



Port Lands Flood Protection and Enabling Infrastructure: Parks, River and Roads

Detailed Design
September 26, 2018

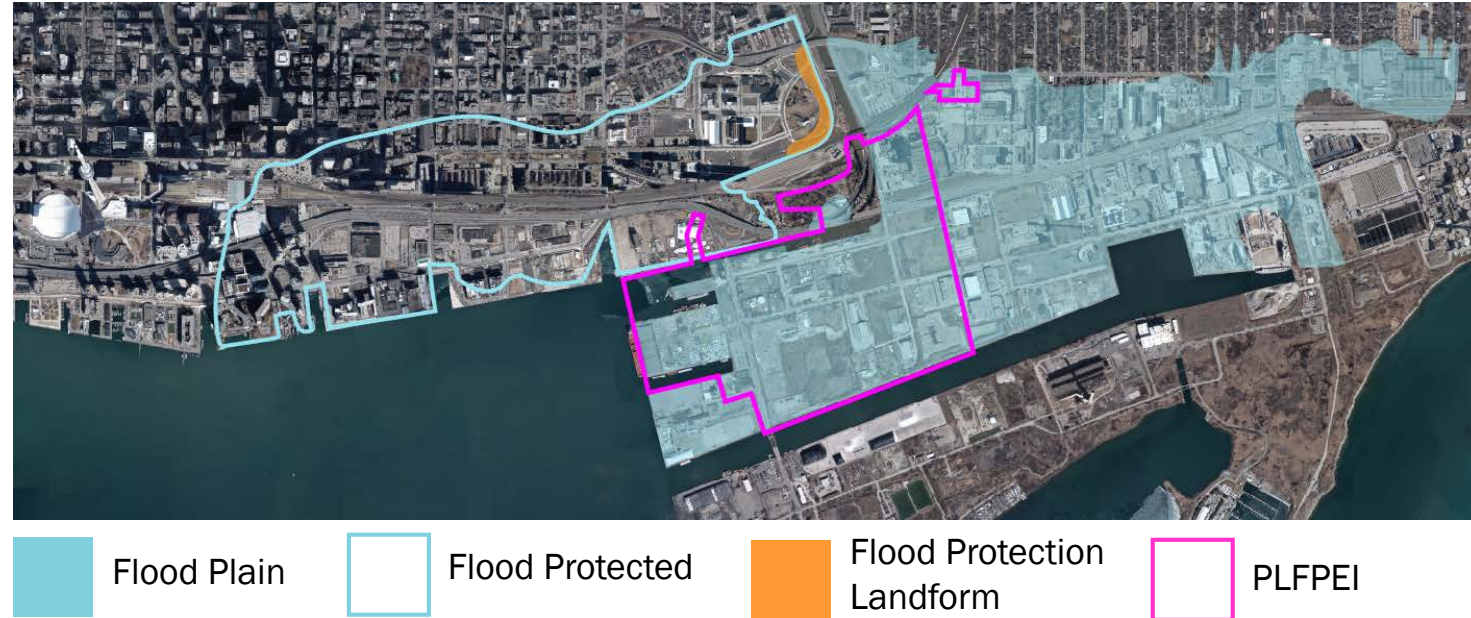
Project Description and Background

Review Stage: Detailed Design

Proponent: Waterfront Toronto

Design Team: MVA (Parks and River), WSP with DTAH (Roads)

- 290 hectares of southeastern downtown Toronto are at risk of flooding from the Don River watershed
- The Port Lands Flood Protection and Enabling Infrastructure Project is a comprehensive solution to flood protection
- The two items that will be presented today:
 1. Parks and River Valley
 2. Roads and Municipal Infrastructure



Policy Context – Central Waterfront Secondary Plan

C21_The mouth of the Don River will be rerouted through lands south of the rail corridor. This will improve the ecological function of the river, provide flood protection for the Port Lands and East Bayfront and attract new wildlife to the area. The renaturalized mouth of the river will also become a key open space and recreational link to the Don Valley, West Don Lands, Port Lands and waterfront park system. This enhanced river setting will provide a gateway to the new urban communities in the Port Lands. Pedestrian and cyclist's bridges over the river mouth will be designed as signature entrances of beauty and inspiration

(P28) Lakefilling will be considered only for stabilizing shorelines, improving open spaces, creating trail connections, preventing siltation and improving natural habitats and is subject to Provincial and Federal Environmental Assessment processes. Consideration will be given to the impact of such lakefilling on recreational uses.

D22_OPENING UP THE PORT LANDS TO URBAN DEVELOPMENT - The vast Port Lands, an area more than 14 times the size of London's Canary Wharf, will be cleaned up and opened to a range of urban development opportunities. The Port Lands will become Toronto's springboard to the future, a place for wealth creation, originality and creativity in all aspects of living, working and having fun. The Port Lands will be transformed into a number of new urban districts set amid the hustle and bustle of Toronto's port activities. An enticing environment conducive to the creation of an international Centre for Creativity and Innovation for knowledge-based industries, film and new media activities will be nurtured. It will be a part of the city where "green" industries can be incubated and thrive. The new Port districts will be supported by a rich infrastructure of recreational, cultural and tourist amenities.

What are we building?

- A** Cherry Street Stormwater and Lakefilling
- B** Polson Slip Naturalization
- C** Flood Protection - River Valley
- D** Don Greenway (Spillway & Wetland)
- E** Don Roadway Valley Wall Feature
- F** East Harbour Flood Protection Land Form
- G** Sediment and Debris Management Area
- H** Flow Control Weirs
- I** Eastern Avenue Flood Protection
- J** Villiers Island Grading
- K** Keating Channel Modifications
- L** Promontory Park South
- M** River Park
- N** Lake Shore Road and Rail Bridge Modifications
- O** Cherry Street Bridge North
- P** Cherry Street Bridge South
- Q** Commissioners Street Bridge
- R** Old Cherry Street Bridge Demolition
- S** Site Wide Municipal Infrastructure
- T** Don Roadway
- U** Hydro One Integration
- V** Commissioners Street
- W** Cherry Street Re-alignment

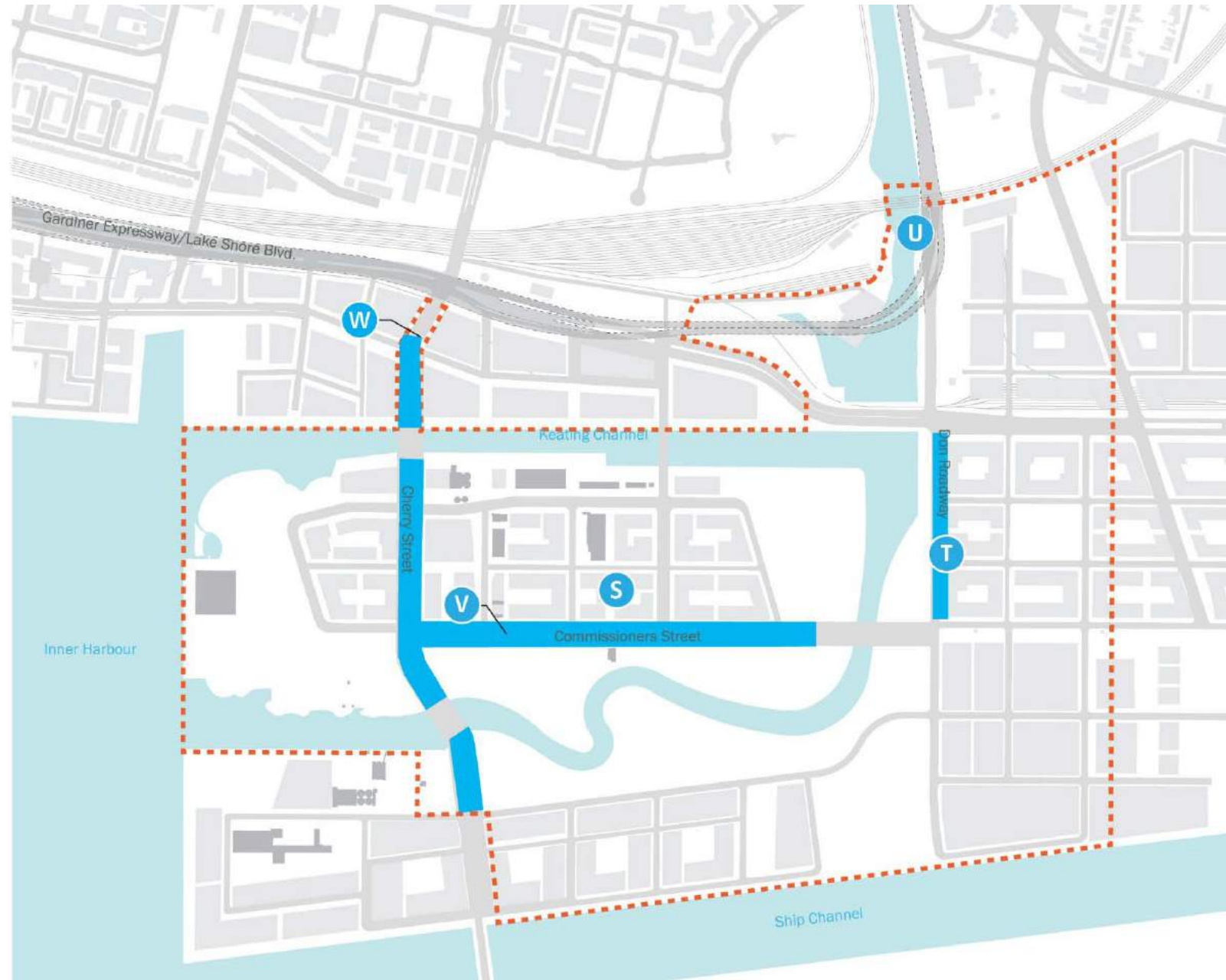
-  Port Lands Flood Protection and Enabling Infrastructure Boundary
-  Earthworks/Flood Protection
-  Parks
-  Bridges & Structures
-  Roads and Municipal Infrastructure



Roads and Municipal Services

- A Cherry Street Stormwater and Lakefilling
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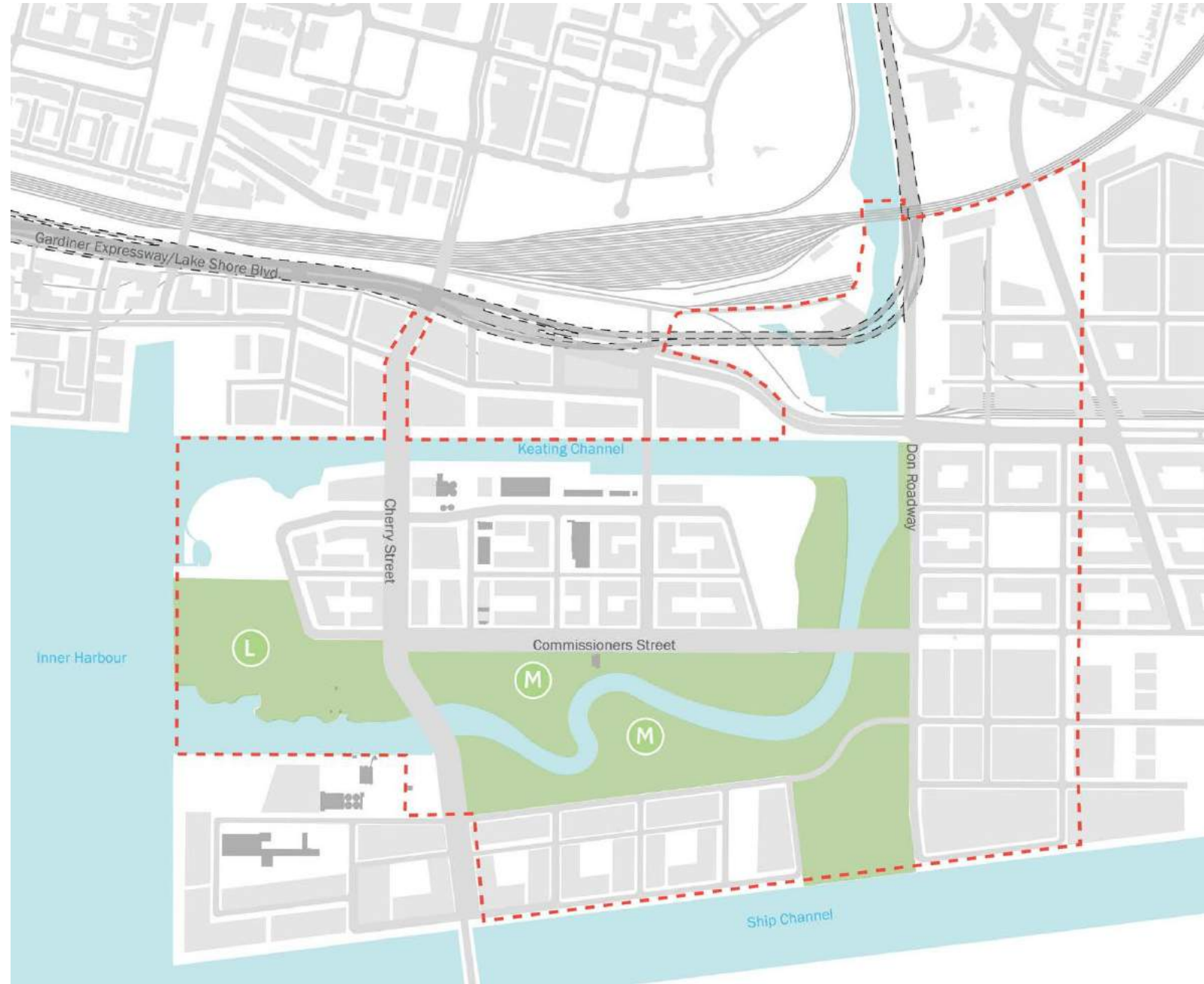
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- Earthworks/Flood Protection
- Parks
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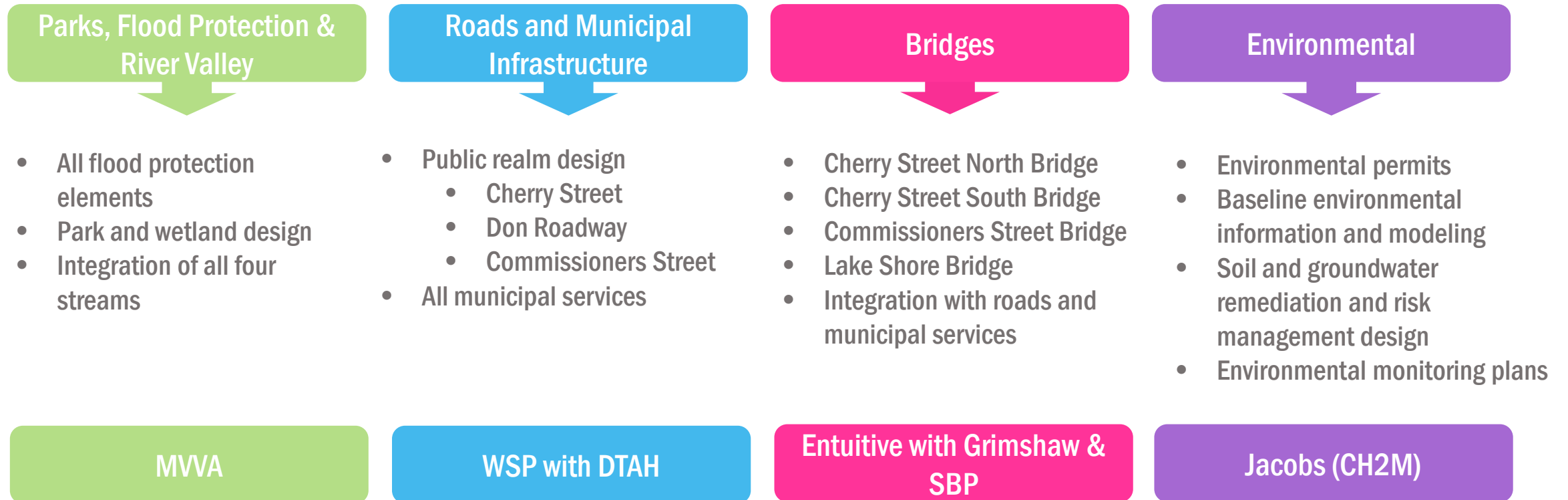
Parks

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- Port Lands Flood Protection and Enabling Infrastructure Boundary
- Earthworks/Flood Protection
- Parks
- Bridges & Structures
- Roads and Municipal Infrastructure



Team Structure



Port Lands Framework Plan - Roads

Complete Street Principles

Transit Prioritization through the use of dedicated transit rights-of-ways will improve the reliability of transit routes and convenience for passengers.

Bicycle Lanes + Cycle Tracks provided on all major streets will create a well-connected, robust and safe cycling network enabling active transportation as a primary means of moving in and through the area.

Accommodation of Goods Movement to ensure the continued economic vitality of live-industry. Critical goods movement corridors will be designed with suitable conditions for truck access balanced with other complete street objectives.

Permeable Surfaces for roadways and sidewalks will reduce flooding, preserve capacity in storm drains and sewers where provided and add visual interest in the overall street design.

Pedestrian + Cycling Amenities are important elements to be considered in the design of streets and encourage people to be on our streets. Benches, bike rings, pedestrian-scaled lighting, weather protection, garbage and recycling receptacles and public art, among others, will be provided.

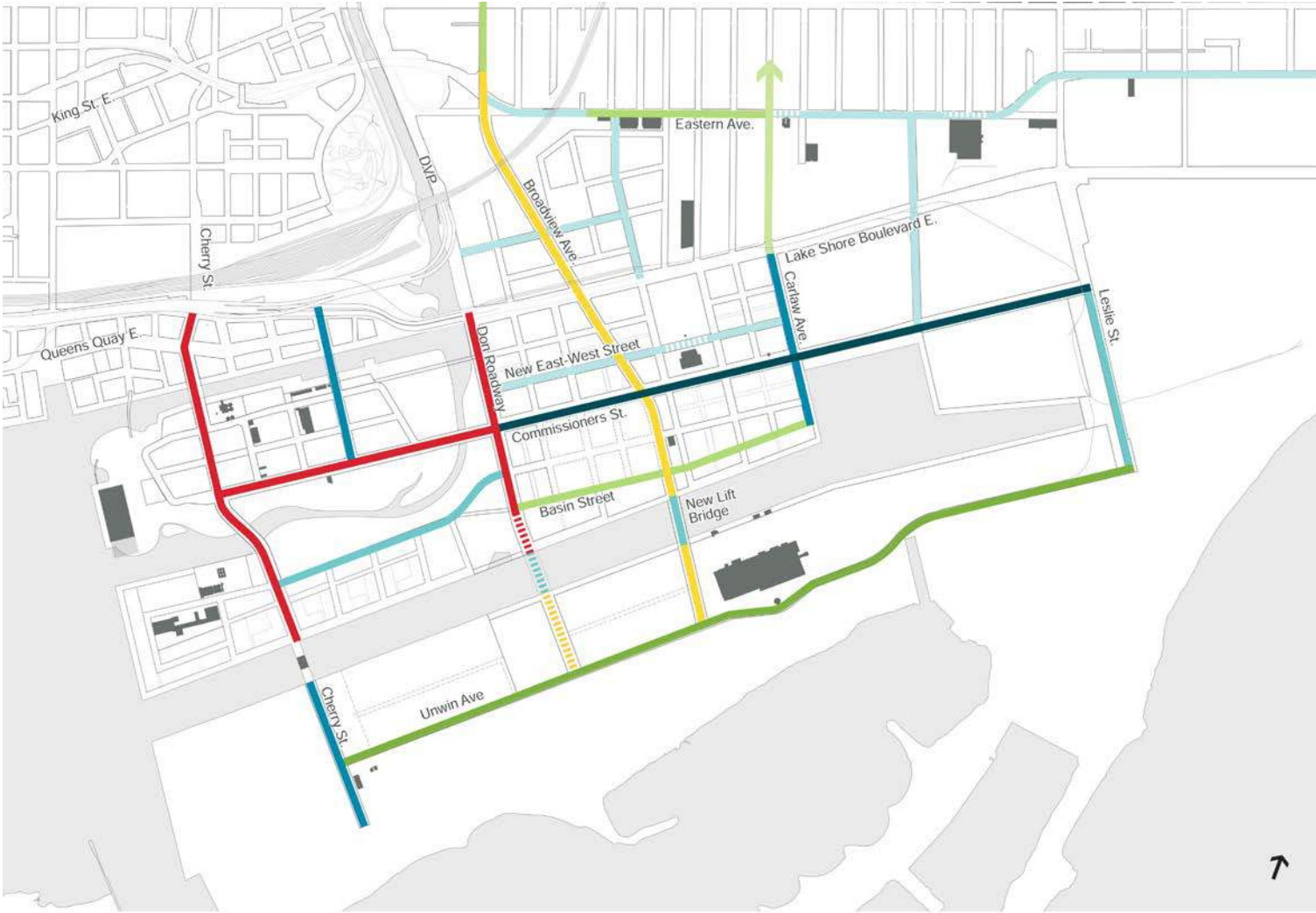
Minimum Lane Widths will assist in making streets safer and more pedestrian friendly. Narrower pavement widths contribute to safer vehicle speeds.

Wide Sidewalks with unobstructed, accessible pedestrian clearways will encourage walking and contribute to the overall vibrancy of in the Port Lands and South of Eastern public realm.

Water as a Community Resource and other greenscape elements will divert stormwater and allow for infiltration while also improving air quality, providing habitat and adding visual interest to an area. Streets celebrate and embrace stormwater as a valuable resource and provide access for LIFE!

Street Trees with adequate room to grow and high-quality soil conditions provide shade, beauty and wildlife habitat. They also reduce air pollution and energy consumption.

Innovative Features such as the port / industrial / infrastructural qualities of the study area will contribute to the character of the area. Other features like electric vehicle charging stations, bicycle and car sharing stations and renewable energy features will contribute to a sustainable future for the area.



