

Bathurst Bridge Replacement

# Design Concept

Design Review Panel Submission

City of Toronto

12 June 2008



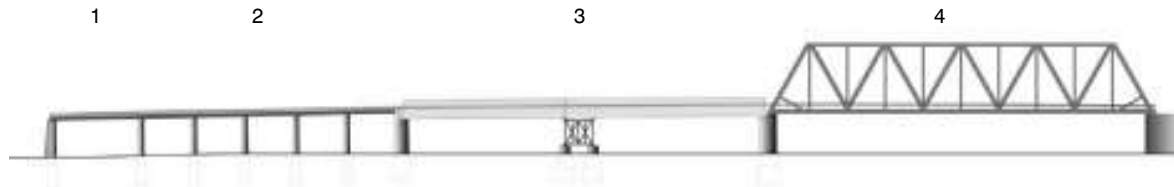
## Approach

This project involves the replacement of the Bathurst Street bridges south of the existing heritage truss due to the deteriorated condition of the existing structure. The project has presented the opportunity to improve public transit on Bathurst Street.

The importance of the project from an urban design perspective stems primarily from sensitivities associated with the bridge's location within the Fort York National Historic Site. The design team hopes to create a structure that is certainly functional, but that also complements the historic setting and facilitates a positive experience for all users both on the bridge and throughout the landscapes below.

With this in mind, the new bridge design should:

- respect and enhance the heritage setting including Fort York and the existing truss bridge;
- create a continuous landscape expression from Fort York through to Blocks 32 and 36;
- optimize views of Fort York both from the bridge and from below;
- be an expression of its own time, establishing a clear distinction between new work and old;
- provide a pedestrian environment, both on the bridge and below, which is appropriately scaled, safe and visually interesting;
- develop an East Gate approach that marks Fort York and complements the new bridge.



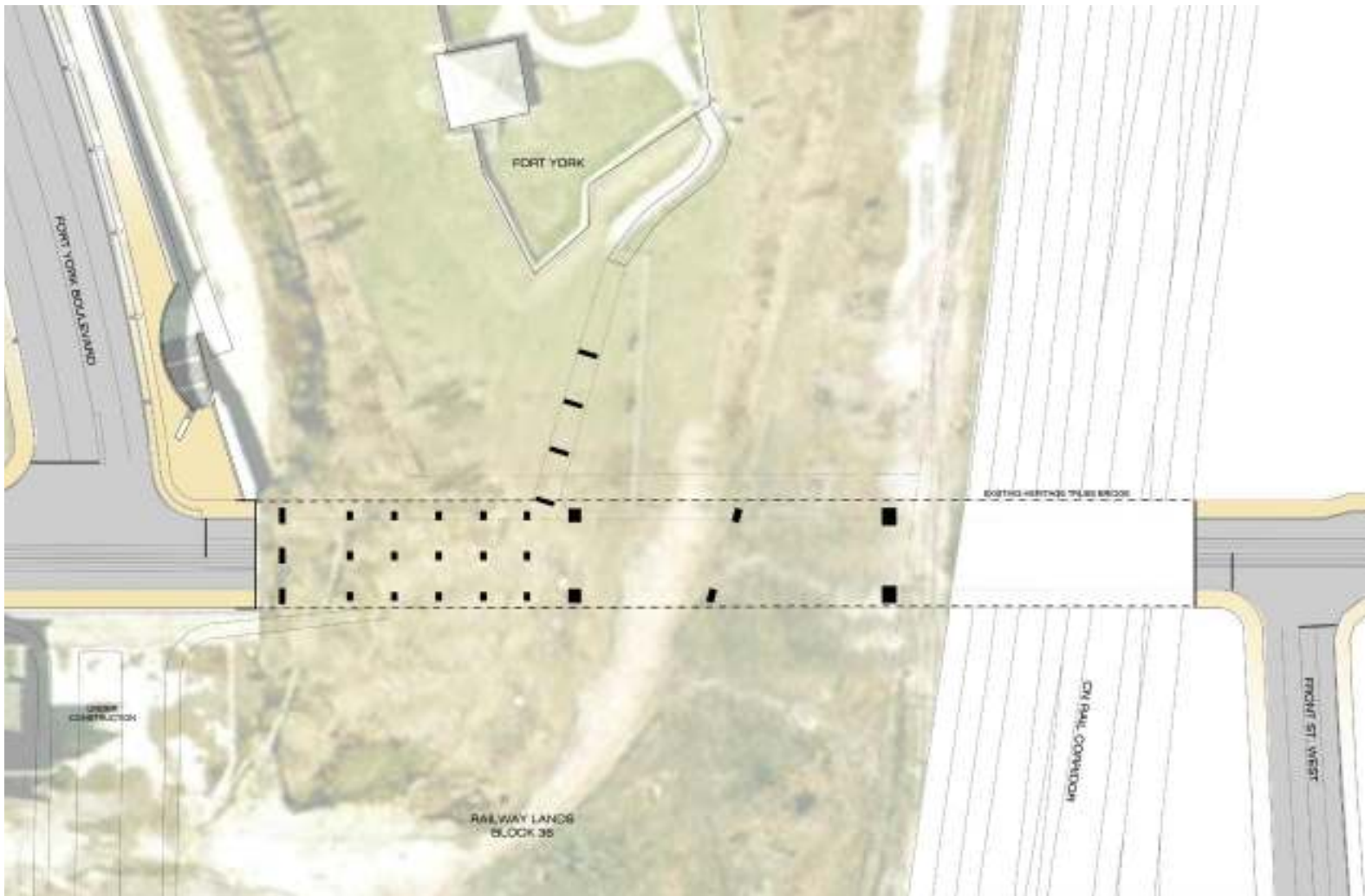
The existing Bathurst Bridge consists of a series of separate structures and distinct bridge types.

