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Credit Valley Conservation inspired by nature

HOW *LOW IMPACT* IS YOUR DEVELOPMENT?

City of Toronto

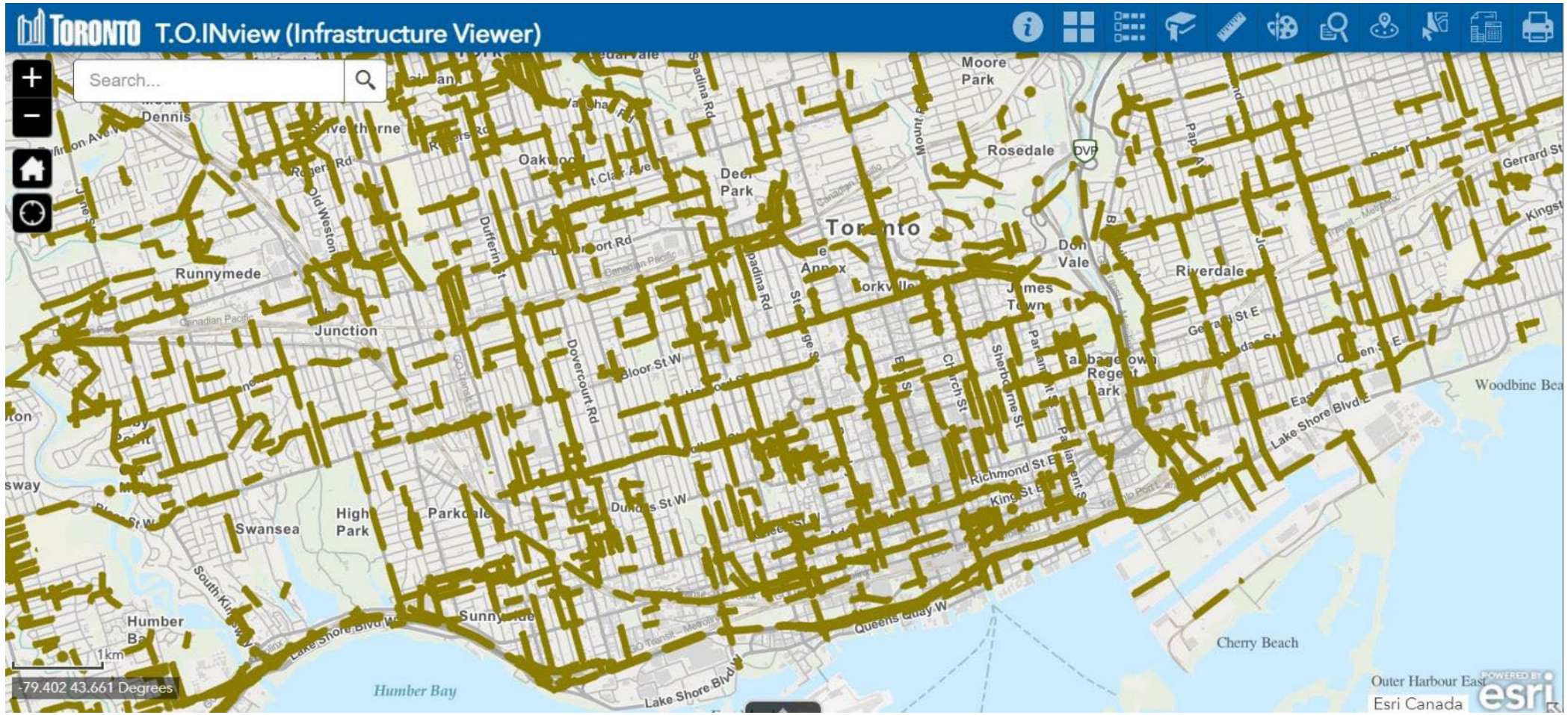
Transportation Services

Planning, Design and Management

Robert Mays,
Neighbourhood Projects

Kristina Hausmanis,
Green Streets

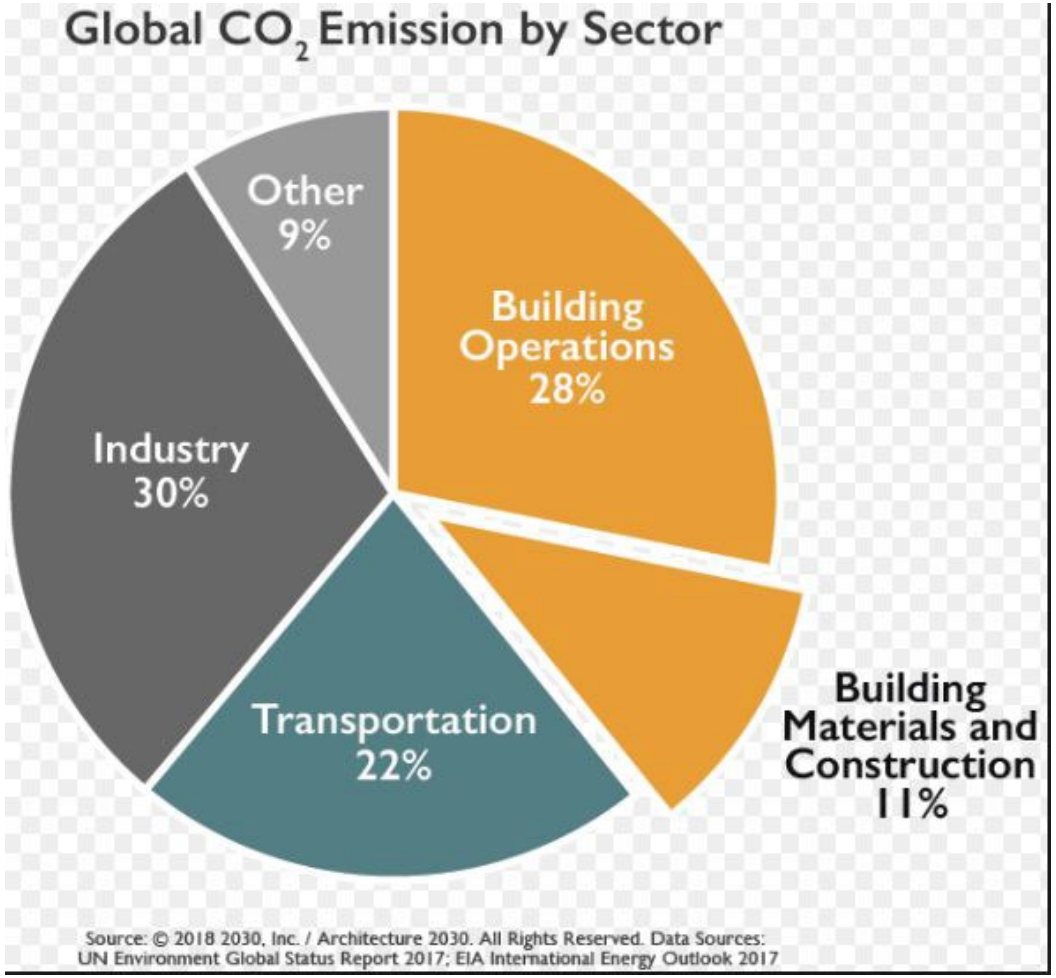
TORONTO


TORONTO T.O.INview (Infrastructure Viewer)
Search...
Moore Park
Rosedale
DVP
Deer Park
Toronto
Annex
Don Vale
Riverdale
James Town
Runnymede
Junction
Bloor St W
Dovercourt Rd
Dufferin St
Spadina Rd
Old Weston
Gerrard St E
Lake Shore Blvd E
Woodbine Bea
Richmond St E
King St E
Queen St E
Swansea
High Park
Parkdale
Dundas St W
Queens Quay W
Lake Shore Blvd W
Sunnyside
Humber Bay
Cherry Beach
Outer Harbour East
Esri Canada
1km
-79.402 43.661 Degrees


The Queen of Tarts
CAT
CAT
DEERE

The Impacts of Construction Activity:

- Increased Mining Activity
- Resource Depletion
- Greenhouse Gas Emissions / Embodied Carbon
- Air Quality / Water Quality
- Transportation of Materials
- Traffic Congestion
- Noise Pollution
- Social Factors: Comfort and Well Being.
- Economic Impacts: Road Closures, Business/ Retail Access.
- Resulting Maintenance / Operational Impacts
- Environmental Impact of Project from Construction to Demolition.