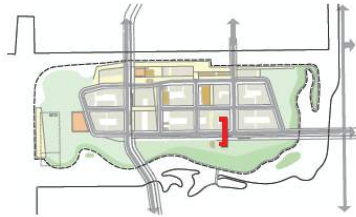
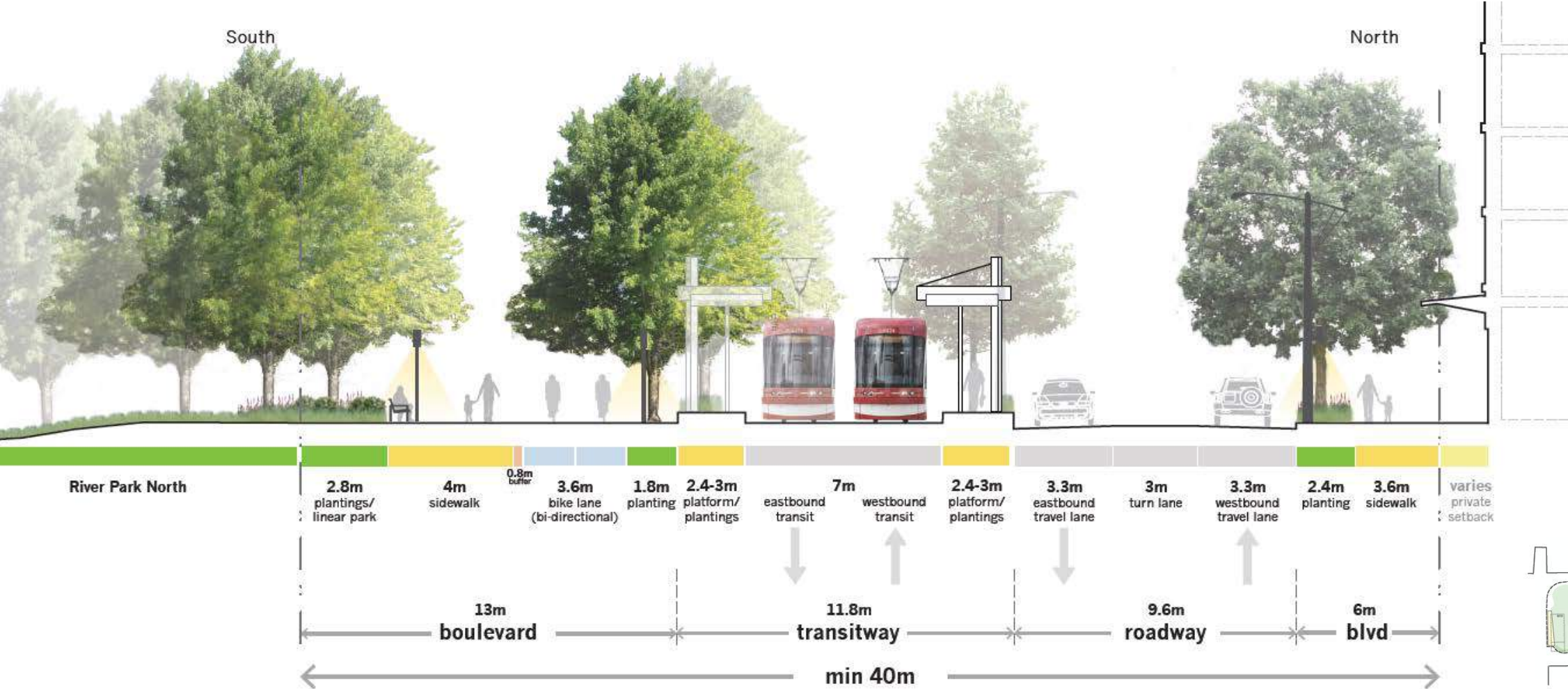
Villiers Island Precinct Plan - Roads

Review Stage: Detailed Design

Proponent: Waterfront Toronto

Design Team: MVVA (Parks and River), WSP with DTAH (Roads)

Commissioners Street



Recap – April 2018

Parks and River:

- The multi-use recreation trail's location in the park space will likely create conflict between users. Further consideration is needed on whether the trail should be shared multi-modal or not.
- There needs to be a good balance between the constructed nature of the park and the landscape. Reconsider the number of paths proposed near the greatest habitat areas.
- Integrating the industrial heritage and city into the park is important and this piece has been lost too much. Work with Waterfront Toronto to reconsider how MT35 will be expressed.

Roads:

- Think about the opportunity to economize with the streets by minimizing some of the plantings to integrate larger development parcels, give more space to the park or just make the street easier to cross.
- Ensure that the plan is forward thinking in terms of where the traffic will naturally go and where car parking will be accommodated during the transition phases.
- Ensure pedestrians are brought forward with as much thought as vehicles and cyclists.

Areas for Panel Consideration

Parks and River:

- Balance between programmed space and designed nature
- Clear articulation of the path network within the parks
- Integration of the industrial heritage into the park

Roads:

- Appropriate use of space within the 40m right-of-way to address all needs of modes
- Creation of appropriate street character through public realm
- Adequate consideration of the interim condition of the streets

Port Lands Flood Protection & Enabling Infrastructure Design Review Submission

Phase 3A

26 September 2018

Michael Van Valkenburgh Associates, Inc.
Landscape Architects

Project Feedback

Design Review Panel (04/18)

- Pleased with the scale of spaces.
- Investigate into **multi-use paths** including research from other cities like Vancouver, Copenhagen and Amsterdam. Look into Tommy Thompson Park as a precedent.
- Focus on paths and movement. Think about the **different user categories** and make it very clear what paths are for each one.
- Find a balance between **nature and path systems**.
- Find a clear balance between **constructed nature and programmed space**.
- Some part of the MT-35 building should be reconsidered. Enough of it to celebrate its history.
- Strong juxtaposition of **industrial past and landscape**.
- Be aware of **future urban runoff** and think of innovative ways to incorporate it into the urban grid.

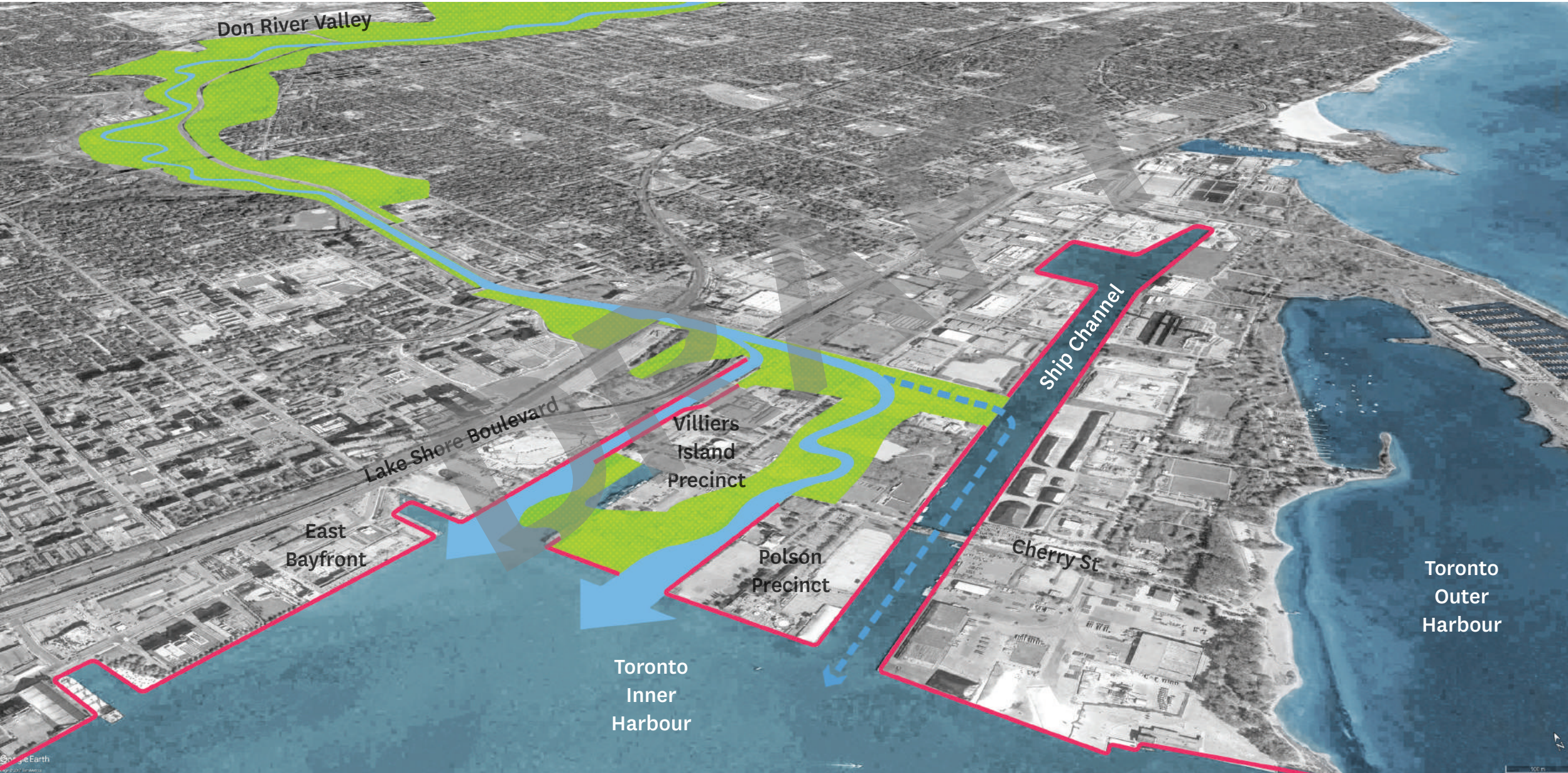
Community (Survey + Consultation) 7/18

- Desire nodes for **multiple modes of transportation** and parking for people coming from different parts of the city.
- People visit parks to walk, read, people watch, bike, sit, play sports, relax, beach, boat, swim.
- Feeling immersed in nature comes from ability to **wander while discovering new views or un-manicured vegetation**.
- Public spaces that were perceived as **clean or well-maintained** created a positive experience.
- **Variation of landscape and ecology** was noted as “nice to have”.
- People expressed a desire for **clear information about access points** (lighting and signage indicating formal paths)
- Cyclists prefer **separation (traffic, pedestrians, regulated speed) by physical barriers** and asked for cues consistent with typical Toronto cycle path treatment.
- People want the **edge of the park to come to the street level**.
- Several mentions of space constraints impacting park experiences.

SAC

- **Water access** and watercraft storage.
- Youth/school group campsites.
- **Flexibility of spaces** to accommodate economic diverse population.
- Recognition of First Nations.
- Universal access.
- Retaining industrial heritage.
- **Protection of habitat and limiting access to naturalized areas**.
- Integrated transportation solutions.

Bringing The Don River Valley to the City



Don River Valley

Lake Shore Boulevard

East Bayfront

Villiers Island Precinct

Polson Precinct

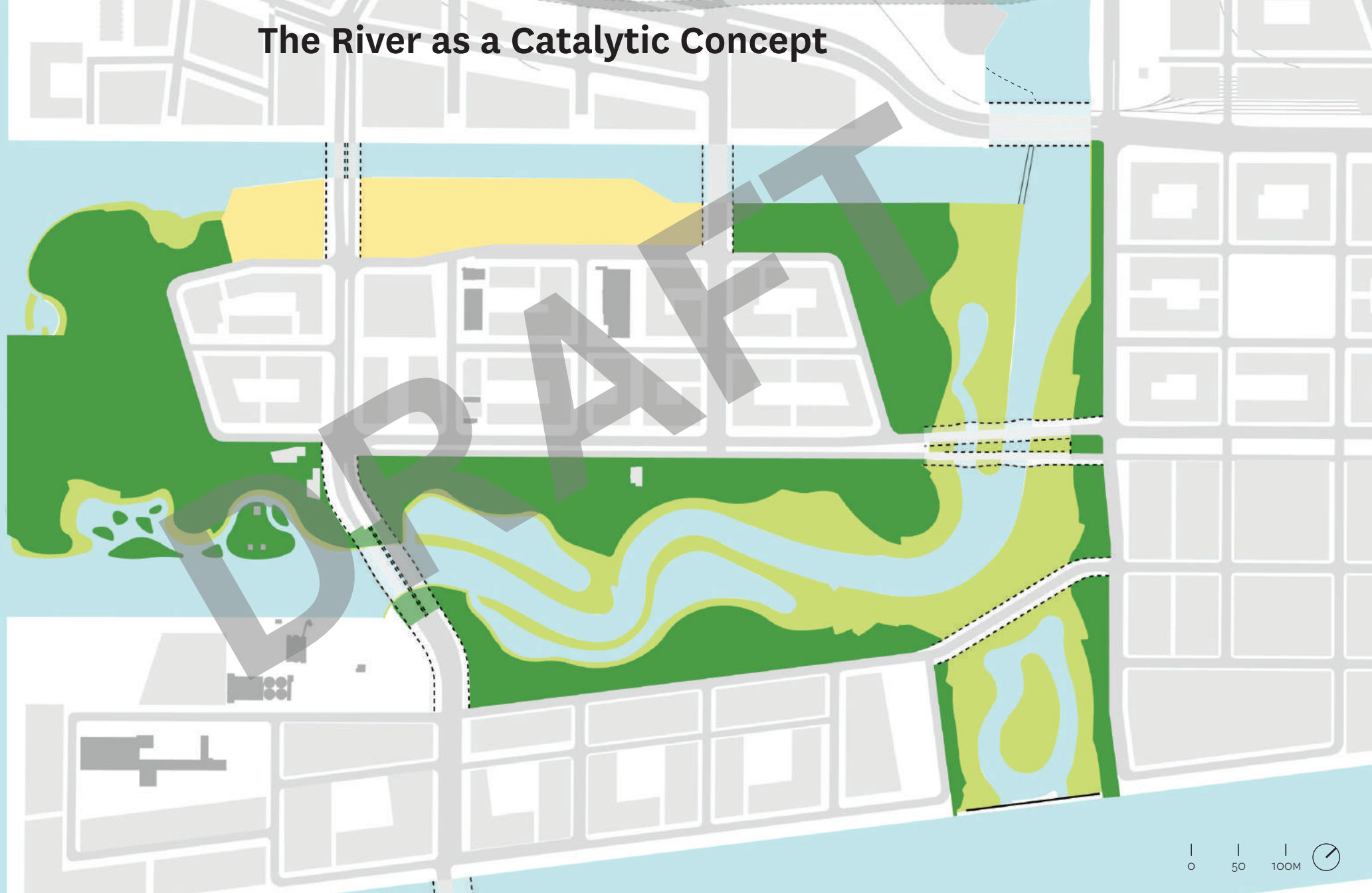
Cherry St

Ship Channel

Toronto Inner Harbour

Toronto Outer Harbour

The River as a Catalytic Concept





River Project Area

Sediment and Debris Management Area

Keating Channel Precinct

Lake Shore Boulevard East

Keating Channel

Ice Management Area

McCleary District

Toronto Inner Harbour

Promontory Park

Trinity Blvd.

Cherry St

Old Cherry St

Villiers St

Villiers Island Precinct

Commissioners St

Munition St

Centre St

Villiers Park

Villiers Park St

Don Roadway

Media City

Basin St

Canoe Cove

Don River

River Valley Park

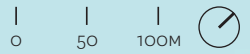
Polson St East

Polson Precinct

South River Precinct

Don Greenway

Ship Channel





Canoe Cove

Keating Channel

River Valley Park

Sediment and Debris Management Area

Ice Management Area

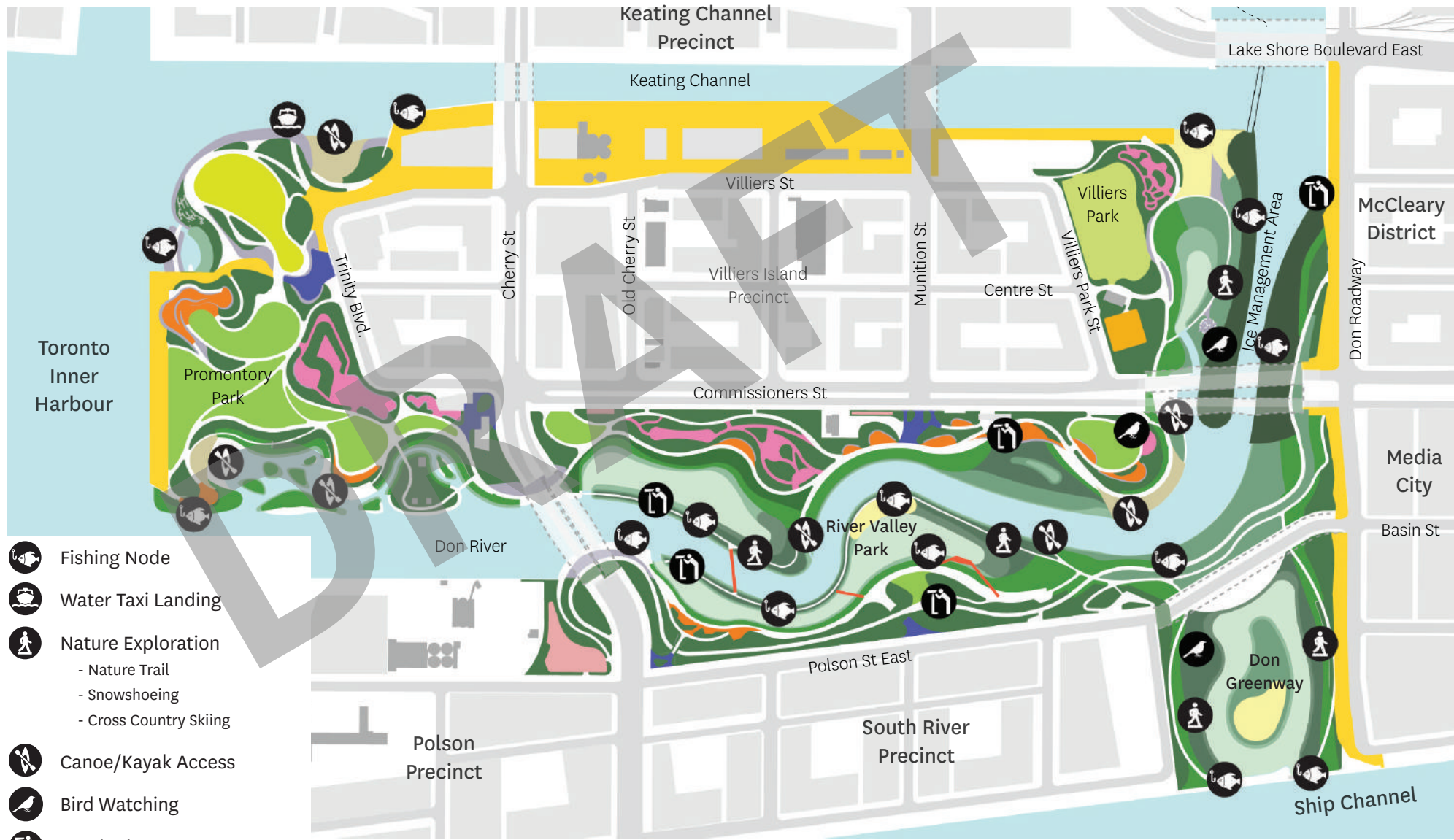
Don Greenway

Park Program and Circulation Network

DRAFT

River Programming - Full Vision

- New Building
 - Playscape
 - Court Sports
 - Dogs Off Leash Area
 - Overlook
 - Picnic Area
 - Urban Promenade
 - Plaza
 - Event Lawn
 - Passive Use Lawn
 - Multi-use Field
 - Rocky Harbour Edge
 - Submergent Marsh
 - Emergent Marsh
 - Meadow Marsh
 - Thicket Swamp
 - Vernal Pool
 - Planted Armour Stone
 - Wooded Upland
 - Floodplain Forest
 - Gravel Beach
-
- 🎣 Fishing Node
 - 🚤 Water Taxi Landing
 - 🚶 Nature Exploration
 - Nature Trail
 - Snowshoeing
 - Cross Country Skiing
 - 🚣 Canoe/Kayak Access
 - 🐦 Bird Watching
 - 🏞️ Overlook
 - Eco Education / Interpretation