1. A single-span steel girder structure with concrete infill.
2. A 5-span concrete girder structure.
3. Two separate through-deck girder bridges.
4. The truss is a visually distinctive structure with an interesting history. It was first built in 1903 as a railway bridge over the Humber River. In 1916, it was dismantled and erected at the foot of Bathurst Street, but on an angle facing southwest. In 1931, the bridge was rotated to its current alignment when Bathurst Street was extended to Lakeshore. In recognition of its heritage value, the truss was listed by Toronto City Council in 1985 and is included on the Ontario Heritage Bridge List by the Ministry of Culture.
5. A 6-span concrete pedestrian bridge provides access to the East Gate of Fort York. Built in 1931 with the other structures, it is oriented at an angle to Bathurst Street because of historical property limitations.

Most of the bridge piers are massive triple concrete structures with deep pier caps. An exception is the centre pier of the through-deck girder bridge, which is a steel trestle structure.

The existing bridges carry numerous utility ducts slung under both sidewalks. The west bank carries Toronto Hydro; the east bank carries Bell Canada.







1. Bathurst Truss Bridge
2. Looking south from Front Street



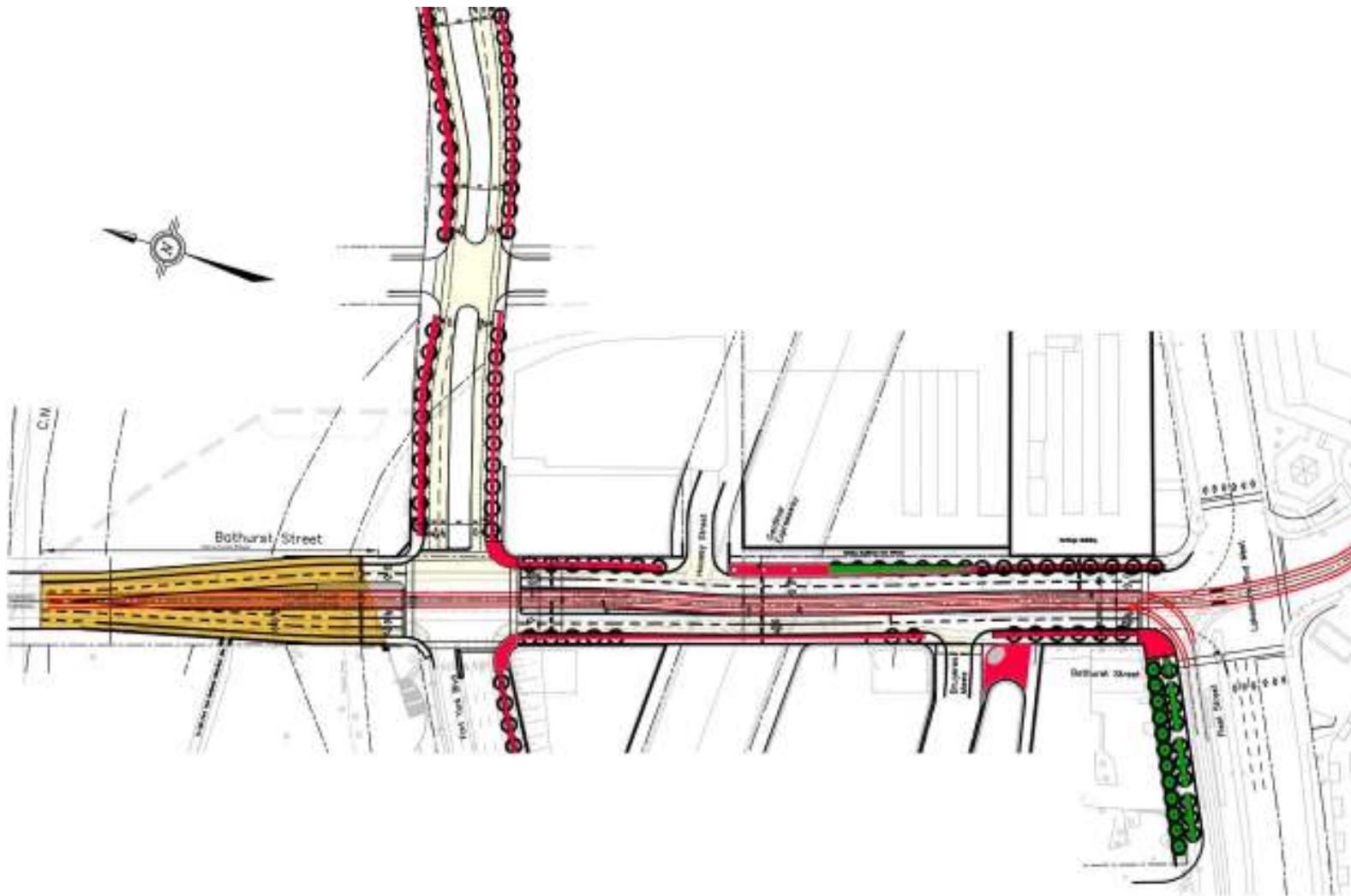
3. Fort York Pedestrian Bridge
4. Piers and Pier Caps

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## Existing Bathurst Bridge





The preliminary planning of the Bathurst Street bridge was a component of a larger Environmental Assessment (EA) process dealing with Fort York Boulevard (formerly Bremner Boulevard), Bathurst Street and Fleet Street. The EA was approved by City Council in July of 2006.