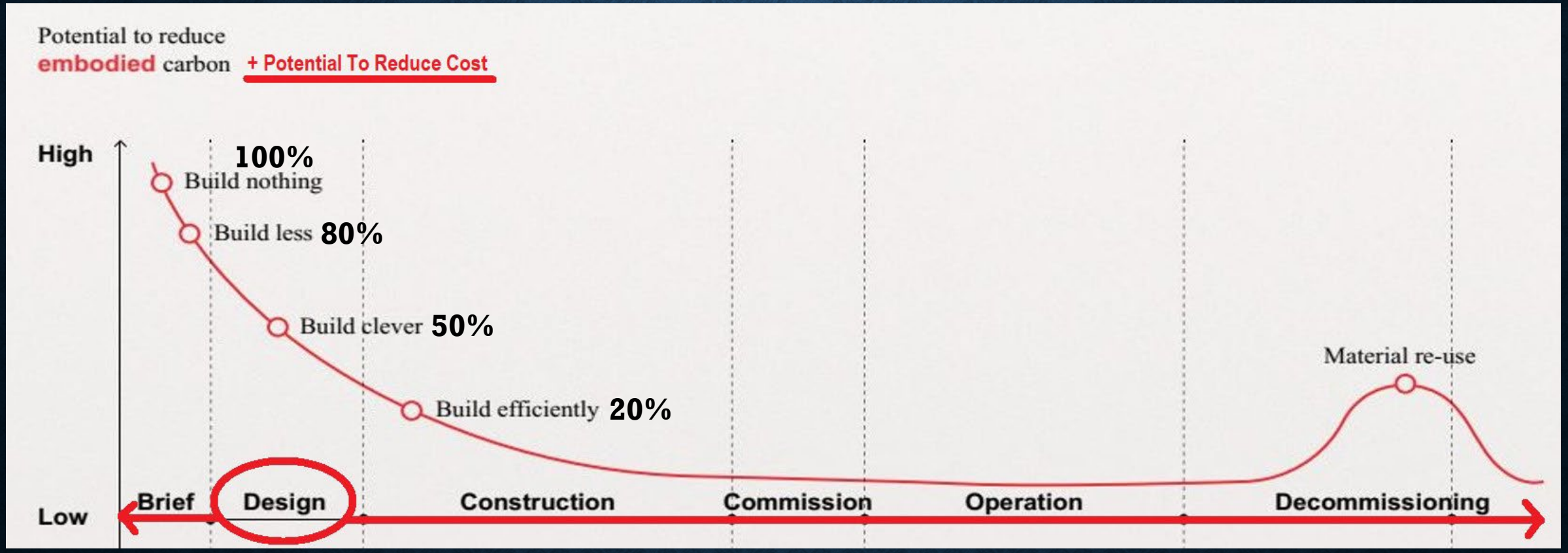


The construction sector consumes 50% of all raw materials.

Construction creates 36% of all waste.

Waste and pollution does not exist by accident, it is the result of design decisions.

ellenmacarthurfoundation.org/


Potential to reduce
embodied carbon
+ Potential To Reduce Cost
High
Low
100%
Build nothing
Build less 80%
Build clever 50%
Build efficiently 20%
Material re-use
Brief
Design
Construction
Commission
Operation
Decommissioning

ARUP

REVISING THE STREETSCAPE DESIGN AND CONSTRUCTION PRACTICE:

Promote production of an existing site material inventory prior to developing a demolition plan or design.

Source local and low embodied carbon alternatives.

Meet project objectives but with reduced construction, reduced waste, and therefore reduced cost.

Use a project carbon impact calculation tool such as: https://climatepositivedesign.com/

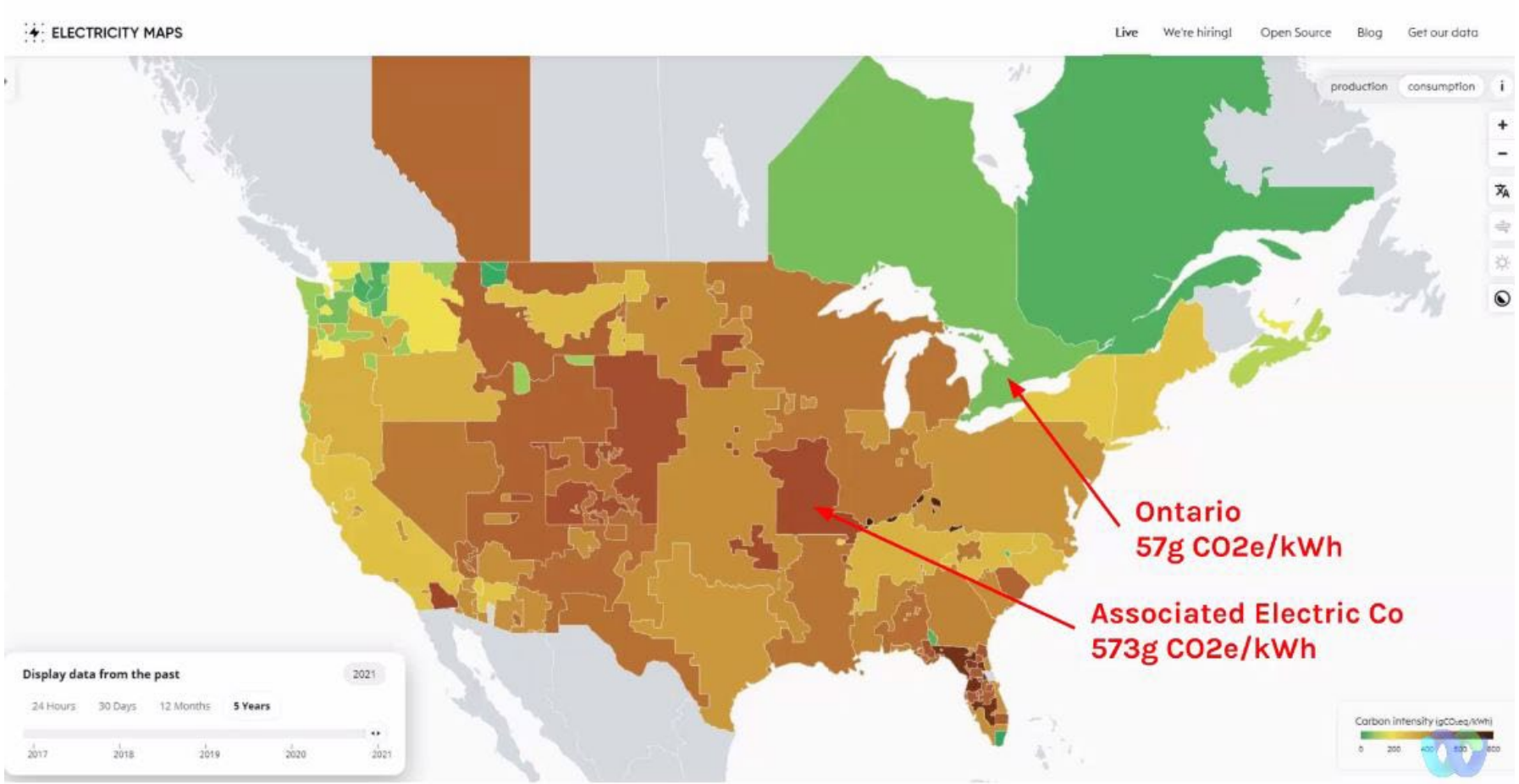
Designing with dry construction and decommissioning in mind.

The good and the bad of standards and specifications:

- Update regularly – Materials and procedures
- Give up some control to foster re-use of existing materials.
- Enable edits to foster innovation.

SOURCING MATERIALS

- Embodied carbon
- How much do you require?
- How rare is the material?
- How long does it need to last?
- How far did it come from?
- Where did it come from?
- What about decommissioning?



https://app.electricitymaps.com/map

https://www.countryliving.com/gardening/garden-ideas/g37284621/best-ornamental-grasses/