Program Opportunities at Don River Valley



Nature Trails



Boardwalks



Gravel Beaches



Fishing



Picnics and Fire Pits



Cross Country Skiing



Aquatic Research

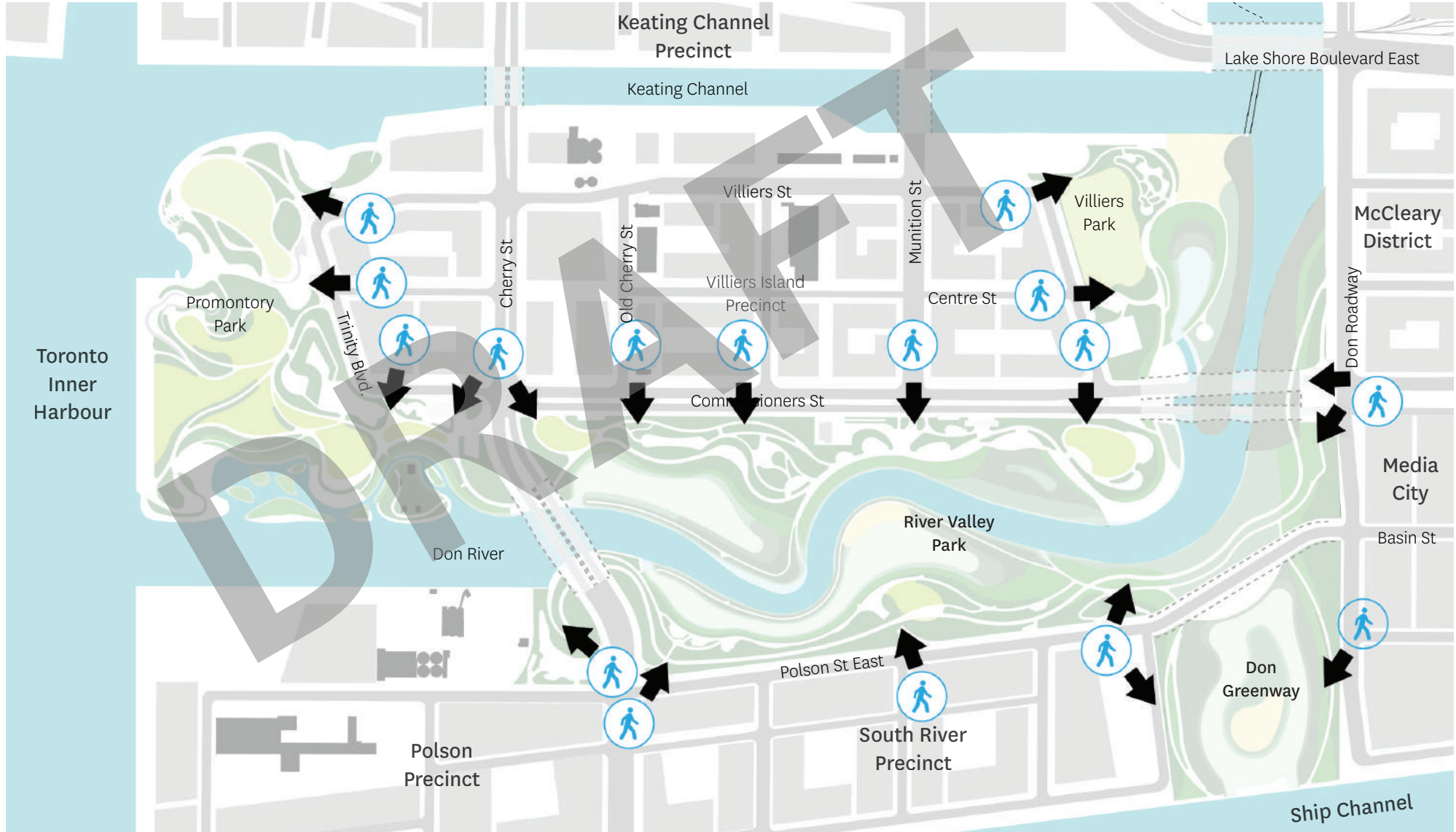


Canoe/Kayak Access

Pedestrian Park Entrances

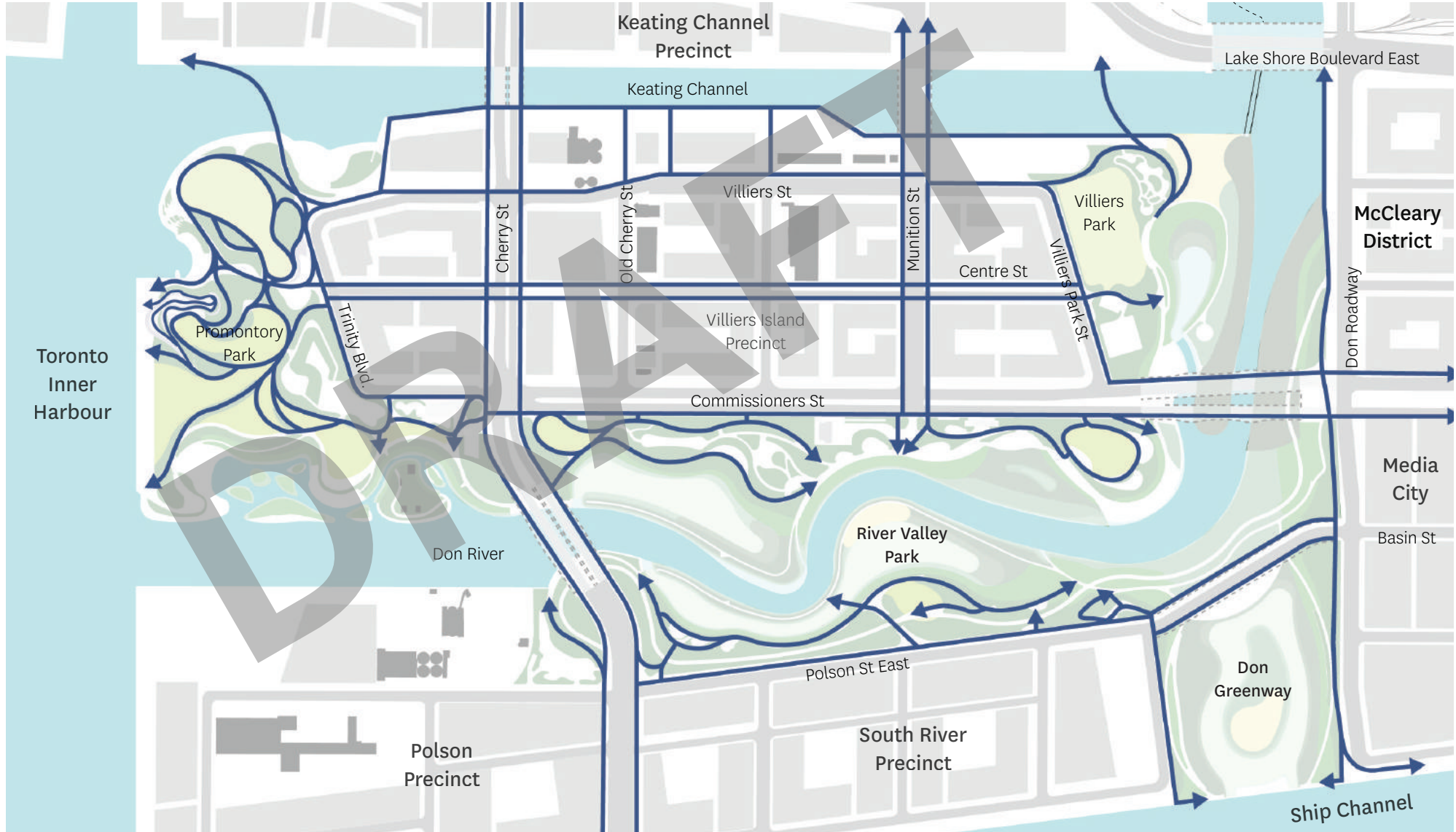
➔ Accessible Park Entrance

🚶 Pedestrian Access



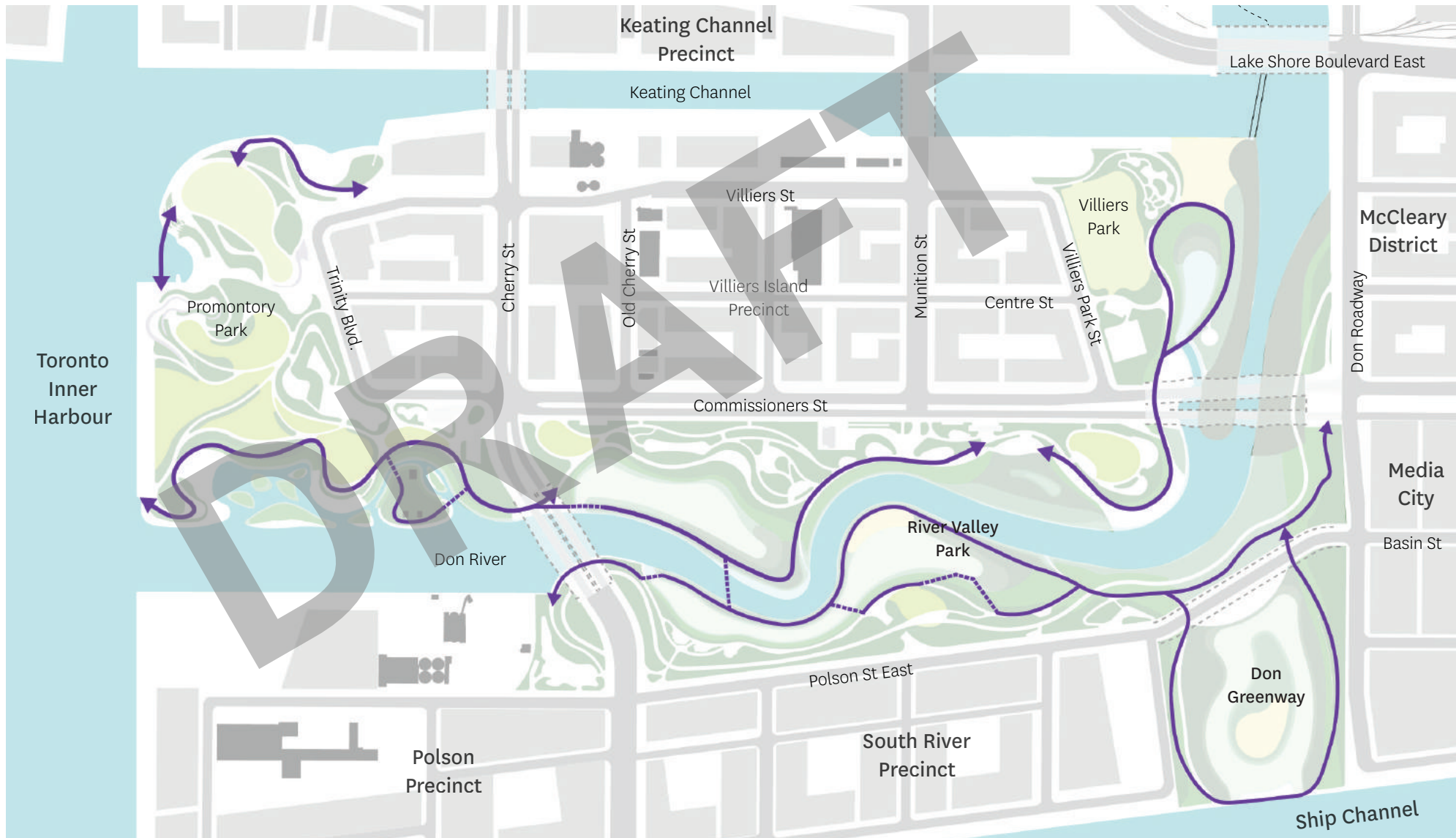
Upland Path Network

→ Upland Path



River's Edge Trail

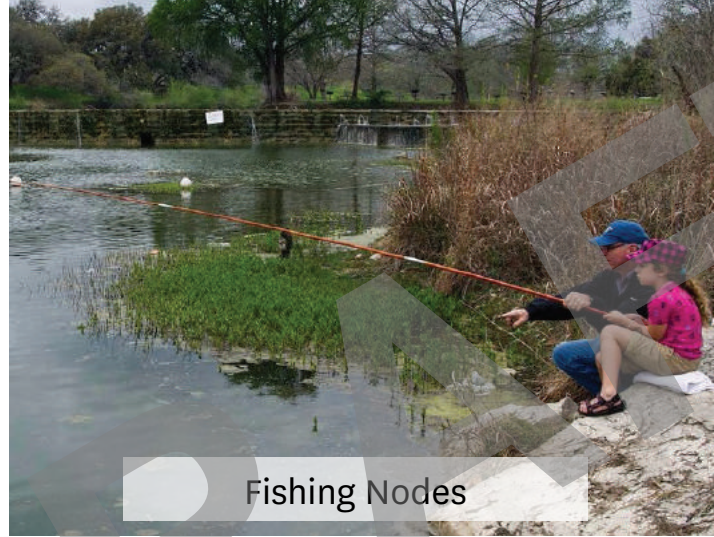
→ River's Edge Trail



Water Access Typologies



Canoe/Kayak Launch



Fishing Nodes



Stepping Stones



Overlook













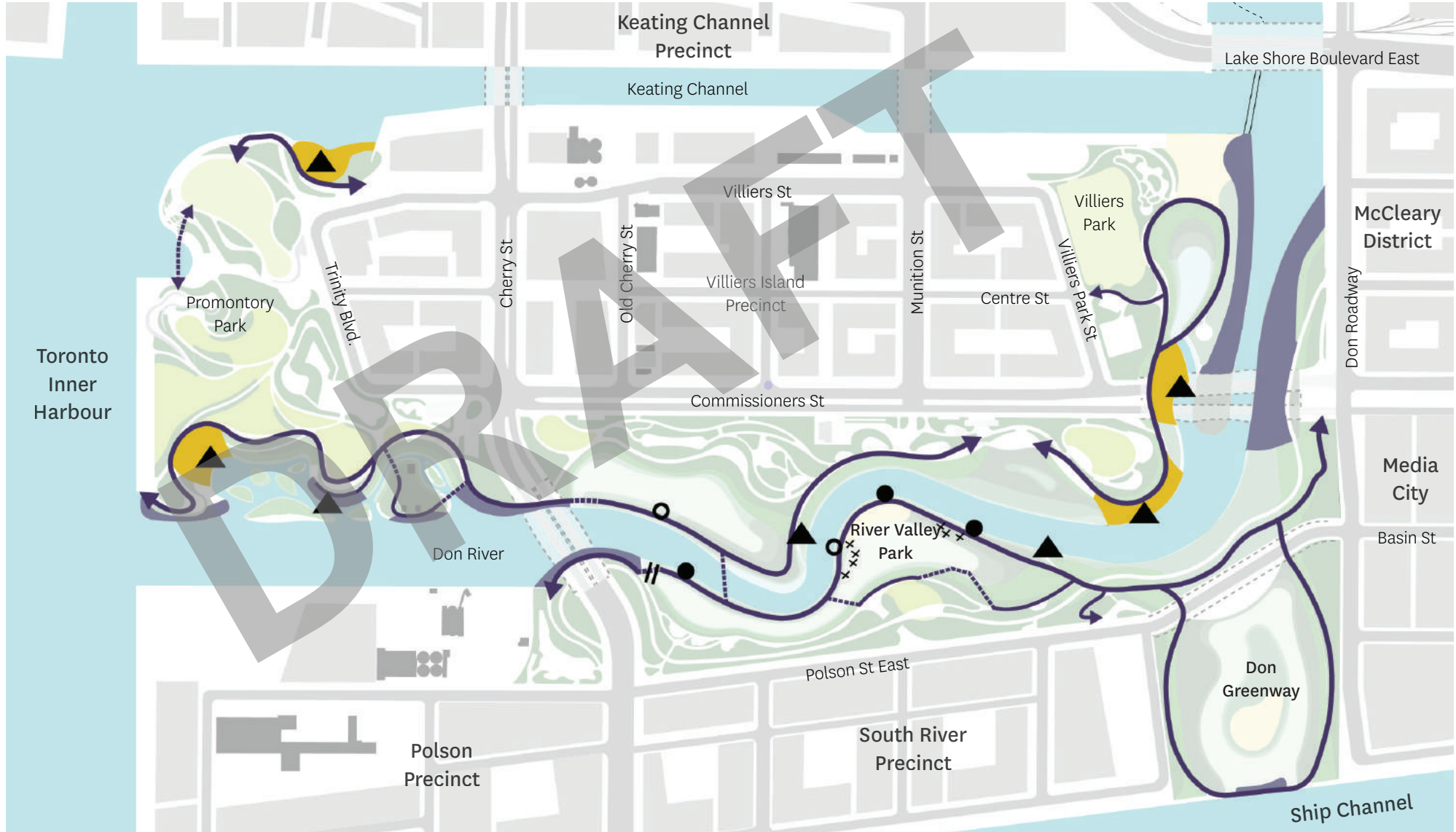
Boardwalk



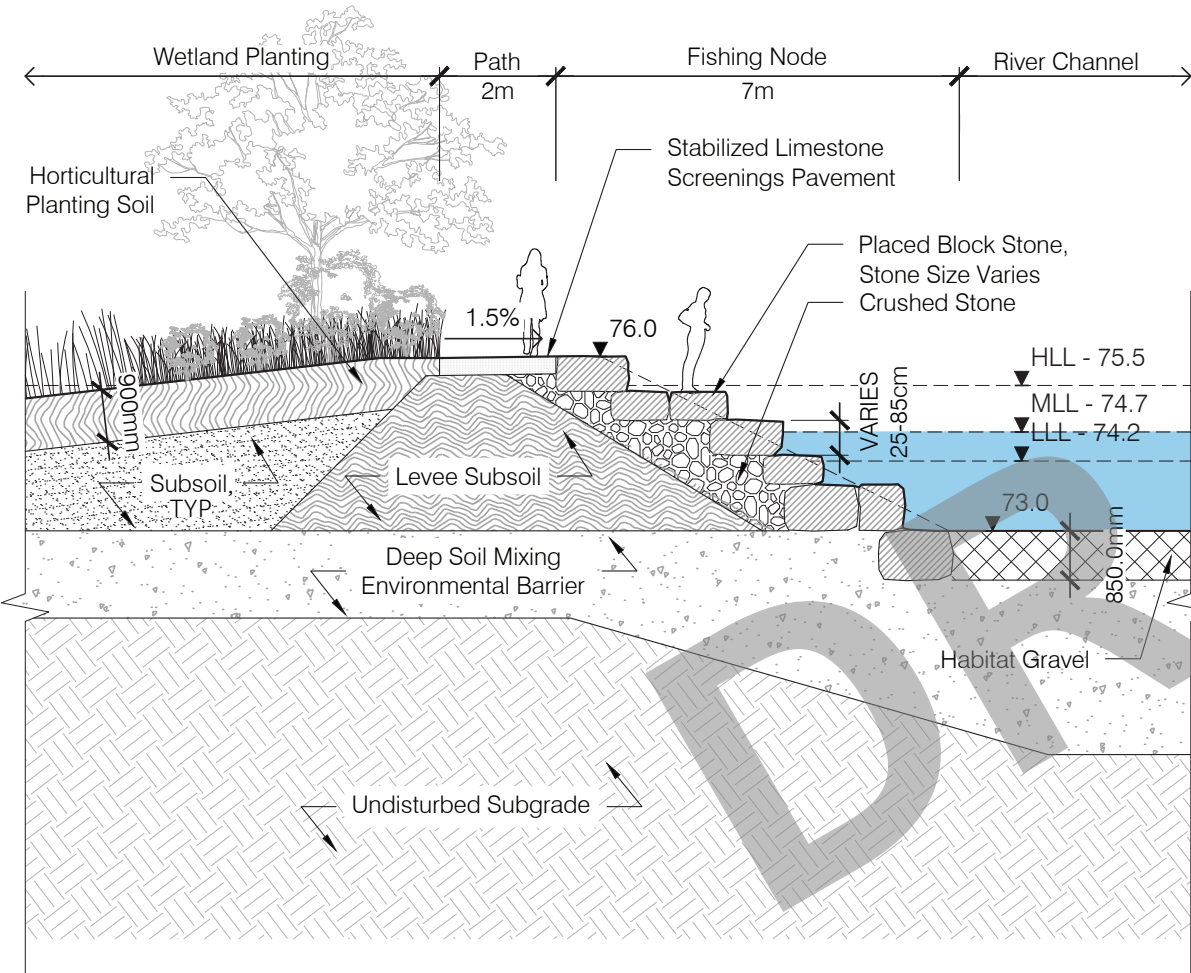
Portage

Water Access Typologies

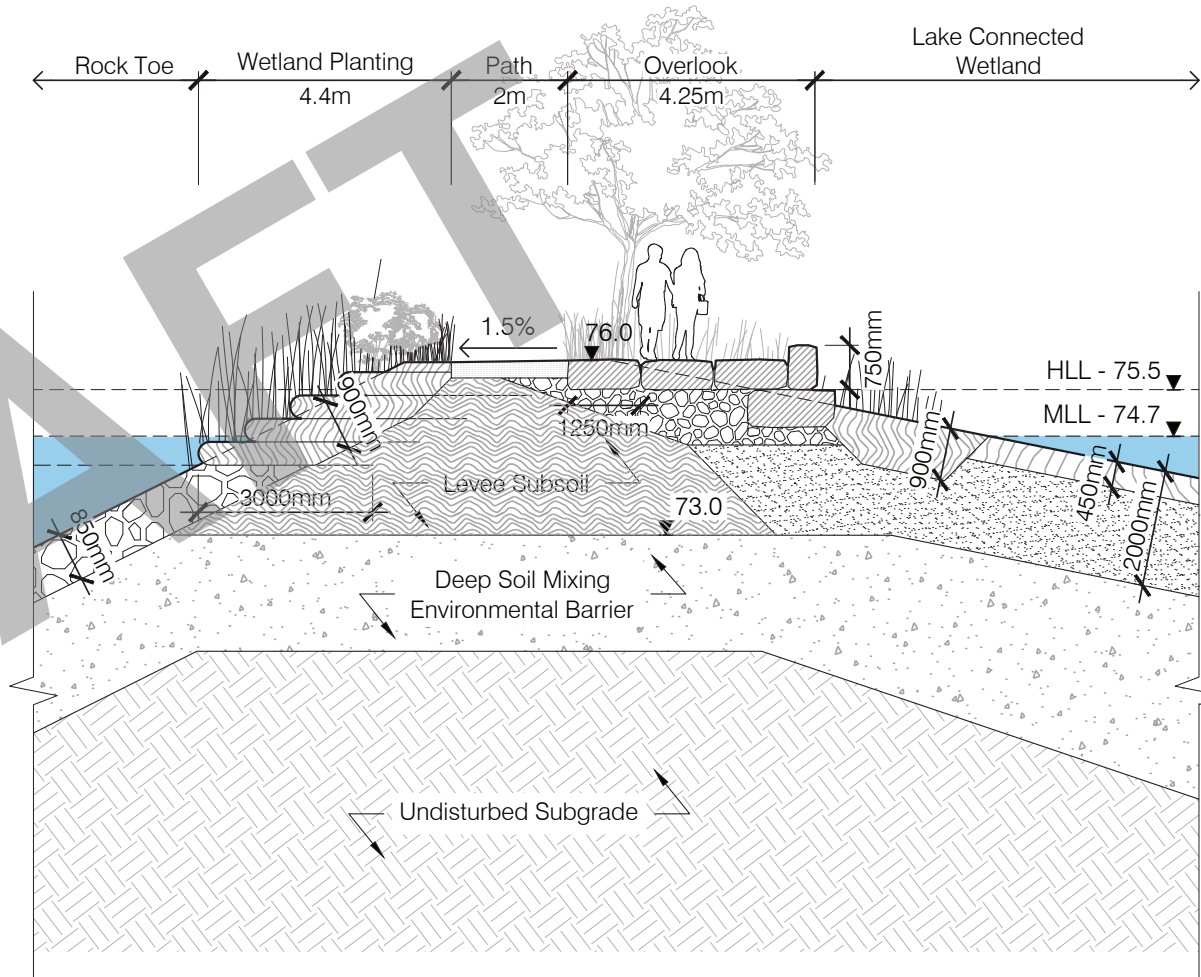
-  Path @ Water's Edge
-  Stone @ Water's Edge
-  Boardwalk/Footbridge
-  Kayak Ramp
-  Kayak Launch
-  Gravel Beach
-  Fishing Node
-  Overlook
-  Stepping Stone
-  Stone Access



