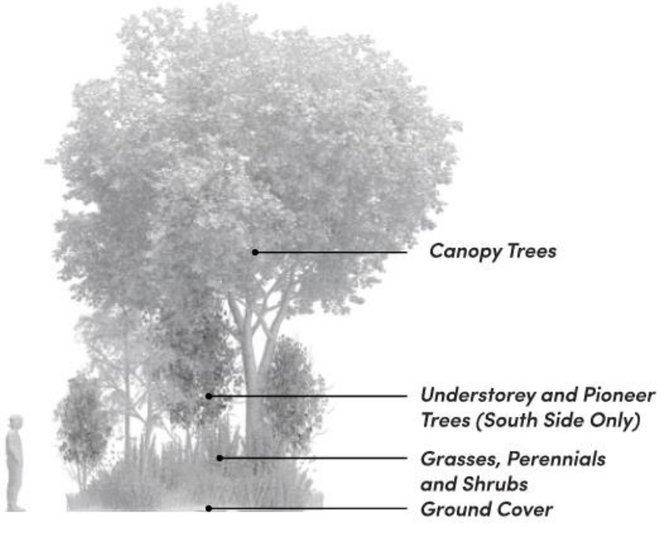
Planting Approach

Lower Salt Zone: More Diverse Plantings

Higher Salt Zone: Brackenish Grasses



Salt Strategy



Layering / Maintenance Strategy

- Eschews traditional same-species and cultivar block / mass planting approach

- Similar species planted together for cohesive look and feel but using different varieties / cultivars

- Avoids mass failure risk / 'gap tooth' effect

- Groundcover layered under brackenish grasses, some self-seed perennials integrated

Similar Species Zones:
Brackenish Grass Bioswales

- No set outcome or aesthetic: Diverse plants closely grouped, most vigorous spreads furthest

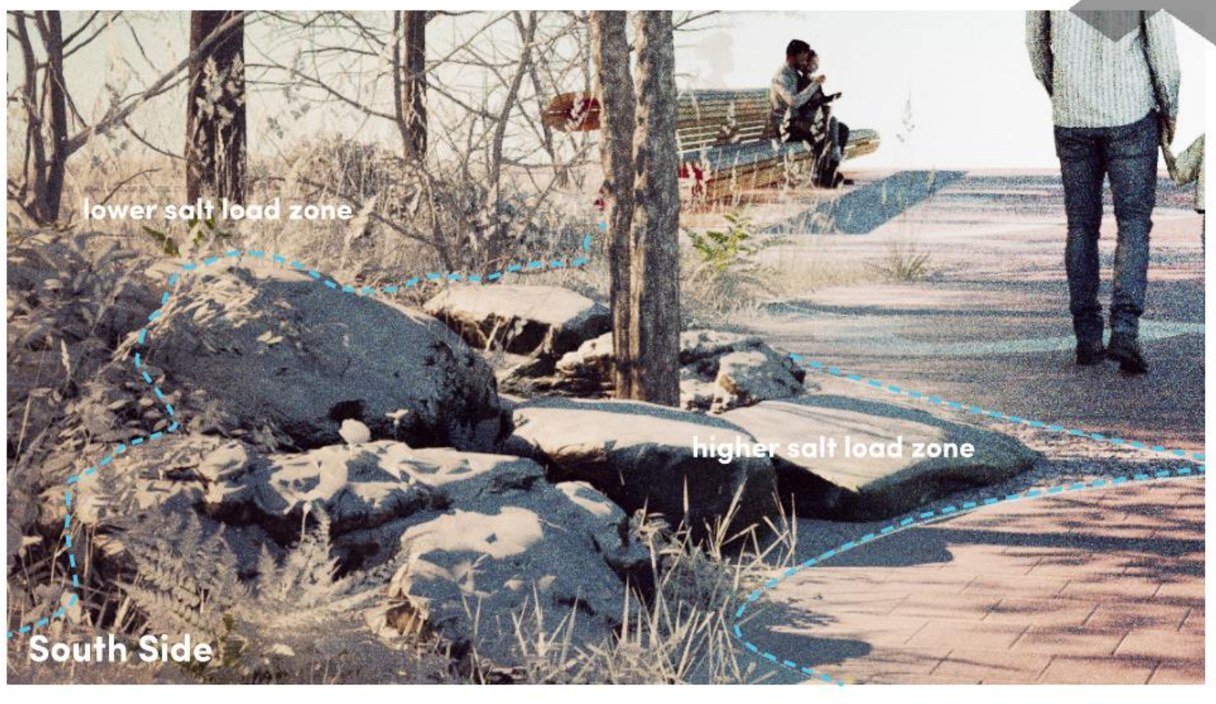
- Includes native self-seeding perennials to spread over time

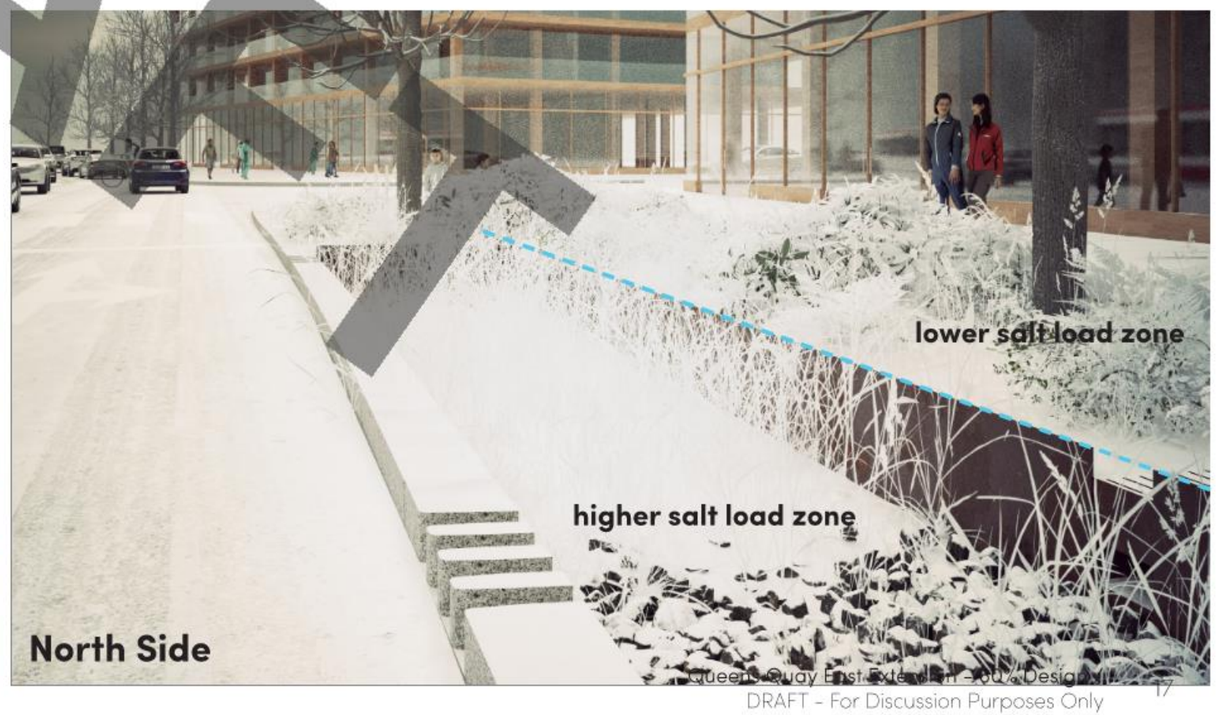
- Multi-layered approach with overlap - vertically and, in time, horizontally

- Can tolerate spontaneous species in the mix without looking like an error

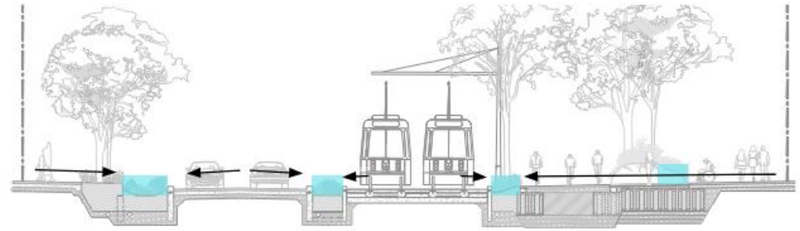
Diverse Species Zones:
E.g. North / South Sidewalk

Higher Salt Zone vs. Lower Salt Zone Planting Palette





Higher Salt Zone Planting Palette Samples



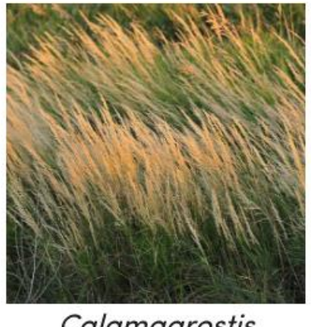
Brackenish Grasses

Andropogon gerardii

Panicum virgatum

Calamagrostis acuti-flora 'Karl Foerster'