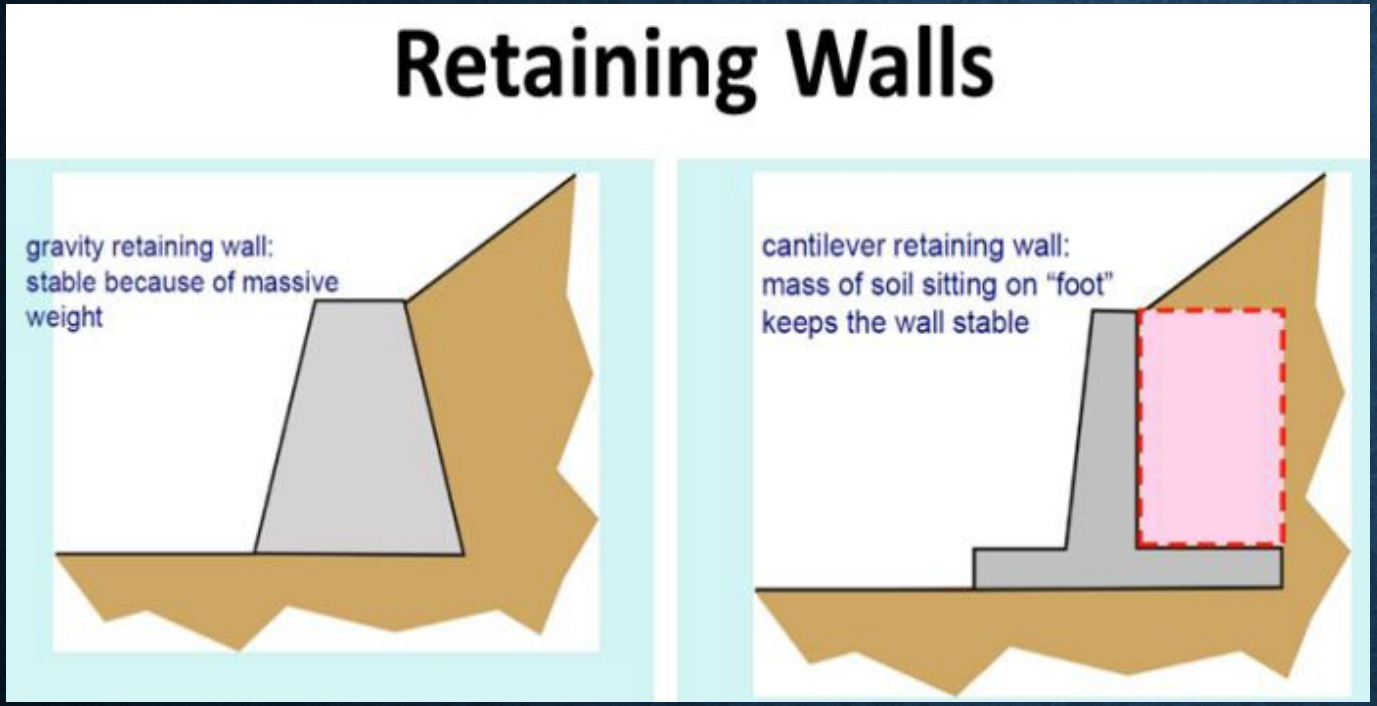
Revising the Aesthetic

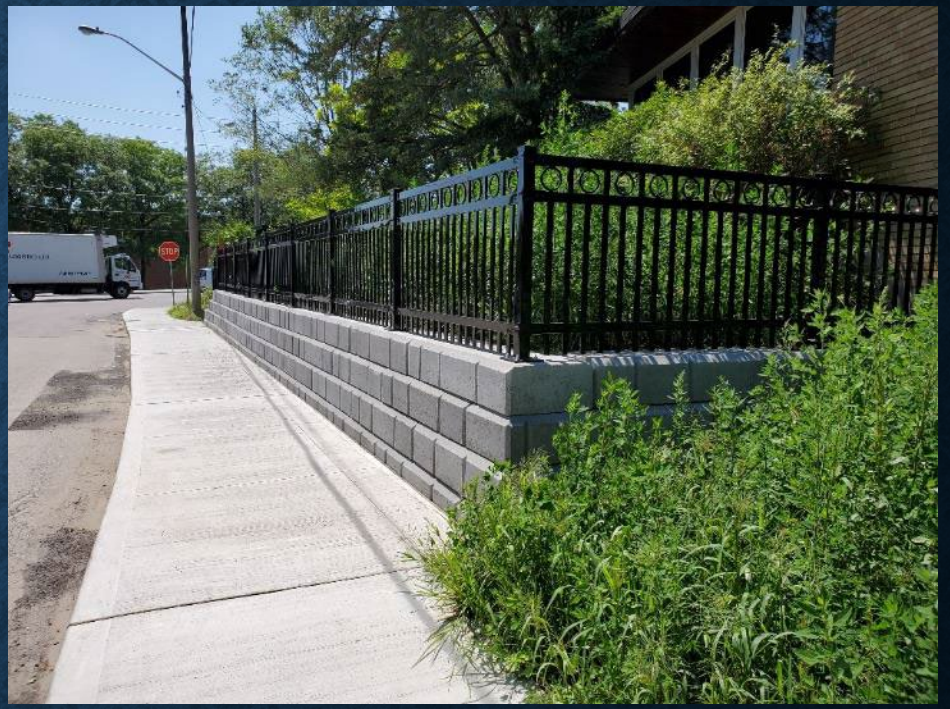
Revising the Aesthetic

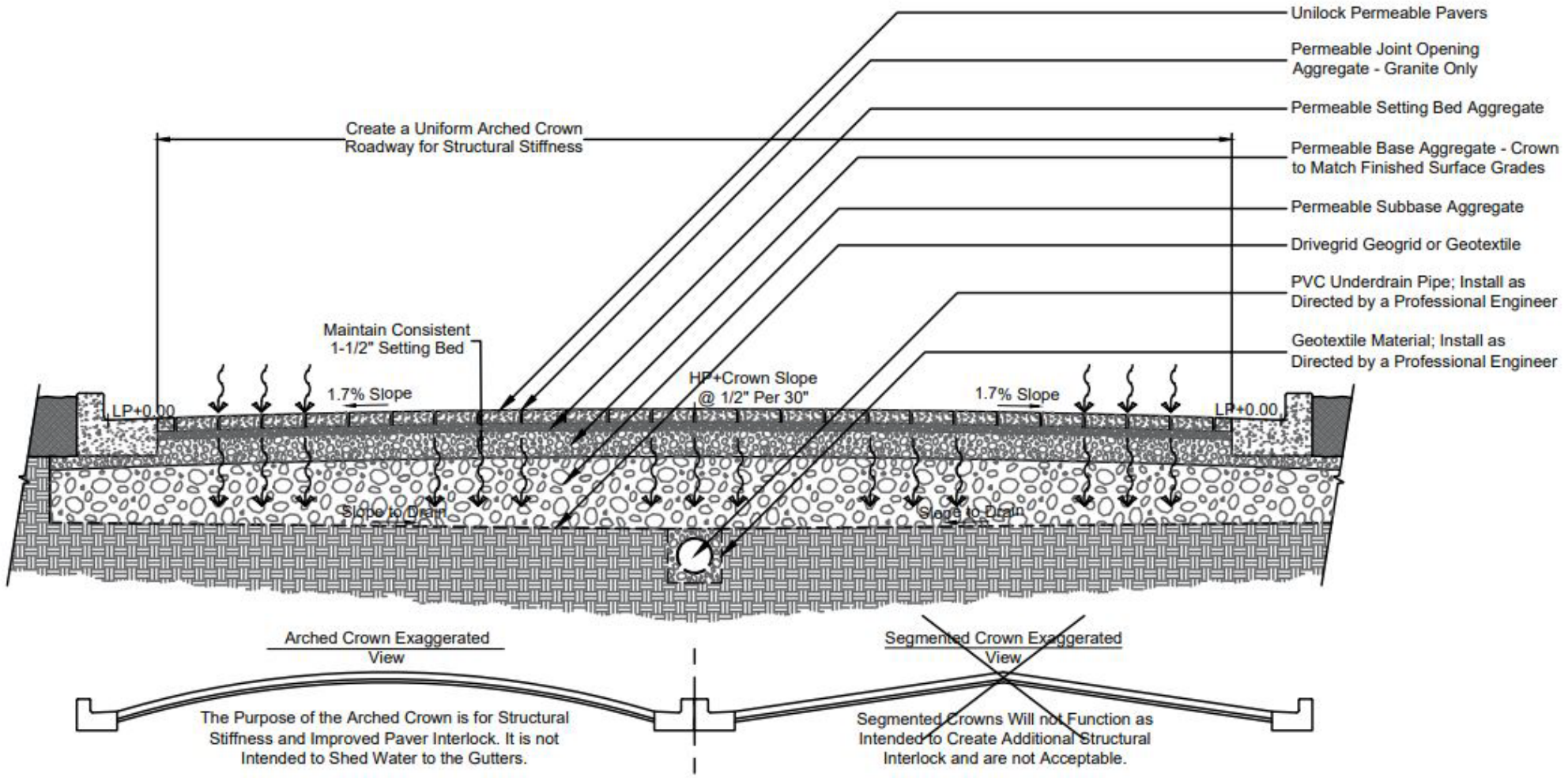
https://utsc.utoronto.ca/news-events/our-community/restoring-utscs-brutalist-masterpiece-gets-helping-hand-concrete-whisperer

Brush layering along a steep slope. (California Department of Transportation: http://www.dot.ca.gov/)

Retaining Walls







Note:

This cross section is intended for preliminary design purposes only. Confirm site conditions and consult with a qualified design professional or installer prior to installation.