Water Access Typologies



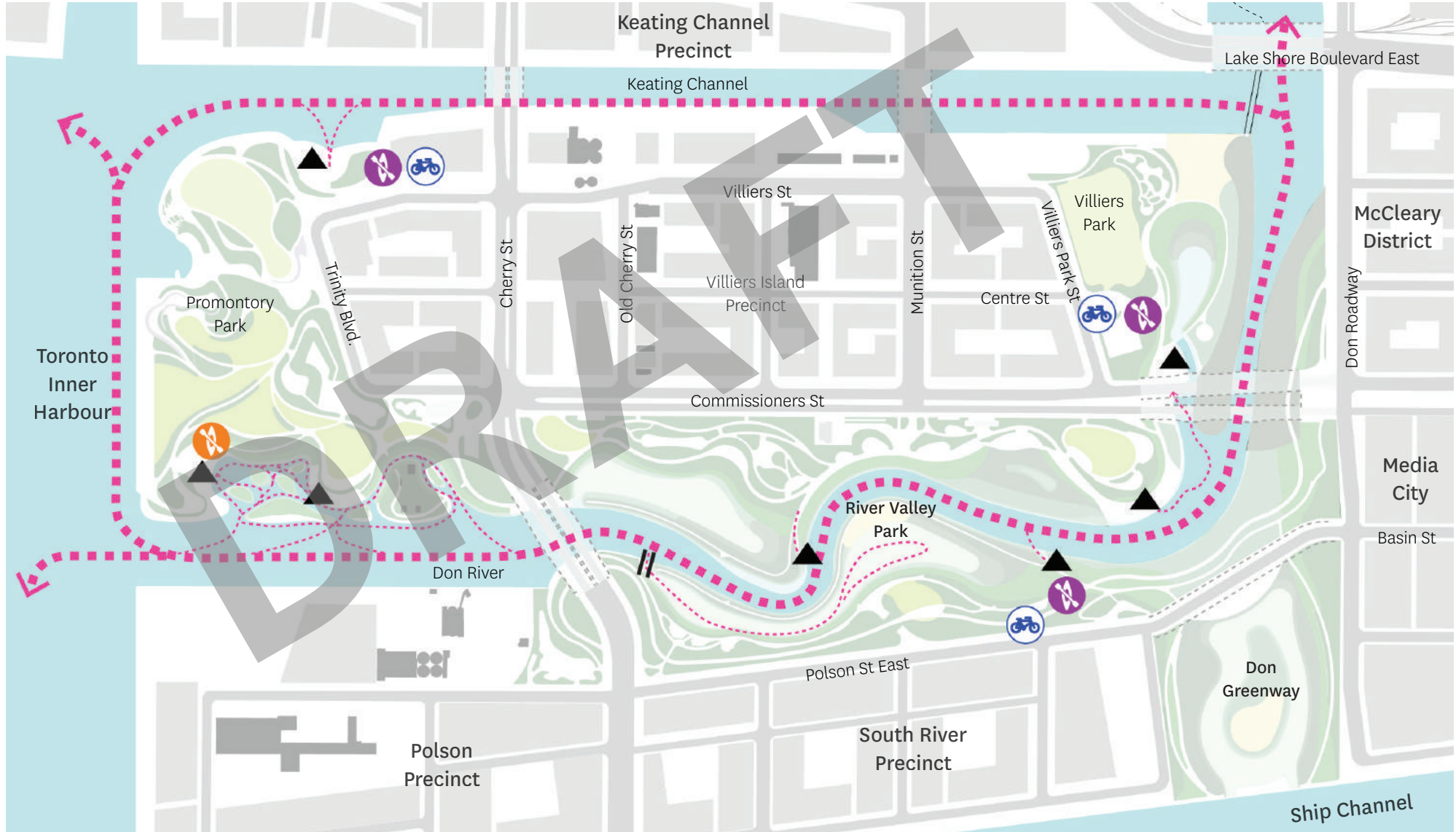
Levee Fishing Node



Levee Overlook

Water Circuit

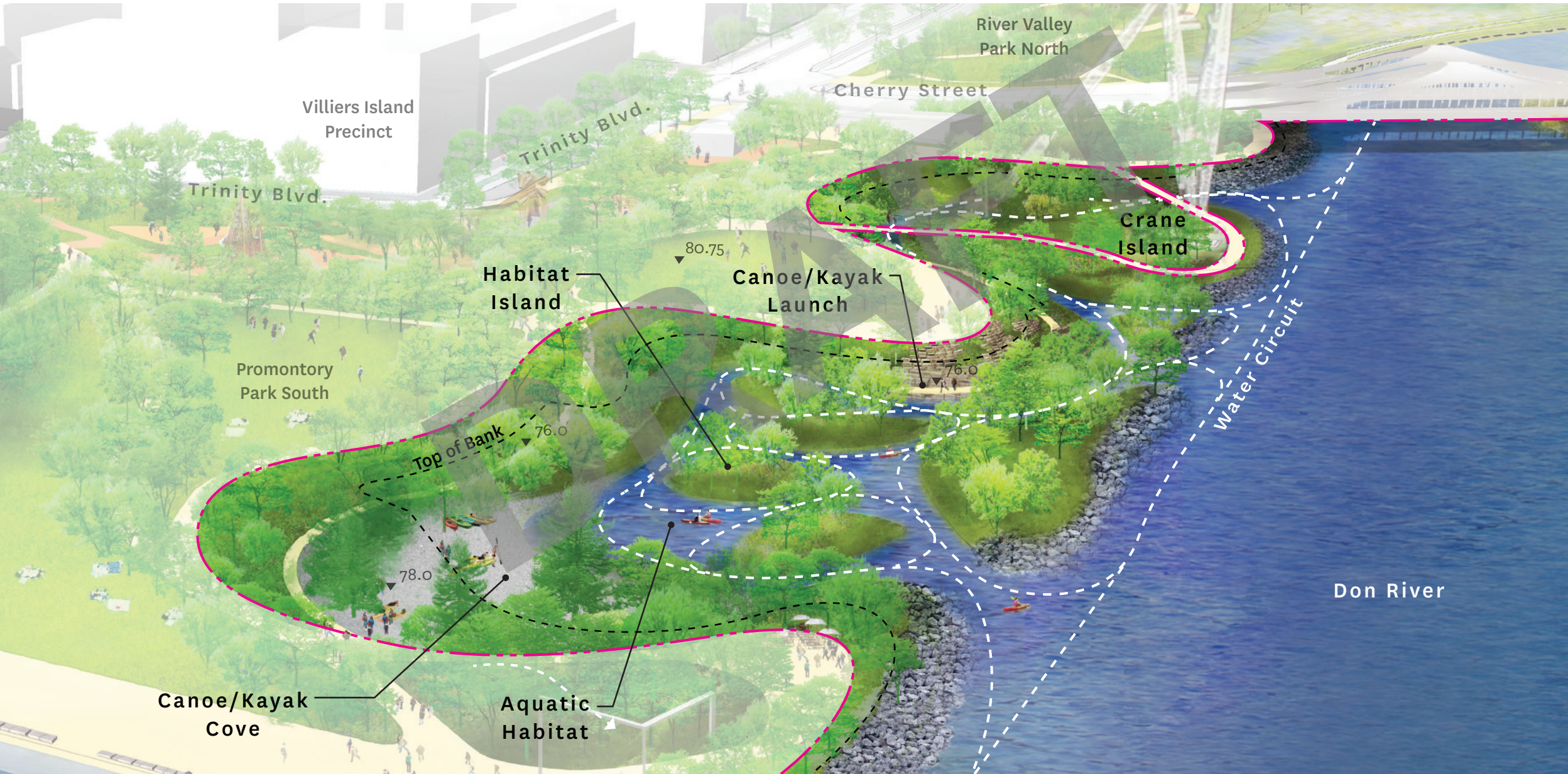
- Primary Kayak Circulation
- Secondary Kayak Circulation
- Kayak Launch
- Kayak Share
- Canoe Cove Rental
- Bike Share @ Kayak Share
- Portage



View Looking South from Point Bar at River Valley Park



Canoe Cove - Bird's Eye View



Canoe/Kayak Launches



View Looking South At River Valley Park



Pedestrian and Bike Paths



Asphalt Pedestrian and Bike Paths



Stabilized Limestone Screening Nature Trails

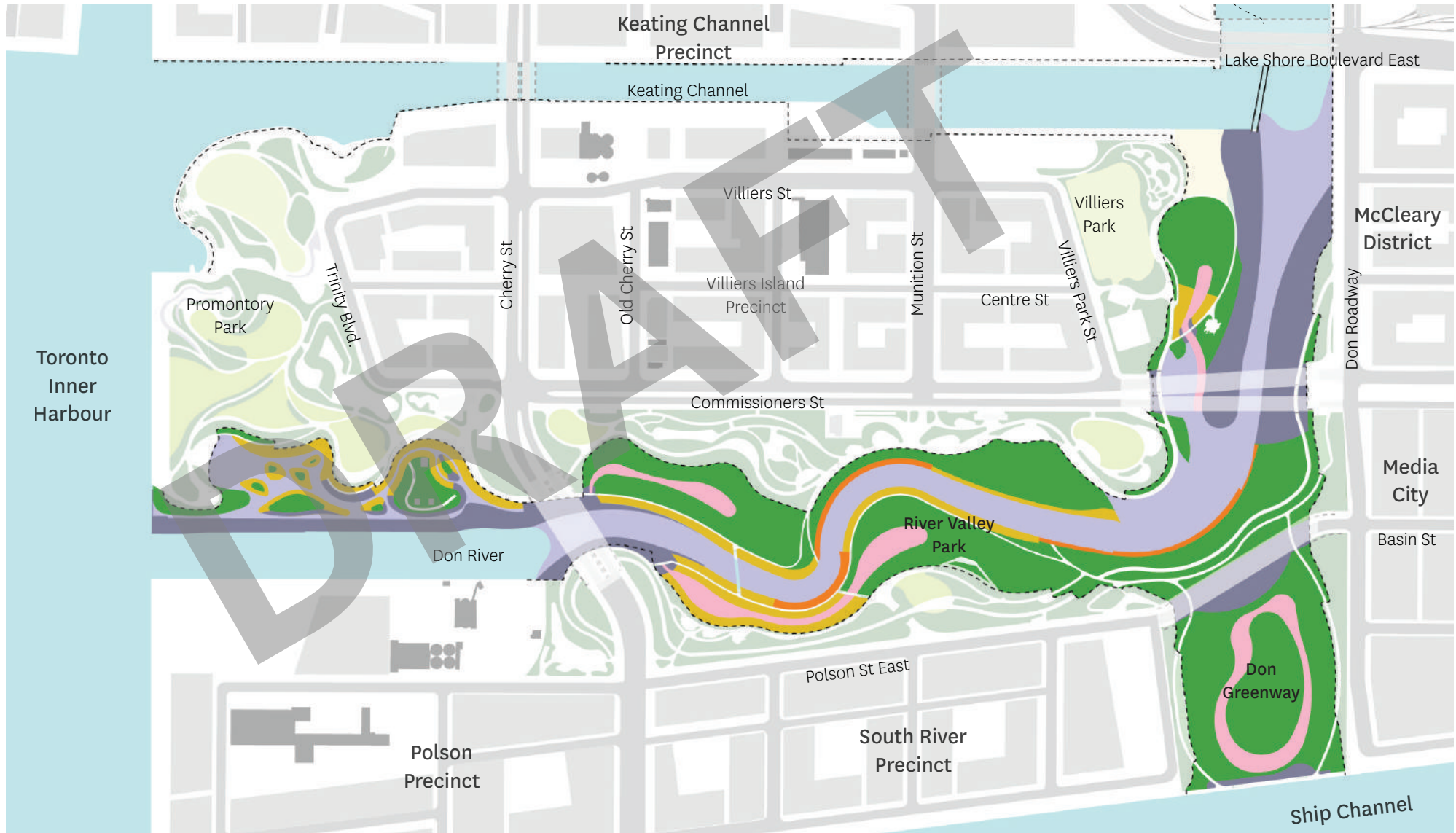
Flood Control and River Stabilization

River Flow: Engineering and Resilience



Floodplain Stabilization Strategies

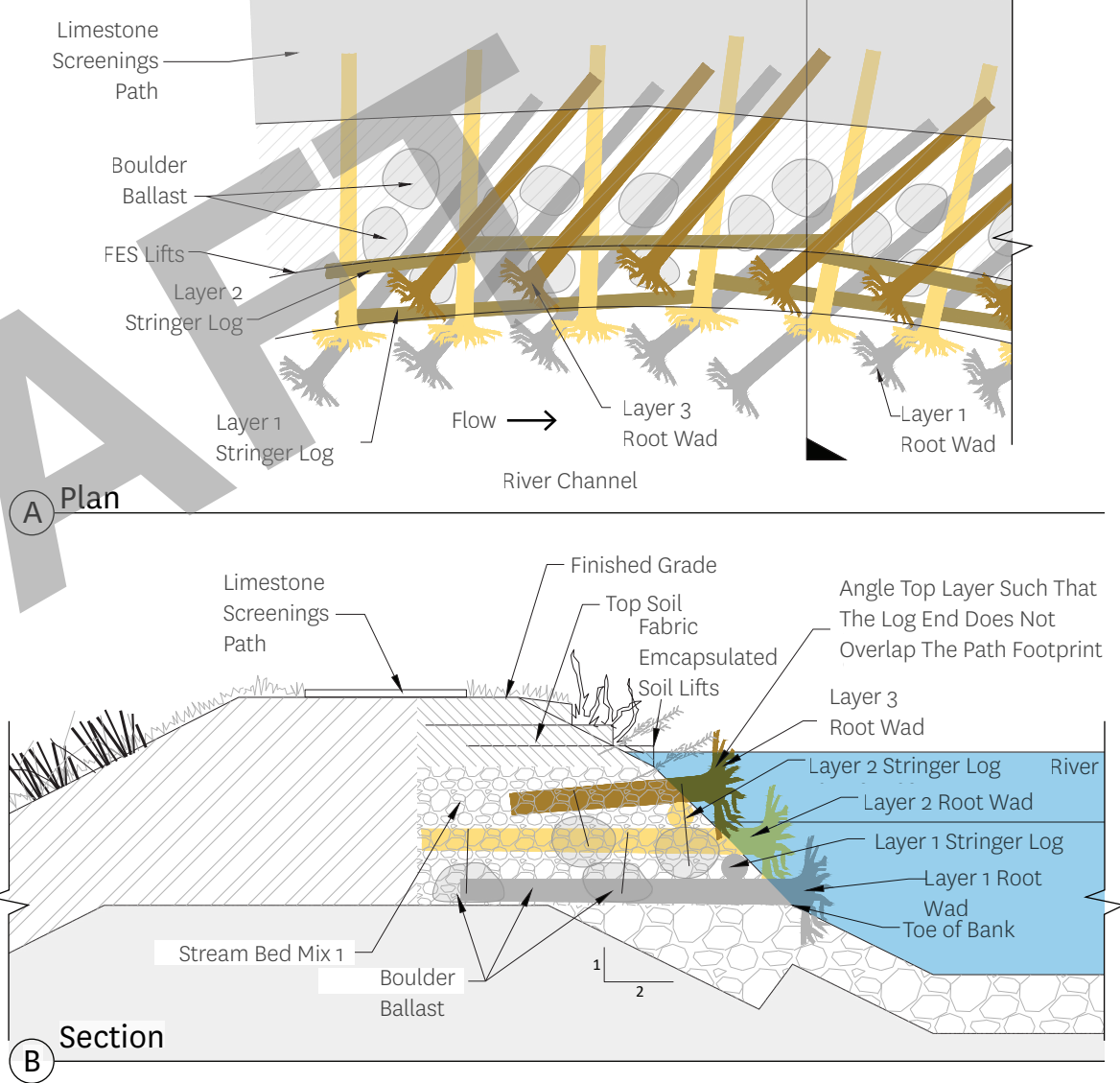
- Open Water
- Floodplain Planting
- Bioengineered Bank (FES)
- Anchored Wood
- Stone Armour
- Streambed Gravel
- Spawning Gravel
- Top of Bank (TOB)



Anchored Wood Stabilization



Crib Wall Treatment



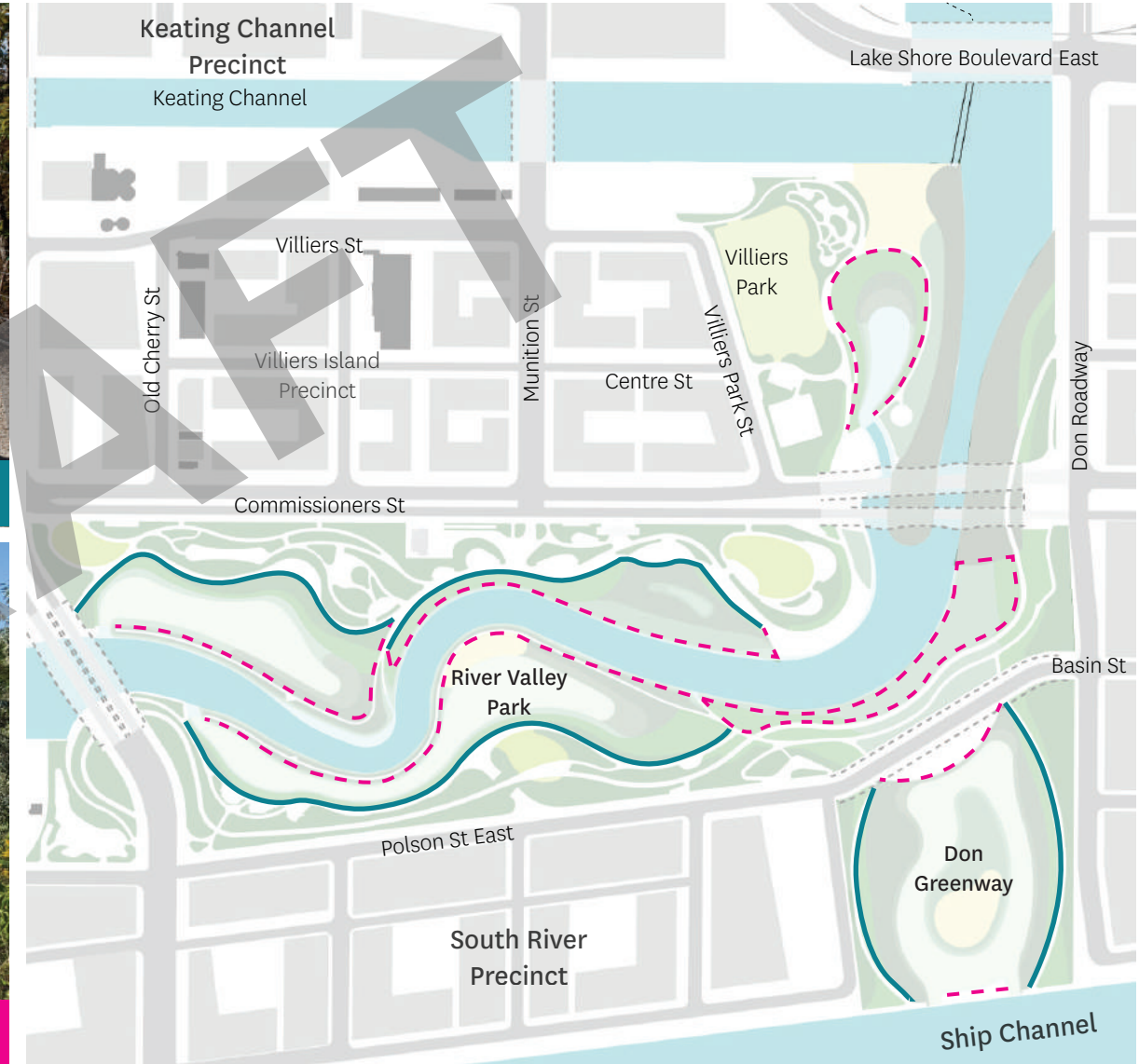
Habitat Protection Barriers



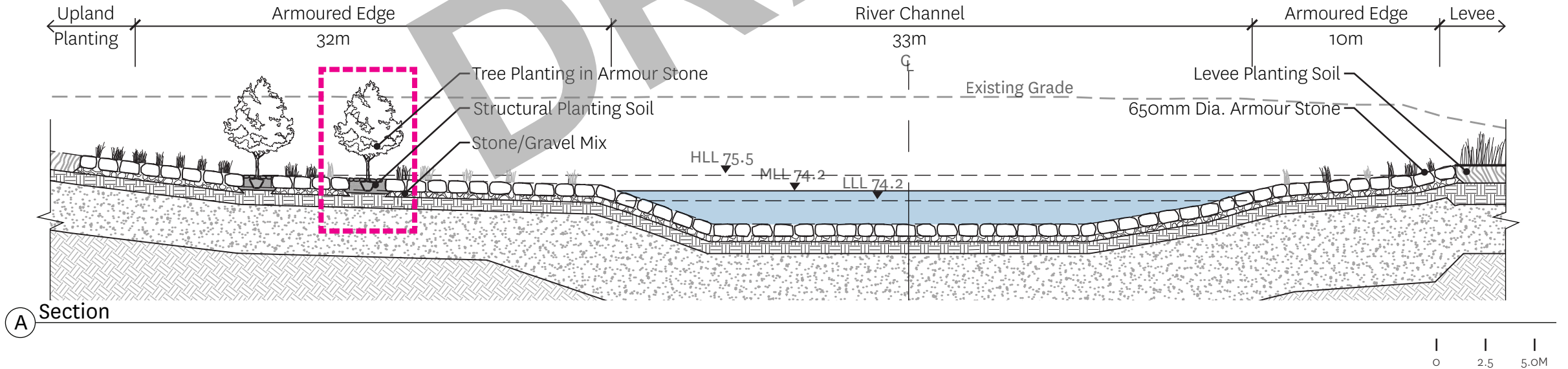
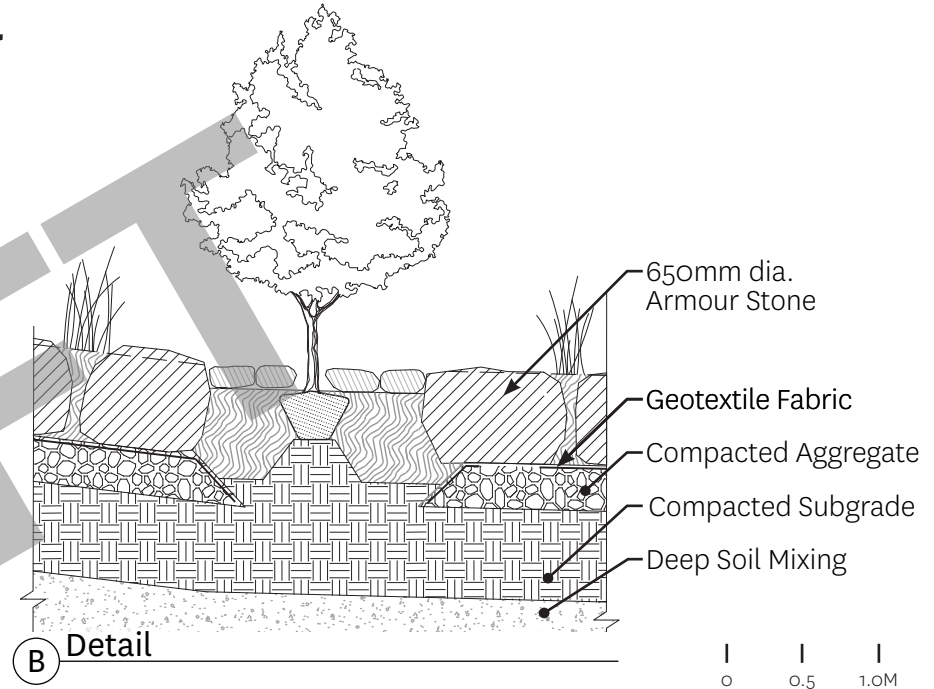
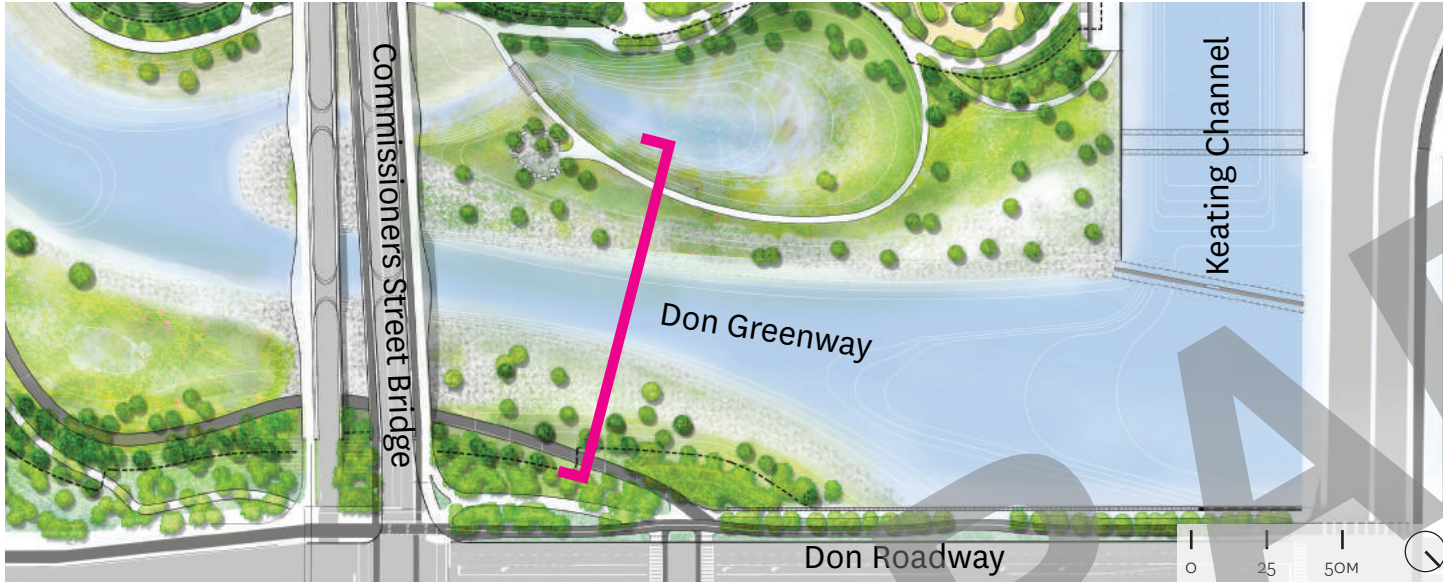
Range Fence