Spartina pectinata



Calamagrostis canadensis

Carex pensylvanica

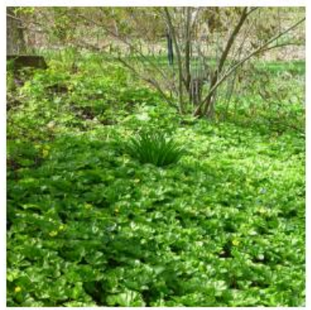
Self-seeding Perennials

Rudbeckia hirta

Verbena hastata

Echinacea purpurea

Ground Cover



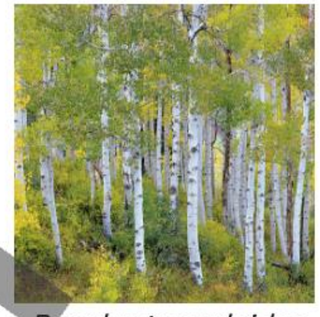
Waldsteinia fragarioides

Anemone canadensis

Canopy Trees

Nyssa sylvatica

Liquidambar Styraciflua



Populus tremuloides

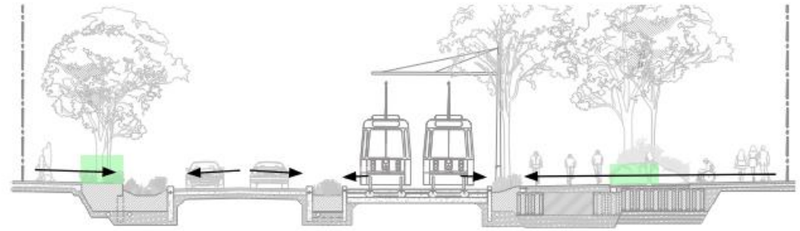
Ulmus americana

Quercus macrocarpa

Acer x freemani

Lower Salt Zone Planting Palette Samples

Balancing Salt Tolerance + Species Diversity



Grasses, and Self-seeding Perennials and Shrubs

Achilliea milefolium

Symphotrichum ericoides

Deschampsia cepitosa

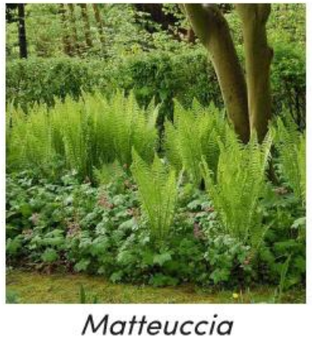
Rudbeckia hirta

Aquilegia canadensis

Schizachyrium scoparium

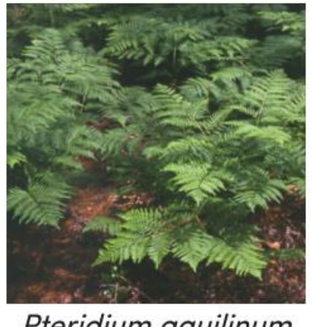
Zizia aurea

Echinacea purpurea



Matteuccia struthiopteris

Geum triflorum



Pteridium aquilinum

Ceanothus americanus

Ground Cover

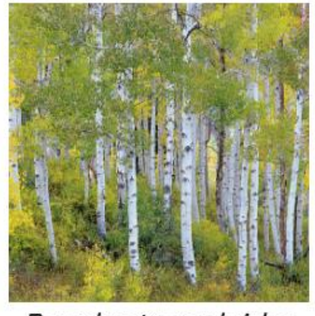
Asarum canadense

Packera obovata

Geranium maculatum

Understorey / Successional Trees

Amelanchier canadensis



Populus tremuloides

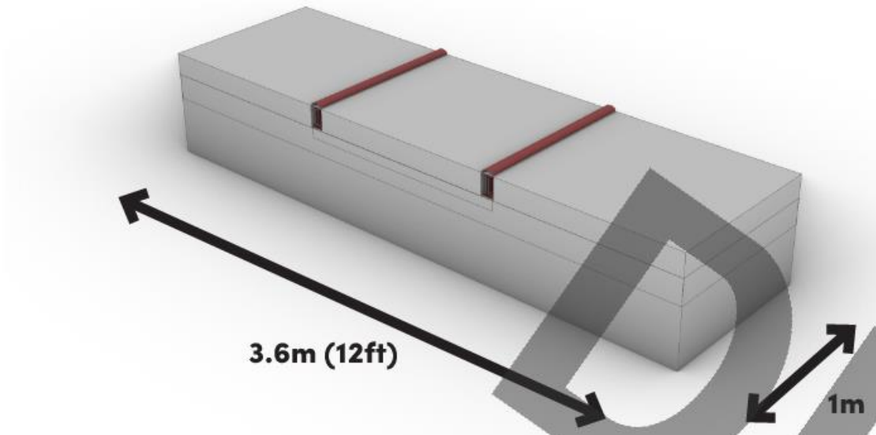
Hamamelis virginiana

Embodied Carbon Metrics

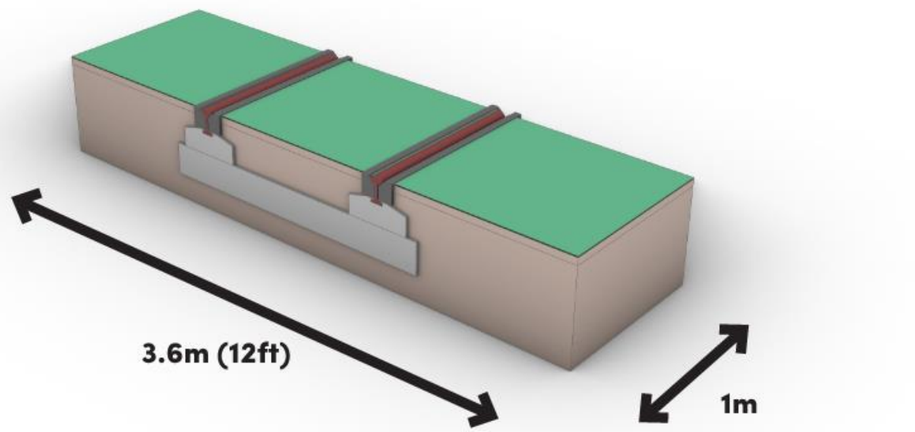
Carbon Savings:

- Granite as a 'centuries' lifespan material
- Increased green infrastructure, softscape and open planting
- Analyzing potential for recycled materials in road / track surfacing

Embodied Carbon Metrics



1,755kg CO2 per metre



836kg CO2 per metre

DRP #2 Goal:

1.1km Green Track (Queens Quay - 2B, Cherry)
Approx **1,010** metric tonnes embodied carbon savings over concrete track

DRP #3 Target Update:

1.25km Green Track (Cherry, Commissioners)
Approx **1,150** metric tonnes embodied carbon savings over concrete track