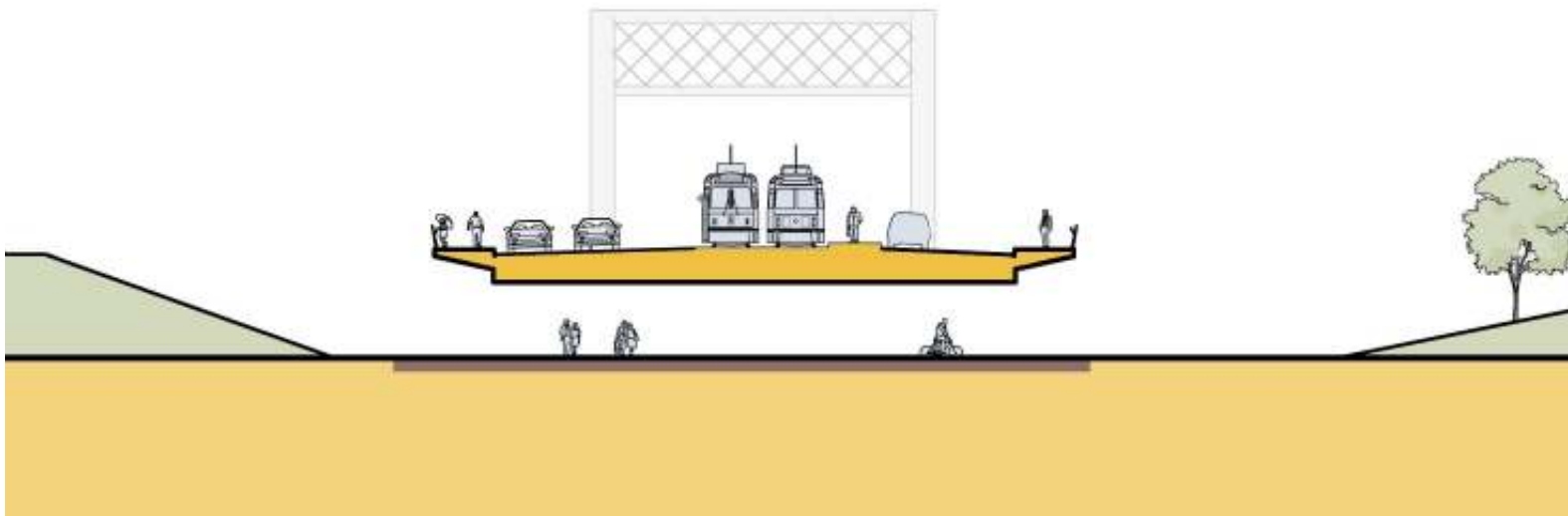
The EA conclusions most relevant to our project include:

- re-construction of Bathurst Street south of Fort York Boulevard to accommodate a designated streetcar right-of-way;
- re-construction of the Bathurst bridge to accommodate the transit right-of-way up to the truss (which is to remain);
- leveling of the Bathurst / Fort York intersection (for streetcars) by raising the south end and depressing the north end.

The basic consequence of these conclusions is a tapering bridge that is lower and wider than the existing bridge at the south end and that rises to meet the existing truss.



West elevation of the new bridge superimposed on the existing (from the ESR, enhanced by DTAH)



Section through the new bridge looking north to the existing truss (DTAH, based on the ESR)





The Bathurst bridge project is being undertaken within the context of a strong planning base guiding the protection and enhancement of historic Fort York and the development of viable new local communities. Key planning initiatives include:

- Fort York Open Space Plan, 2001 (tabled by City Council, 2002)
- Fort York Neighbourhood Public Realm Plan (endorsed by City Council, 2004)
- Blocks 32/36 Public Realm Plan (endorsed by City Council, 2008)

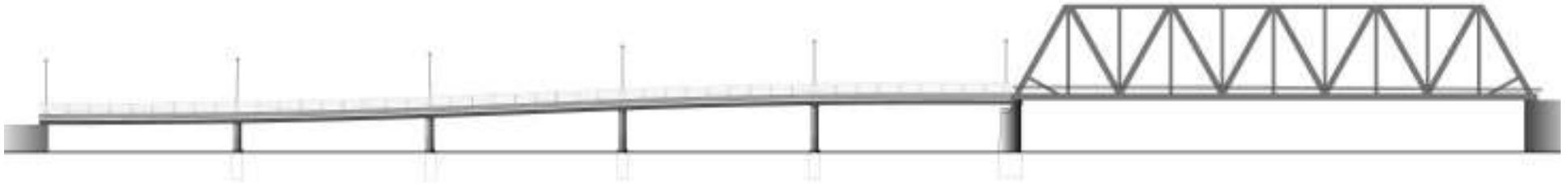
The bridge also crosses through the Fort York Heritage Conservation District, which extends east of Bathurst Street into Block 36.

Common to all of these directives are the following principles, which are relevant to the Bathurst Bridge:

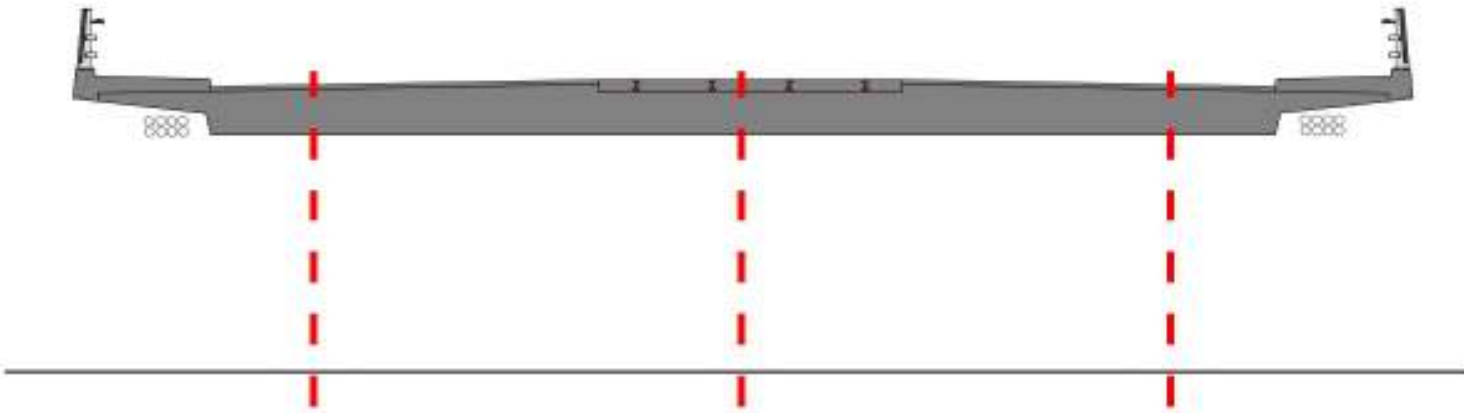
- Establish the continuity of the Fort York landscape under the bridge into Block 36;
- Optimize views under the bridge to and from Fort York;
- Provide for pedestrian/cyclist movement under the bridge;
- Protect and interpret the significant archaeological resources in the vicinity of the bridge;
- Establish Bathurst Street as a major north/south link for all users;
- Support and complement the historic setting through the design of the bridge.