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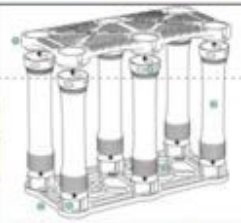
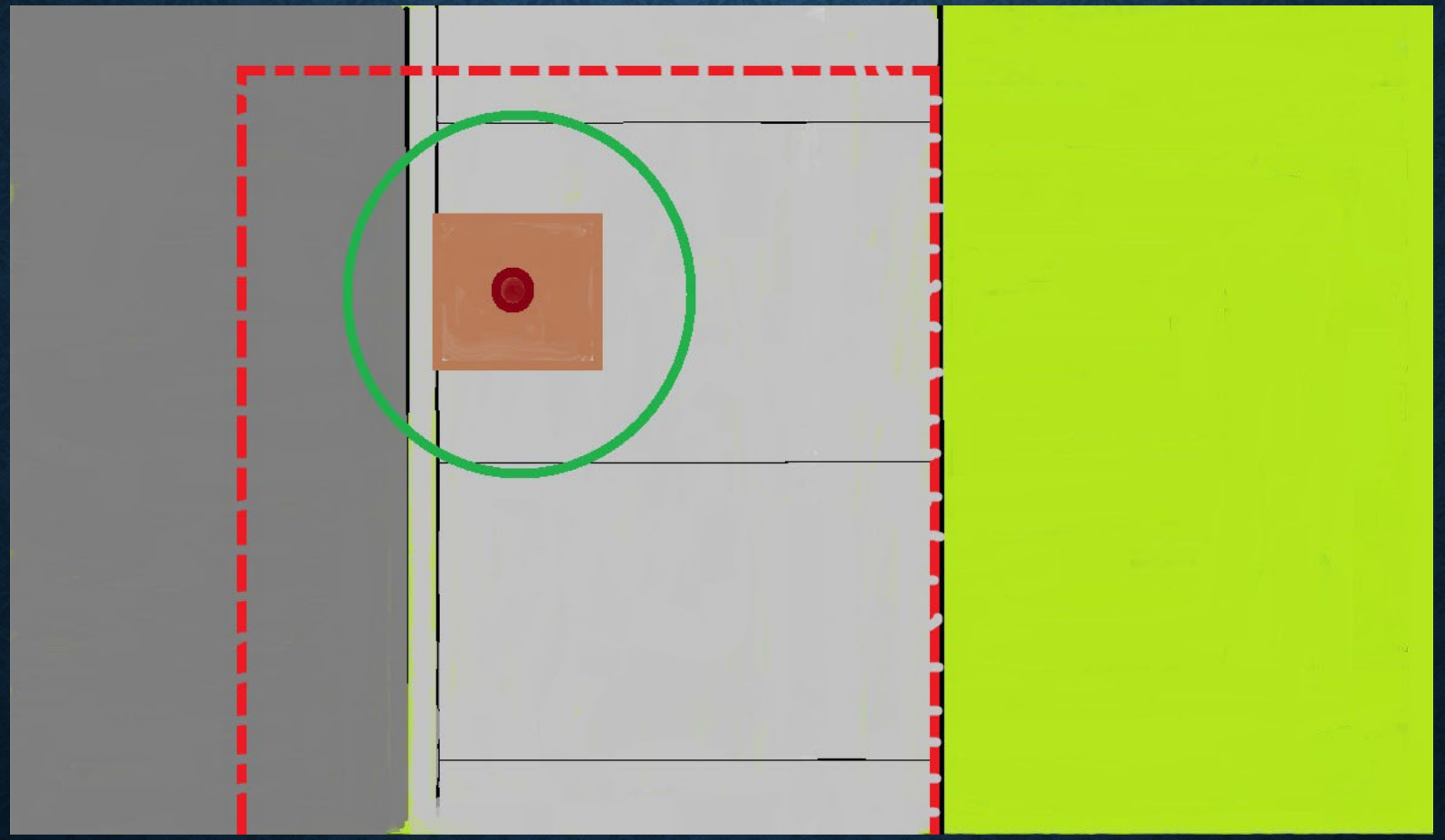
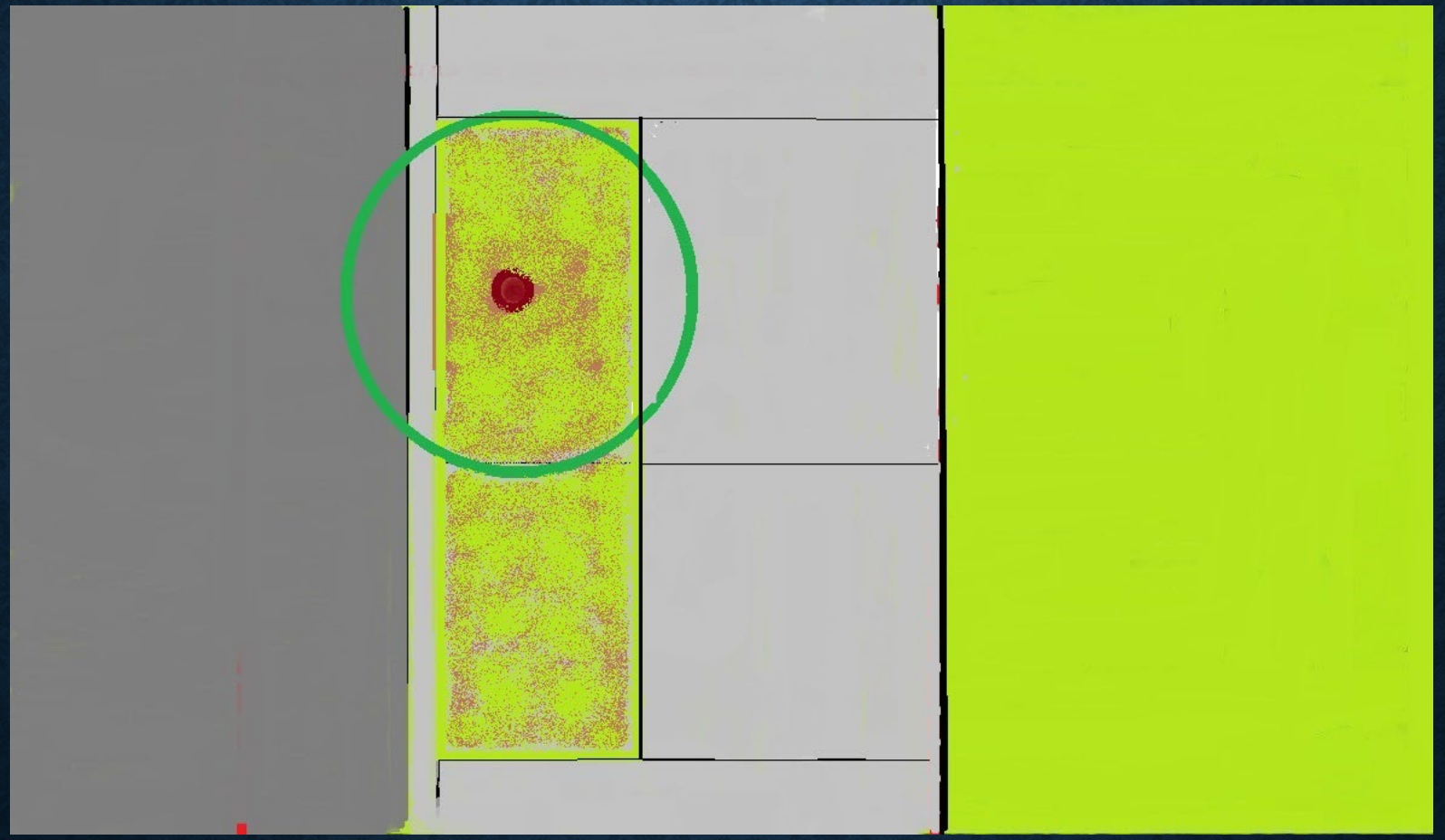
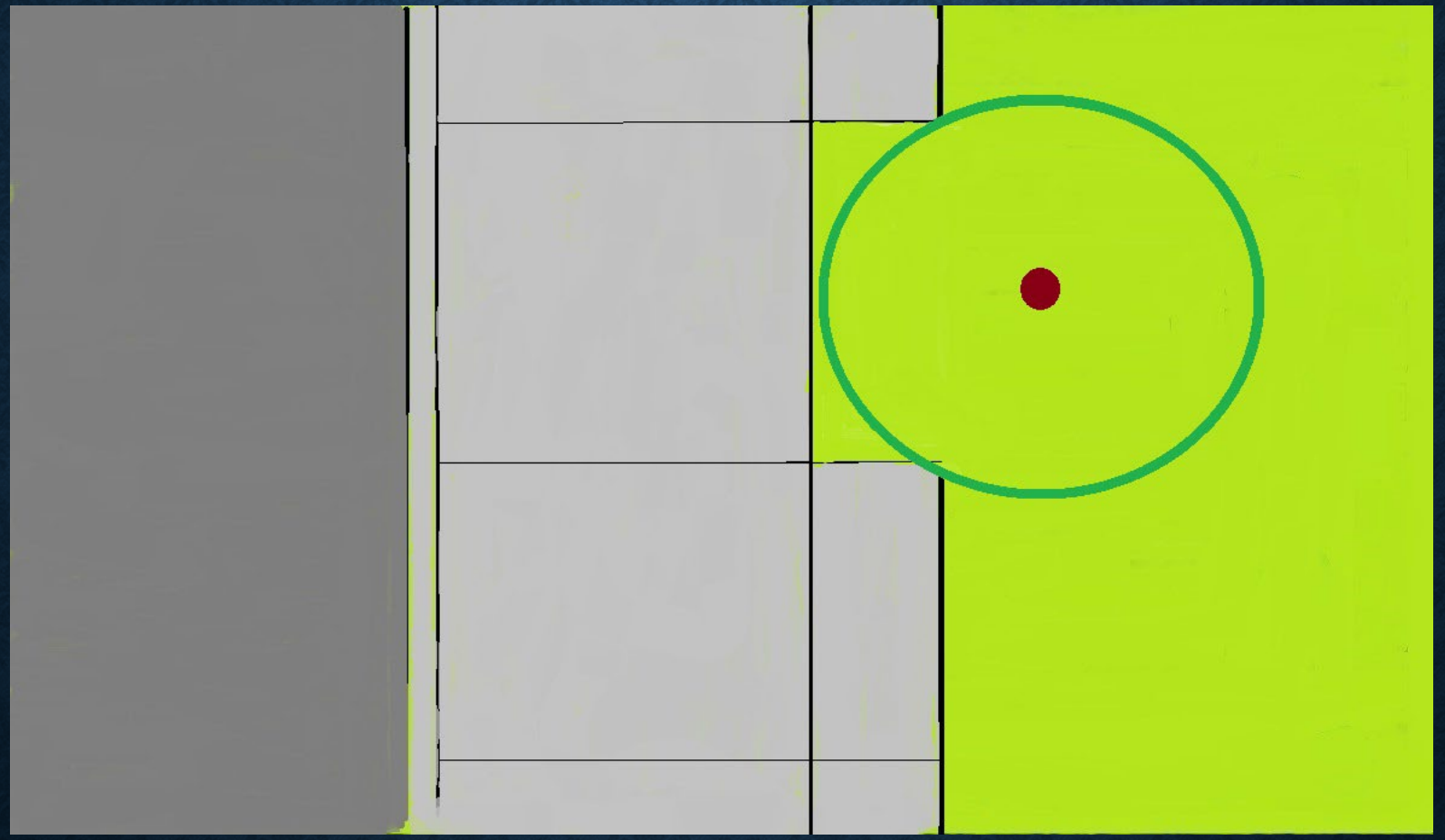
DeepRoot