Immersive and Dynamic

S

Performative and Didactic

N

Immersive and Dynamic

S

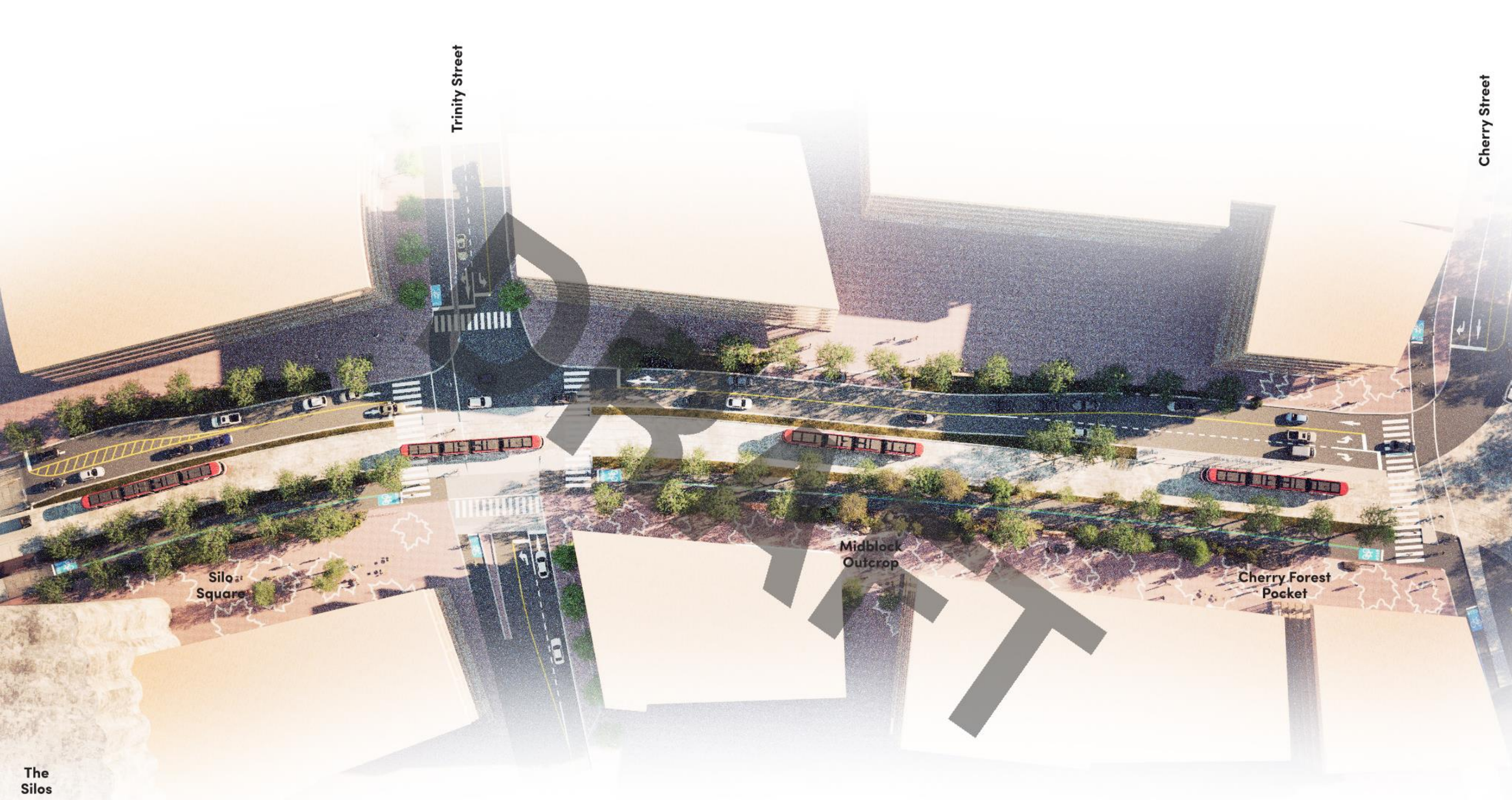
Performative and Didactic

N

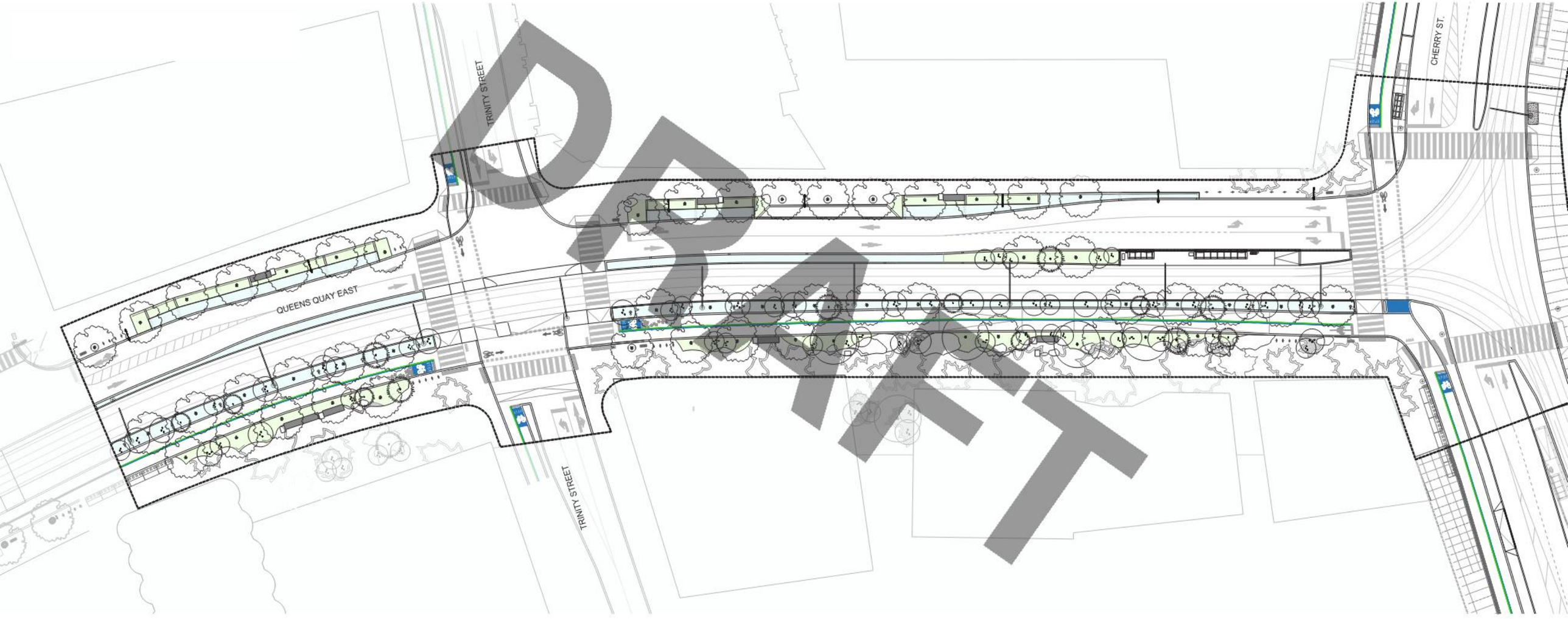
DRAFT

Performative and Didactic

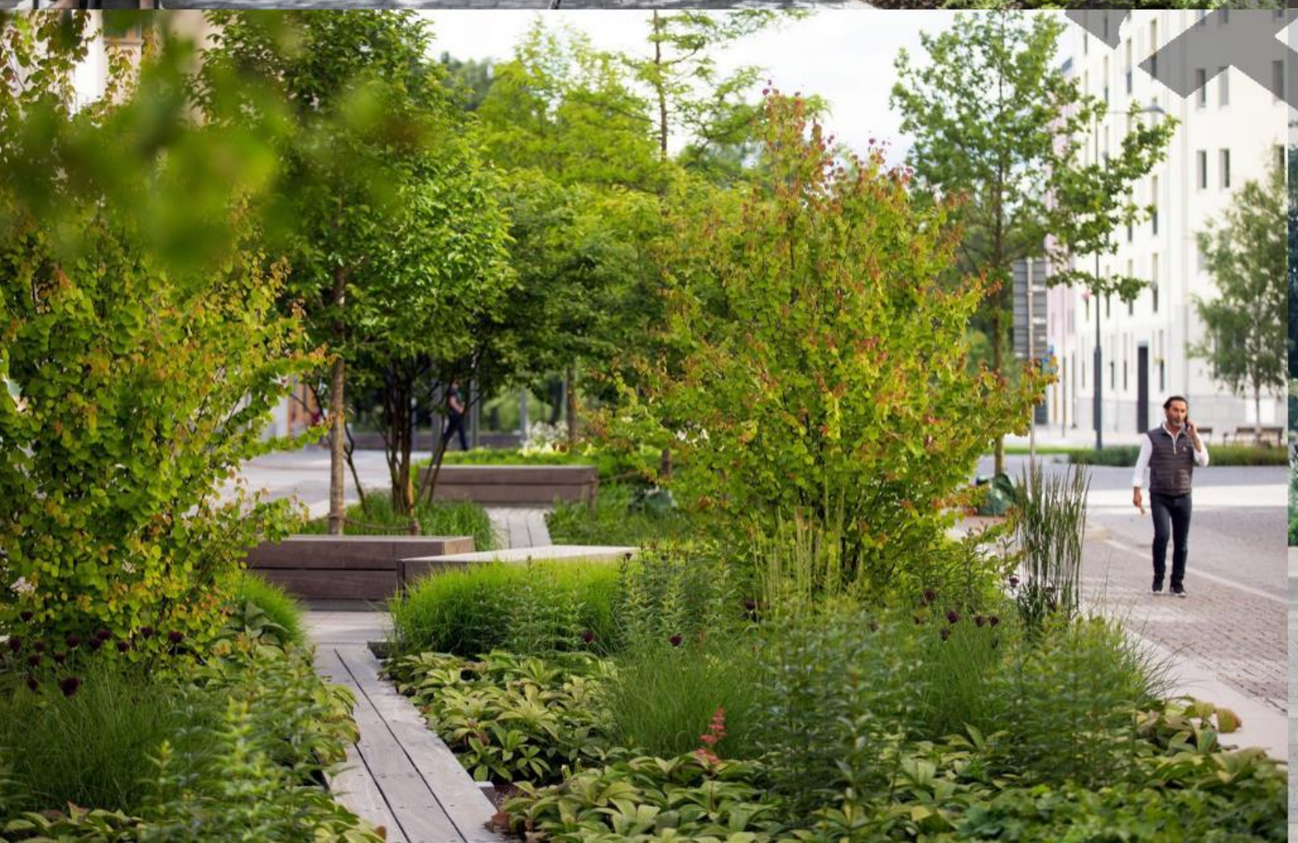
Immersive and Dynamic


Trinity Street
Cherry Street
Silo Square
Midblock Outcrop
Cherry Forest Pocket
The Silos