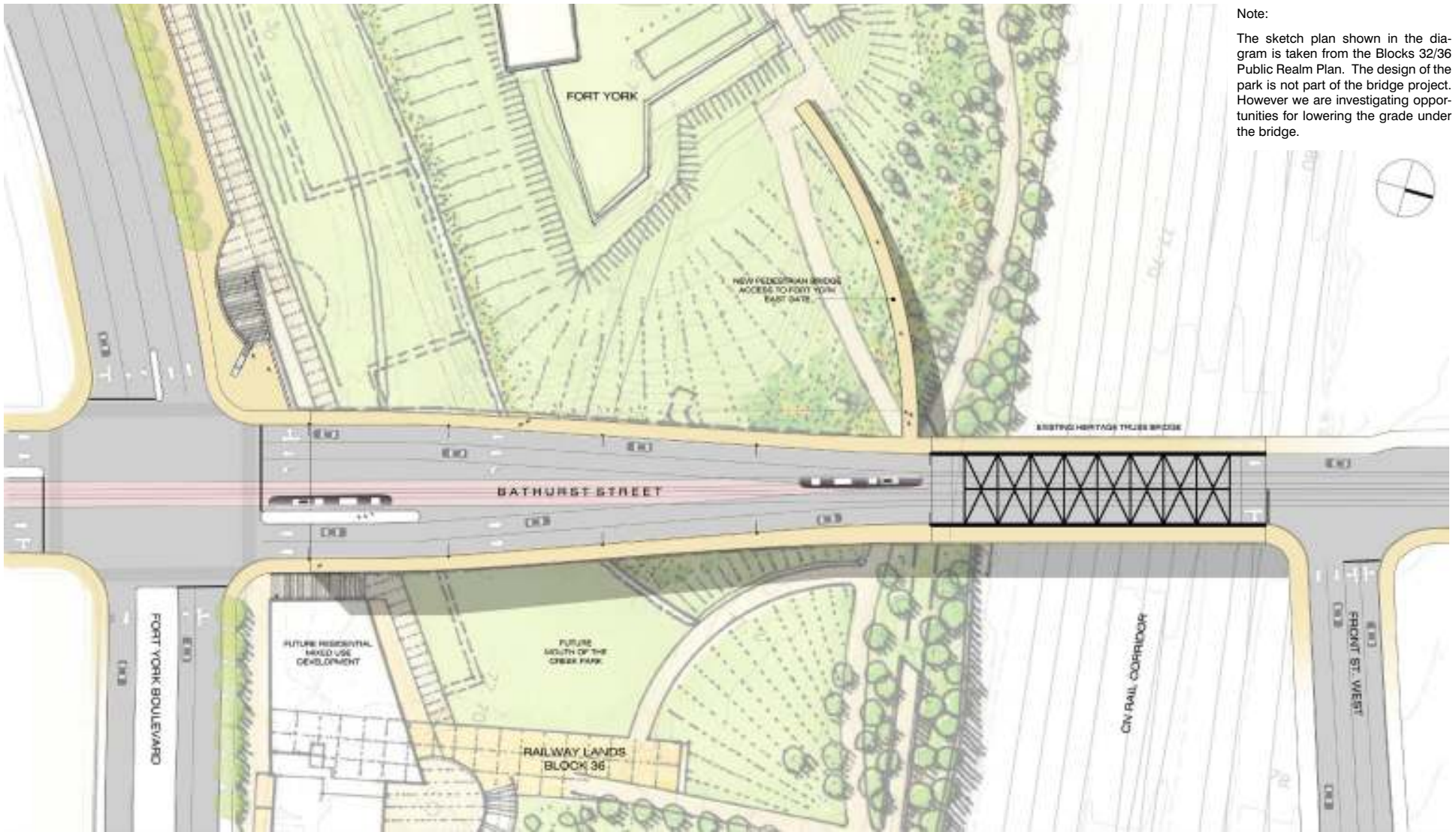
East Elevation



Section

Having examined a broad range of both above- and below-deck structural types, the team recommends a 5-span, post-tensioned concrete deck bridge configuration. The primary reasons include:

- A simple, elegant statement that features the existing truss as the focus of the composition;
- Maximizes slenderness of deck and vertical clearance for pedestrians;
- Reduces the number and mass of piers to facilitate views under the bridge.
- Cast-in-place concrete allows for architectural treatments to deck sides and soffit;
- Minimizes bird roosting locations.
- Provides space below sidewalk for conduit duct banks.



Note:  
 The sketch plan shown in the diagram is taken from the Blocks 32/36 Public Realm Plan. The design of the park is not part of the bridge project. However we are investigating opportunities for lowering the grade under the bridge.

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**Plan - Deck Level**

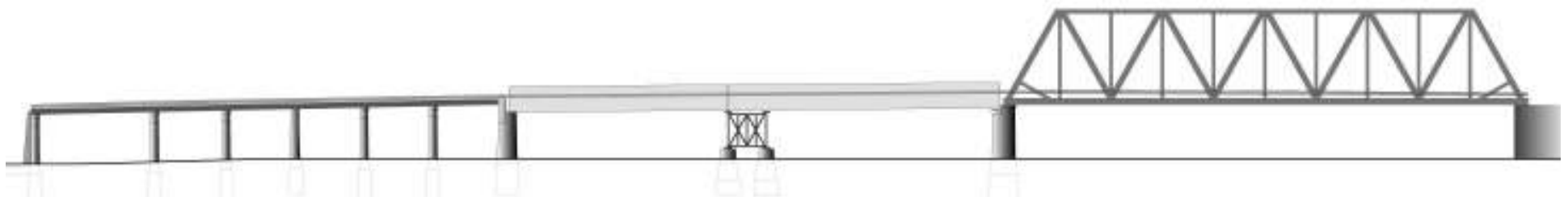




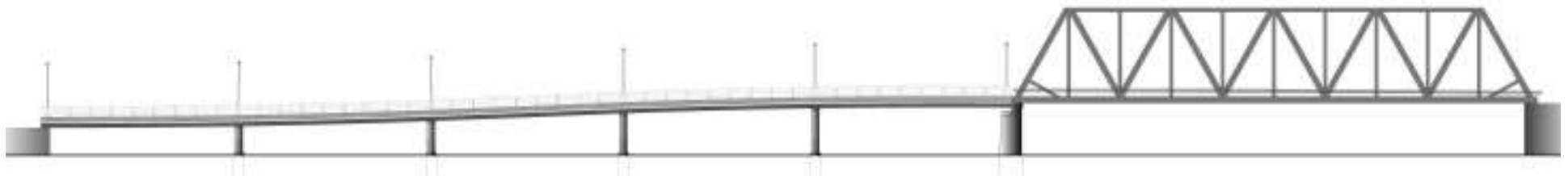
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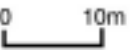