Vegetated Buffer



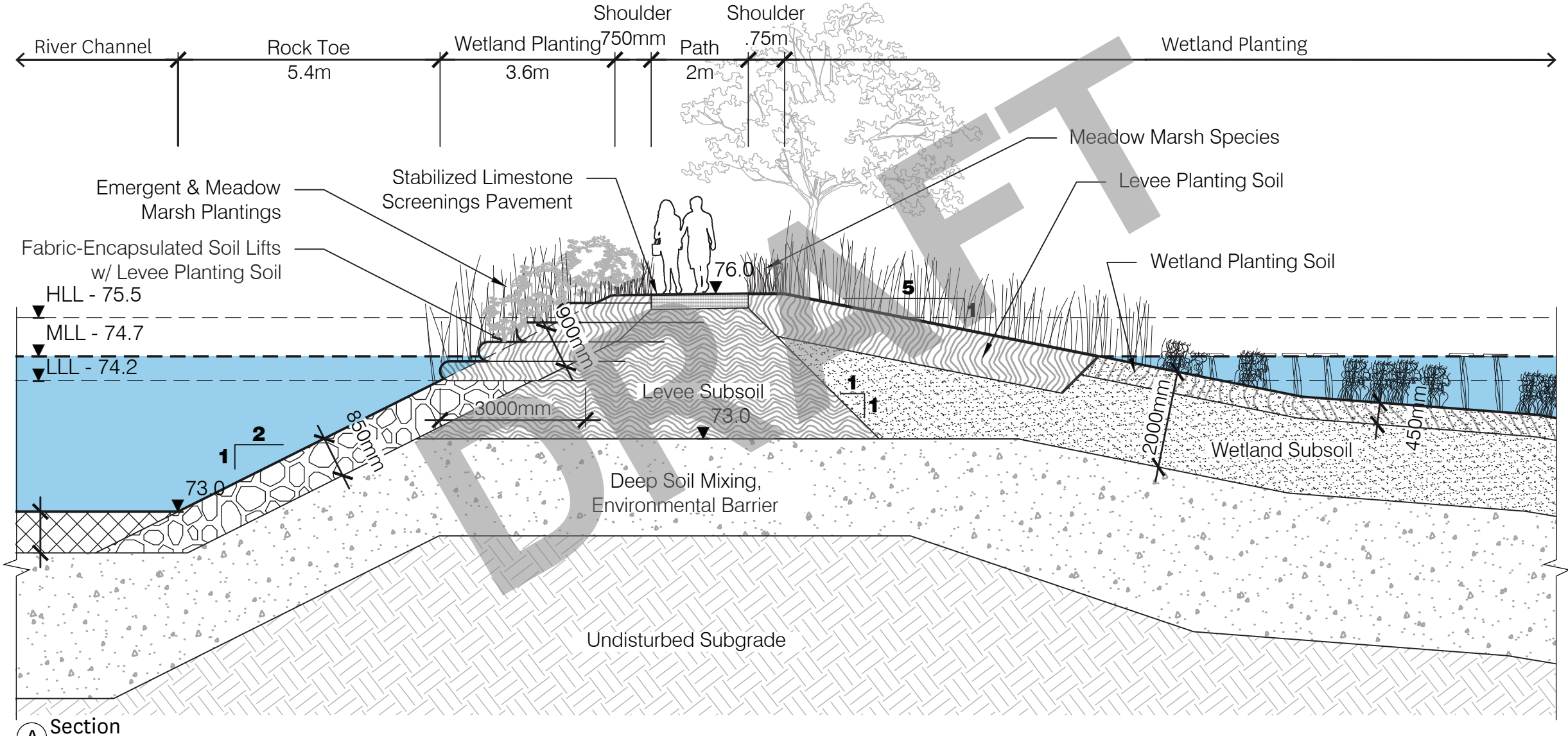
Ice Management Area



Wetland Levee Trail



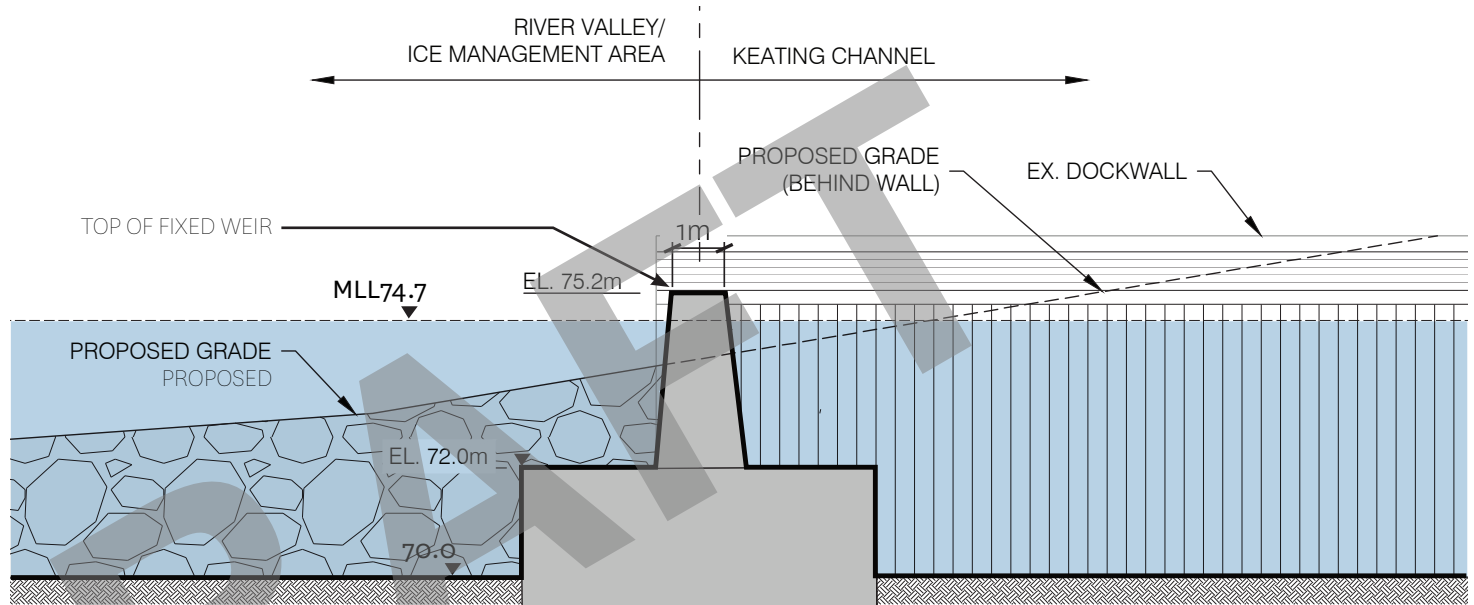
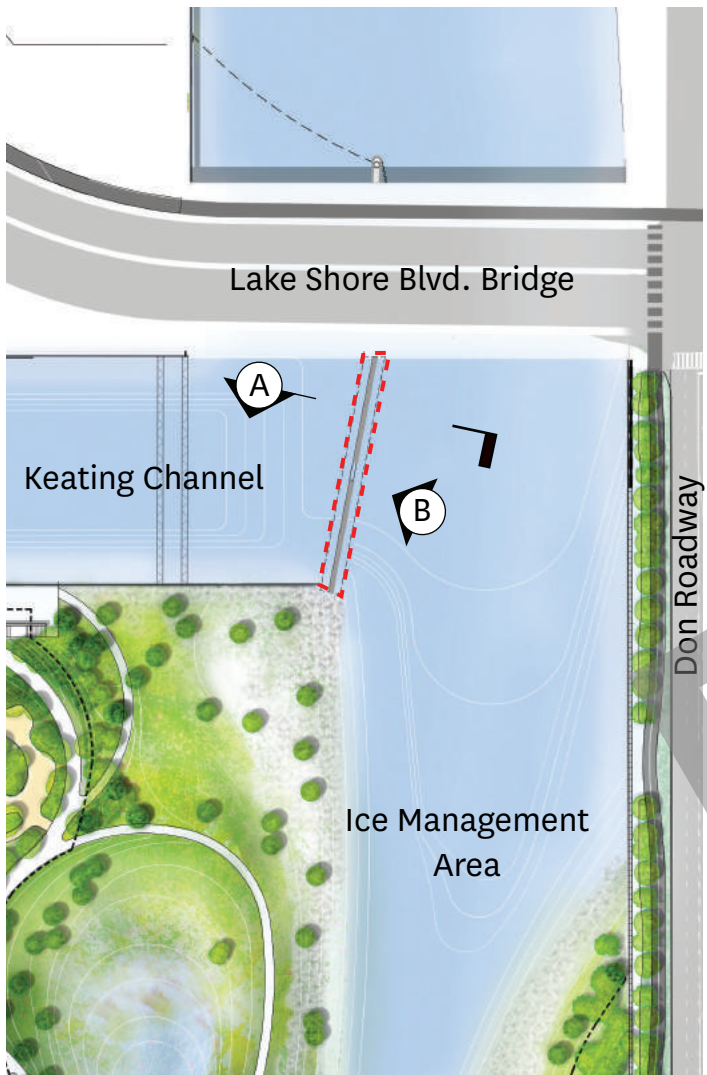
Levee Wetland



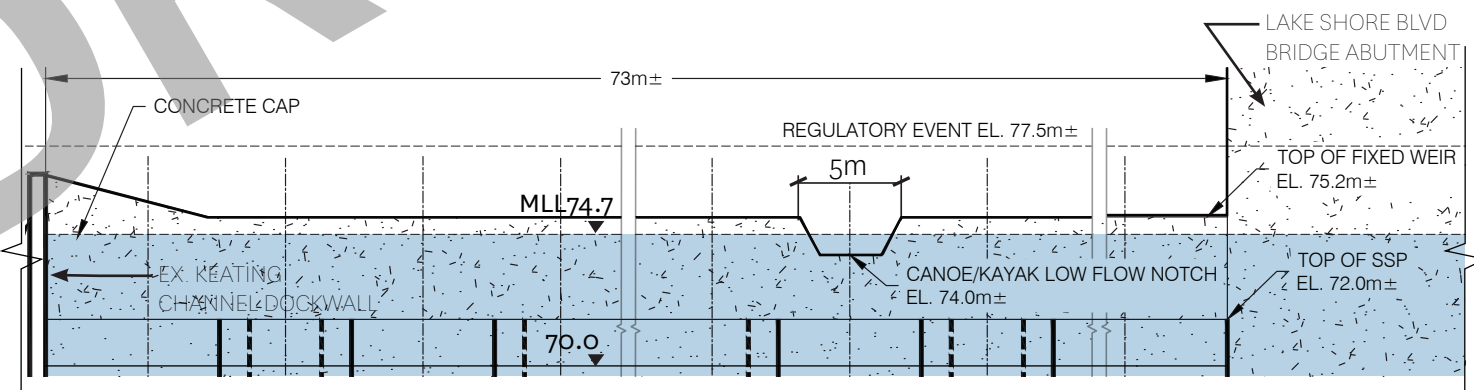
(A) Section



Sideflow Weir



(A) Section / Elevation



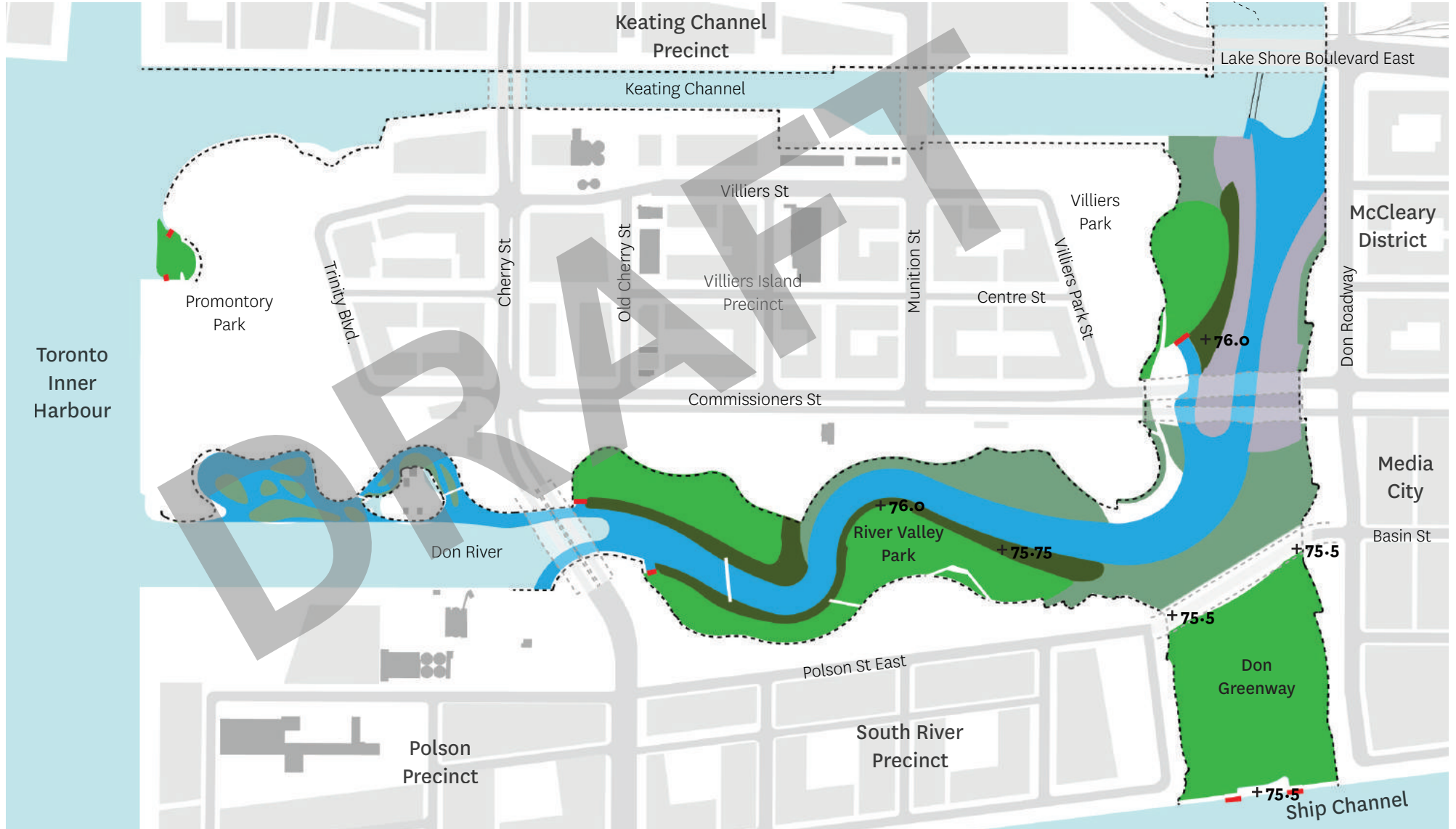
(B) Elevation



Planting and Habitat

Habitat Types

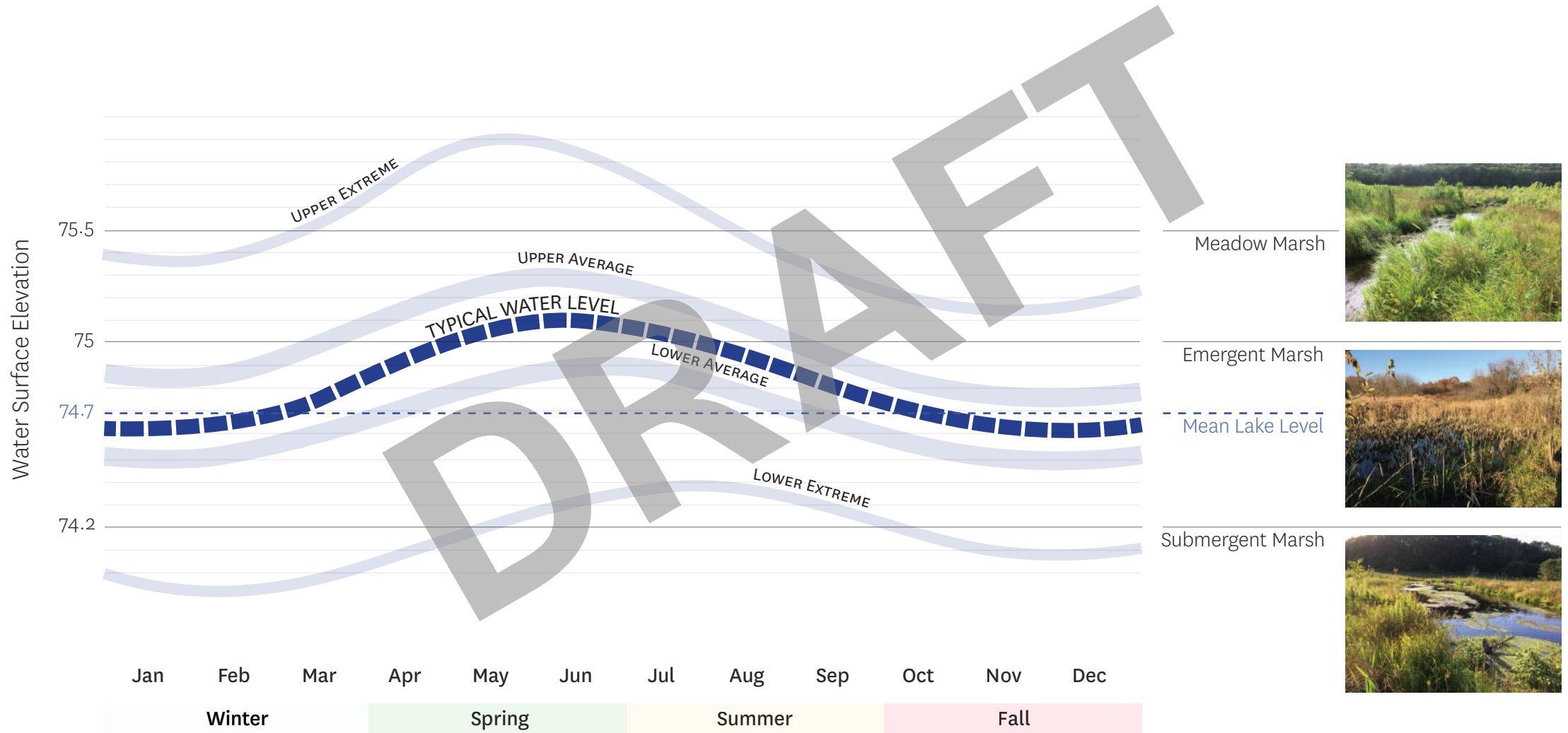
- Open Water >5m
- River Channel
- Lake Connected Wetland
- Floodplain
- Levee: 76.0
- Planted Stone
- Fish Gate
- Top of Bank (TOB)