QQE Layout Plan – 60% Design



South Side: Promenade




One International
Centre Tower 4

South Side: Promenade


DRAFT
14–16m
+ setbacks
flow +
clearway
7.0–9.0m
ROW/
PL


DRAFT
Add coop!
14-16m
7.0-9.0m
+ setbacks
ROW/
PL


DRAFT
ROW/
PL


DRAFT
ROW/
PL

Edge Protection and Planting / Salt Strategy

Edge Protection and Planting / Salt Strategy

Forest Pocket Planting

Forest Pocket Planting

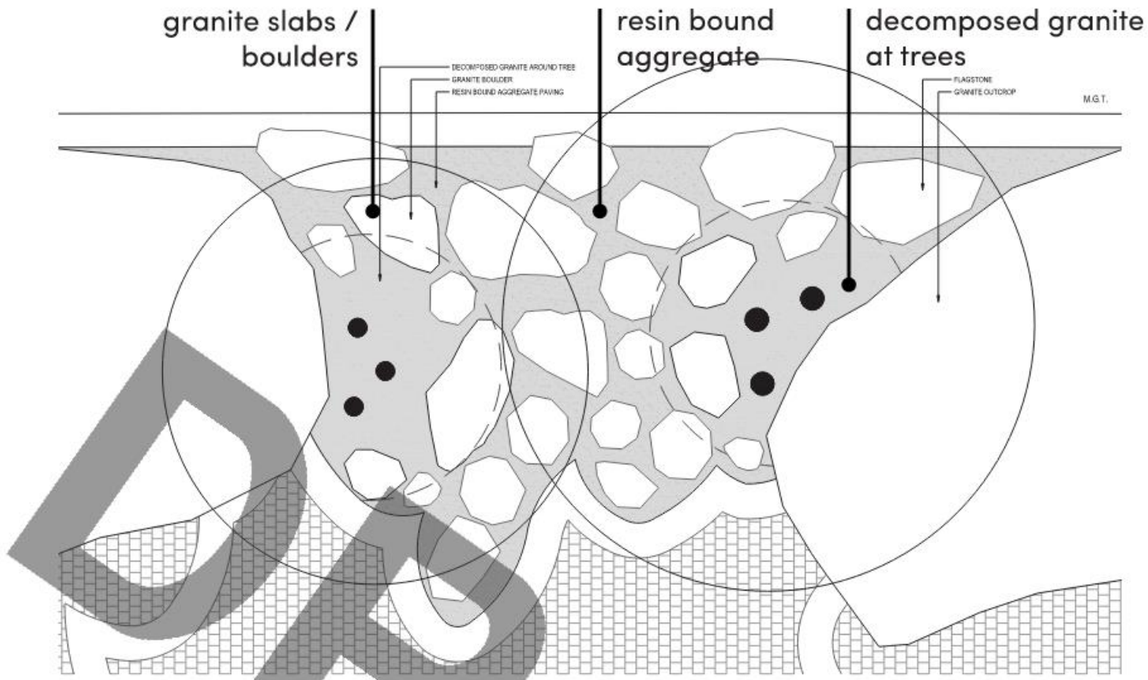
Forest Pocket Planting

Trail Experience

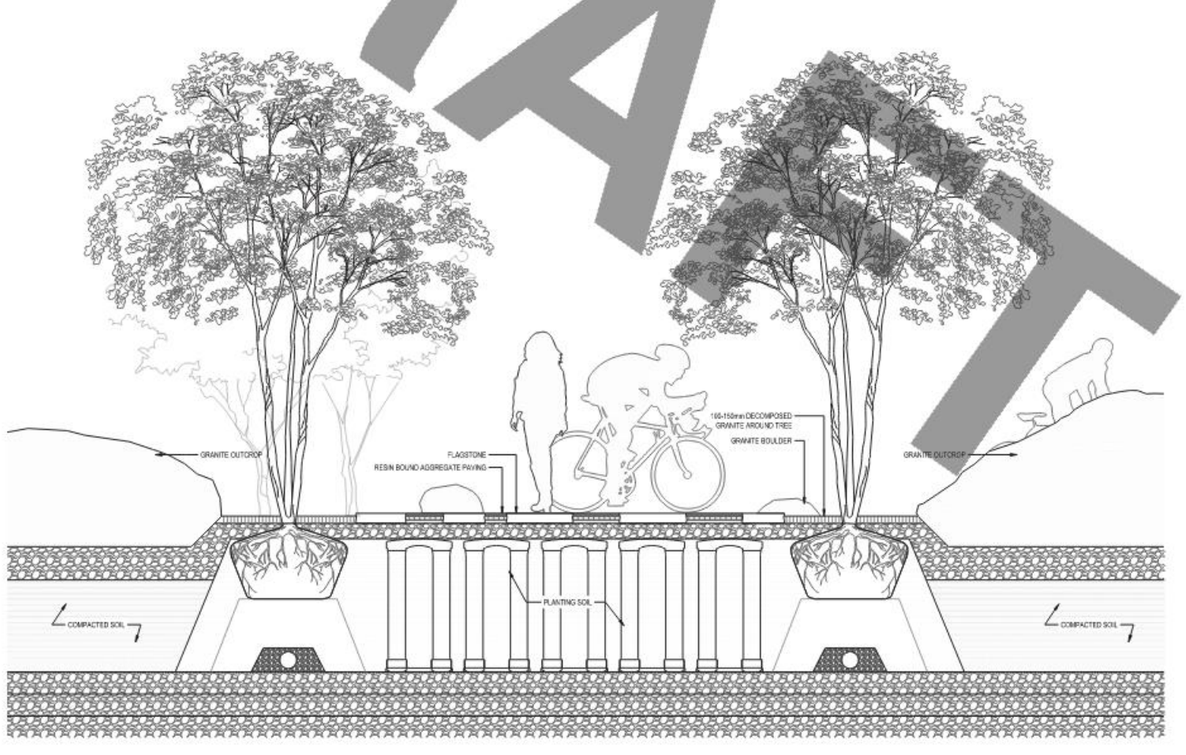
Trail Experience

Trail Experience

Mid-block Granite Outcrop



MGT mid-block access point plan for QQE (60% design 2B detail)



MGT mid-block access point detail for QQE (60% design 2B detail)