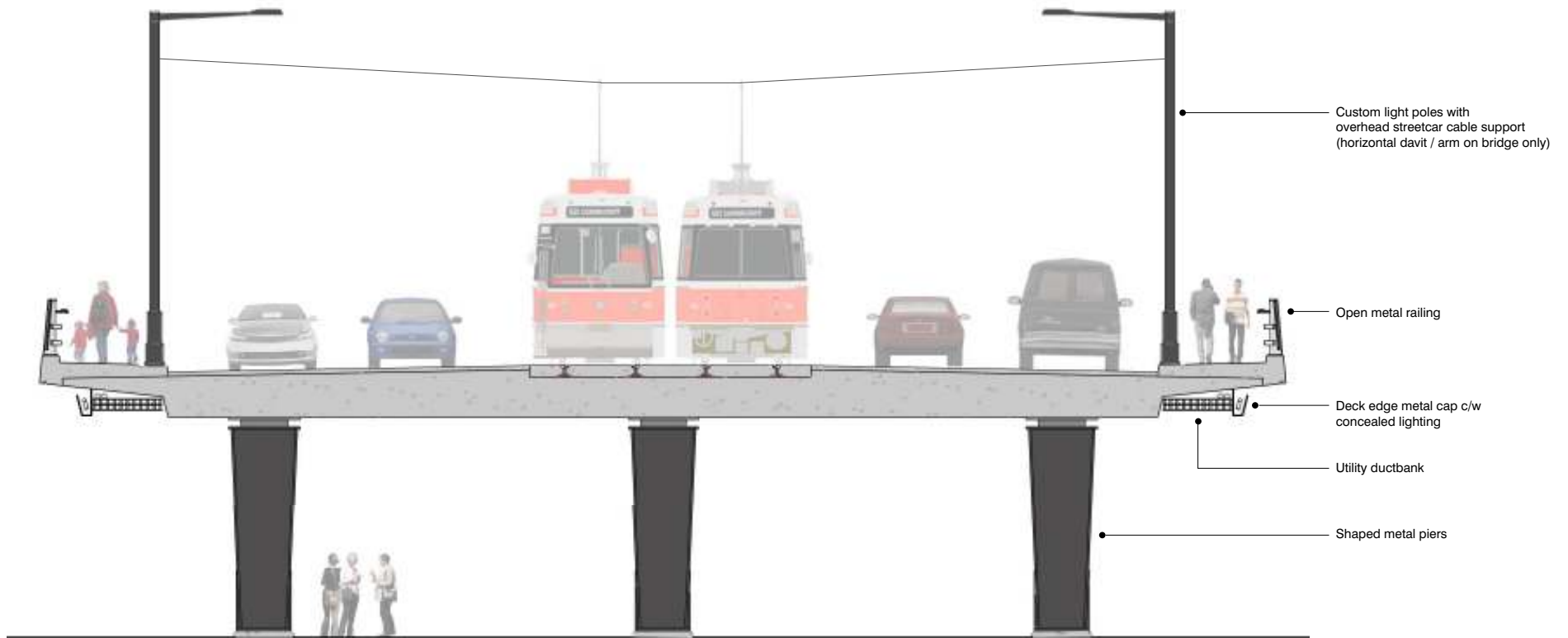


Existing Elevation



Proposed Elevation



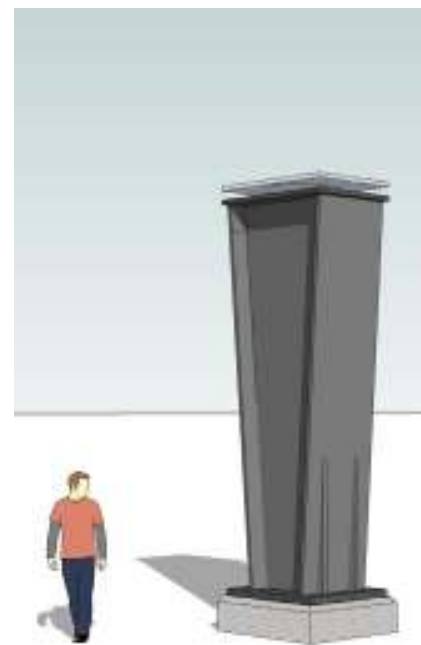
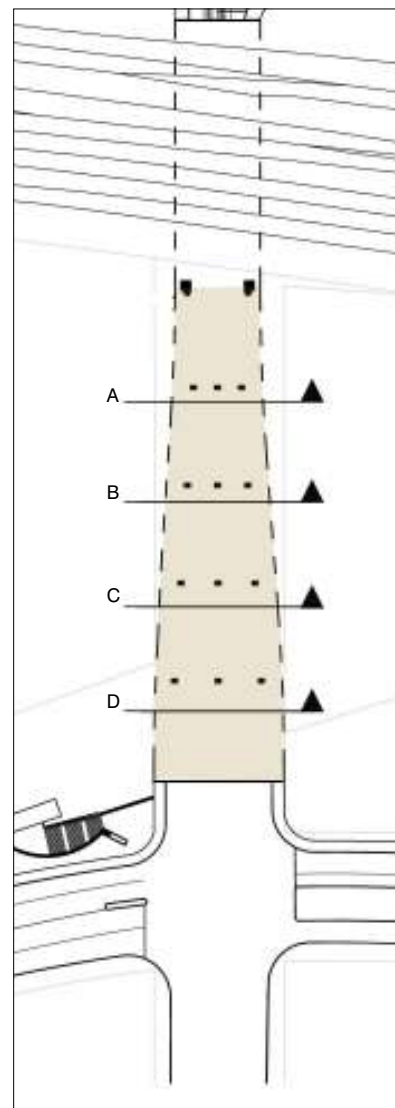
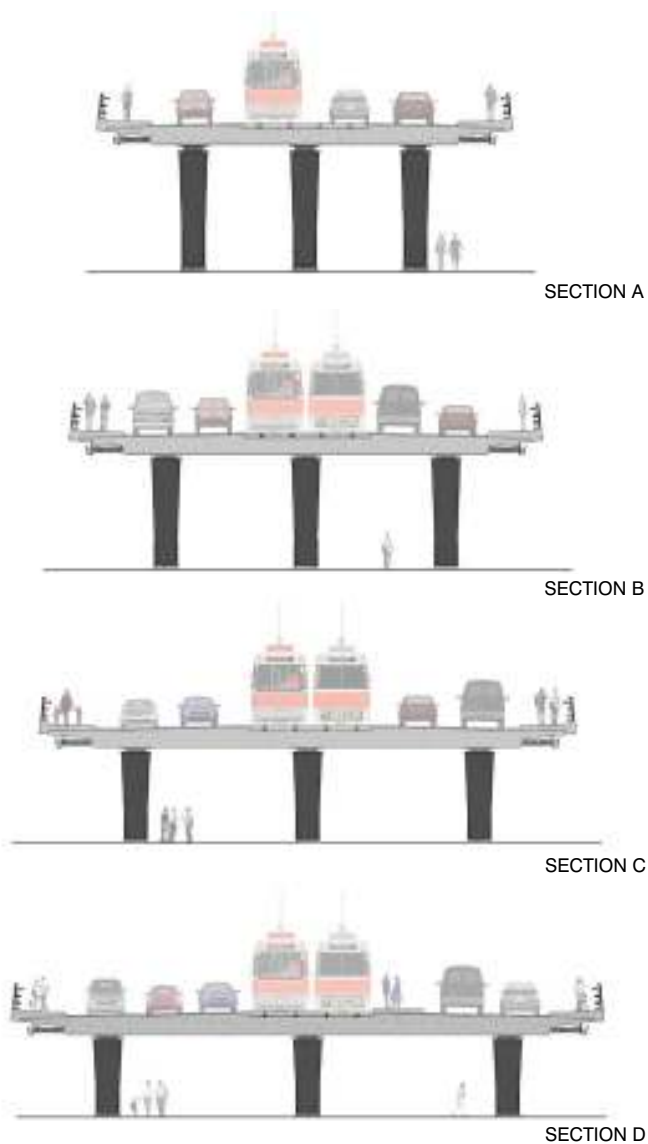


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Proposed Cross Section





The design of the pier and the layout of piers provides visual interest and acknowledges the tapering, rising bridge form.

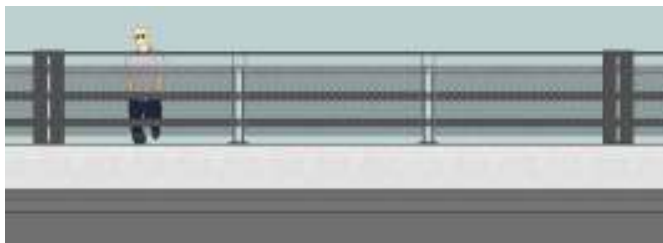