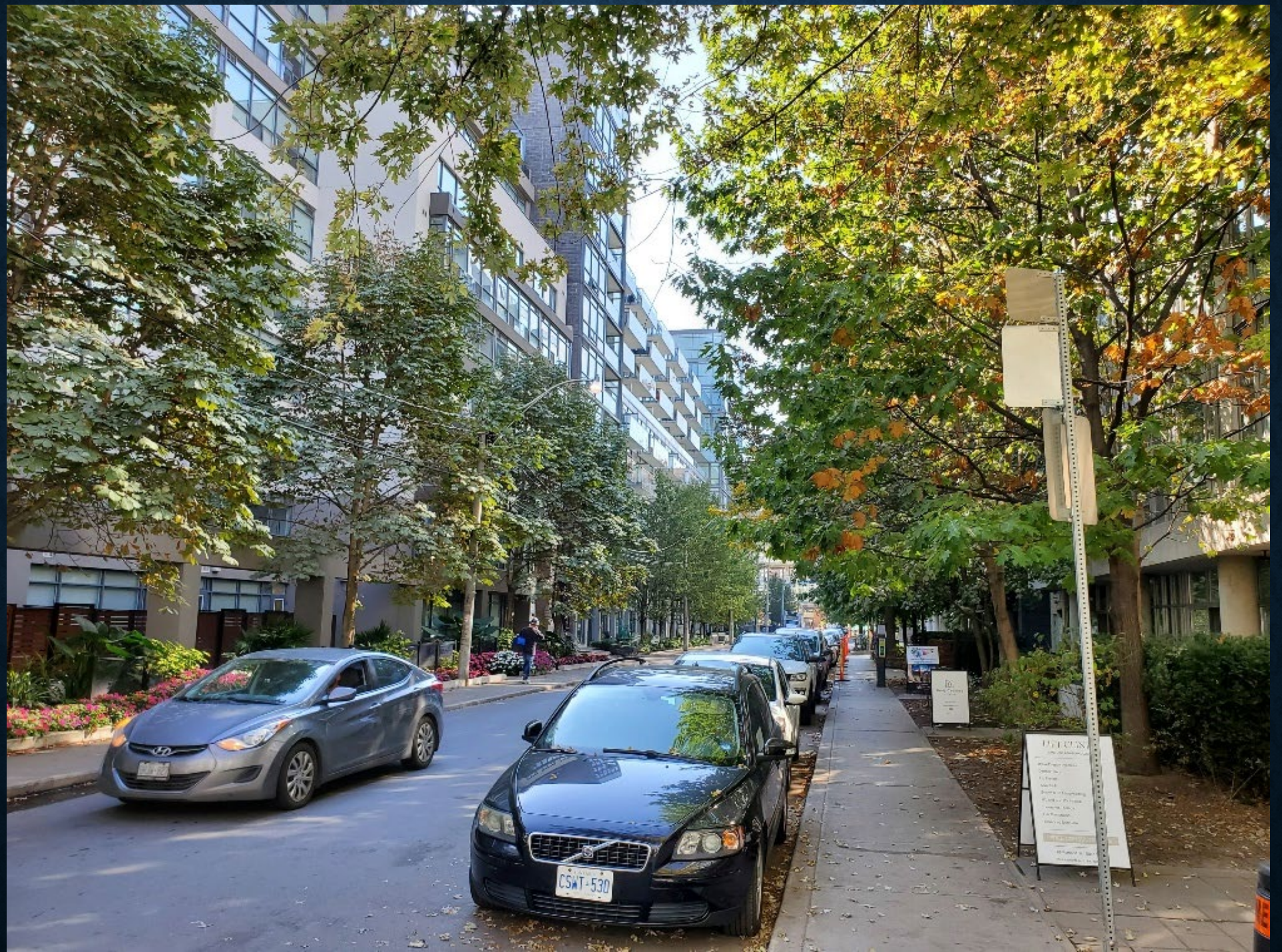


GreenBlue
URBAN



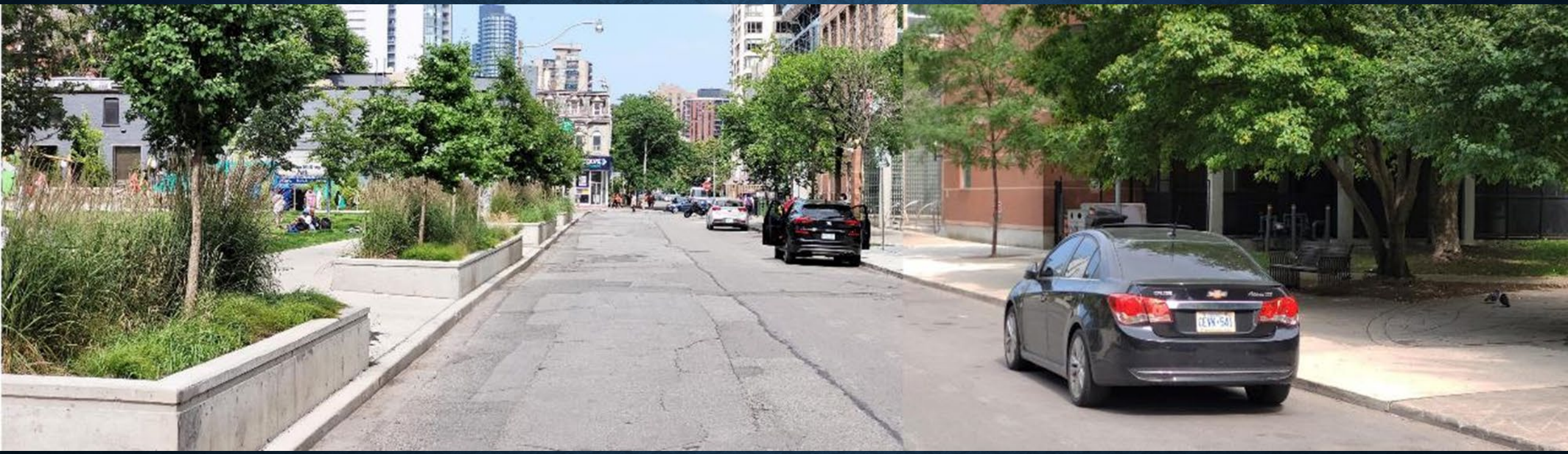




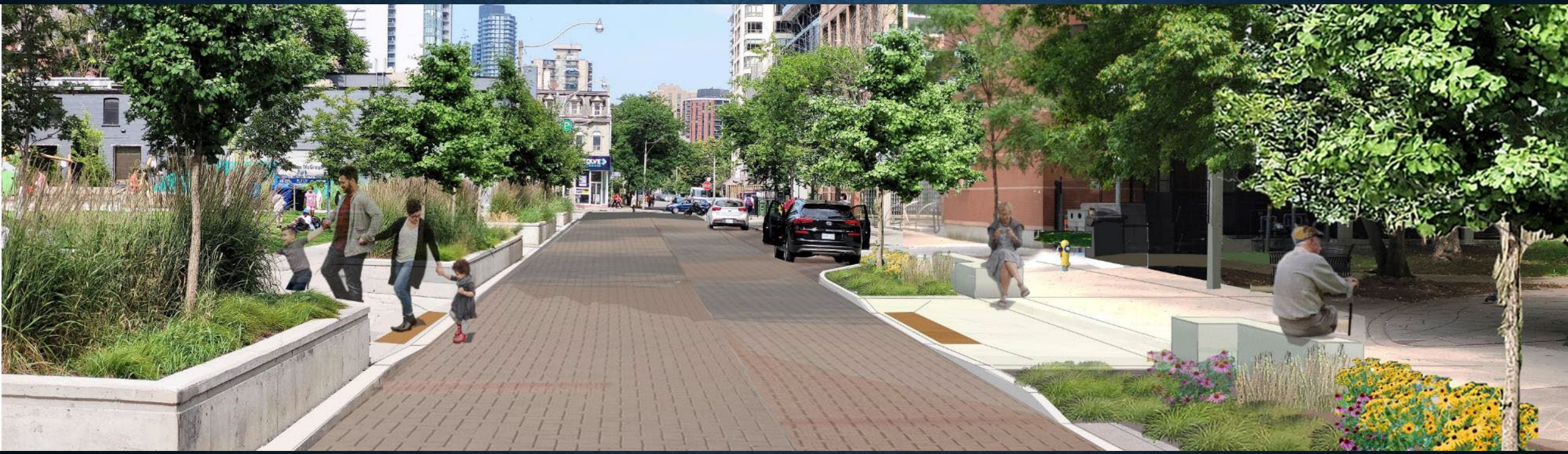

CSWT-530


STOP

BREADALBANE ST.
THE 100 KM STREET



BREADALBANE ST.
THE 100 KM STREET



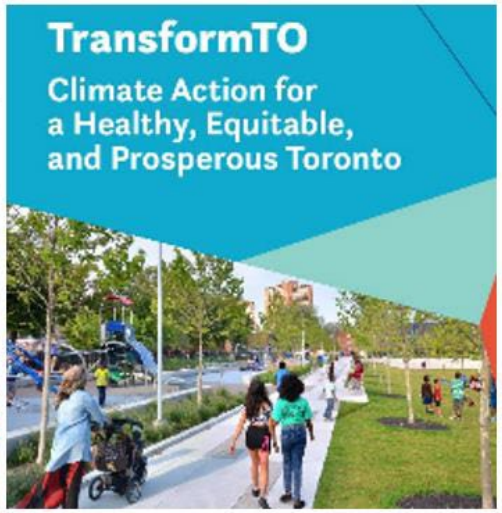
LANEWAY GREENING

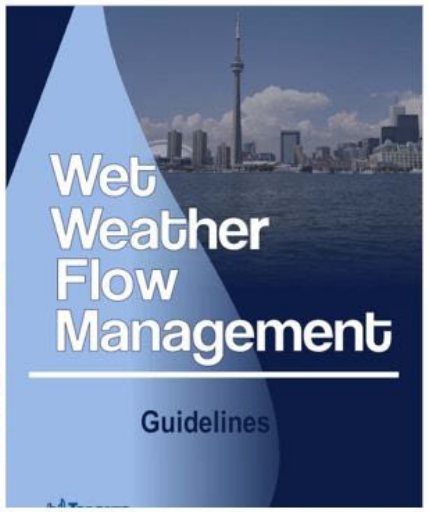
Victoria Taylor Landscape Architect w/ The Laneway Project.org

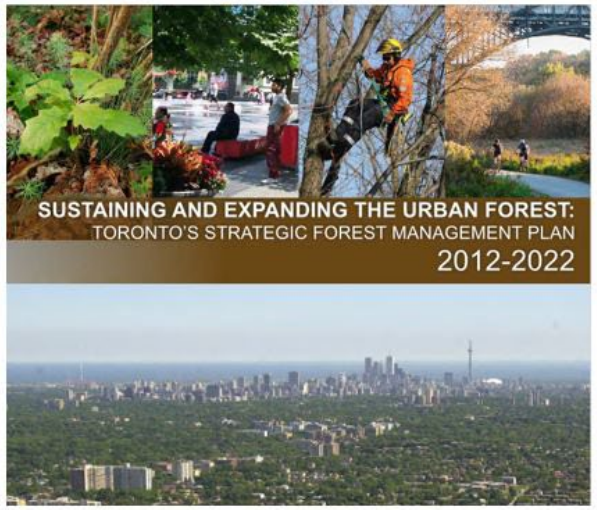
HARBORD VILLAGE

Circular Economy Principles to Support Climate Positive Design

WE WANT TO BE A SUSTAINABLE CITY….





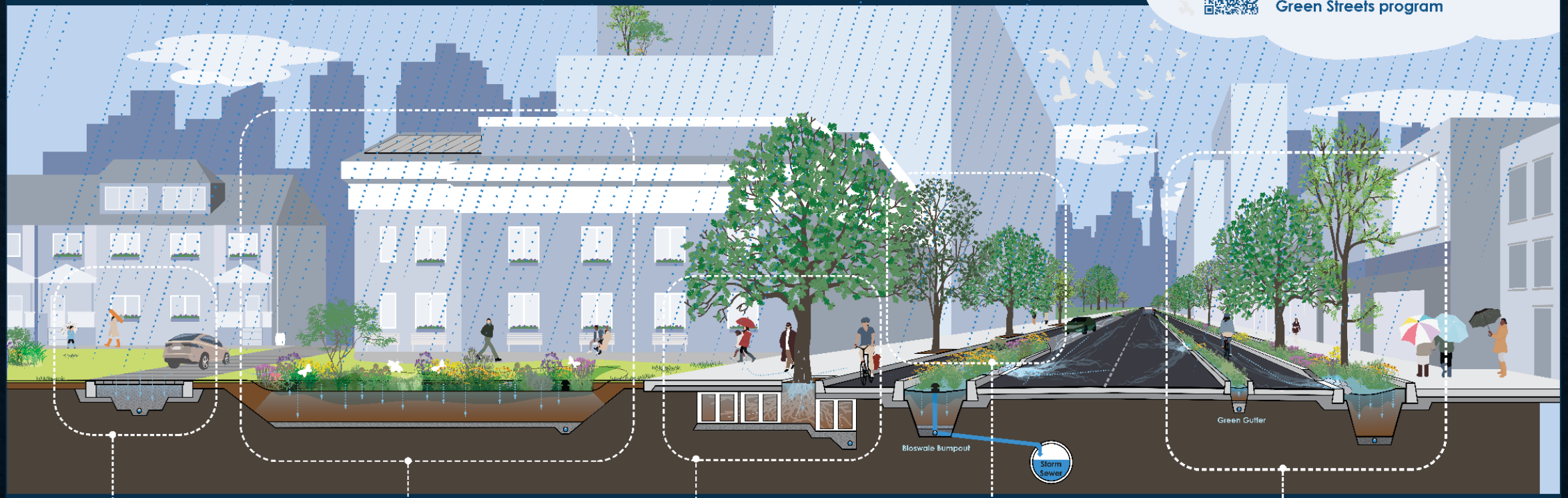


October 2 and 3, 2019: City Council declared a **climate emergency** for the purpose of naming, framing, and deepening our commitment to protecting our economy, our ecosystems and our community from climate change.

Green Streets in Toronto

Green Streets are roads that include green infrastructure (GI) that mimic the natural water cycle, increase urban biodiversity, and improve resilience to extreme heat and storm events. Below are four (4) common types of green infrastructure found in the city.

Scan this QR code to learn more about the City of Toronto's Green Streets program



Permeable Pavement

Permeable pavements are specialized pavements with small surface gaps that drain stormwater runoff into an underground stone reservoir. Water is stored in this reservoir and slowly released to the surrounding soil and/or municipal sewer system. The three most common permeable pavements are permeable interlocking concrete pavers, porous asphalt and pervious concrete.

Bioretention

Bioretention facilities are specialized green spaces designed to receive, filter and retain stormwater from the surrounding area which may then be absorbed by plants, recharge groundwater or slowly released back into the municipal sewer system. Three common forms of bioretention found in the city are bioretention curb extensions, bioretention planters and rain gardens.

Stormwater Tree Trench

Stormwater Tree Trenches are underground systems that promote healthy tree growth in highly urbanized streets by significantly improving soil conditions. Often invisible from the surface, perforated pipes deliver stormwater runoff to the tree roots while underground structures support the weight of the pavement above. This keeps the soil in the trench moist and uncompacted; providing the environment ideal for tree health and growth.

Street Trees

Street trees provide a wide range of environmental, economic, and social benefits to the public. They provide habitat for wildlife, improve air quality, and sequester carbon from the atmosphere. Additionally, trees* absorb stormwater and mitigate urban heat effects through evapotranspiration and shade provision. When thoughtfully implemented, street trees can beautify streets, calm traffic, reduce noise pollution and create a more welcoming streetscape.