decomposed granite at trees

yellow birch

serviceberry

Mid-block Granite Outcrop

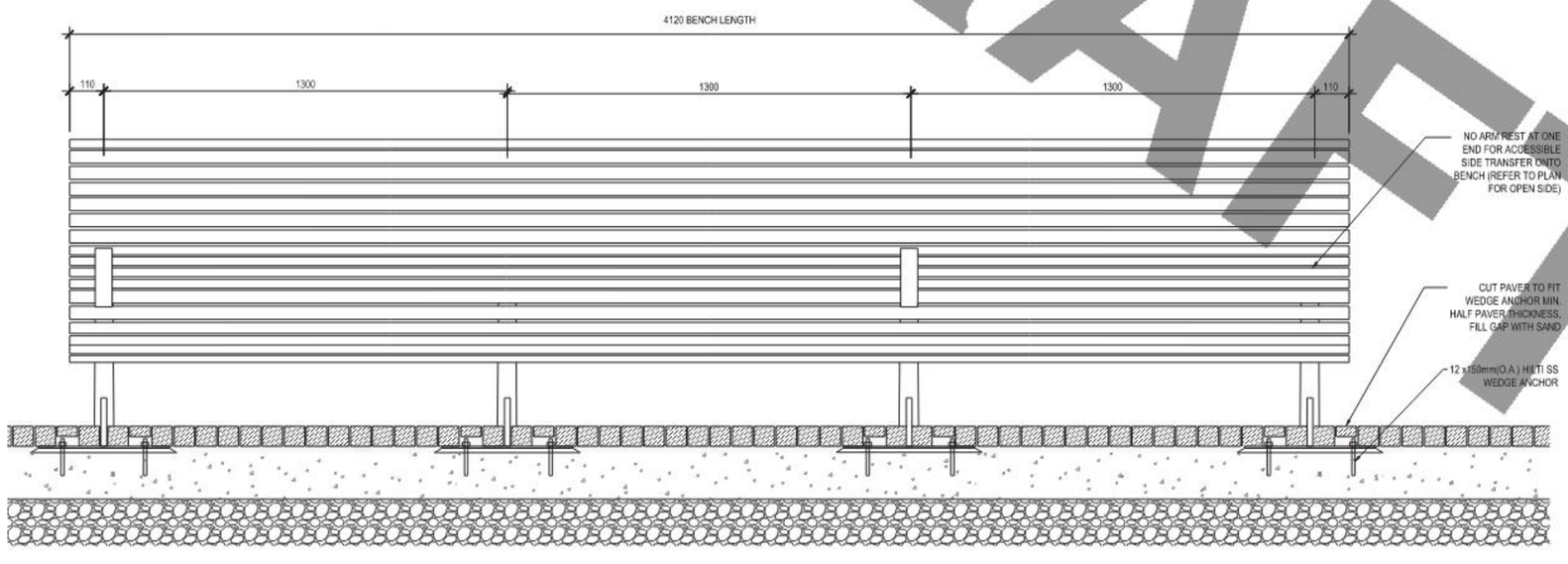
Mid-block Granite Outcrop

Mid-block Granite Outcrop

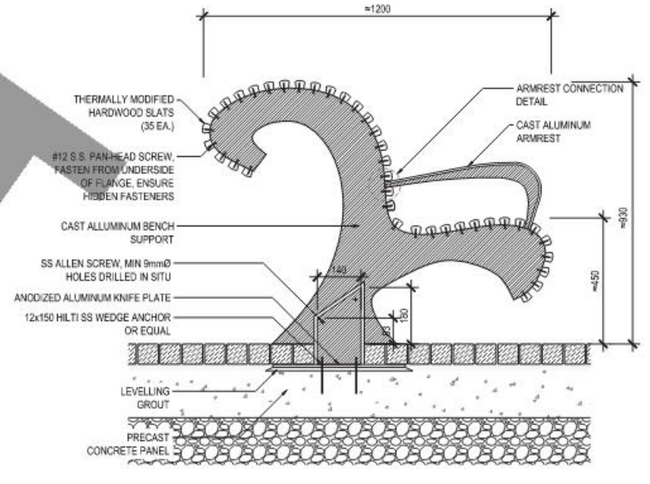
Mid-block Connection and Carved Leaf Tip Seating

Signature Waterfront Bench with Back & Arm Rests

Queens Quay Central Waterfront short / backless bench



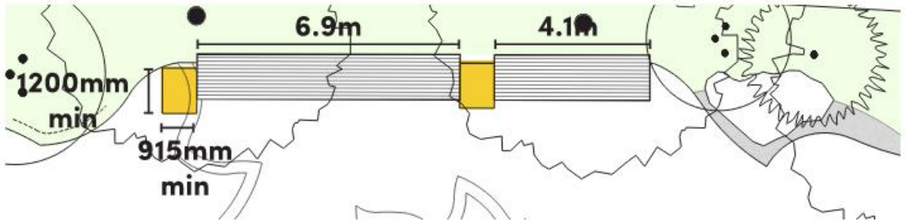
ELEVATION 1:20



SECTION DETAIL 1:20

Queens Quay East long signature waterfront bench with back and arm rests (2A/2B detail)