The pier is fabricated from steel plate in recognition of the heritage metal truss structure. It is gently tapered and articulated with projecting ribs. The pier is founded on a concrete footing which rises slightly above the surrounding grade to form a small plinth.

The piers are organized in groups of three with the outer piers set back an equal distance from the edge of deck. As shown in the sections opposite, the piers become taller and closer together as the bridge rises from south to north.

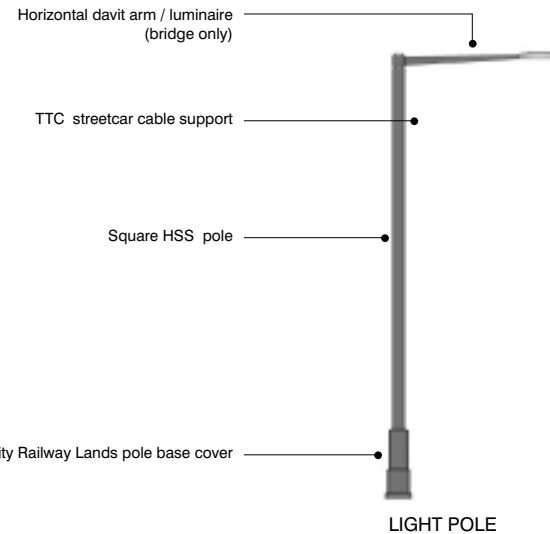
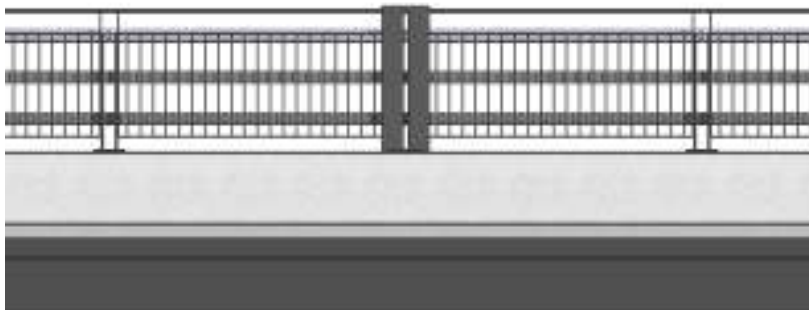