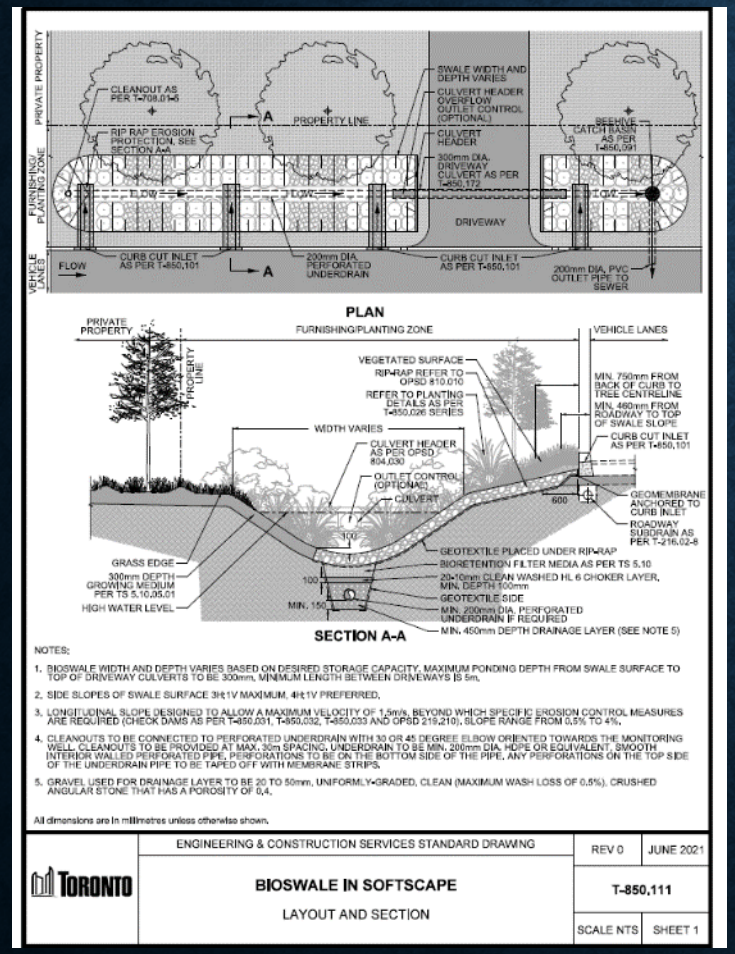
Bioswales

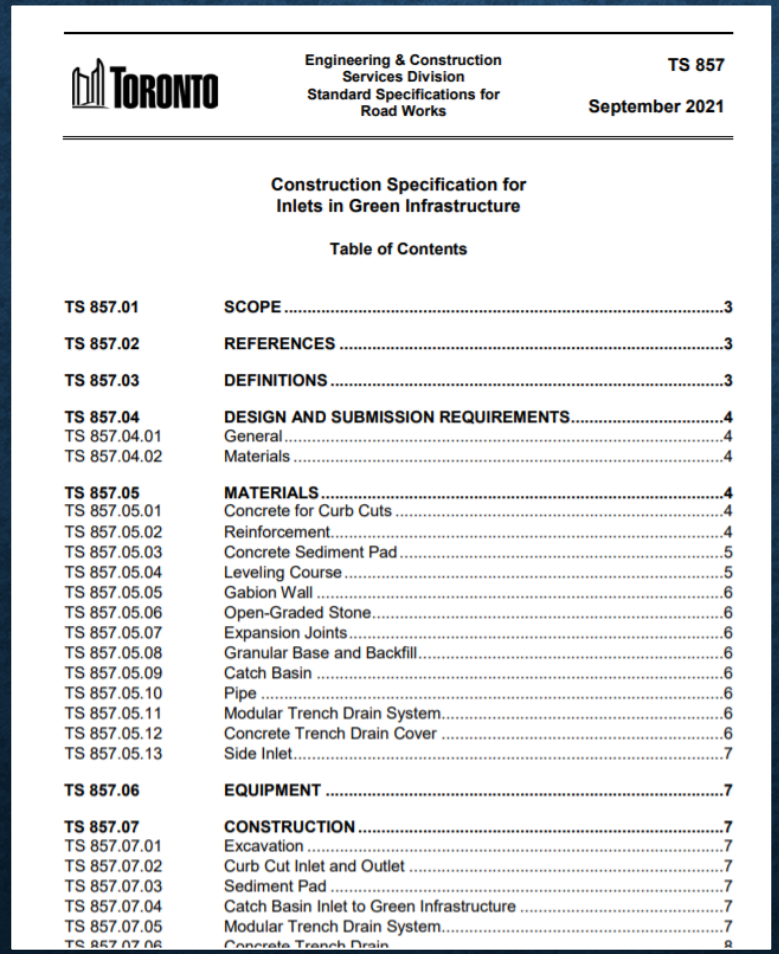
Bioswales are vegetated channels designed to receive, filter, and convey stormwater. Using a combination of perennial plants and specialized soil, stormwater runoff is slowed down, filtered, and partially absorbed as it flows through. Bioswales can installed as part of a centre median, a bike lane separator or as part of a continuous open boulevard.

TORONTO Live green Toronto

DETAILS & SPECIFICATIONS

FOR GREEN INFRASTRUCTURE IN THE RIGHT-OF-WAY





TORONTO

Engineering & Construction Services Division
Standard Specifications for Road Works

TS 857
September 2021

Construction Specification for Inlets in Green Infrastructure

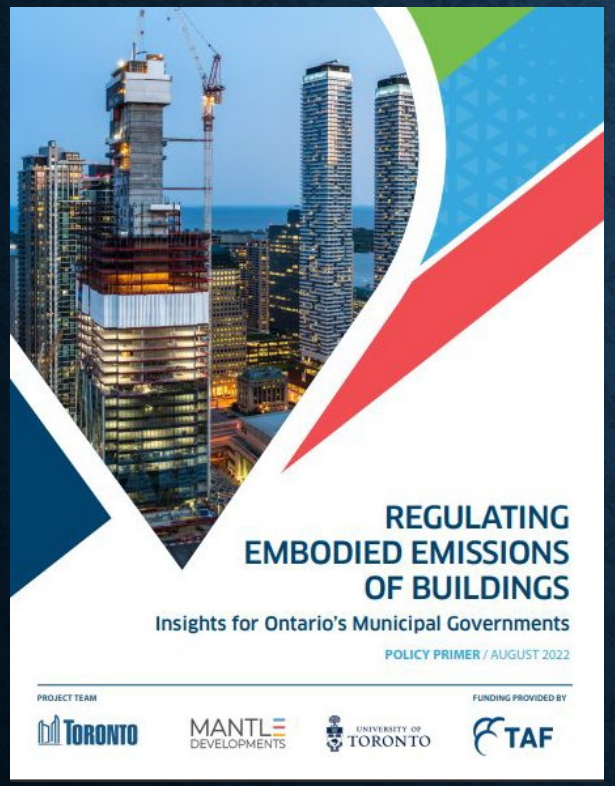
Table of Contents

Documents developed to date:

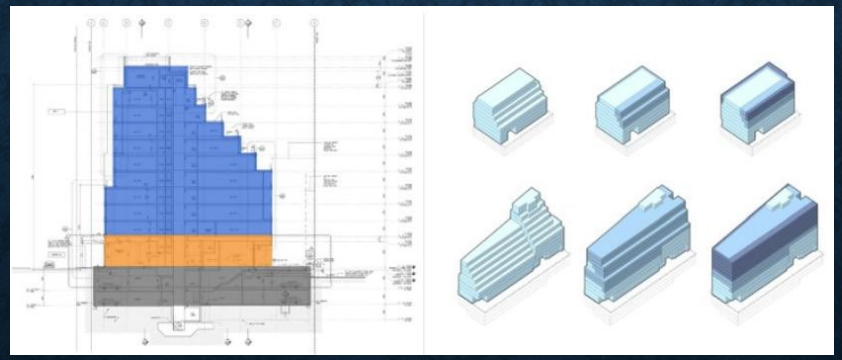
- **80** Standard Drawings
- **8** Construction Specifications
- **3** Guidelines:
  - Design Criteria Guideline
  - Lifecycle Activities Guideline
  - Public Notification & Engagement

EMBODIED CARBON WORK COMPLETED

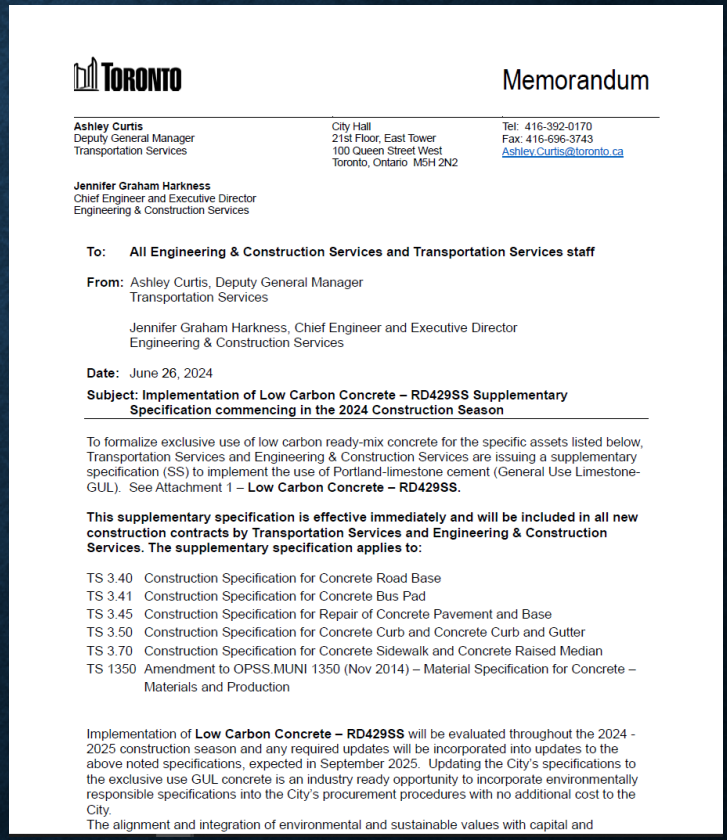
Phase 1: Embodied Carbon Primer & Benchmarking