Signature Waterfront Bench with Back & Arm Rests

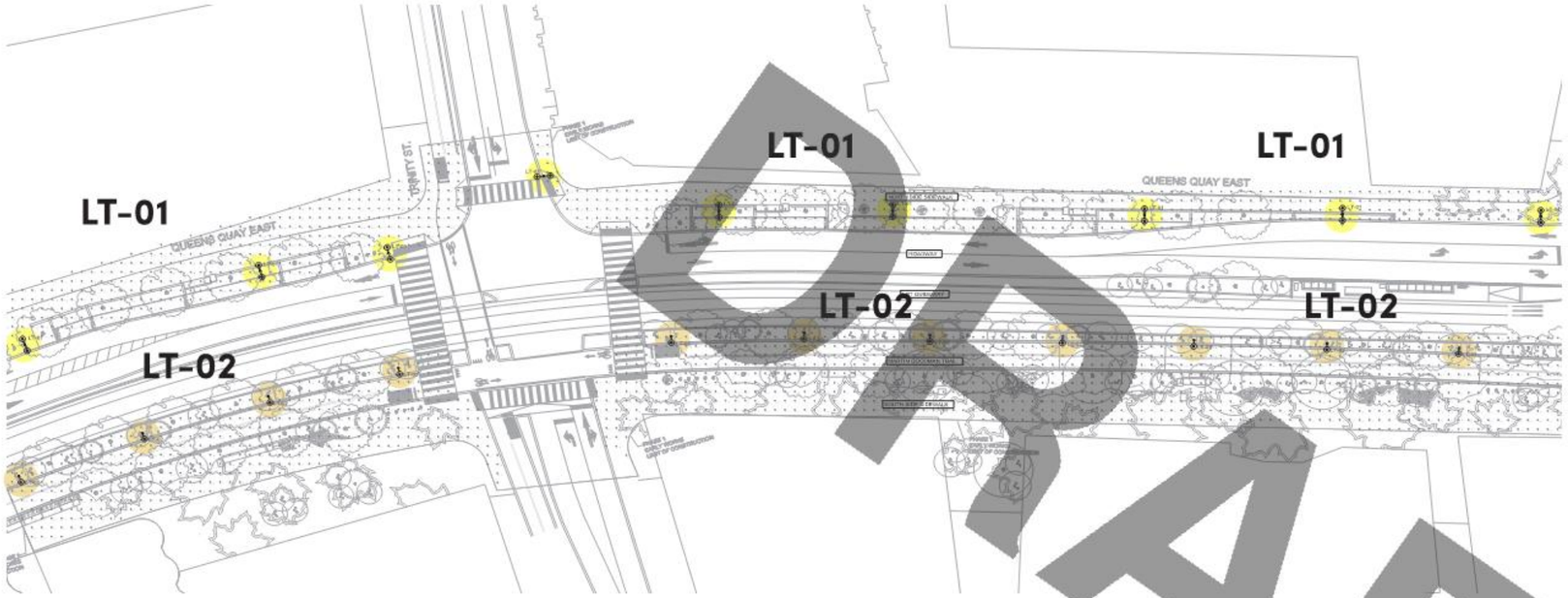


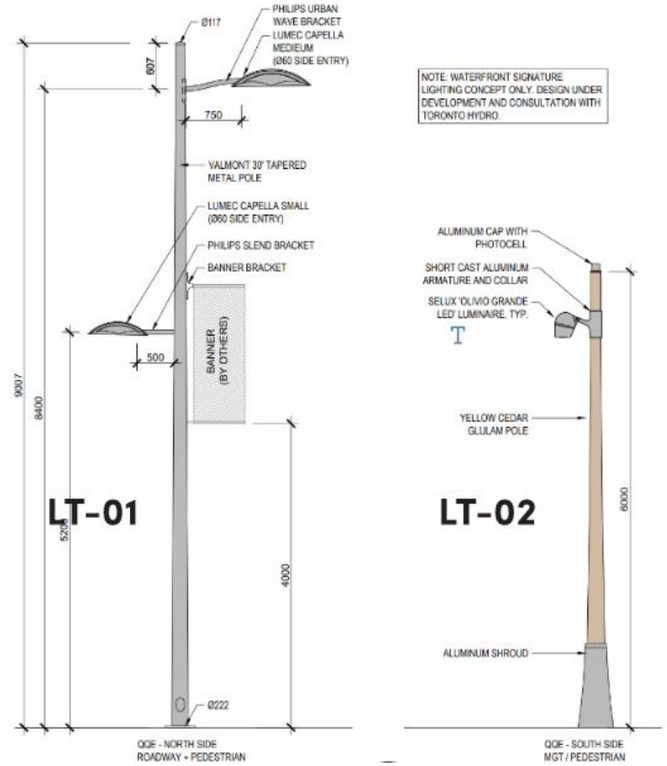
Companion Seating Locations

View at Site Square

QQE Lighting Strategy

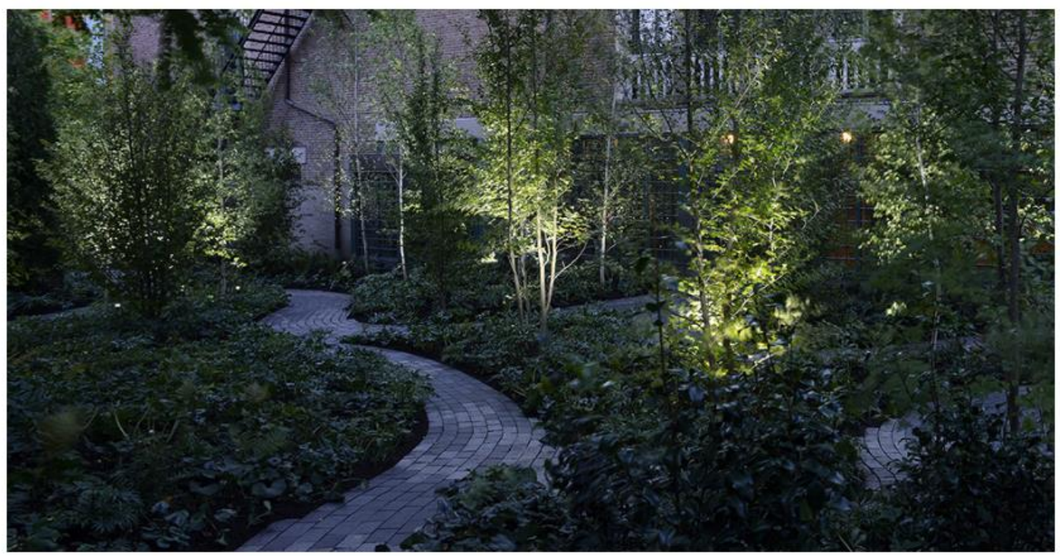
A Seamlessly Lit Environment: Comfort, Health, and Safety

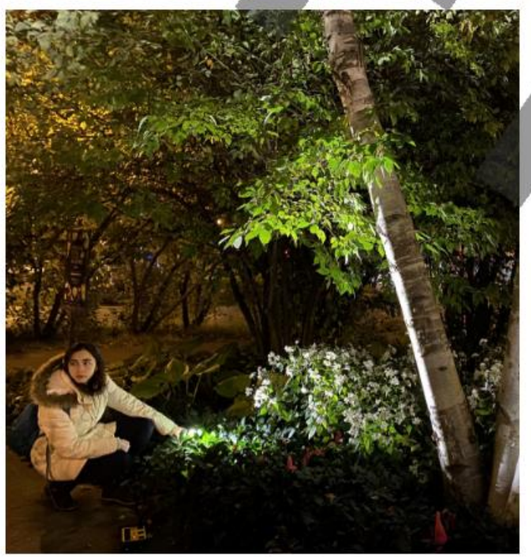




waterfront proposed lighting standards for QQE:

- north side lighting (metal pole + capella)
- south side lighting (wood pole + olivio)

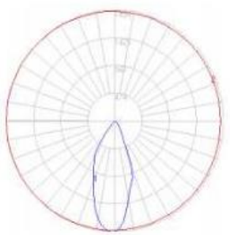




under investigation for 60% design:

secondary lighting (ground mounted or elevated / supported in immersive planting beds)
carefully nestled within planting beds to provide ambient, warm lighting

LT-03

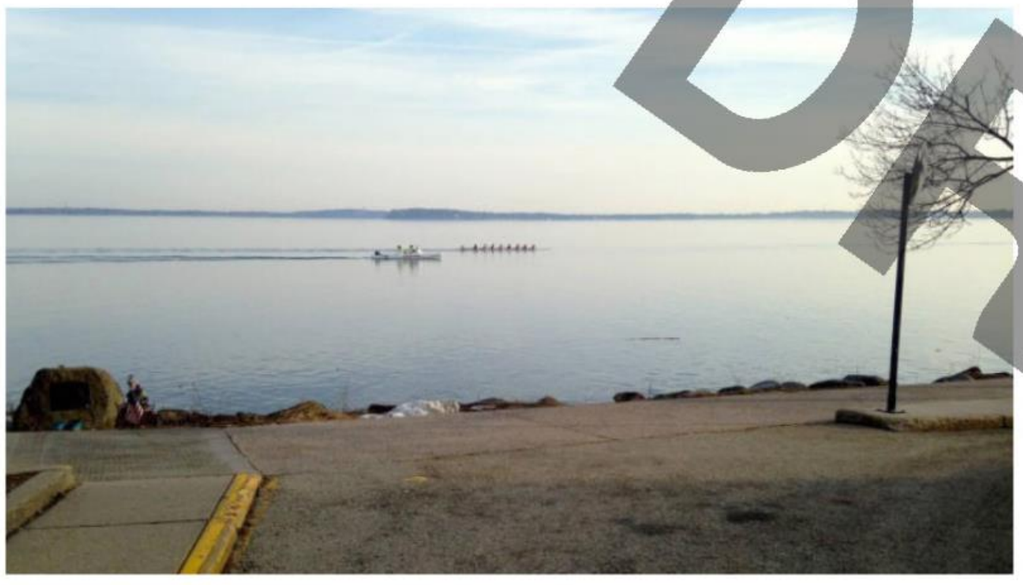


North Side: Water Capture

Road salt threatening health of freshwater lakes, study finds

Study of 371 North American lakes finds melting snow and runoff put ecosystems at risk

Margo McDiarmid · CBC News · Posted: Apr 10, 2017 5:04 PM ET | Last Updated: April 10, 2017



A University of Wisconsin study that looked at 371 lakes in eastern North America has found that road salt runoff is increasing salt concentration in freshwater lakes. Above is Lake Mendota in Madison, Wis. (Hilary Dugan)

416 comments

Melting snow from roads and parking lots is threatening thousands of lakes in North America.

A new study of 371 lakes in eastern North America shows they're getting saltier because of runoff from the salt used to melt winter snow and ice.

CBC, April 10th, 2017

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Road salt is poisoning water bodies, study finds

MARTIN MITTELSTAEDT ›
PUBLISHED MARCH 5, 2010
UPDATED APRIL 28, 2018

ENVIRONMENT REPORTER

One of the most detailed investigations ever conducted in Canada into the fate of road salt has found that it is polluting groundwater and causing some streams during winter thaws to have salinity levels just under those found in the ocean.

The elevated salt readings were detected in Pickering, where researchers from the University of Toronto have been studying how the salt spread on highways, such as the 401, and other roadways through suburban sprawl affects water quality. They found that so much salty water from the community is ending up in Frenchman's Bay, a scenic lagoon on the shores of Lake Ontario, that the small water body is being poisoned.

"Our findings are pretty dramatic, and the effects are felt year-round," said Nick Eyles, a geology professor at the university and the lead researcher on the project. "We now know that 3,600 tonnes of road salt end up in that small lagoon every winter from direct runoff in creeks and effectively poison it for the rest of the year."

He called the findings, which were published recently in the journal Sedimentary Geology , "a really bad-news story" involving a "relentless chemical assault on a watershed."

The Pickering area provided researchers with an ideal place to study the effects of road-salt spreading, because most of the city lies within a relatively compact 27-square-kilometre watershed, where it was easy for pollution monitors to track where salt spread on roads ended up.

About 7,600 tonnes of salt is applied each year to roads in the community. About half of this amount seeps into groundwater, which in turn flows into streams year-