RAILING ELEVATION OPTION 1 - VERTICAL PICKETS

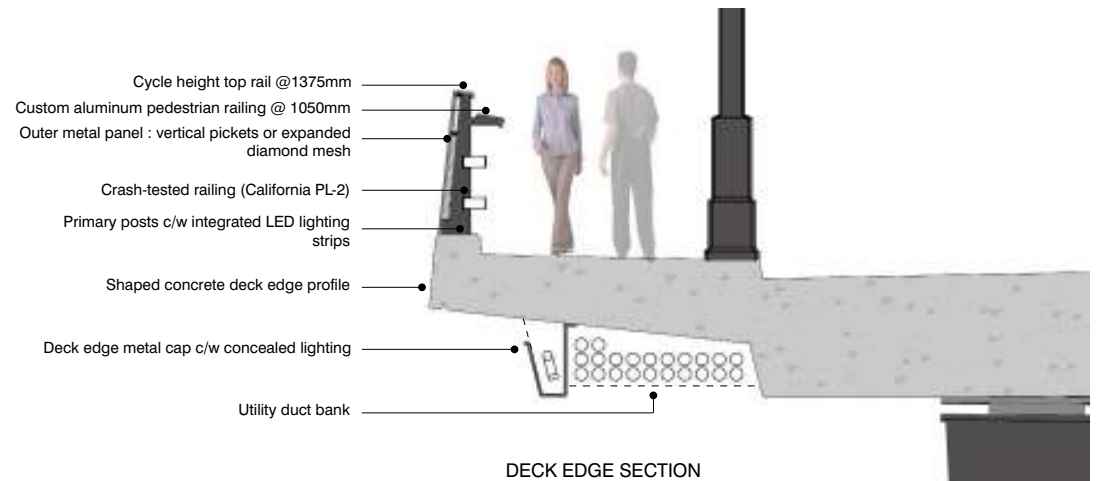


RAILING ELEVATION OPTION 2 - MESH PANELS



The deck edge and associated components are designed to visually lighten the bridge, optimize views and provide an integrated design approach.

- Railing designed as open metal crash barrier (in lieu of standard concrete barrier), as well as safety guard for pedestrians and cyclists; rhythm of "robust" primary posts and lighter more open secondary posts.
- Outer panels have lighter expression to maximize transparency (vertical picket or mesh options being considered).
- Linear LED strip lighting in posts to provide above deck rhythm of vertical accents.
- Continuous linear metal deck edge cap contains concealed lighting to wash underside of deck edge as well as shielding required utility ducts.
- Light poles double as supports for overhead streetcar cables, located adjacent to curb to minimize disruption of deck edge.