View Looking East from Wetland at River Valley Park



Seasonal Water Fluctuations Influence on Plant Community Distribution



Habitat

Aquatic



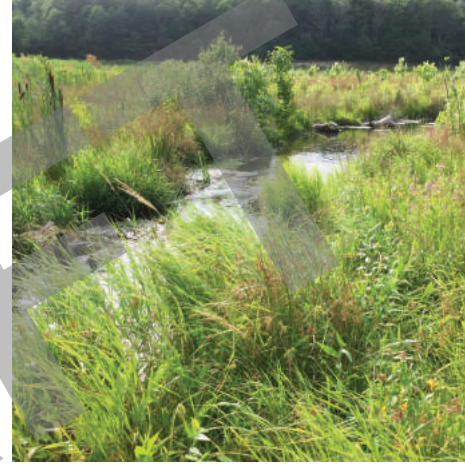
Submergent Marsh



Emergent Marsh



Meadow Marsh



Floodplain Forest



Fauna

Aquatic



Submergent Marsh



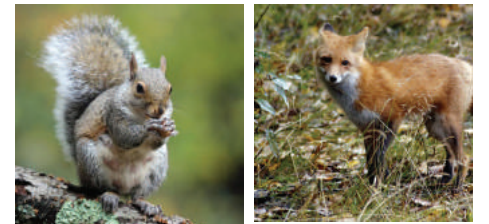
Emergent Marsh



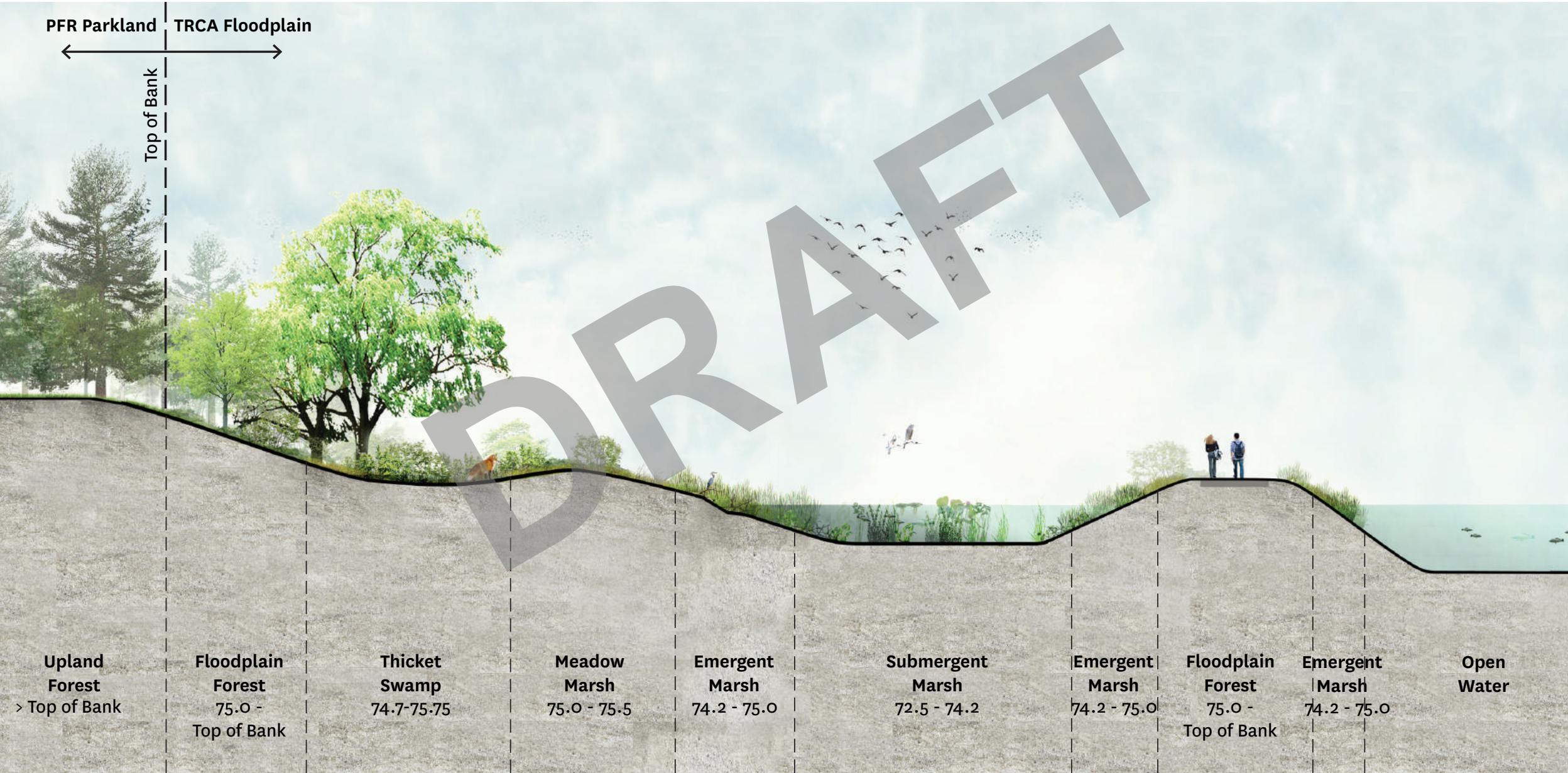
Meadow Marsh



Floodplain Forest

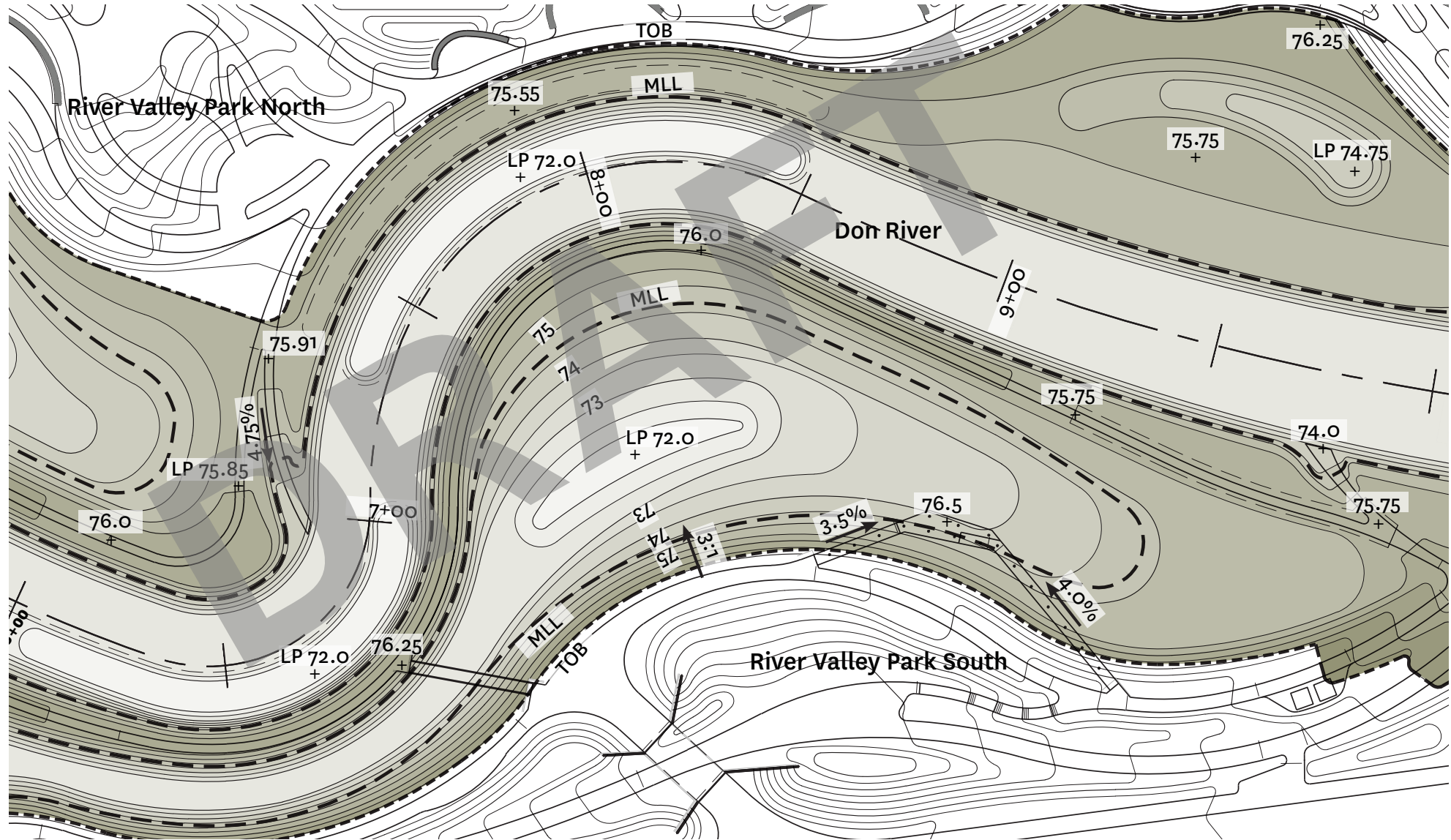


Plant Communities - Section



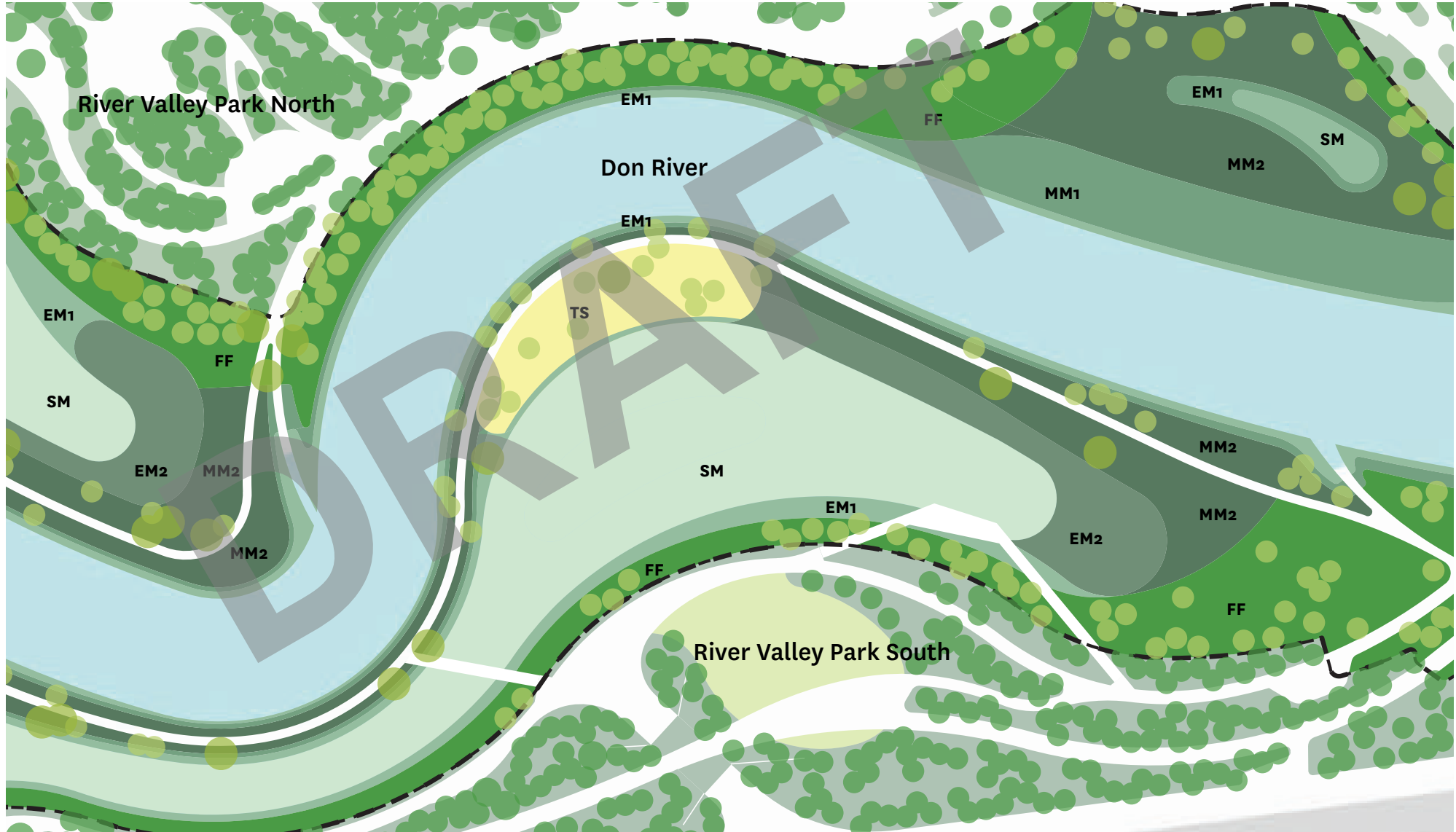
River Valley Grading - Enlargement Plan

- TOB** Top of Bank
- MLL** Mean Lake Level (74.7)
- River Centerline
- Proposed Contour, 1m
- Proposed Contour, .5m
- - Grade Break
- X.X%** → Percentage/Direction of Slope
- XX.X** + Proposed Spot Elevation
- LP XX.X** + Low Point
- X+00** Centerline Station Point of River



River Valley Planting - Enlargement Plan

- Submergent Marsh:**
Forbs, Sedges, Rushes
72.5 - 74.2
- Emergent Marsh 1:**
Grasses, Sedges, Rushes
74.2 - 75.0
- Emergent Marsh 2:**
75% Forbs
74.2 - 75.0
- Meadow Marsh 1:**
Grasses, Sedges, Rushes
75 - 75.50
- Meadow Marsh 2:**
75% Forbs
75 - 75.50
- Thicket Swamp:**
Forbs, Grasses, Sedges
74.7 - 75.75
- Floodplain Forest:**
Forbs, Grasses, Sedges
75.0 - TOB
- Willow Tree
- Floodplain Tree
- Park Tree
- Top of Bank (TOB)



Submergent Marsh (72.5 - 74.2) - Plant Palette



Ceratophyllum demersum



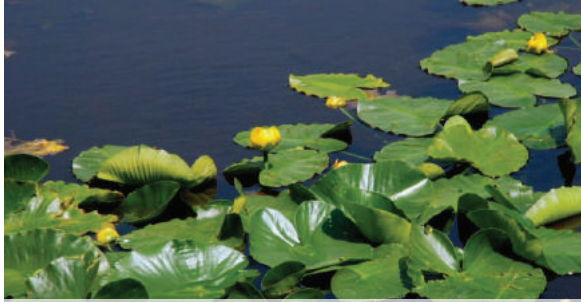
Heteranthera dubia



Heteranthera limosa



Najas flexilis



Nuphar lutea



Nymphaea odorata



Potamogeton gramineus



Utricularia macrorhiza



Schoenoplectus acutus



Sparganium eurycarpum



Zizania aquatica



Ranunculus aquatilis

Emergent Marsh (74.2 - 75.0) - Plant Palette



Calamagrostis canadensis



Acorus calamus



Schoenoplectus acutus



Sparganium eurycarpum



Polygonum amphibium



Calla palustris



Caltha palustris



Typha latifolia



Poa palustris



Carex comosa



Symplocarpus foetidus



Eleocharis obtusa

Meadow Marsh (75 - 75.50) - Plant Palette



Betula nigra



Impatiens capensis



Carex hystericina



Monarda fistulosa



Carex stricta



Eupatorium maculatum



Salix nigra



Aster lucidulus



Liatris pycnostachya



Typha latifolia



Lobelia cardinalis



Matteuccia struthiopteris

Thicket Swamp (74.7 - 75.75) - Plant Palette



Onoclea sensibilis



Salix sp.



Cornus sericea



Asclepias syriaca



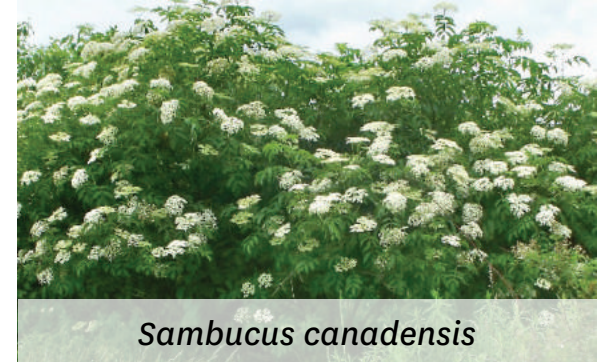
Cornus racemosa



Asclepias incarnata



Alnus rugosa



Sambucus canadensis



Viburnum trilobum



Elymus riparius



Alopecurus aequalis



Ilex verticillata

Floodplain Forest (75.0 - TOB) - Plant Palette



Sporobolus heterolepis



Acer saccharum



Acer saccharinum



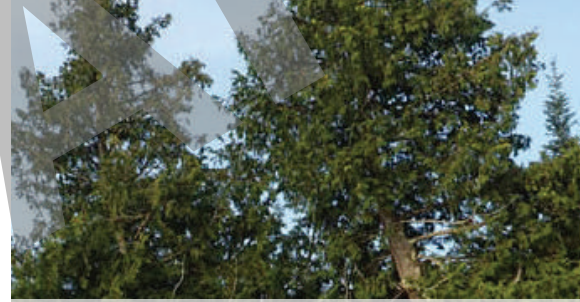
Carex lupulina



Viburnum acerifolium



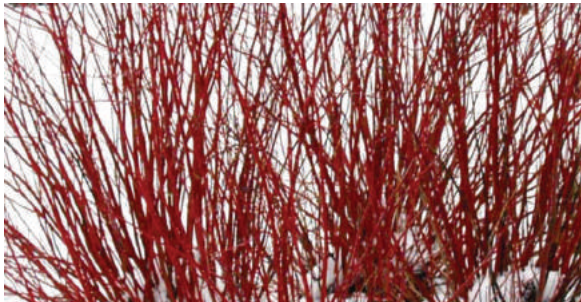
Amelanchier arborea



Thuja occidentalis



Solidago caesia



Cornus sericea



Betula lutea



Carex grayi



Tilia americana

River Ecology: Constructed Habitat



Bird Boxes



Anchored Wood



Osprey Platforms

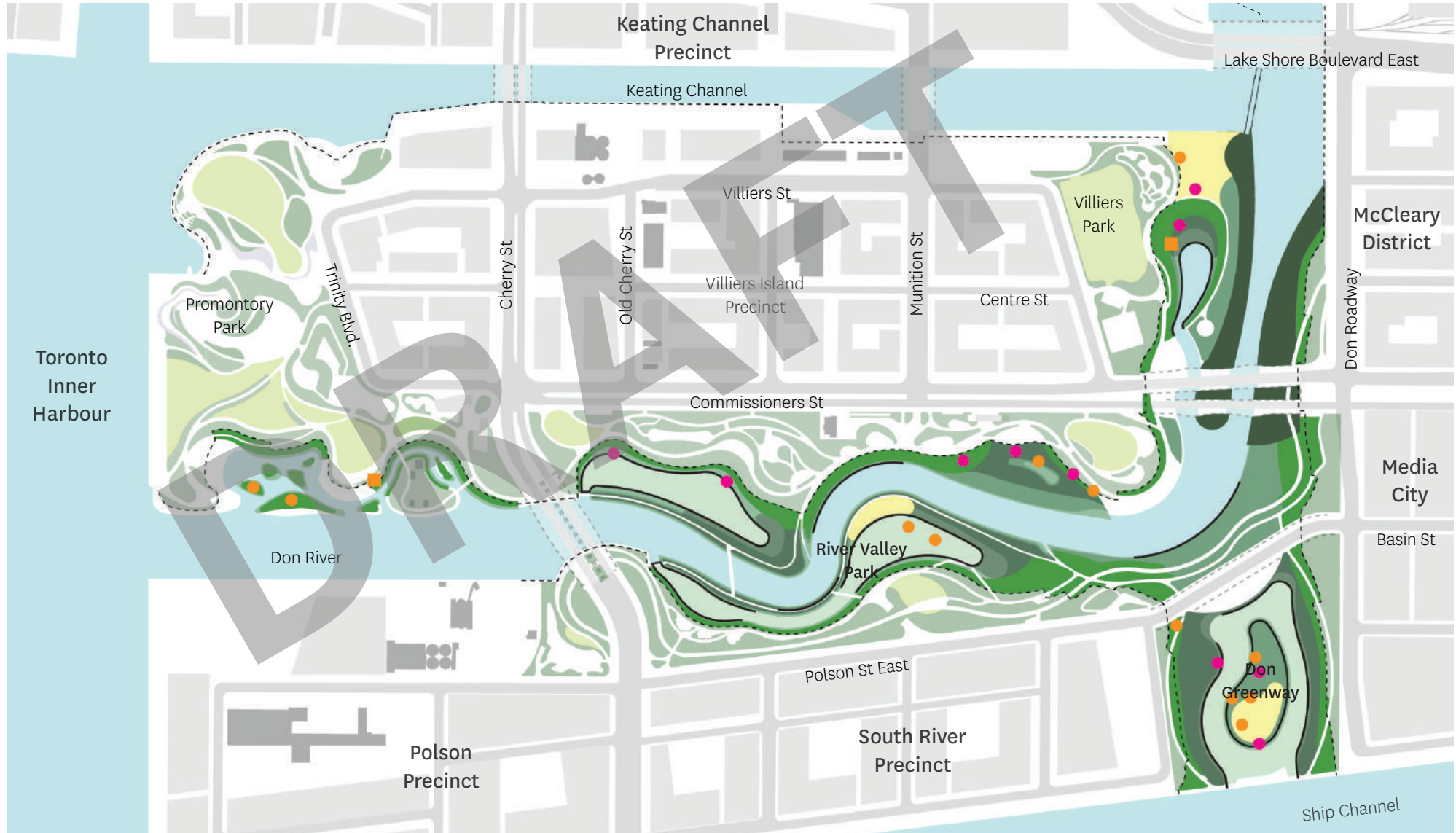


Turtle Habitat



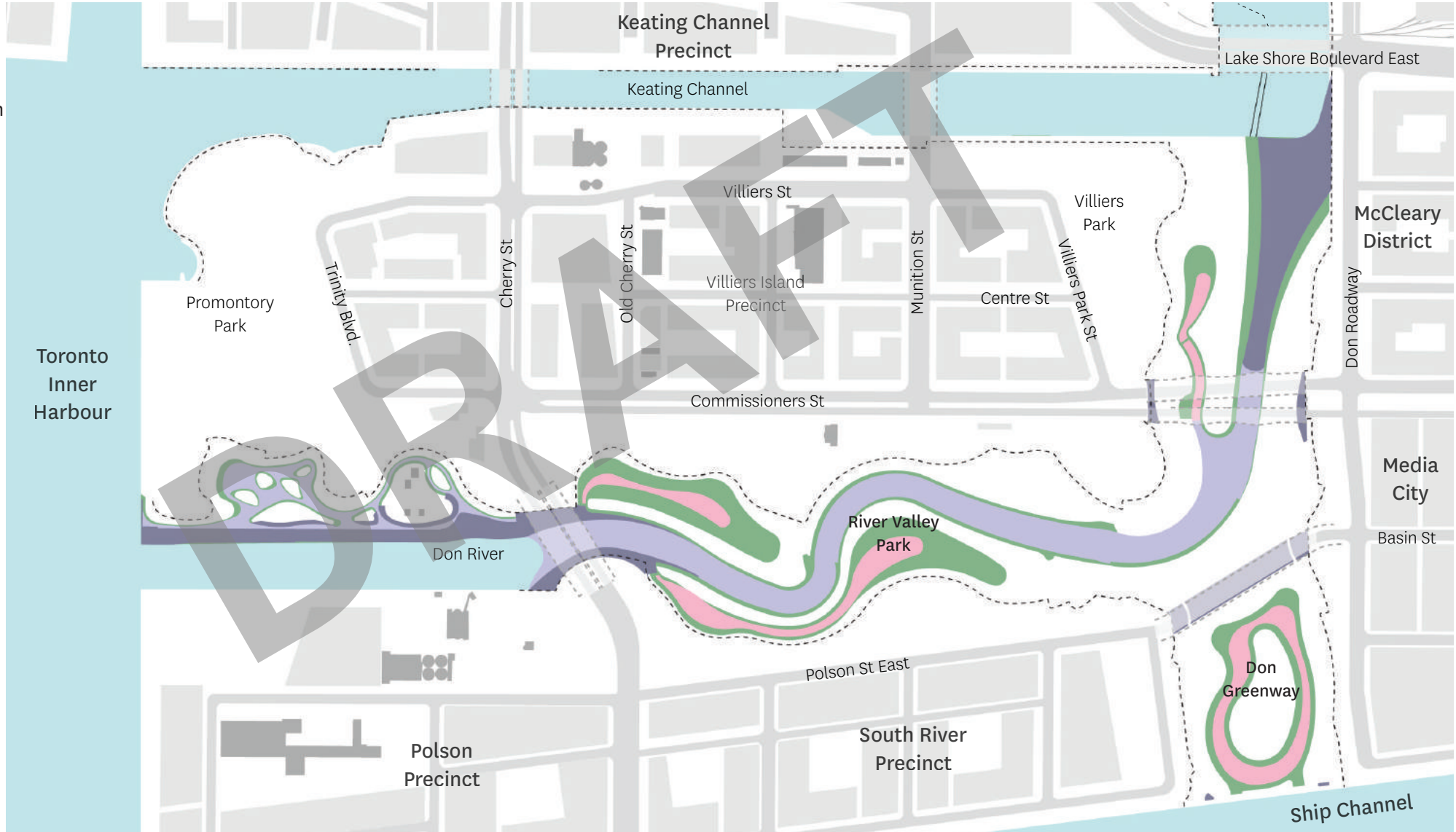
River Ecology: Plant Communities and Habitat

- Submergent Marsh:
72.5 - 74.2
- Emergent Marsh:
74.2 - 75.0
- Meadow Marsh:
75 - 75.50
- Thicket Swamp:
74.7 - 75.75
- Floodplain Forest:
75.0 - TOB
- Upland Forest:
> TOB
- Planted Armour Stone
- Vernal Pool
- Nest Boxes
- Turtle Bank Habitat
- Anchored Wood Habitat
- Nesting Platform
- Top of Bank (TOB)



Aquatic Substrates

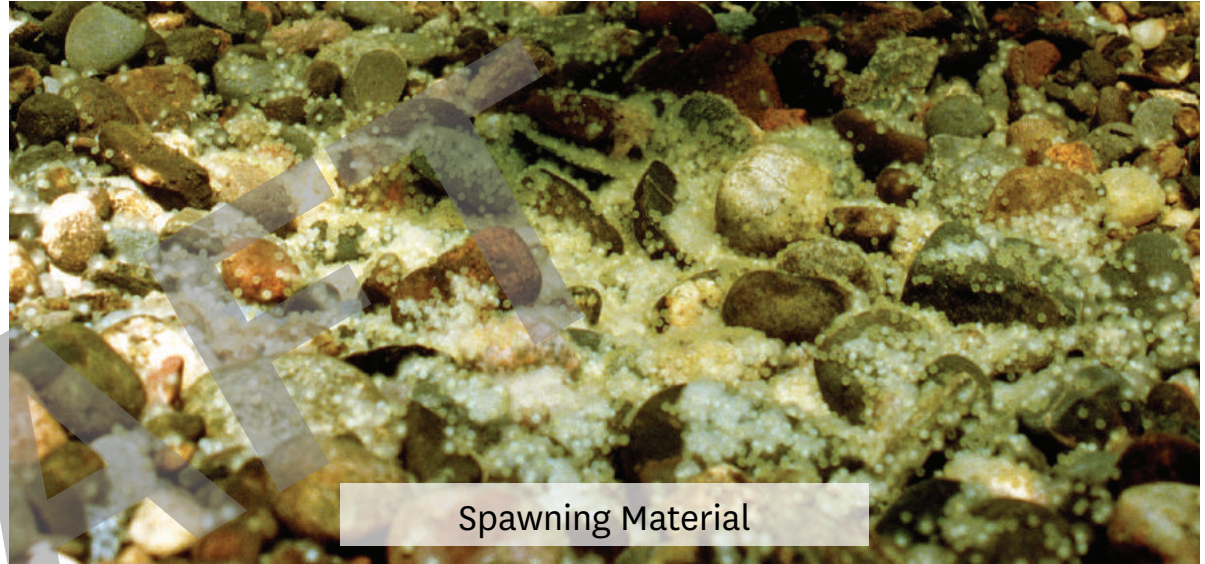
- Wetland Soil
- Open Water
- Spawning Gravel: 9,500 sm
- Streambed Material: 28,500 sm
- Stone Armour, In Water
- - - Top of Bank