Phase 2: Municipal toolkit



Outcome: Low Carbon Concrete Specification update



TORONTO — Memorandum

Ashley Curtis
Deputy General Manager
Transportation Services

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Toronto, Ontario M5H 2N2

Tel: 416-392-0170
Fax: 416-696-3743
Ashley.Curtis@toronto.ca

Jennifer Graham Harkness
Chief Engineer and Executive Director
Engineering & Construction Services

To: **All Engineering & Construction Services and Transportation Services staff**

From: Ashley Curtis, Deputy General Manager
Transportation Services

Jennifer Graham Harkness, Chief Engineer and Executive Director
Engineering & Construction Services

Date: June 26, 2024

Subject: Implementation of Low Carbon Concrete – RD429SS Supplementary Specification commencing in the 2024 Construction Season

To formalize exclusive use of low carbon ready-mix concrete for the specific assets listed below, Transportation Services and Engineering & Construction Services are issuing a supplementary specification (SS) to implement the use of Portland-limestone cement (General Use Limestone-GUL). See Attachment 1 – **Low Carbon Concrete – RD429SS.**

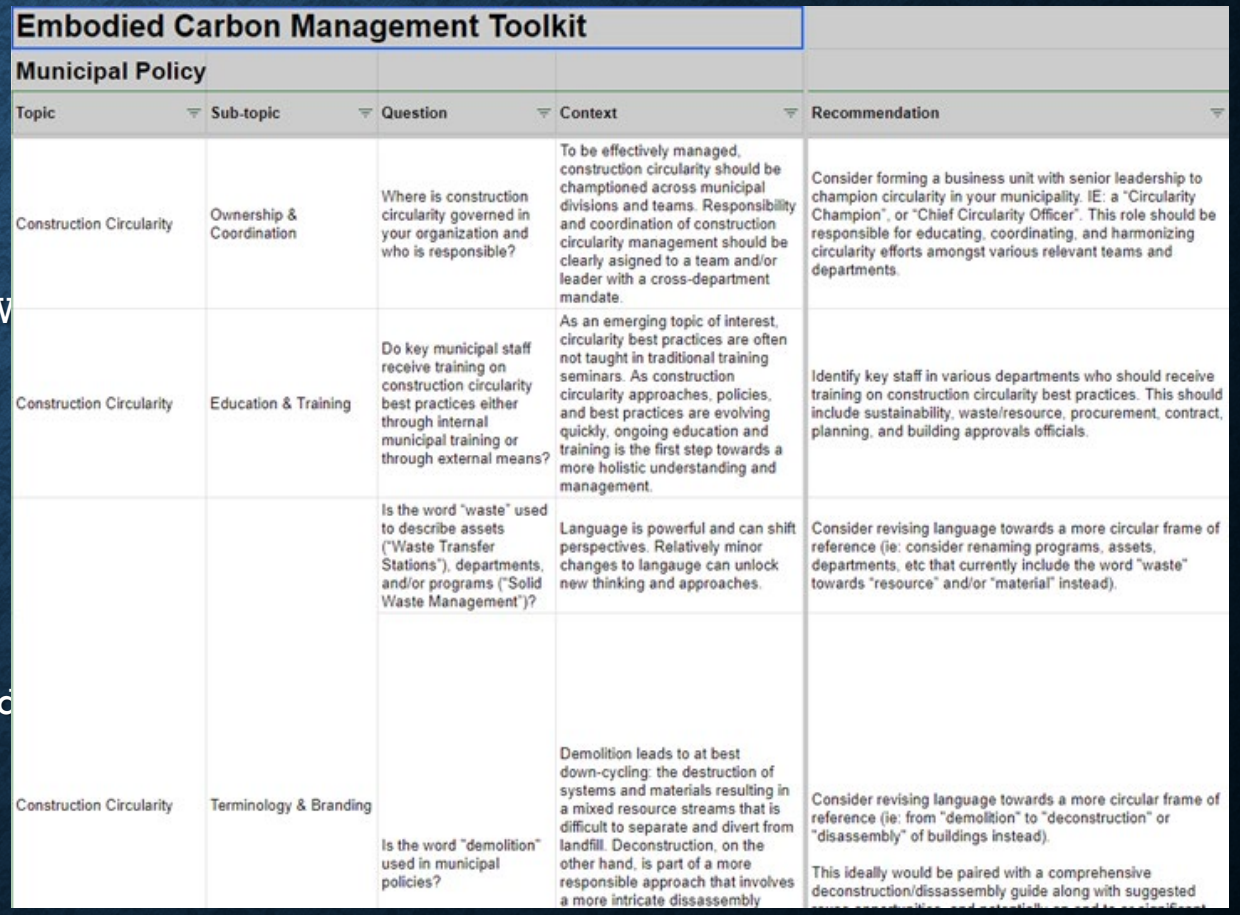
This supplementary specification is effective immediately and will be included in all new construction contracts by Transportation Services and Engineering & Construction Services. The supplementary specification applies to:

TS 3.40 Construction Specification for Concrete Road Base
TS 3.41 Construction Specification for Concrete Bus Pad
TS 3.45 Construction Specification for Repair of Concrete Pavement and Base
TS 3.50 Construction Specification for Concrete Curb and Concrete Curb and Gutter
TS 3.70 Construction Specification for Concrete Sidewalk and Concrete Raised Median
TS 1350 Amendment to OPSS.MUNI 1350 (Nov 2014) – Material Specification for Concrete – Materials and Production

Implementation of **Low Carbon Concrete – RD429SS** will be evaluated throughout the 2024 - 2025 construction season and any required updates will be incorporated into updates to the above noted specifications, expected in September 2025. Updating the City's specifications to the exclusive use GUL concrete is an industry ready opportunity to incorporate environmentally responsible specifications into the City's procurement procedures with no additional cost to the City.
The alignment and integration of environmental and sustainable values with capital and

EMBODIED CARBON – UPCOMING WORK

- Low carbon concrete specification
  - Monitoring and evaluation
- Embodied Carbon in the public realm study (2025)
  - Study scope to include Parks & Open space and ROV
- Applying an Embodied Carbon Lense to Master Planning
- Toronto Green Standard V5 update (2026)
  - Exploring EC performance metrics for buildings and landscape in Tier 1
- Tools and Resources:
  - ENVISION
  - Climate Positive Design - PATHFINDER



Embodied Carbon Management Toolkit

Municipal Policy

Topic	Sub-topic	Question	Context	Recommendation
Construction Circularity	Ownership & Coordination	Where is construction circularity governed in your organization and who is responsible?	To be effectively managed, construction circularity should be championed across municipal divisions and teams. Responsibility and coordination of construction circularity management should be clearly asigned to a team and/or leader with a cross-department mandate.	Consider forming a business unit with senior leadership to champion circularity in your municipality. IE: a "Circularity Champion", or "Chief Circularity Officer". This role should be responsible for educating, coordinating, and harmonizing circularity efforts amongst various relevant teams and departments.
Construction Circularity	Education & Training	Do key municipal staff receive training on construction circularity best practices either through internal municipal training or through external means?	As an emerging topic of interest, circularity best practices are often not taught in traditional training seminars. As construction circularity approaches, policies, and best practices are evolving quickly, ongoing education and training is the first step towards a more holistic understanding and management.	Identify key staff in various departments who should receive training on construction circularity best practices. This should include sustainability, waste/resource, procurement, contract, planning, and building approvals officials.
		Is the word "waste" used to describe assets ("Waste Transfer Stations"), departments, and/or programs ("Solid Waste Management")?	Language is powerful and can shift perspectives. Relatively minor changes to langauge can unlock new thinking and approaches.	Consider revising language towards a more circular frame of reference (ie: consider renaming programs, assets, departments, etc that currently include the word "waste" towards "resource" and/or "material" instead).
Construction Circularity	Terminology & Branding	Is the word "demolition" used in municipal policies?	Demolition leads to at best down-cycling: the destruction of systems and materials resulting in a mixed resource streams that is difficult to separate and divert from landfill. Deconstruction, on the other hand, is part of a more responsible approach that involves a more intricate dissassembly	Consider revising language towards a more circular frame of reference (ie: from "demolition" to "deconstruction" or "disassembly" of buildings instead). This ideally would be paired with a comprehensive deconstruction/dissassembly guide along with suggested

THANK YOU! QUESTIONS?

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Kristina.Hausmanis@Toronto.ca

GreenStreets@Toronto.ca

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