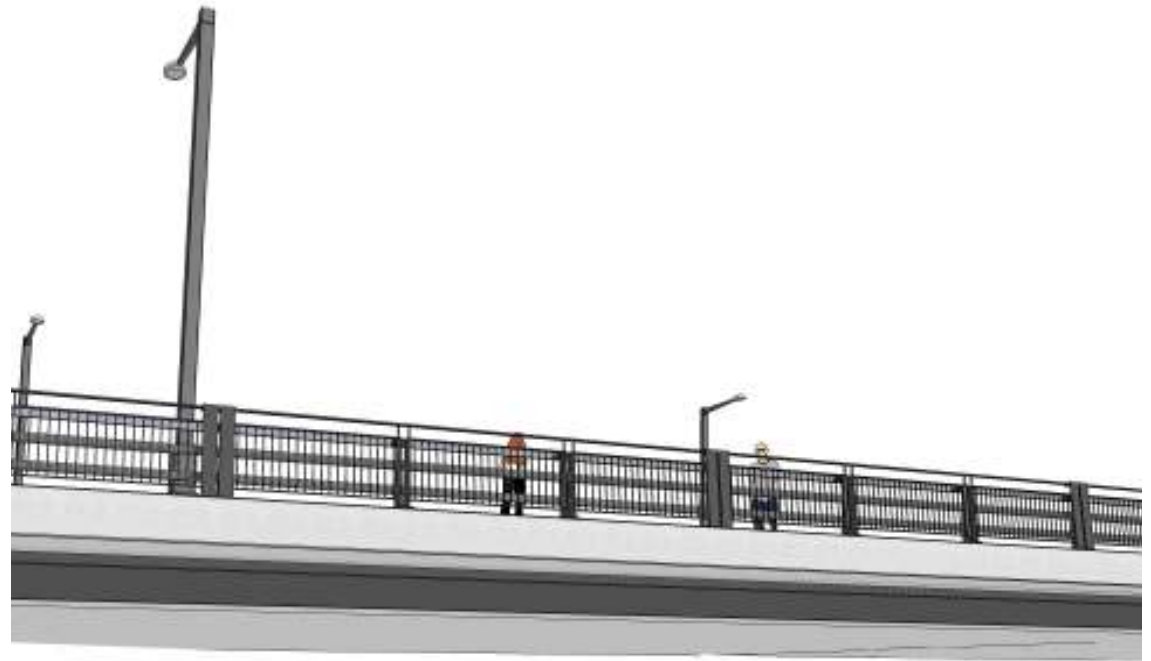
ISOMETRIC OF DECK EDGE



OPTION 1



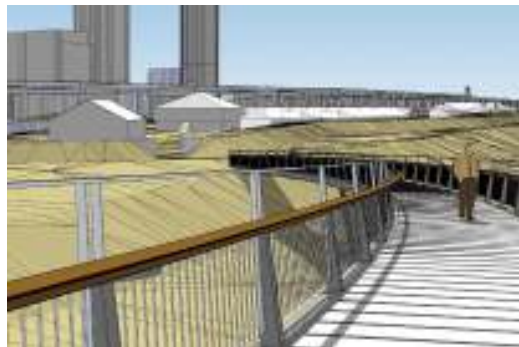
OPTION 2



DECK EDGE FROM BELOW



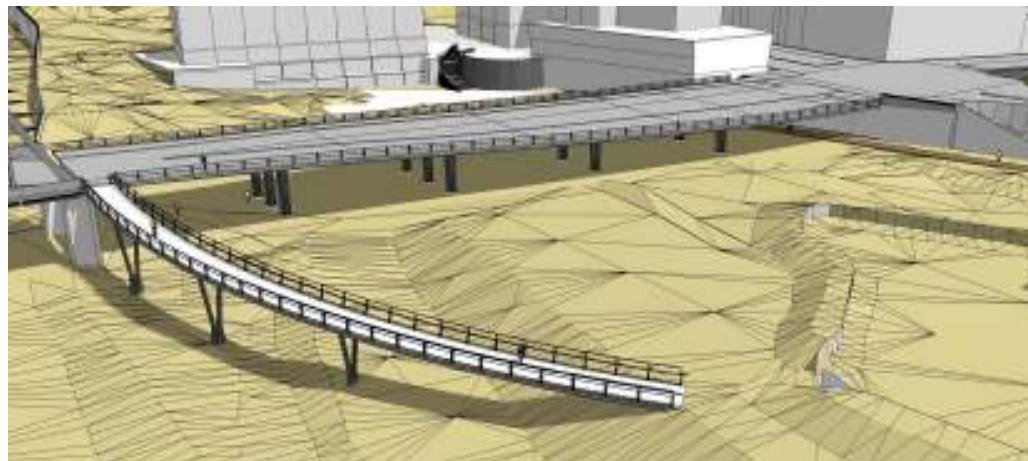
PLAN VIEW



LOOKING TOWARDS THE FORT



LOOKING BACK AT THE EXISTING TRUSS



LOOKING SOUTHEAST



VIEW FROM BELOW

The existing pedestrian bridge to the east gate of Fort York will be replaced as part of this project. The new bridge will also provide additional access to the landscapes under and adjacent to the bridge.

The bridge is located at the south end of the existing truss to reflect the historic approach to the fort, which came from the northeast and crossed Garrison Creek by means of small bridge.

The bridge consists of a metal frame with split piers. Railings are similar to those on the main bridge with the exception of the crash rails, which are not required.

On this page is illustrated a gently curved alignment that leads directly to the east gate and the path leading down into the park.

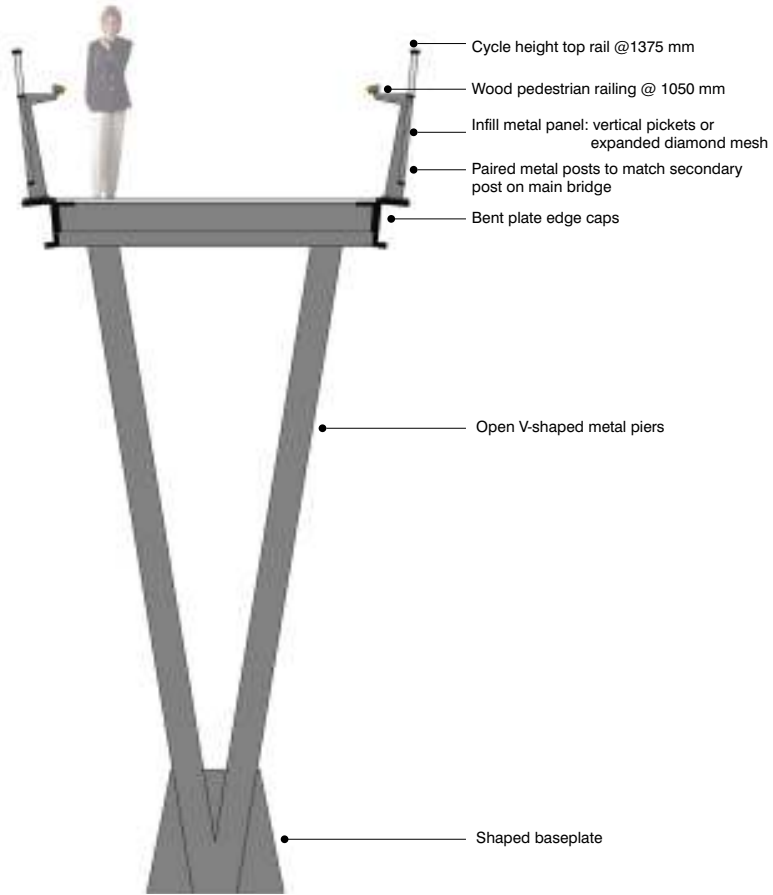
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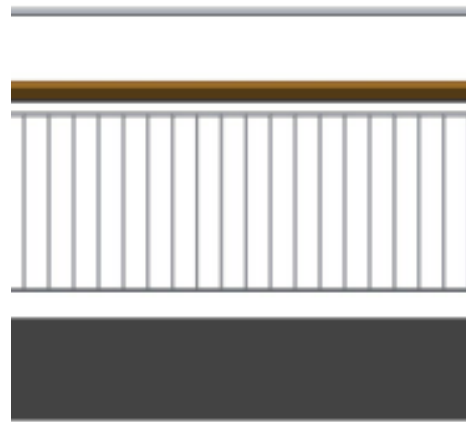
## Pedestrian Bridge Concept







SECTION

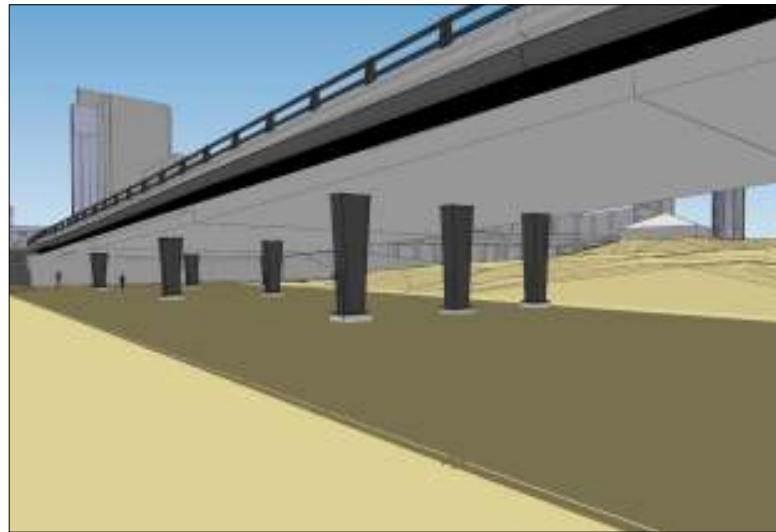


RAILING DETAIL





1. Looking east towards south span
2. Looking west towards north span



3. Looking west at the north end
4. Looking southwest to Fort York

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## Views Under the Bridge