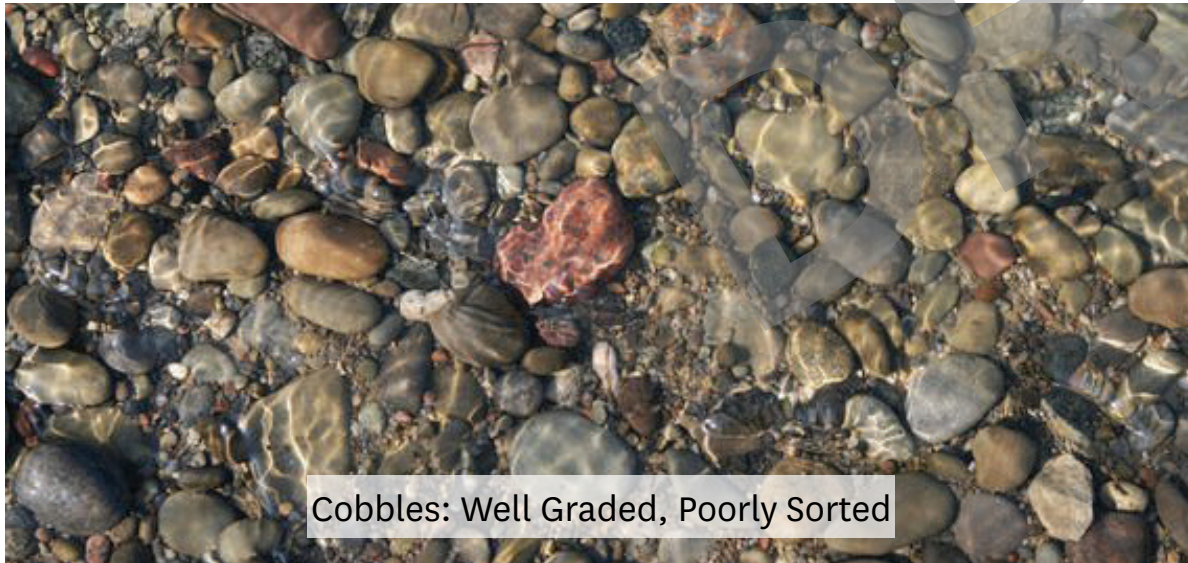
Streambed Material



Spawning Material



Spawning Material



Cobbles: Well Graded, Poorly Sorted



Lake Ontario Cobble Bottom

View Looking East from Canoe Cove at Promontory Park



View Looking South from Picnic Area at River Valley Park



View Looking East from Overlook at Don Greenway

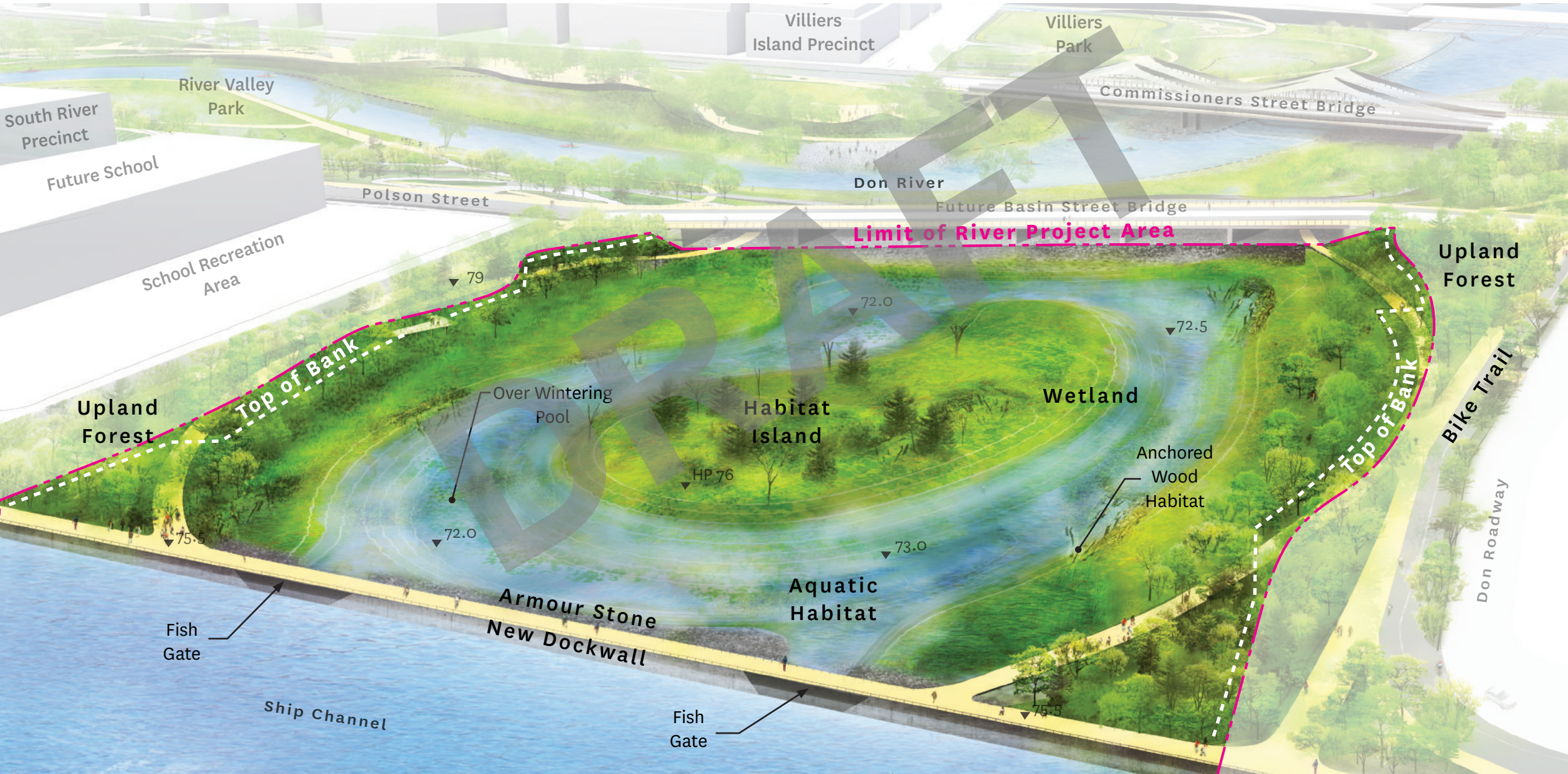


View Looking South at Ice Management Area at Villiers Park

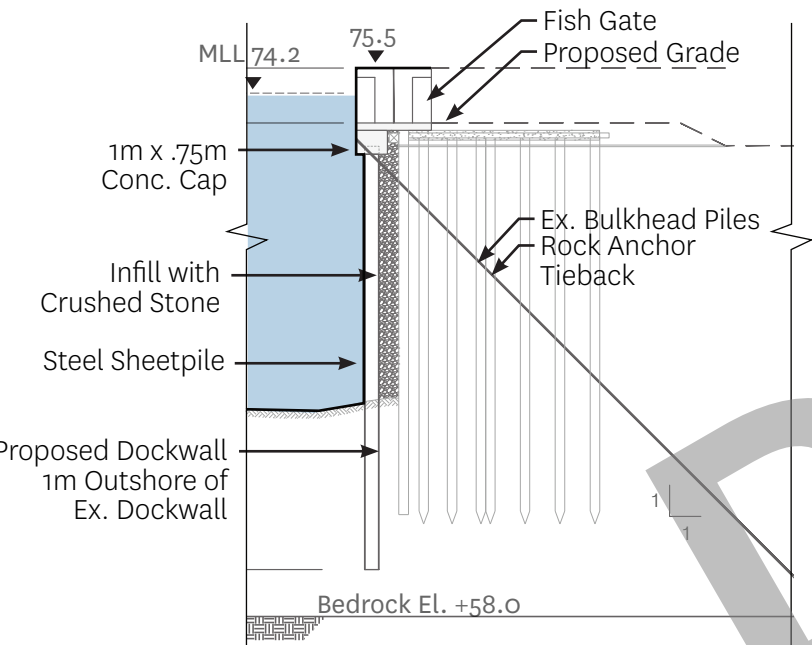


Bridges, Boardwalks and Fish Gates

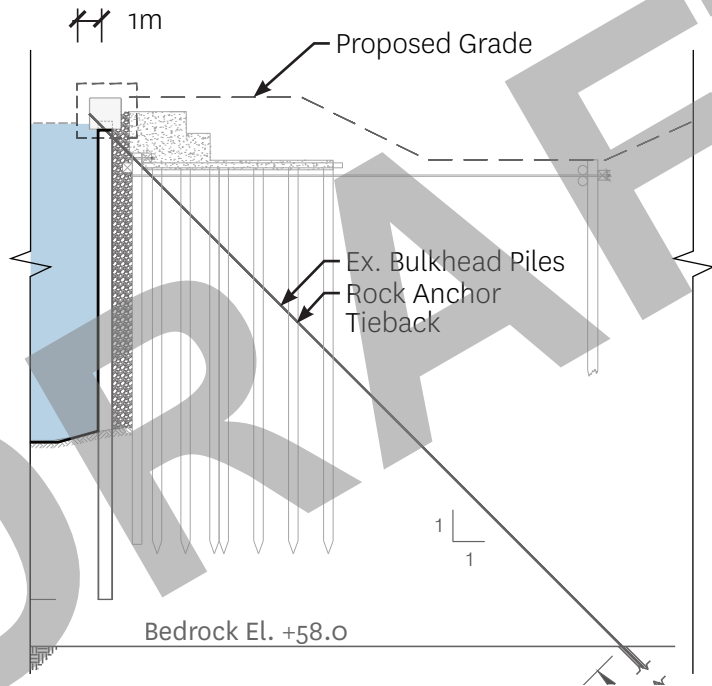
Don Greenway - Bird's Eye View



Don Greenway - Dockwall



A Dockwall Section at Fish Gate

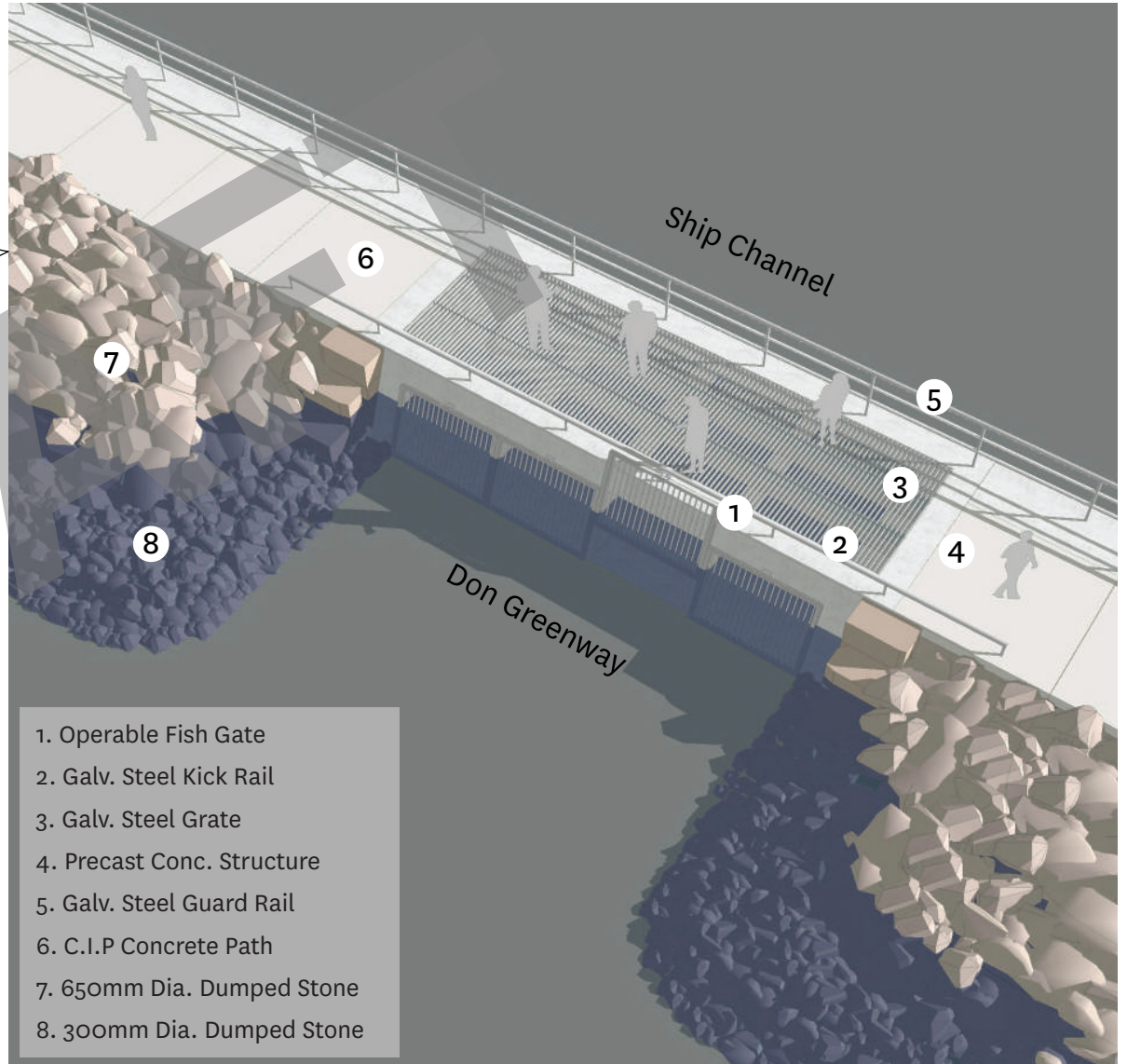
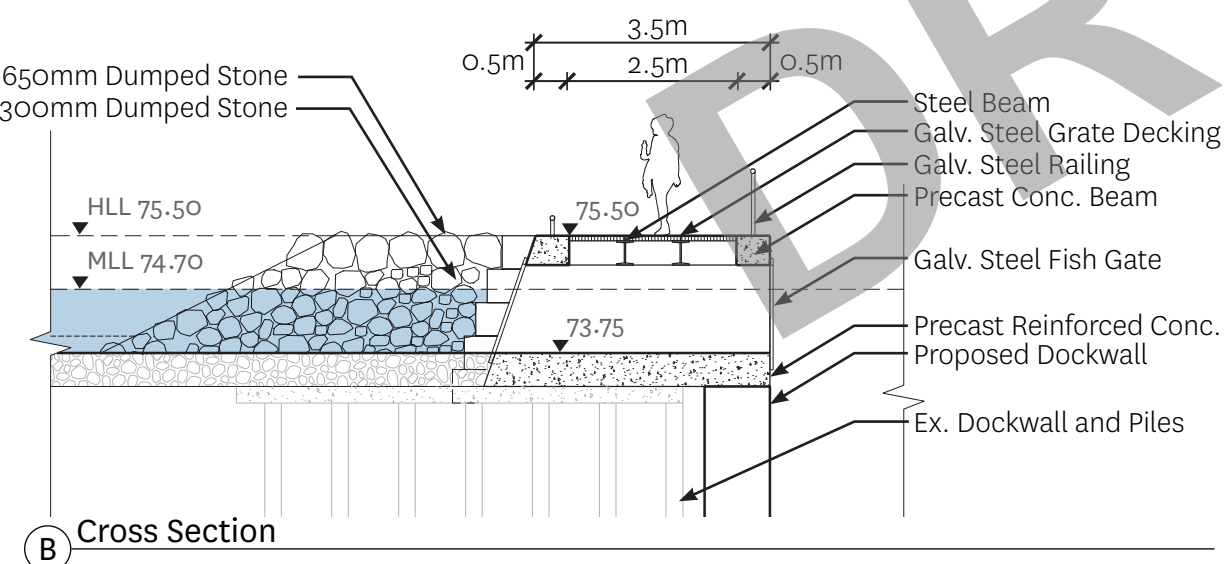
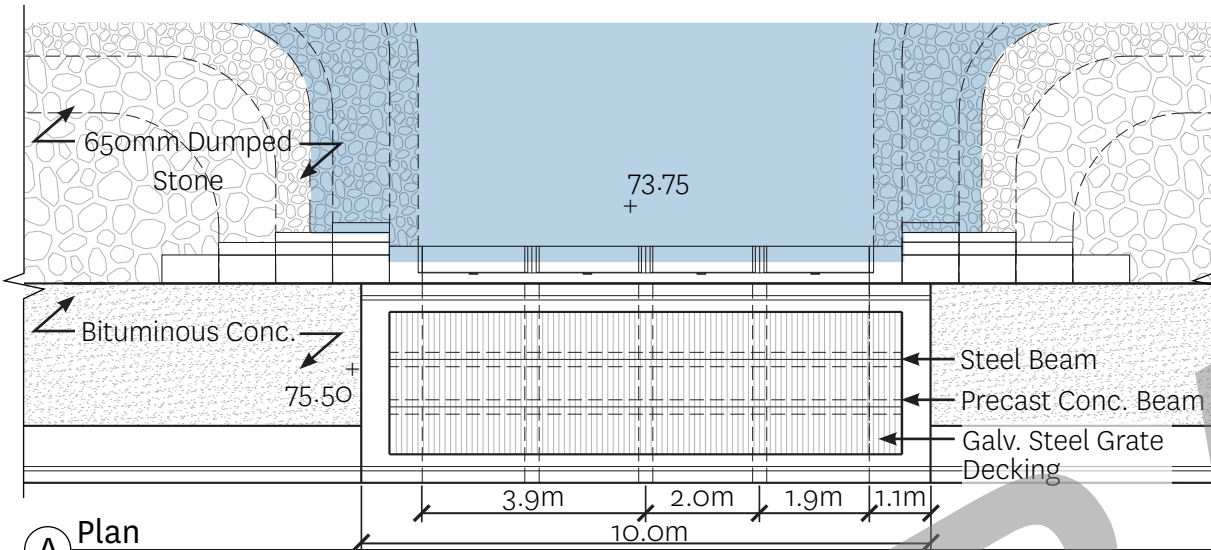


B Dockwall Section (TYP)



C Existing Ship Channel Dockwall Image

Don Greenway - Fish Gate



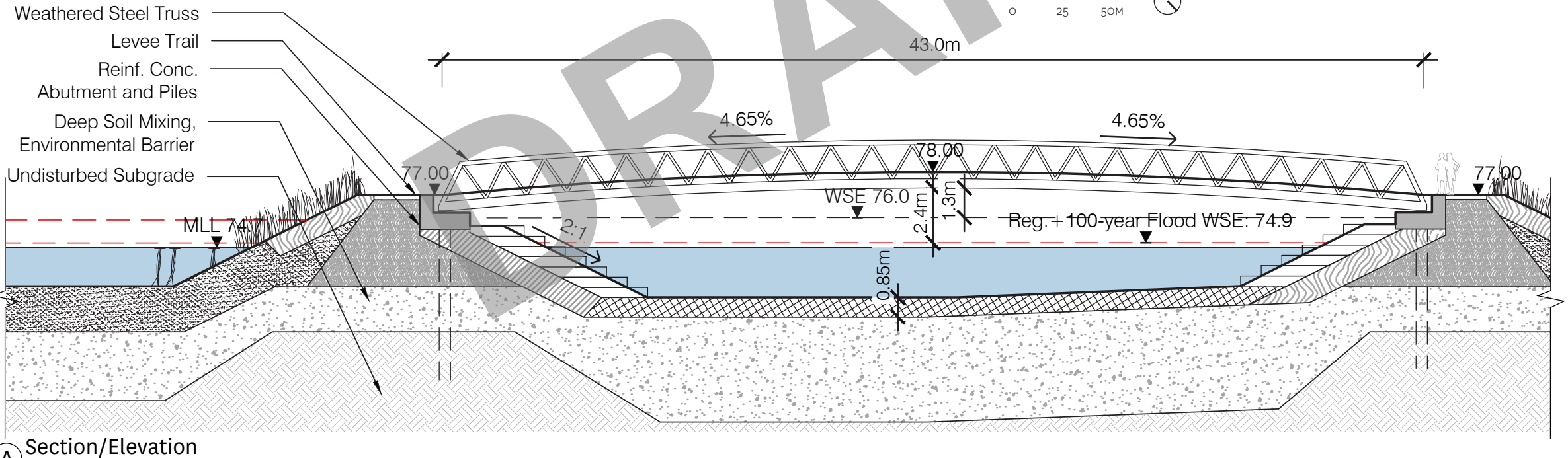
1. Operable Fish Gate
2. Galv. Steel Kick Rail
3. Galv. Steel Grate
4. Precast Conc. Structure
5. Galv. Steel Guard Rail
6. C.I.P Concrete Path
7. 650mm Dia. Dumped Stone
8. 300mm Dia. Dumped Stone