TRENDING

1 When it comes to pensions, don't follow Ottawa's example

2 Toronto doctor resigns from committee, accuses pharmaceutical company of deliberately creating shortage of drug

3 China warns Canada to abandon 'prejudice' after Ottawa blocks Aecon deal

4 Trudeau cabinet blocks Chinese takeover of Aecon over national security concerns

5 Seven reasons why the Bank of Canada won't raise rates and send the loonie higher

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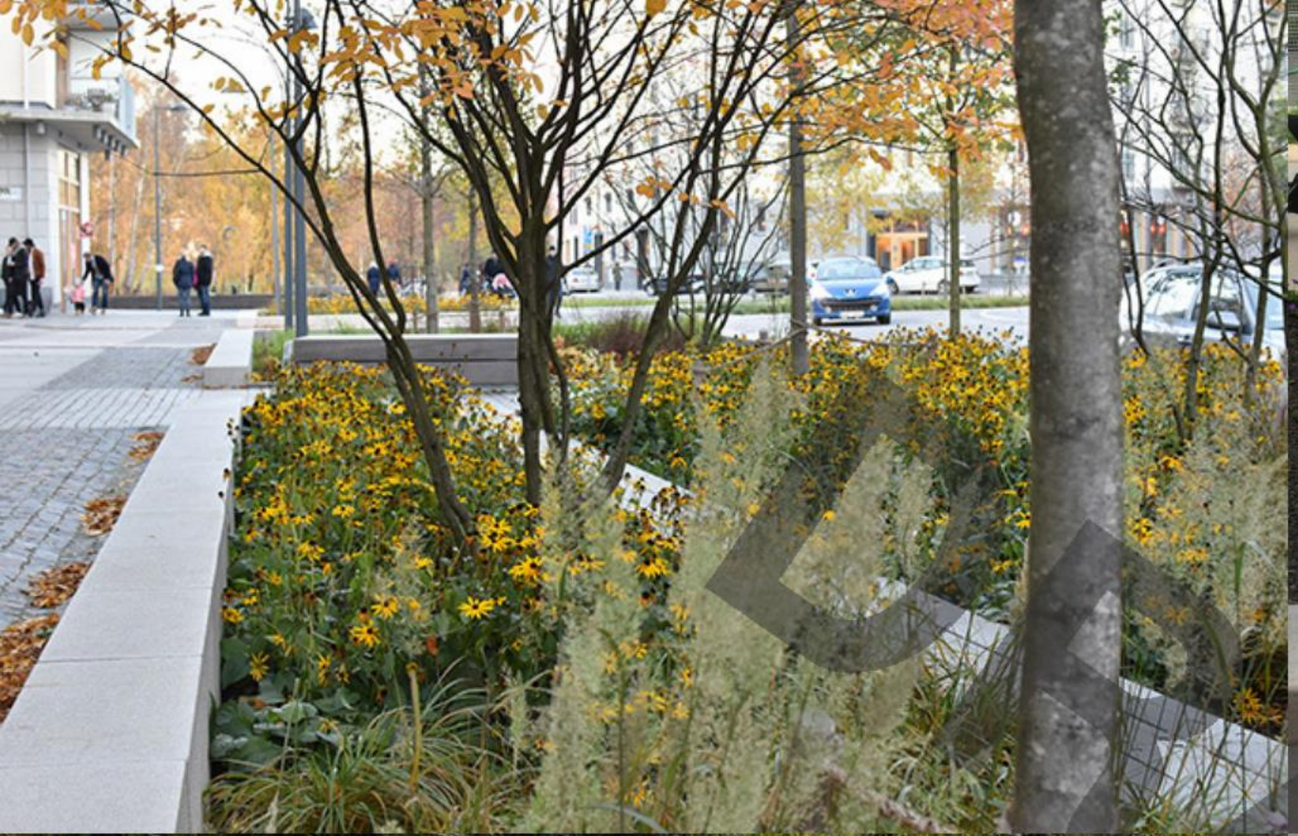
Trudeau talks possible U.S. auto tariffs 2:28

Weinstein expected to surrender in sexual-misconduct investigation 0:

Trudeau defends blocking Chinese takeover of Aecon 1:45

Globe and Mail, April 28th, 2018



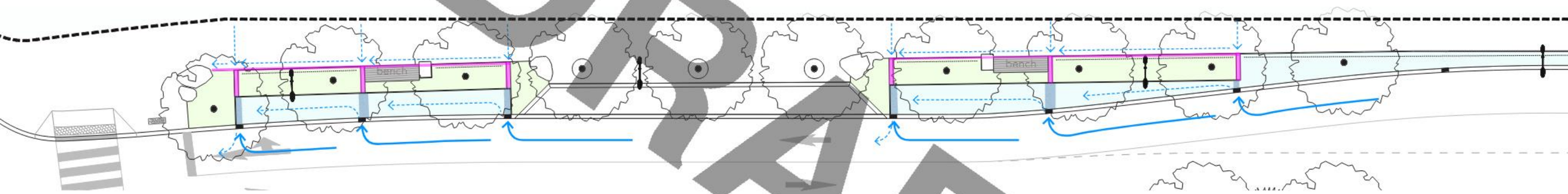
North Side Bioswale System

North Side Bioswale System

more diverse / tree planting

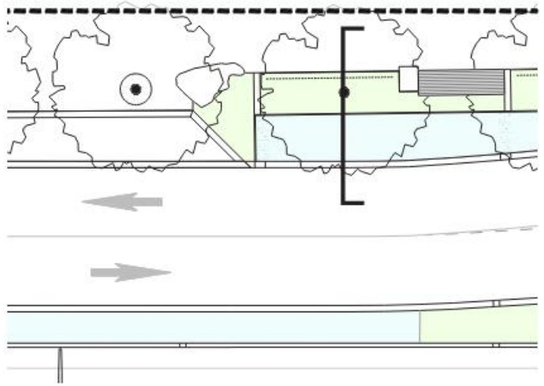
brackenish grasses / salt tolerant

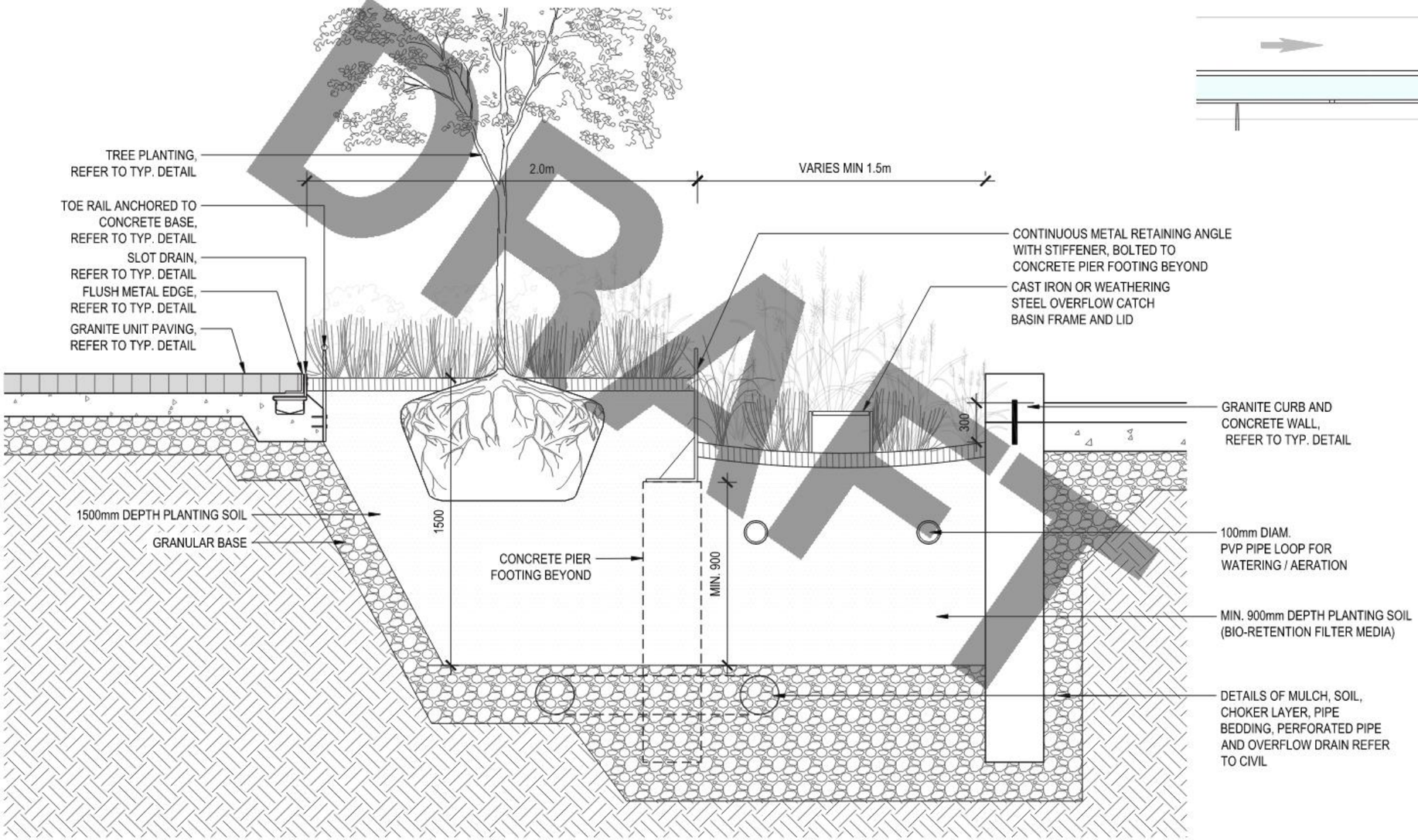
rock, pre-treatment



typical north bioswale system flows

Typical North Side Tree Planting and Bioswale Detail

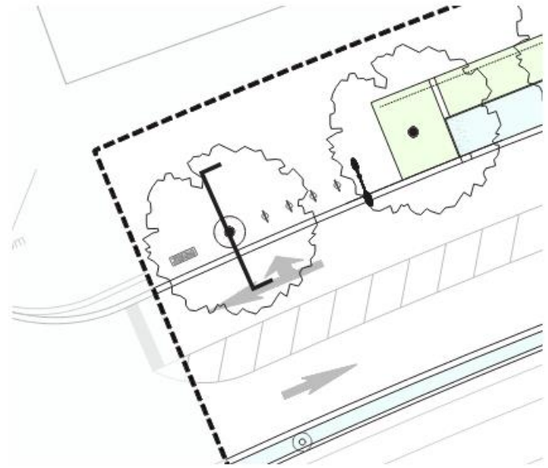


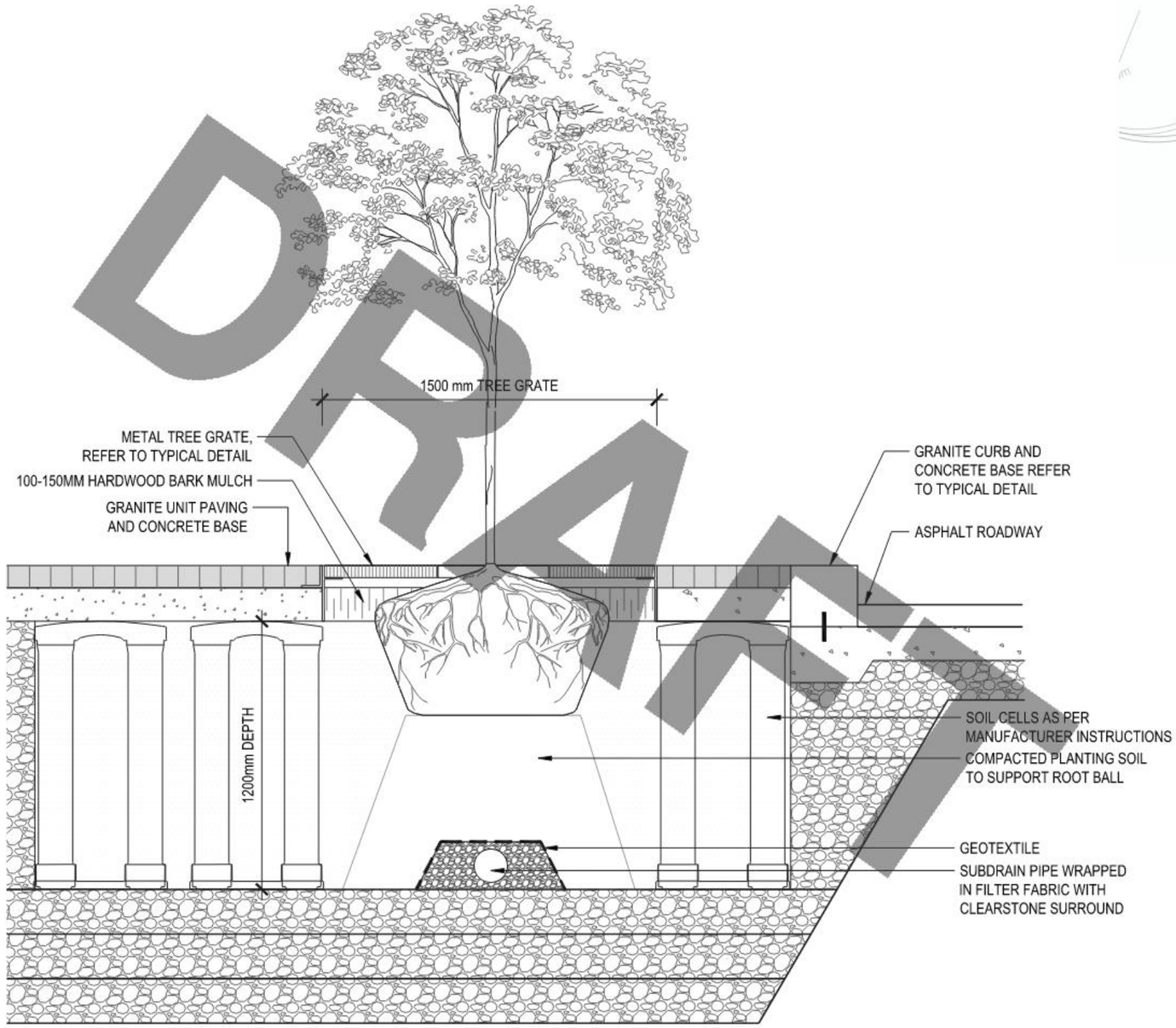


typical north side - tree planting and bioswale detail for QQE (60% design 2B detail)

North Side Sidewalk and Mid-block Layby

Trees in Hardscape





typical tree in hardscape detail for QQE (60% design 2B detail)

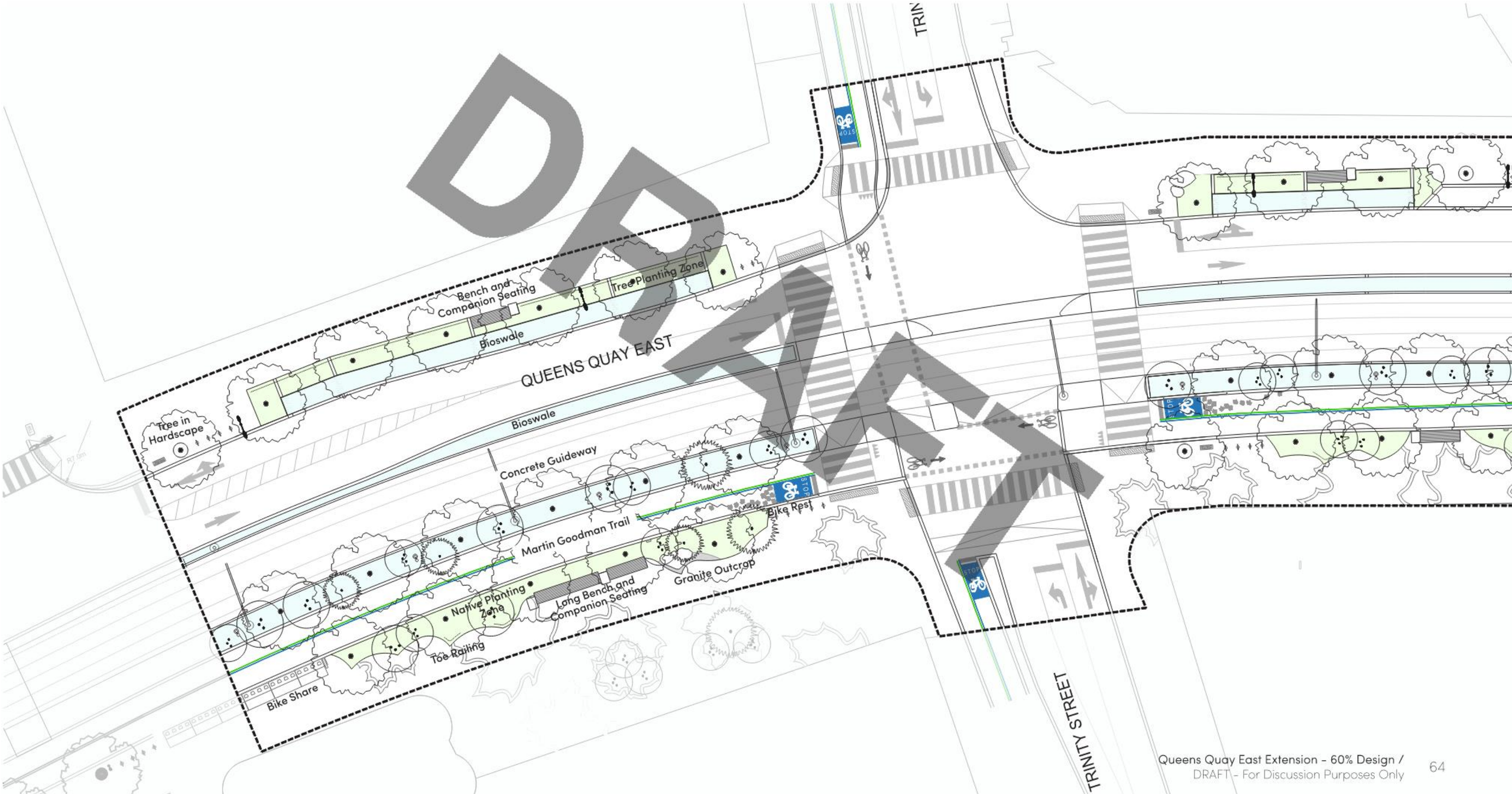
North Side Bioswale System

North Side Bioswale System

North Side Bioswale System

[end]

QQE Layout Plan - Street A to Trinity Street



QQE Layout Plan - Trinity to Cherry Street