River Valley Park - Bird's Eye View



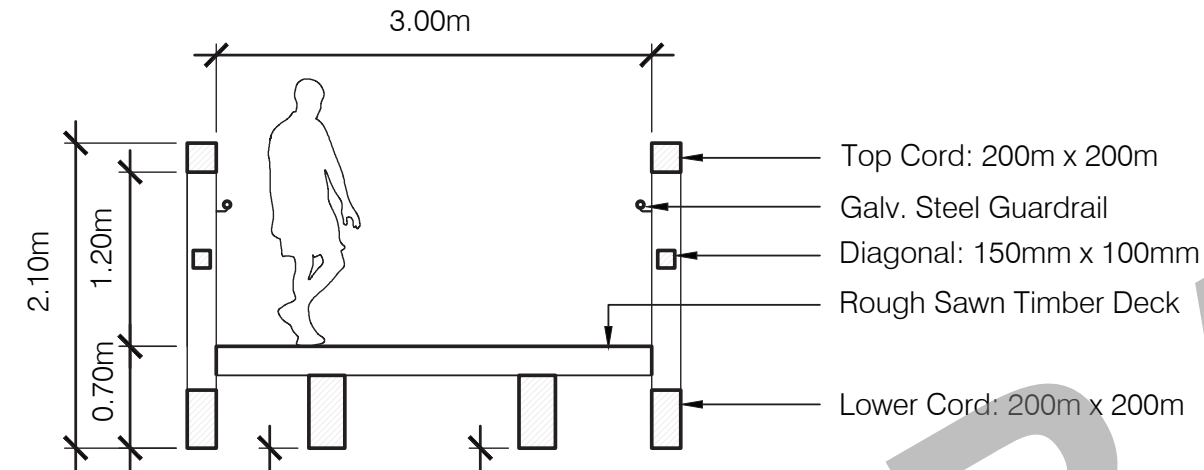
River Valley Park - Pedestrian Bridge



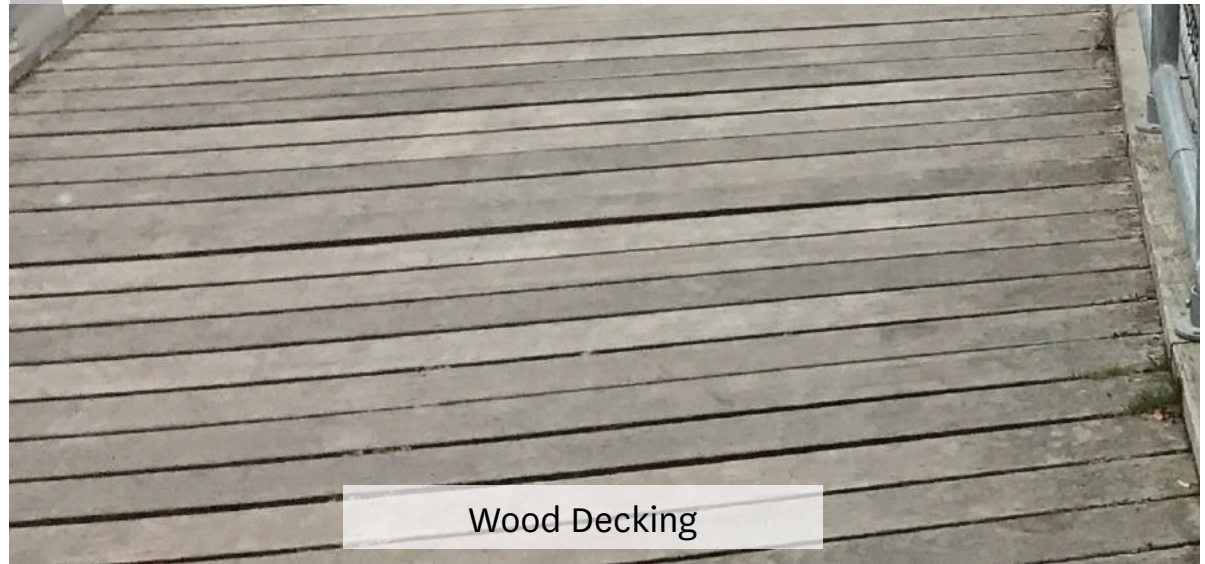
A



River Valley Park - Pedestrian Bridge



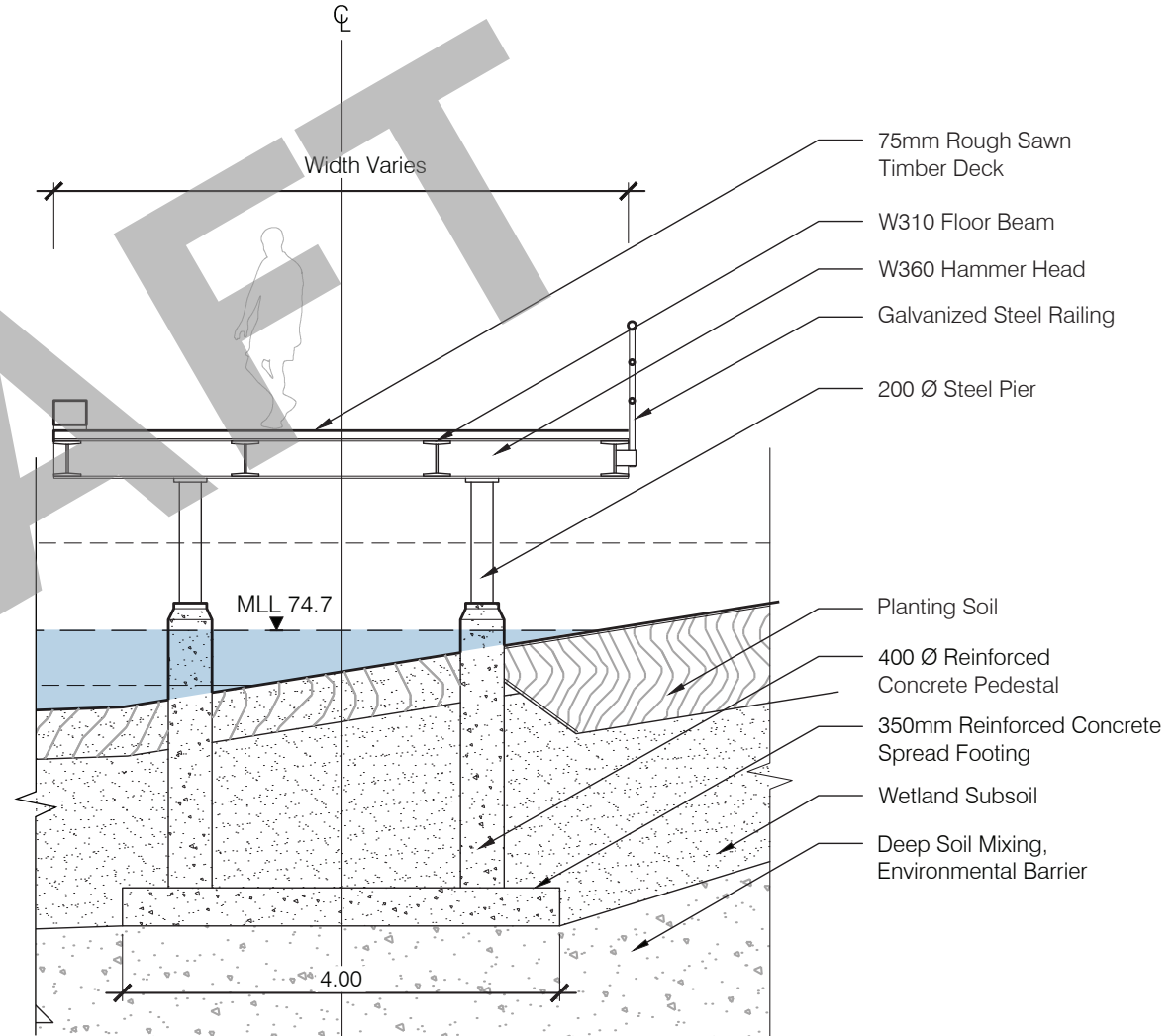
(A) Cross Section



River Valley Park - Boardwalk

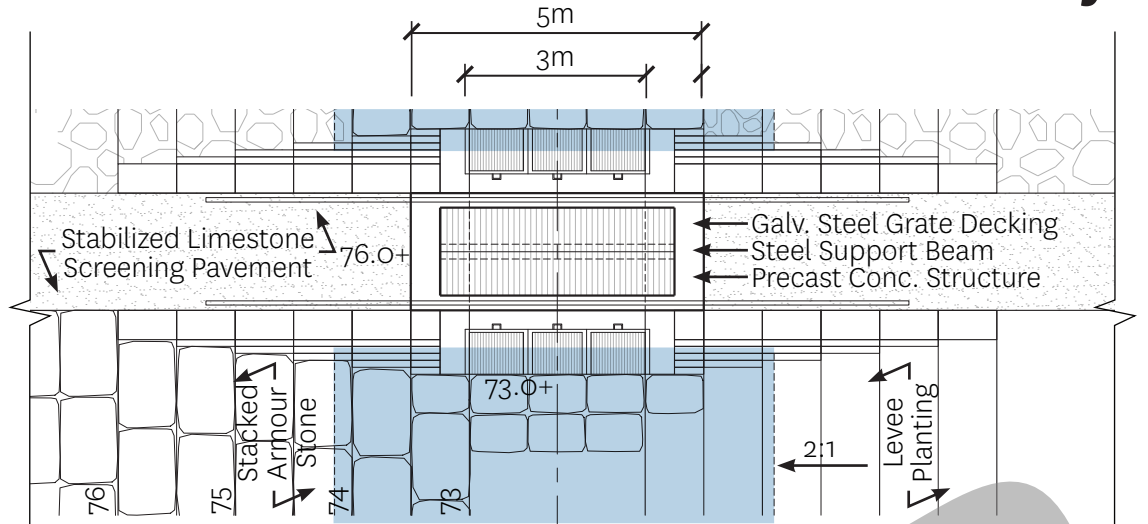


Wood Boardwalk, Evergreen Brickworks, Toronto ON

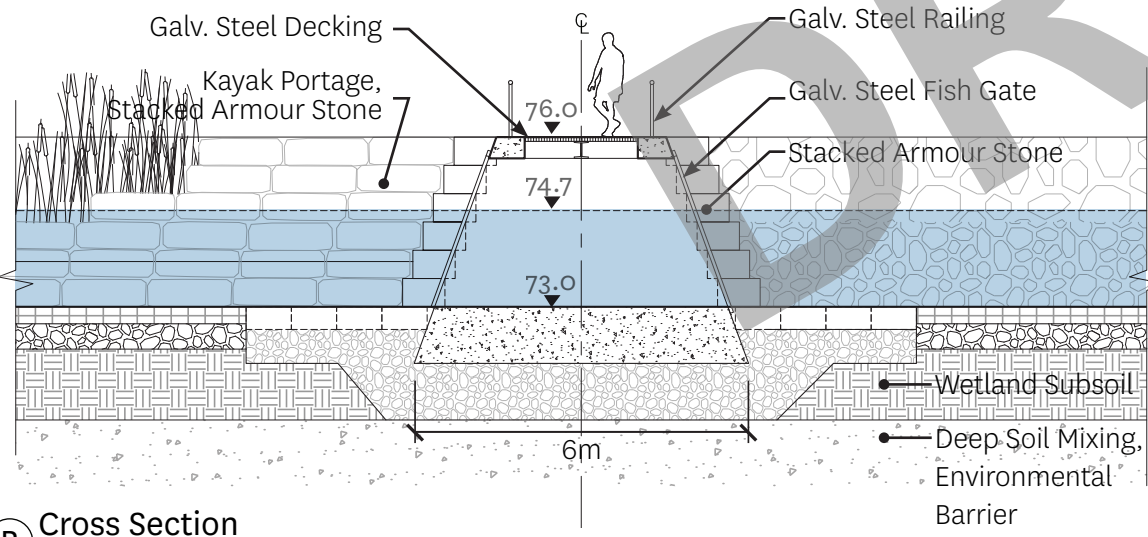


(A) Cross Section

River Valley Park - Fish Gates



A Plan



B Cross Section



TRCA Precedent

View Looking Northeast from Levee Trail at River Valley Park



Full Vision Plan



DRAFT

Appendix

Plant Schedules

Trees			
QTY	KEY	Botanical Name	Common Name
-		<i>Acer rubrum</i>	Red maple
-		<i>Acer saccharinum</i>	Silver maple
-		<i>Amelanchier canadensis</i>	Serviceberry
-		<i>Betula alleghaniensis</i>	Yellow birch
-		<i>Betula lutea</i>	Yellow birch
-		<i>Betula nigra</i>	River birch
-		<i>Betula papyrifera</i>	White Birch
-		<i>Carpinus caroliniana</i>	American hornbeam
-		<i>Cercis canadensis</i>	Canada redbud
-		<i>Celtis occidentalis</i>	Common Hackberry
-		<i>Fagus grandifolia</i>	American beech
-		<i>Larix laricina</i>	Tamarack
-		<i>Ostrya virginiana</i>	Am. hornbeam/ironwood
-		<i>Populus balsamifera</i>	Balsam Poplar
-		<i>Populus deltoides</i>	Cottonwood
-		<i>Populus tremuloides</i>	Quaking aspen
-		<i>Prunus serotina</i>	Black Cherry
-		<i>Quercus alba</i>	White oak
-		<i>Quercus bicolor</i>	Swamp white oak
-		<i>Quercus palustris</i>	Pin oak
-		<i>Quercus rubra</i>	Red oak
-		<i>Quercus velutina</i>	Black oak
-		<i>Salix babylonica</i>	Weeping Willow
-		<i>Salix nigra</i>	Black willow
-		<i>Salix eriocephala</i>	Heart-leaved Willow
-		<i>Thuja occidentalis</i>	Northern white cedar
-		<i>Tilia americana</i>	Basswood
700	-	-	-

Shrubs			
QTY	KEY	Botanical Name	Common Name
-	-	<i>Alnus rugosa</i>	Speckled Alder
-	-	<i>Amelanchier arborea</i>	Common serviceberry
-	-	<i>Amelanchier canadensis</i>	serviceberry
-	-	<i>Amelanchier arborea</i>	Common serviceberry
-	-	<i>Aronia melanocarpa</i>	Black chokecherry
-	-	<i>Berberis canadensis</i>	American Barberry
-	-	<i>Cornus alternifolia</i>	Alternate-leaved dogwood
-	-	<i>Cornus amomum</i>	Silky dogwood
-	-	<i>Cornus racemosa</i>	Grey dogwood
-	-	<i>Cornus sericea</i>	Red-osier dogwood
-	-	<i>Hammelis virginiana</i>	Witch hazel
-	-	<i>Ilex verticillata</i>	Winterberry holly
-	-	<i>Lindera benzoin</i>	Spicebush
-	-	<i>Sambucus canadensis</i>	Common elderberry
-	-	<i>Alnus rugosa</i>	Speckled Alder
-	-	<i>Physocarpus opulifolius</i>	Common ninebark
-	-	<i>Pyrus arbutifolia</i>	Red chokeberry
-	-	<i>Prunus pennsylvanica</i>	Pin cherry
-	-	<i>Prunus virginiana</i>	Choke cherry
-	-	<i>Viburnum acerifolium</i>	Maple-leaved viburnum
-	-	<i>Viburnum recognitum</i>	Arrowwood
-	-	<i>Viburnum trilobum</i>	Highbush cranberry
1,400	-	-	-

Plant Schedules

Submergent Marsh : EL 72.5-74.2		
Herbaceous Perennials		
QTY	Botanical Name	Common Name
1,300	<i>Ceratophyllum demersum</i>	Coontail
1,300	<i>Heteranthera dubia</i>	Grassleaf mudplantain
1,300	<i>Heteranthera limosa</i>	Longleaf mudplantain
1,300	<i>Najas flexilis</i>	Nodding waternymph
1,300	<i>Nuphar luteum or variegatum</i>	Spatterdock
1,300	<i>Nymphaea odorata</i>	White water lily
1,300	<i>Potamogeton gramineus</i>	Variableleaf pondweed
1,300	<i>Utricularia macrorhiza</i>	Common bladderwort
10,400		
Grasses, Sedges, Rushes		
16,400	<i>Schoenoplectus acutus</i>	Hardstem bulrush
16,400	<i>Sparganium eurycarpum</i>	Giant burreed
16,400	<i>Zizania aquatica</i>	Wild rice
49,200		

Emergent Marsh: EL 74.2-75.0		
Herbaceous Perennials		
QTY	Botanical Name	Common Name
9,900	<i>Acorus calamus</i>	Sweetflag
9,900	<i>Bidens connata</i>	Beggar's Ticks
9,900	<i>Calla palustris</i>	Water Arum
9,900	<i>Caltha palustris</i>	Marsh Marigold
9,900	<i>Iris versicolor</i>	Blue flag iris
9,900	<i>Orontium aquaticum</i>	Golden Club
9,900	<i>Polygonum amphibium</i>	Smartweed
9,900	<i>Sagittaria latifolia</i>	Common Arrowleaf
9,900	<i>Symplocarpus foetidus</i>	Skunk Cabbage
9,900	<i>Utricularia vulgaris</i>	Bladderwort
9,900	<i>Vallisneria americana</i>	Water Celery
108,900		
Grasses, Sedges, Rushes		
9,500	<i>Calamagrostis canadensis</i>	Blue-joint
9,500	<i>Carex comosa</i>	Bottlebrush sedge
9,500	<i>Carex hystericina</i>	Porcupine sedge
9,500	<i>Carex stricta</i>	Tussock sedge
9,500	<i>Eleocharis obtusa</i>	Spike Rush
9,500	<i>Glyceria canadensis</i>	Rattlesnake manna grass
9,500	<i>Hierochloa odorata</i>	Sweetgrass

Plant Schedules

9,500	<i>Juncus effusus</i>	Soft rush
9,500	<i>Leersia oryzoides</i>	Rice cutgrass
9,500	<i>Poa palustris</i>	Fowl-manna grass
9,500	<i>Pontederia cordata</i>	Pickereel weed
9,500	<i>Rhynchospora capitellata</i>	Beak rush
9,500	<i>Schizachyrium scoparium</i>	Little bluestem
9,500	<i>Schoenoplectus acutus</i>	Hardstem bulrush
9,500	<i>Scirpus atrovirens</i>	Dark green bulrush
9,500	<i>Scirpus cyperinus</i>	Woolly sedge
9,500	<i>Scirpus fluviatilis</i>	River bulrush
9,500	<i>Scirpus microcarpus</i>	Small-fruited bulrush
9,500	<i>Scirpus validus</i>	Softstem bulrush
9,500	<i>Sparganium eurycarpum</i>	Giant burreed
9,500	<i>Typha latifolia</i>	Broad-leaved cattail
9,500	<i>Zizania aquatica</i>	Wild rice
209,000		

Meadow Marsh EL 75.0-75.5		
Herbaceous Perennials, Ferns		
QTY	Botanical Name	Common Name
12,200	<i>Asclepias incarnata</i>	Swamp milkweed
12,200	<i>Asclepias syriaca</i>	Common milkweed
12,200	<i>Aster lucidilis</i>	Swamp aster
12,200	<i>Aster novae-angliae</i>	New England Aster
12,200	<i>Eleocharis obtusa</i>	Spike rush
12,200	<i>Eupatorium perfoliatum</i>	Boneset
12,200	<i>Eupatorium maculatum</i>	Joe pye-weed
12,200	<i>Helianthus grosseserratus</i>	Sawtooth sunflower
12,200	<i>Impatiens capensis</i>	Jewelweed
12,200	<i>Impatiens capensis</i>	Spotted touch-me-not
12,200	<i>Liatris pycnostachya</i>	Gayfeather
12,200	<i>Lobelia cardinalis</i>	Cardinal flower
12,200	<i>Lycopus americanus</i>	Bugleweed
12,200	<i>Monarda fistulosa</i>	Wild bergamot
12,200	<i>Polygonum amphibium</i>	Smartweed
12,200	<i>Rhynchospora capitellata</i>	Beak rush
12,200	<i>Rubus hispidus</i>	Swamp Dewberry
12,200	<i>Spiraea latifolia</i>	Meadowsweet
12,200	<i>Thelypteris thelypteroides</i>	Marsh Fern
12,200	<i>Veratrum viride</i>	False hellebore
244,000		

Plant Schedules

Grasses, Sedges, Rushes		
24,700	<i>Agrostis gigantea</i>	Redtop
24,700	<i>Alopecurus aequalis</i>	Foxtail
24,700	<i>Calamagrostis canadensis</i>	Blue-joint
24,700	<i>Carex comosa</i>	Bottlebrush sedge
24,700	<i>Carex hystericina</i>	Porcupine sedge
24,700	<i>Carex lacustris</i>	Lake sedge
24,700	<i>Carex rostrata</i>	Beaked sedge
24,700	<i>Carex stricta</i>	Tussock sedge
24,700	<i>Cyperus diandrus</i>	Umbrella sedge
24,700	<i>Dulichium arundinaceum</i>	Three way sedge
24,700	<i>Elymus riparius</i>	Wild rye
24,700	<i>Glyceria canadensis</i>	Mana grass
24,700	<i>Leersia oryzoides</i>	Rice cutgrass
24,700	<i>Poa palustris</i>	Fowl-manna grass
24,700	<i>Schizachyrium scoparium</i>	Little bluestem
24,700	<i>Scirpus atrovirens</i>	Green bulrush
24,700	<i>Scirpus cyperinus</i>	Woolly sedge
24,700	<i>Scirpus validus</i>	Softstem bulrush
24,700	<i>Spartina pectinata</i>	Prairie cordgrass
469,300		

Thicket Swamp EL 74.7-75.75		
Herbaceous Perennials, Ferns		
QTY	Botanical Name	Common Name
700	<i>Asclepias incarnata</i>	Swamp milkweed
700	<i>Asclepias syriaca</i>	Common milkweed
700	<i>Matteuccia struthiopteris</i>	Ostrich fern
700	<i>Onclea sensibilis</i>	Sensitive Fern
700	<i>Osmunda cinnamomea</i> L.	Cinnamon Fern
700	<i>Osmunda regalis</i>	Regal fern
4,200		
Grasses, Sedges, Rushes		
800	<i>Agrostis gigantea</i>	Redtop
800	<i>Alopecurus aequalis</i>	Foxtail
800	<i>Andropogon gerardii</i>	Big bluestem
800	<i>Calamagrostis canadensis</i>	Blue-joint
800	<i>Carex lacustris</i>	Lake sedge
800	<i>Elymus riparius</i>	Wild rye
800	<i>Glyceria canadensis</i>	Mana grass
800	<i>Glyceria grandis</i>	tall mannagrass
800	<i>Juncus effusus</i>	soft rush
800	<i>Leersia oryzoides</i>	Rice cutgrass
800	<i>Poa palustris</i>	Fowl manna grass
800	<i>Scirpus atrovirens</i>	dark green bulrush
800	<i>Scirpus microcarpus</i>	small-fruit bulrush
800	<i>Spartina pectinata</i>	Prairie cordgrass
11,200		

Plant Schedules

Floodplain Forest: EL 75.0- Top of Bank		
Herbaceous Perennials, Ferns		
QTY	Botanical Name	Common Name
13,900	<i>Allium tricoccum</i>	Wild leek
13,900	<i>Hepatica acutiloba</i>	Sharp-lobed hepatica
13,900	<i>Impatiens capensis</i>	Jewelweed
13,900	<i>Maianthemum stellatum</i>	Starry false Solomon's seal
13,900	<i>Matteuccia struthiopteris</i>	Ostrich fern
13,900	<i>Oenothera biennis</i>	Common evening primrose
13,900	<i>Ranunculus hispidus</i>	Swamp buttercup
13,900	<i>Solidago caesia</i>	Bluestem goldenrod
13,900	<i>Symplocarpus foetidus</i>	Skunk cabbage
13,900	<i>Thalictrum dasycarpum</i>	Purple meadow rue
13,900	<i>Tiarella cordifolia</i>	Heartleaf foamflower
152,900		

Grasses, Sedges, Rushes		
8,800	<i>Calamagrostis canadensis</i>	Blue-joint
18,300	<i>Carex crinita</i>	Fringed sedge
18,300	<i>Carex grayi</i>	Gray's sedge
18,300	<i>Carex intumescens</i>	Great bladder sedge
18,300	<i>Carex lacustris</i>	Lake sedge
18,300	<i>Carex lupulina</i>	Hop sedge
8,800	<i>Elymus riparius</i>	Wild rye
8,800	<i>Elymus trachycaulus</i>	Slender wheatgrass
8,800	<i>Glyceria striata</i>	Fowl manna grass
8,800	<i>Leersia oryzoides</i>	Rice cut grass
8,800	<i>Spartina pectinata</i>	Prairie cordgrass
8,800	<i>Sporobolus heterolepis</i>	Prairie dropseed
153,100		